# The Knowledge Society Delphi: Executive Summary of Main Results

...underpinning trends, impacts and policy areas in EU15’s working conditions, industrial relations & living conditions

by

Rafael Popper

## PREST

## contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction and Delphi Framework</td>
<td>2</td>
</tr>
<tr>
<td>Knowledge Society Delphi</td>
<td>3</td>
</tr>
<tr>
<td>KS Trends more likely to characterise EU15 by 2015</td>
<td>4</td>
</tr>
<tr>
<td>Life-long learning</td>
<td>5</td>
</tr>
<tr>
<td>Use of environmental technologies</td>
<td>6</td>
</tr>
<tr>
<td>Decrease of gender-related pay inequalities</td>
<td>7</td>
</tr>
<tr>
<td>New forms of networked business organisation</td>
<td>8</td>
</tr>
<tr>
<td>Use of electronic networks for remote supervision</td>
<td>9</td>
</tr>
<tr>
<td>Widespread use of ICT in e-governance</td>
<td>10</td>
</tr>
<tr>
<td>Harmonisation of educational standards</td>
<td>11</td>
</tr>
<tr>
<td>Use of telemedicine and online health monitoring</td>
<td>12</td>
</tr>
<tr>
<td>Increased family stress and conflict</td>
<td>13</td>
</tr>
<tr>
<td>Abandonment of common retirement notions</td>
<td>14</td>
</tr>
<tr>
<td>Promotion of labour market mobility</td>
<td>15</td>
</tr>
<tr>
<td>Main Lessons</td>
<td>16</td>
</tr>
<tr>
<td>Prospective Policy Areas</td>
<td>17</td>
</tr>
<tr>
<td>Delphi-based scenario for the Knowledge Society</td>
<td>19</td>
</tr>
<tr>
<td>References</td>
<td>20</td>
</tr>
<tr>
<td>Annex: List of 32 cross-national statements considered in the Delphi</td>
<td>21</td>
</tr>
</tbody>
</table>

Manchester, November 2003
Introduction and Delphi Framework

In the context of its four-year work programme, *Analysing and Anticipating Change to Support Socio-Economic Progress 2001-2004*, the European Foundation for the Improvement of Living and Working Conditions has undertaken a foresight project (Euforia) on the ‘European Knowledge Society and its influence on living conditions, working conditions and industrial relations’.

Euforia is also linked to the Lisbon objectives for the EU to become ‘the most competitive and dynamic knowledge-based economy, capable of sustained economic growth with more and better jobs and greater social cohesion.’ The purpose of the project is to:

- Increase understanding of the forces (colloquially called ‘drivers’) shaping the evolution of the EU as a Knowledge Society
- Anticipate the potential impacts of the Knowledge Society on living conditions, working conditions and industrial relations
- Identify and support paths to positive transformation while avoiding unsatisfactory development paths

This research is based on current and future developments concerning the EU15 with a main focus on three pilot countries (Finland, Germany and Greece) where pilot foresight exercises were carried out.

The project had a multi-fold nature:

- Integrative: involving different European countries, open international participation, coordinated cross-national and national workshops, etc.
- Explorative: using different methods to understand a quite complex topic such as the Knowledge Society.
- Experimental: trying new approaches and modifying existing foresight methods such as the cross-impact analysis, and testing usefulness of multilingual activities, etc.
- Developmental: using previous activities outcomes as inputs for following stages, thus providing a dynamic development on the methodological framework.
- Forward looking: using 15 years as the time horizon in all activities, methods and workshops.

Euforia looked at life as a mix of living conditions, working conditions and industrial relations through experimental, developmental and future-oriented methods in which the Delphi survey played a key part.

The Delphi method was the approach chosen for eliciting expert opinion on the likely occurrence of specific topics. It required the preparation of a carefully designed sequence of interrogations, through a web-based questionnaire, interspersed with the recycling of earlier results. The main assumption in the traditional Delphi is that consensus among a group of respondents is likely to be a better guide than individual opinion; but this is not always the case. There are many examples where collective opinion has been completely wrong and individual opinion, however eccentric, would have been a better guide. But the method still remains a flexible tool and most of its shortcomings can be mitigated. Nevertheless, it must be remembered that the Delphi method is not science and expectations tempered by any contrary view will be sadly mistaken.

The Euforia Delphi looked at 32 cross-national social, technological, economic, environmental, political and values-related (STEEPV) trend statements, clustered into six categories: (1) governance and mobility, (2) health and privacy, (3) industrial relations, (4) living conditions, (5) sustainable development and (6) working conditions.

This report presents a summary of the main results of the Knowledge Society Delphi survey. The full report can be downloaded from the project website: [http://prest.mbs.ac.uk/euforia](http://prest.mbs.ac.uk/euforia)
Euforia Delphi had the great challenge of including every-day-life and social issues from a macro-regional perspective (EU15).

The Delphi process has been very complex and demanding at the same time. Because it was under the framework of a pilot foresight exercise on three countries, the research team decided to explore new ways of carrying out the survey. So a web based-questionnaire was designed in four languages and all traditional face-to-face activities were carried out through the Internet.

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.

So far, Delphi surveys have been generally 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.

Analysing the Delphi output was not a problem given the online 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.

It is important to bear in mind that Euforia Delphi had the great challenge of including every-day-life and social issues from a macro-regional perspective (EU15). For this reason some of the statements may not be seen as futuristic enough or suitable for every EU country. In addition to the participation of selected EU experts, the contribution of interested citizens and researchers from all over the world was also allowed. Therefore, some results of Euforia Delphi may highlight developments that are already in a quite advanced stage in leading European countries. However this summary for the most part focuses on the three pilot country results.

A total of 208 participants answered the Delphi. About 70% of them were from the 3 pilot countries. 22 other countries also contributed, thus increasing to 25 the total number of countries involved. Most responses were from current EU members and candidate countries; however, some researchers from other regions (Asia and The Americas) also participated and shared their concerns about the Knowledge Society by the year 2015.
KS Trends more likely to characterise EU15 by 2015

There were 32 cross-national topics evaluated in the Euforia Delphi but only 11 were considered by respondents as reinforcing trends characterising the European Knowledge Society in 2015.

This report presents those reinforcing KS trends ranked by their degree of influence on nine (9) factors, selected to assess the impacts on living conditions (factors 1, 2, 3), industrial relations (factors 4, 5, 6) and working conditions (factors 7, 8, 9):

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; and
9. **Job creation** – refers to the expansion of employment opportunities at all skill levels irrespective of gender.

In order to understand WHY we have selected these 9 factors we should recall the Lisbon goal of the EU to become ‘the most competitive and dynamic knowledge-based economy, capable of sustained economic growth with more and better jobs and greater social cohesion’.

The idea of a competitive and dynamic knowledge-based economy (goal 1) is more or less captured in factor 6. The idea of sustained economic growth (goal 3) is covered by factors 3 and 5, respectively. The idea of more (goal 4) and better jobs (goal 5) is covered well by factors 4, 7, 8 and 9. Finally, greater social cohesion (goal 6) is strongly covered factors 1 and 2.

The reinforcement of such factors by the various KS trends could give some insight into whether contemporary and anticipated developments in Europe may lead the EC to reach the goals of the Lisbon Summit.
Life-long learning

At the most important and recent events organised by the European Commission (Lisbon Summit 2000 and Barcelona Summit 2002), lifelong learning was acknowledged to have a key role within the European social model. The EC defines life-long learning as “all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competence, within a personal, civic, social and/or employment-related perspective.”

The concept of life-long learning has been used since the 1970s by many other organisations (e.g. UNESCO, UNU, OECD, The Council of Europe, etc.) to promote and implement training and educational programmes.

The Euforia Delphi results pretty much strengthen the idea of life-long learning boosting a great number of Lisbon goals.

In the Delphi, participants were asked to assess the impacts of the trend:

“Life-long learning becomes widespread with a majority of workers undertaking more than one period of substantial retraining during their working life”.  

In addition to the positive impact of life-long learning over most of the factors considered in the Euforia Delphi, two findings can be highlighted: First, opinions about the impact on work-life balance are rather uncertain. Second, opinions about the impact on social exclusion or divides in Finland are at odds with other countries.

The multi-cultural character of the EU15 and the uneven social and economic development of some countries may also lead to localised and unique ways of implementing life-long learning, thus creating different settings for a wide range of European knowledge societies.
Use of environmental technologies

Environmental technologies are an important bridge between the Lisbon strategy (2000), aiming at a more dynamic and competitive Europe, and the Göteborg strategy (2001) for sustainable development.

In the Delphi, participants were asked to assess the impacts of the trend:

“Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies”.

We can conclude that there is a consensus about most of the impacts on the considered factors.

Environmental technologies can increase job creation, enhance entrepreneurship and innovativeness, boost economic growth and wealth creation, and improve sustainability and environmental quality.

The use of environmental technologies goes far beyond the production of devices to clean up pollution. It involves the concentration of resources to develop and implement:

• ‘integrated’ technologies to prevent pollutants being generated during the production process;
• new materials;
• energy and resource-efficient production processes;
• environmental know-how; and,
• new ways of working.

To sum up, we should acknowledge European leadership and strengths of environmental programmes and take advantage of the opportunities that environmental technologies represent for the region. Other important benefits of the use of environmental technologies are the expected improvement of social cohesion and the decline of social exclusion.
The 3rd reinforcing KS Trend

...gender mainstreaming involves a systematic assessment of measures and policies. It also requires the evaluation of possible effects when defining and implementing them...

...the Finnish Delphi shows that a decrease in gender related pay inequalities would worsen work-life balance...

...the promotion of equality must not be confused with the simple objective of balancing the statistics...

Decrease of gender-related pay inequalities

The Euforia Delphi results are pretty much aligned with the European Community Framework Strategy on Gender Equality (2001-2005) and therefore strengthen the idea that all Community policies should promote gender equality.

Two types of interventions have been envisaged by the EC:

- **Pro-active intervention**: based on gender mainstreaming.
- **Reactive intervention**: based on concrete actions designed to improve the situation of women in society.

In the Delphi, participants were asked to assess the impacts of the trend:

"Social and policy changes in European countries encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities".

BUT as clearly stated in the 1996 EC Communication on Incorporating equal opportunities for women and men into all Community policies and activities, we should keep in mind that:

"The promotion of equality must not be confused with the simple objective of balancing the statistics".

Gender equality policies should be carefully designed in order to reach the desired impacts on social cohesion, employer-employee relations, job creation, economic growth, sustainable development and entrepreneurship.

One outstanding result of the Finnish Delphi was the expected negative impact over work-life balance.
New forms of networked business organisation

In the EU15 it is realistic to believe that networks are and will be the backbone of new organisations. Networks are capable of forming and spreading throughout all the highways and byways of the global economy because they are based on the power of information.

In the Delphi, participants were asked to assess the impacts of the trend:

"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".

From the Delphi results we can clearly see that the emergence of new forms of networked organisations is perceived to increase job creation, employ autonomy and responsibility at work, entrepreneurship and innovativeness, economic growth and wealth creation. However, there are serious concerns about the real impact of networks in key social factors such as work-life balance, employer-employee relations, social exclusion or divides and social cohesion.

Whilst Greeks assume that the employer-employees relations will improve, both Germans and Finns believe that the opposite would occur in their countries. On the other hand we can see that social exclusion and or divides is expected to increase in Germany and Finland while in Greece the foreseeable impact pictures an integrated society with less social exclusion.

Last but not least, we should draw attention to the high level of uncertainty regarding the impacts of new networked organisations over social cohesion. In all countries the distribution of answers led to multi-modal histograms where the Greek ended with a MEAN of zero, Germany with a slight tendency towards a negative impact over social cohesion and Finland with a moderate positive impact.
The 5th reinforcing KS Trend

...there are many driving forces promoting the use of electronic networks...

...In some countries electronic supervision may worsen the relationships between employers & employees...

...the use of electronic networks for remote supervision requires further research on possible social drawbacks...

Use of electronic networks for remote supervision

Electronic networks are progressively more integrated into society. In the Euforia Delphi we have considered their use for remote supervision but there are many other driving forces promoting extensive research and development of electronic networks (i.e. moves towards a knowledge-based economy, intensification of consumer choice, growing concerns about privacy, and impacts of private and public planning and monitoring systems, among others).

In the Delphi, participants were asked to assess the impacts of the trend:

“A major increase occurs in the use of electronic networks for remote supervision of new kinds of work (tele-working, mobile working), and new atypical forms of work”.

In a recent study conducted by the Strategy Unit of the UK Cabinet Office several uses of electronic networks were pinpointed:

- improving services to financial institutions and enabling the rapid and accurate exchange of information;
- helping companies to adopt new ways of working that can increase the quantity and quality of their output;
- helping people to match their working skills with companies’ needs;
- contributing to the delivery & management of public services that would be less effectively and more expensively delivered by other means; and
- facilitating the transfer of data in place of the transfer of people or goods.

The above arguments certainly give reasons for the use of electronic networks. But, their use for remote supervision needs further research on possible drawbacks (i.e. decreased social cohesion, increased social exclusion).
The widespread use of ICT in e-governance

The widespread use of ICT in European societies is still a big challenge for some of the current EU15 Member States. As highlighted in the country profile indicators report prepared by empirica, the use of internet and broadband access in some countries (e.g. Greece) is rather low when compared with the EU15 average. Yet, it is widely believed that by 2015, ICT will be extensively used in e-governance.

Ministers of EU Member States and EFTA have recently met in Athens (May 2003) to discuss tools of e-governance in the EU15. In that meeting, they agreed that:

**ICT can be a powerful tool for good governance and endorsed the following key principles:**

- Universal Access to information
- Openness-Transparency
- Participation
- Equity
- Accountability
- Effectiveness
- Coherence
- Quality of e-services

In the Delphi, participants were asked to assess the impacts of the trend:

“**Widespread use of ICT in e-governance enhances transparency in the procedures concerning the relationship between the citizen and the state**”.

The results were roughly consistent with the views of European ministers. Its use would positively impact on industrial relations factors. Social cohesion, environmental quality and sustainable development would also increase. BUT uncertainties about the impacts on social exclusion or divides, work-life balance, and job creation may challenge EU Ministers’ assumptions about the use of ICT resulting in more equity.
Harmonisation of educational standards

In June 2003, the Governing Board of the European Police College submitted its annual activity report in which reference is made to harmonisation of educational standards. The report briefly states that “in order to achieve a real harmonisation of educational standards in Europe, a more consistent and compulsory implementation has to be carried out”. Of course, this would involve an extensive peer review process which has not been designed or started yet but hopefully already implemented by 2015.

In the Delphi, participants were asked to assess the impacts of the trend:

“Harmonisation of educational standards (including certification) across the EU increases trust and transparency in the educational system”.

The results show clearly that if Europe has a harmonised educational standard then it would contribute tremendously to all Lisbon related strategies.

Participants from all participating EU countries, including Finland, Germany and Greece, are aware of the positive impact of a transparent system where diplomas and certificates are recognised at the European level.

In the enlarged Europe of 2015, characterised by a knowledge-based economy, it is hard to imagine the EU educational systems not being standardised and harmonised yet.

Of course this will involve a long and complex process of revision of academic programmes where, at least at the higher education and post-graduate levels, strict control systems must be implemented.

Another challenge is the maintenance of traditional and cultural characteristics of each national educational programme. So, research efforts in this direction should not be underestimated.
Use of telemedicine and online health monitoring

The Euforia project looked at telemedicine as the provision of health services (clinical, educational or administrative) by means of the transfer of information (video, audio, graphics, text, signals or data content), via telecommunication technologies.

In the Delphi, participants were asked to assess the impacts of the trend:

“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”.

Both use of telemedicine and online health monitoring were believed to improve the following factors:

Economic growth, wealth creation, entrepreneurship and innovativeness, social cohesion and job creation.

A considerable number of participants believed that the use of telemedicine and online health monitoring will have no effect over sustainable development, environmental quality and work-life balance but the distribution of responses still favoured the MEAN to reach a positive value. Finally, many participants believed that there would be no effect over employer-employee relations and employee autonomy and responsibility at work.

Regarding the impacts on social exclusion, there was a nearly flat distribution on Finnish opinions but results suggested that social exclusion would slightly increase.

A different position was assumed by the Greeks and Germans who show a strong determination in presenting telemedicine and online health monitoring as an important contributor in reducing social exclusion or divides.
The 9th reinforcing KS Trend

Work-life balance is about correcting working habits and patterns in order to find a desirable and efficient time distribution between working activities and other responsibilities and/or pleasures.

Increased family stress and conflict

Work-life balance seeks for a desirable and efficient time distribution between working activities and other responsibilities and/or pleasures...

...doubts arise on whether this trend will slow down economic growth and wealth creation, especially in Germany.

...over 75% of the Greek participants believe that sustainability and environmental quality would decrease...

In the Delphi, participants were asked to assess the impacts of the trend:

"Despite social and employment policy interventions, for most workers their work-life balance deteriorates causing rising family stress and conflict".

A considerable number of participants believed that increased stress and family conflicts would have no effect over job creation; the Greeks strongly hold a position assuming that the impact would be negative whilst Germans expect job creation to increase.

This unenthusiastic trend was believed to decrease social cohesion, employer-employee relations and work-life balance.

Doubts arise on whether this trend will slow down economic growth and wealth creation, especially in Germany.

Social exclusion or divides were believed to increase in all countries.

Much ambiguity can be detected on the way rising family stress and conflict would impact on entrepreneurship and innovativeness as well as on employee autonomy and responsibility at work.

The work-life balance deterioration and the rising of family stress and conflict were perceived by many as a phenomenon completely independent of environmental and sustainability issues. But in absolute terms, the majority still believe that it would have a negative impact.

![Diagram showing the impacts of increased family stress and conflict on various factors such as job creation, employee autonomy and responsibility at work, sustainability and environmental quality, entrepreneurship and innovativeness, social exclusion or divides, and social cohesion, with data from Greece, Germany, and Finland.

Mean of the impact:
-1 = decreases
0 = no effect / doubts
1 = increases

- Greece (62 experts)
- Germany (23 experts)
- Finland (53 experts)
Abandonment of common retirement notions

The Lisbon Summit set very ambitious targets in the field of retirement policies: to promote active ageing, notably by fostering working conditions conducive to job retention – such as access to continuing training and flexible forms of work organisation – and eliminating incentives for early exit from the labour market, notably by reforming early retirement schemes and ensuring that it pays to remain active in the labour market.

Some European countries have already launched National Programmes for Ageing Workers. The Finnish NPAW (1998-2002) has implemented various measures to improve the employment situation of persons aged over 50.

The NPAW aims to offer employment to over-45s thus decreasing early retirement and social exclusion. The NPAW also promotes the dissemination of research related to the ageing society.

In the Delphi, participants were asked to assess the impacts of the trend:

“Widespread abandonment of conventional notions of retirement enable the elderly to continue working if they wish to”.

The Delphi results show that job creation would slightly increase if more flexible retirement notions emergence.

Bi-modal distributions can be found in the countries’ histograms on work-life balance and these explain the zero value (or doubts) of Greek respondents.

We could say that in general participants are confident on the positive impact that new notions of retirement would have over entrepreneurship and innovativeness, economic growth and wealth creation.
Promotion of labour market mobility

In a recent communication on labour-market mobility, the European Commission states the following: “The emerging new European labour markets contain geographical and occupational dimensions, too. The drivers of these new labour markets are, however, rather different: globalisation; technological, social and demographic change; the processes of European integration itself, including the euro; and the shift to services. These driving forces affect not only the mobility of labour, but also the need for and availability of skills at all levels, including basic and intermediate skills.”

In the Delphi, participants were asked to assess the impacts of the trend:

“EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions & employer organisations”.

The promotion of labour market mobility 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.

The Delphi results are particularly interesting on the perceived impact of labour mobility in the different pilot countries.

First, there is too much uncertainty on how labour mobility would impact on social cohesion, social exclusion, sustainability and environmental quality at the EU level.

Second, the impacts over work-life balance are remarkable and may encourage future research in the field.

Finally, we should highlight the different country perceptions about the impacts on employer-employee relations and employee autonomy & responsibility at work.
Main Lessons

Lessons on participation
The main concern with the Delphi 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.

A further problem is the ever present lack of appreciation of the viability of a 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.

Lessons on online Delphi
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.

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. 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 (marketing, promotion, management of panels, etc.).

Lessons on technical issues
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 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. The most tiresome problem was translation of the questionnaire into Finnish, German and Greek. The effort and cost involved cannot be underestimated. Another lesson that can be drawn is that some languages such as Greek, Japanese, Korean or Arabic require special characters and features that are not always provided in basic software packages and this was discovered while designing the Greek questionnaire. We had therefore to adapt our Delphi system in order for the Greek Delphi to be launched at the same time as the German, Finnish and English versions. 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.

Lessons on results
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.
Prospective Policy Areas

After analysing all the Euforia Delphi data, we have detected seven KS trends presenting some interesting results (see table below).

<table>
<thead>
<tr>
<th>ID</th>
<th>Category</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>Governance &amp; mobility</td>
<td>Labour relations organisations (e.g. trade union and other representative bodies) will have a major influence on government and business in shaping the knowledge society in my country.</td>
</tr>
<tr>
<td>15</td>
<td>Industrial relations</td>
<td>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.</td>
</tr>
<tr>
<td>16</td>
<td>Industrial relations</td>
<td>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.</td>
</tr>
<tr>
<td>17</td>
<td>Living conditions</td>
<td>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.</td>
</tr>
<tr>
<td>22</td>
<td>Sustainability &amp; development</td>
<td>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.</td>
</tr>
<tr>
<td>26</td>
<td>Sustainability &amp; development</td>
<td>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.</td>
</tr>
<tr>
<td>31</td>
<td>Working conditions</td>
<td>New organisational procedures and systems that turn firms and other organisations into &quot;learning organisations&quot; have been widely adopted, and not just by a small vanguard, in my country.</td>
</tr>
</tbody>
</table>

Many of these topics accord closely with the Lisbon objectives. Increased application of IT; orientation of innovation toward sustainability; life-long learning; new forms of work; and networked organisations are all explicit or implicit in these declarations. A few topics are rather more ambiguous, especially those concerning workplace stress and work-life balances. 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 above).

Notably, many of these topics concern workplace, employment and industrial relations issues. They 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 be seriously tackled. There are two key characteristics that the above sets of KS trends have in common. The first one is that their development overestimates the situation by 2015, and the second is related to their influence on LC, IR and WC on the basis of their hypothetical development by 2015. By looking more carefully we can observe the following behaviour:

- All seven KS trends were believed to increase economic growth
- Six out of seven trends (6/7) were believed to increase social cohesion and employee autonomy and responsibility at work.
- Five out of seven (5/7) show a similar positive behaviour on the way they impact over the remaining factors.
The overall assessment of the impacts of these KS trends can be described as follows: In terms of living conditions most trends could positively influence all LC factors (increasing social cohesion, decreasing social exclusion and increasing sustainability and environmental quality).

The above KS trends could also improve all IR factors (employer-employee relations, economic growth / wealth creation, and entrepreneurship and innovativeness) and WC factors (employee autonomy and responsibility at work, work-life balance and job creation). In this section we present the seven KS trends ranked by number of positive influences on the LC, IR and WC factors. We also believe that in spite of the general lack of optimism regarding the future development of these Knowledge Society trends, it is still worth keeping them in mind and think about them as prospective policy areas requiring further work and analysis from policy-makers. This would then help us envisage new paths for Europe to reach the Lisbon goals.

**Weak trends strongly aligned with the Lisbon objectives**

The 1st policy area: **Emphasis on ethics, justice and equity**

Statement 17: 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.

The 2nd policy area: **Widespread organisational learning**

Statement 31: 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.

Remarks: Assuming that the above assessments of the impacts of this trend are well-founded, then why has it been partially suggested that the introduction of new procedures and systems promoting organisational learning could have a negative impact over work-life balance?

The 3rd policy area: **Bottom-up decision-making style in organisations**

Statement 16: 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.

The 4th policy area: **E-commerce as a tool for regional development**

Statement 22: 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.

The 5th policy area: **Improved trade unions**

Statement 15: 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.

The 6th policy area: **Labour organisations hand-by-hand with government & business**

Statement 03: Labour relations organisations (e.g. trade union and other representative bodies) will have a major influence on government and business in shaping the knowledge society in my country.

Remarks: Assuming that the impacts of this trend are well-founded, what could be the actual impact on entrepreneurship, innovativeness and job creation of an increased influence of labour relations organisations on government and businesses?

The 7th policy area: **Shifts of EU resources towards accession countries**

Statement 26: 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.
Delphi-based scenario for the Knowledge Society

In this section we used the results of the Delphi survey for the creation of a Delphi-based scenario. The scenario shows some events around the life of a 16 years old European school student and her family. Using story telling techniques, we have tried to link those trends that were identified by the 208 Delphi participants as the most likely characteristics of the European society by 2015.

Leia’s Monday morning by 2015

On a warm sunny spring Monday morning Leia wakes up at 6:45 AM. She goes to the kitchen to have early breakfast with her mother who is leaving soon for a trip. After breakfast her mother takes a taxi to Brussels Airport. Leia’s mother (Jennifer) works for the Information Society Directorate of the European Commission in a new unit called ARTIST (Applied Research and Training in Information Society Technologies). ARTIST was created last year, one of the ultimate outcomes of the Eighth Framework Programme (2010-2014) of the EU. Jennifer is having a one-week course on remote office management. The course is paid for by the European Commission using LOLILE (long-life learning) funds. Already on the airplane at 8:30 AM, she uses the ‘remote office supervision’ menu in her mobile phone and sees that her assistant has arrived to the office at 8AM. She can also see that her assistant is already finishing a proposal that should be delivered before midday, but she still sends a pop-up reminder to the assistant’s computer screen. After 2 hours, Leia receives a message from the airline saying her mother arrived safely in Finland.

At 9:30 Jennifer gets to Helsinki University of Technology where the 5-days training course on remote technologies is delivered by Finnish, Czech and Swedish experts. After successful completion of the course, she will be posted a standard certificate from the ETC (European Training Certificates) office in Slovenia.

Leia’s mother is Hungarian and she moved to Belgium after getting married to a Bulgarian professor (Christian). Christian has been teaching environmental science at the Brussels University since labour mobility became widely accepted in 2010. Occasionally he does some consultancy work for international organisations such as UNIDO and more recently for OECD and the European Environmental Agency. Currently he is supervising a Masters student from France writing a dissertation on the main impacts of the implementation of leading European environmental technologies in the USA and China during 2010-2015.

Leia’s grandfather is a 77 year old congressman. He is still working thanks to the introduction of a new active-retirement scheme. He actually delivers the job from home since he volunteered to the e-CT programme (electronic Congress Tester). The e-CT was launched by the e-Europe programme in 2010 in order to promote a gradual move towards an e-governance system. Besides his age, another reason for him to do home-based work is because of some skin related allergy problems that require constant monitoring using online health services. Such services are provided by a health centre located in London, UK.

It is nearly midday and Leia is sitting with a new classmate (Mimoko) in the high-school’s canteen. Mimoko is from Japan and speaks no French but her English is rather good. Her family moved to Europe only a few months ago at the beginning of the summer. After fifteen minutes of conversation about life styles in Japan, Leia asked Mimoko about the thing she likes the best in her new life in Europe. Mimoko started thinking and suddenly became a bit nervous, but keeping an innocent smile on her face… after 3 seconds she said to Leia:

- “It’s kind of an embarrassing but at the same time nice situation… I am very surprised my mom’s income is very close to my father’s…they are both accountants with the same years of working experience…but she had always earned half or less than my dad!”

- “Well Mimoko, you don’t have to feel embarrassed about it! Last year we had a course about working conditions at the beginning of the 21st century and the teacher said that Europe suffered quite a lot from gender-related pay inequalities at that time!” And… What is the thing you don’t like in your life in here?”

- “I really don’t know Leia…maybe something related to what the teacher said today about increased family stress and conflicts in life-style…remember when she explained about the work-life balance problem?! …but honestly, we have the same problem in Japan too!”

- “Yes, I feel the same Mimoko… I would like to spend more time with my mother. Imagine! I only saw her a few minutes this morning and she will be back from her trip only next week!”
References


- **European Commission** (March 2002) - Joint Research Centre (DG JRC) - IPTS, *Enlargement Futures Project Information and Communication Technologies*, Enlargement Futures Series 05.

- **European Commission** (Spring 2003), DG for Employment and Social Affairs, Employment & European Social Fund, Unit A.2, *Observatory Review: European Employment*

- **European Training Foundation** (2002), Parallel session on *Lifelong learning: a comprehensive approach to education and training policies* at the World Bank Institute Labour Market Policies course.

- **EU Ministerial Meeting Declaration** (May 2003), *Tools of e-governance in the European Union and its South Eastern European Neighbours*


- **Commission of the European Communities** (2003), DG for Employment and Social Affairs, *Gender mainstreaming in the Joint Inclusion Memoranda for future Member States - practical guide*, Brussels.

  - [http://www.kent.ac.uk/economics/research/1europe/RIIACHapter-final.pdf](http://www.kent.ac.uk/economics/research/1europe/RIIACHapter-final.pdf)


- **UK Cabinet Office of the Prime Minister** (December 2002), Strategy Unit Report on *Electronic Networks: Challenges for the Next Decade*, London.
<table>
<thead>
<tr>
<th>ID</th>
<th>List of cross-national Delphi statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>The balance between immigration and emigration in the EU15 causes the percentage of non-EU15 immigrant workers to more than double by 2015</td>
</tr>
<tr>
<td>02</td>
<td>Widespread use of ICT in e-governance enhances transparency in the procedures concerning the relationship between the citizen and the state in my country</td>
</tr>
<tr>
<td>03</td>
<td>Labour relations organisations (e.g. trade union and other representative bodies) will have a major influence on government and business in shaping the knowledge society in my country</td>
</tr>
<tr>
<td>04</td>
<td>New technologies and knowledge management methods greatly strengthen the ability of governments and organisations to engage in widespread social control in my country</td>
</tr>
<tr>
<td>05</td>
<td>Regulatory authorities take steps to ensure that users are confident that world-wide communication networks are secure against practically all conceivable emergencies</td>
</tr>
<tr>
<td>06</td>
<td>EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions and employer organisations</td>
</tr>
<tr>
<td>07</td>
<td>Concerns about possible health effects of low-level, long-term exposure to physiologically and psychologically active chemicals, microwave radiation and products of genetic engineering have debilitating influences on major industries</td>
</tr>
<tr>
<td>08</td>
<td>Social and political movements concerned with civil liberties have a major influence on government and business</td>
</tr>
<tr>
<td>09</td>
<td>Widespread use of telemedicine and on-line health monitoring systems increases the ability of people with serious chronic and age related diseases to maintain their independence</td>
</tr>
<tr>
<td>10</td>
<td>Practical use of DNA screening to test a person’s suitability for work, education and health insurance creates new forms of (&quot;genetic&quot;) inequality and discrimination in my country</td>
</tr>
<tr>
<td>11</td>
<td>Everyone in my country is compelled (at birth or entry) to provide blood or tissue for depositing in a national &quot;genetic fingerprint&quot; databank to support health, criminal justice, and other systems</td>
</tr>
<tr>
<td>12</td>
<td>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</td>
</tr>
<tr>
<td>13</td>
<td>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</td>
</tr>
<tr>
<td>14</td>
<td>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</td>
</tr>
<tr>
<td>15</td>
<td>Trade unions have become more important in my country, responding to new work arrangements, offering new types of social security and other services to their members</td>
</tr>
<tr>
<td>16</td>
<td>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</td>
</tr>
<tr>
<td>17</td>
<td>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</td>
</tr>
<tr>
<td>18</td>
<td>Harmonisation of educational standards (including certification) across the EU increases trust and transparency in my country’s educational system</td>
</tr>
<tr>
<td>19</td>
<td>Widespread concerns are expressed in my country about social isolation and loneliness, associated with increased reliance on Information and Communications Technologies in working and everyday life</td>
</tr>
<tr>
<td>20</td>
<td>Life-long learning becomes widespread with a majority of workers undertaking more than one period of substantial retraining during their working life</td>
</tr>
<tr>
<td>21</td>
<td>Despite social and employment policy interventions, for most workers their work-life balance deteriorates causing rising family stress and conflict</td>
</tr>
<tr>
<td>22</td>
<td>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</td>
</tr>
<tr>
<td>23</td>
<td>New European styles of business management emerge to rival the American model of economic and business management</td>
</tr>
<tr>
<td>24</td>
<td>Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies</td>
</tr>
<tr>
<td>25</td>
<td>Increases in wealth creation and quality of life are achieved using proportionally less energy and natural resources than at present</td>
</tr>
<tr>
<td>26</td>
<td>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</td>
</tr>
<tr>
<td>27</td>
<td>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</td>
</tr>
<tr>
<td>28</td>
<td>Widespread growth of a ‘24-hour’ society in my country leads to a doubling in the amount of unsocial working time</td>
</tr>
<tr>
<td>29</td>
<td>Widespread self-employment reduces reliance on conventional forms of employment in my country</td>
</tr>
<tr>
<td>30</td>
<td>Widespread abandonment of conventional notions of retirement in my country enable the elderly to continue working if they wish to</td>
</tr>
<tr>
<td>31</td>
<td>New organisational procedures and systems that turn firms and other organisations into &quot;learning organisations&quot; have been widely adopted, and not just by a small vanguard, in my country</td>
</tr>
<tr>
<td>32</td>
<td>There is widespread perception in my country that workplace violence and harassment has been reduced substantially by new monitoring, reporting and management procedures</td>
</tr>
</tbody>
</table>