

Living conditions, working conditions and industrial relations in the knowledge society

Summary of workshops

Dublin, 13-14 July and 27-28 November 2000

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The European Foundation for the Improvement of Living and Working Conditions is an autonomous body of the European Union, created to assist the formulation of future policy on social and work-related matters. Further information can be found at the Foundation Web site at <http://www.eurofound.ie/>



EUROPEAN FOUNDATION
for the Improvement of Living and Working Conditions



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This report is available in electronic format only and has not been submitted to the standard Foundation editorial procedures




Preface

The European Foundation for the Improvement of Living and Working Conditions organized two research workshops in 2000 related to the emerging knowledge society. The challenge of the workshops was to produce new ideas for the Foundation's Four Year Rolling Programme 2001-2004 by putting together three future oriented project areas. The first area covered the Foundation's own project on the New Forms of Work in the Information Society, especially development of atypical work, telework, flexitime, flexispace, flexi contract and virtual company. The second area covered the work done by the Commission related to the development of information society, especially the strategic challenge to make Europe "the most competitive and dynamic knowledge-based economy in the world." The third innovative area consisted of national technology foresights projects from selected European, Asian and African countries.

This report is a summary of the workshop speeches, group works and discussions. The outcome of the workshop confirms the hypothesis on emergence of knowledge society and its great and unknown impacts on living conditions, working conditions and industrial relations. Based on the presentation, group works and discussions there was a joint message to the Foundation to start a new research project in order to understand and anticipate impacts of the emerging knowledge society. Project should also help decision-makers to find ways to strengthen new positive paths for development. The project was proposed to start with the concept analysis, which would give a framework for concrete analyses and also would lead to European Knowledge Society Foresights for Living Conditions, Working Conditions and Industrial Relations.

About sixty experts participated the seminars, which were organized jointly with Lars Grönkvist, NUTEK and the Swedish Technology Foresight project. Tanja Christiansen, Århus University, Denmark, produced summaries from the first workshop speeches and Bob Day, Unisa, South

Africa, produced summaries from the second workshop speeches and workgroups and he was also closely involved in drafting this report. Camilla Galli da Bino and Victoria Rahm, European Foundation, assisted in the collating of the report. I want to present warm thanks to all of them for their valuable work and good cooperation.

I am especially thankful to all the people who participated, made presentations and contributed to the project on Living Conditions, Working Conditions and Industrial Relations in the Knowledge Society.

Dublin 15 February 2001

Timo Kauppinen,
Research manager



Objectives of the workshops

Timo Kauppinen, European Foundation for the Improvement of Living and Working Conditions

The motto: "We cannot plan the future but we can plan for the future"

(Swedish Technology Foresight 2000)

In Lisbon in March 2000 the European Council set a strategic goal for Europe "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable growth with more and better jobs and greater social cohesion". This and many previous decisions on information society have meant that over the past few years European Union has paved the way to information society and we can also argue that Europe has taken a big jump towards knowledge society. A continent that seemed in danger of becoming an industrial museum is rapidly reinventing itself as a paragon of the new economy and knowledge society.

The target on knowledge society means a great challenge to Europe at the same time when globalising, new economy and adjustment into EMU guidelines are increasing competition and causing rapid structural change. As a response to Lisbon, the European Employment Strategy further reinforced its focus on life-long learning and quality jobs in the knowledge-based economy. This approach is supported by the eEurope Action Plan, the European Union's roadmap to the Information Society by 2002, with one of the key objectives focusing on investing in people and skills. The European Commission has also launched the "eLearning: Designing Tomorrow's Education" initiative in May 2000 in order to speed up changes in the education and training systems for Europe's move to a knowledge-based society.

The aim of the seminars organised in July and November 2000 by the European Foundation was to provide the latest information about the European Commission work on information society

and look at the national level development in the lights of technology foresights. Another target was to find ideas for a new project related to the impacts on knowledge society on living conditions, working conditions and industrial relations. Foresight was selected as a start concept for discussion because it deals with opportunities for building European future, rather than attempting to forecast it. It is worth to mention that foresight has become a popular means of systematising participative public-policy debates at national level on the future impacts of science, technology and other drivers of social and economic debate. It has been noticed that that European competitiveness and welfare society development are dependent on many drivers like knowledge, technology, people, attitudes, will, power and resources. Knowledge and technology create opportunities and are good drivers for progress. However, the wishes and demands of people generate development and markets, and economics establishes limits and creates opportunities. Foresight is a method to analyse and understand development.

Workshops used existing research material from the Commission on information society and a variety of national technology foresight projects carried out in Europe, Asia and Africa, as a basis for developing action plans for the development of "European Social/Knowledge Society Foresights". It is intended that the action plans include:

- a knowledge society programme for the Foundation for the period 2001 - 4;
- a knowledge society macro-project for 2001.

The Foundation's research emphasis is to comprehensively analyse the impacts of the emerging knowledge society on:

- living conditions;
- working conditions; and
- industrial relations.

Research setting

The Foundation's major research themes are being pursued in the context of the transformation from the industrial society to the knowledge society. If it were possible to simply represent the industrial society with a circle and the knowledge society with a square then we could clearly see the extent of the mismatch between the two, and, therefore, how living conditions, working conditions and industrial relations are likely to differ. At the moment, however, there is only uncertainty and confusion about how different these societies will be. What is it like to live and work in the knowledge society? How will industrial relations be structured in the knowledge society compared to the industrial society? In terms of the above analogy, we need to learn how to square the circle. Mathematically, this has proven to be an extremely complex problem, and we can anticipate that it will prove an equally complex challenge to the social sciences.

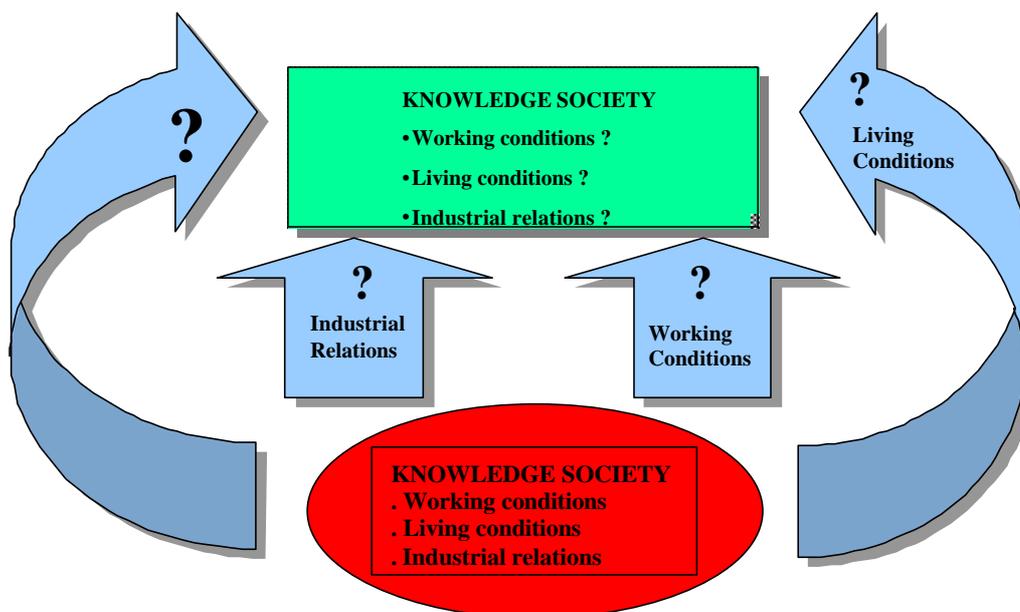
The challenge of the research project is to:

- Develop and grow understanding of the above transformation.
- To anticipate the wide range of changes which the knowledge society will bring, and to analyse their impacts.
- From the political viewpoint, to help decision-makers to identify and support paths to positive change whilst avoiding unsatisfactory development paths.

The seminar and the planned research are closely related to the European Foundation's four year programme which explains the focus on three specific dimensions of the transformation, ie the impacts on living conditions, working conditions and industrial relations.

The project will start by analysing a range of relevant studies and programmes, ie the European Foundation's research, the European Commission's project and several national technology foresights. The relevant Foundation research, called Work in the Information Society, has been carried out since the mid 1980s. The European Commission has been carrying information society project in the 1990s and has added to that eEurope project, which is intended to convert Europe into the world's leading and most competitive knowledge society. In this report special attention will also be put into technology foresights projects carried out in many countries, since technology is a core driving force behind the emergence of the knowledge society. The goal is to learn from these previous projects, especially the technology foresight projects, and to use these insights to define a new project focusing on the social impacts of technology development. Research is a creative process the outcomes of which cannot fully be defined beforehand. Hence, we allow for new ideas and unexpected research results, as represented in the graphic by question marks.

From the industrial society to the knowledge society: Challenges for Living Conditions, Working Conditions and Industrial Relations





Information Society - Analysis and policy planning

Martin Ulbrich, Directorate General Information Society,
European Commission

eEurope 2002, Action Plan

In December 1999 the European Commission launched the eEurope initiative, which afterwards has been discussed at the Lisbon Summit in March 2000 and, finally, adopted at the Feira Summit June 2000. The importance of the EU initiative stems from the necessity that Europe enters the information and knowledge society well prepared, as this will be crucial for Europe's ability to fully achieve the benefits of the new economy. Preparing Europe for the new economy of the information society implies that the awareness of it must be increased and that more political decisions concerning the issue should be made on a high level.

Europe learning from America

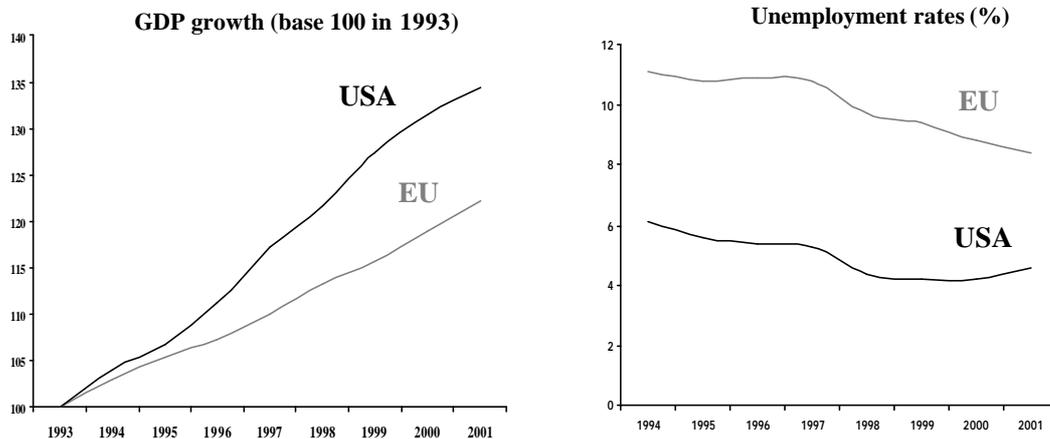
"Admit that Europe is learning from A*****? No thanks. Europe will build its new economy 'in a manner consistent with its values and concepts of society', i.e., slowly and late."

The Economist, April 1st 2000

Following the talks on the information society at the Lisbon Summit a sceptical comment was made by "The Economist". There were two main points of criticism. First, the EU adaptation to the new economy was criticised for being "slowly and late". Faced with such an accusation, however, it must be emphasised that there is a crucial difference between being late and adapting slowly. Thus, the fact that the EU is relatively late in building its new economy does not imply that the EU is acting slowly. Of course we can say that EU is late, but at the same time we can

argue that it is not slow at all. The Economist disapproves of the EU's lack of admission that the main role model on this issue is the USA. In making this point, The Economist is reflecting a general trend in which the information society is exquisitely associated with the US and Silicon Valley.

Picture 1: *The US economy grows faster and creates more jobs*

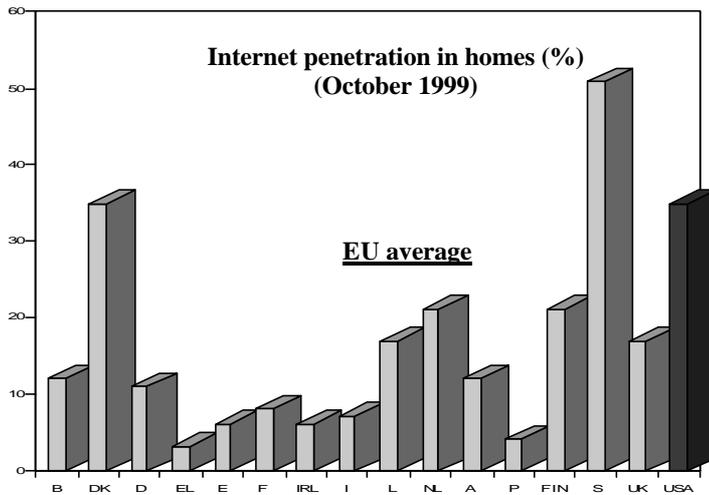


The trend might be explainable in as much as the US economy has been growing rapidly. As the statistics indicate, it might be assumed that the US has had a productivity growth from 1995-96 and onwards, which is linked to the level of information penetration, leading to a remarkable low level of unemployment. Fascinated with the American example, many do however neglect the important fact that the US and EU economies have different business cycles. Therefore, the admiration and call for an imitation of the American way "sometimes get too far. (Picture 1)

Internet penetration in EU

Regarding the Internet penetration in homes, the 1999 statistics demonstrate that the EU average level is still far behind the USA. A well-known fact is of course that the EU average number does disguise high differences between each of the EU Member States. While the Swedish level of approximately 50% is actually above the US level, some EU countries are far below the EU average of approximately 13%. Yet, it would be a major mistake if the Swedes merely compare themselves to these less well performing countries and take pleasure in their high score. Any triumphant readings based on comparisons with less well performing countries would be an error simply because they neglect that the new economy is by nature a network economy. Thus, a Swedish company might face difficulties in expanding to foreign markets as the Internet penetration - and the corresponding possibility to reach foreign customers there - is very low. The conclusion is, therefore, that due to the linkage of economies in the information society the EU Member States must show solidarity and help the less advanced countries to catch up if any of the economies are to expand.

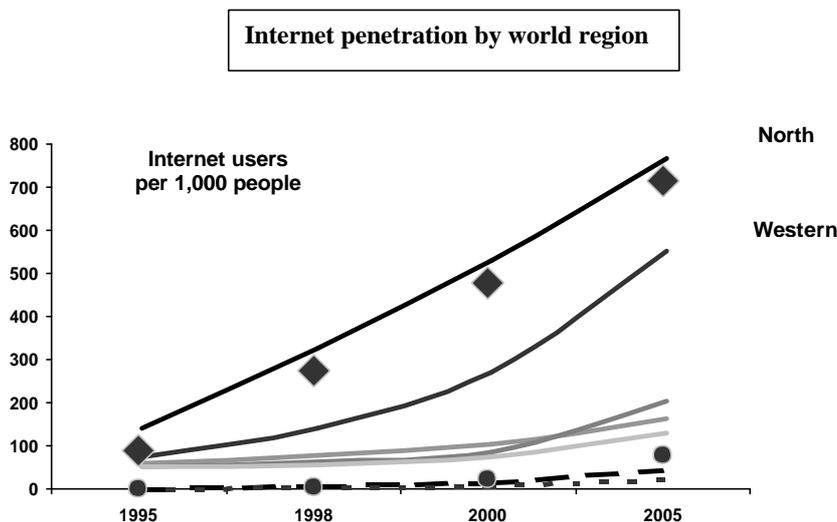
Picture 2: *Internet : EU behind the USA*



Internet penetration in the world regions

The conclusion reached on the importance of solidarity across borders in the EU does also apply when considering the internet penetration in the three world regions of 1: North America, 2: Western Europe and 3: the group comprising Eastern Europe, Latin America, Asia-Pacific, Africa, and Middle-East. More important than interpreting Western Europe's position or future development compared to North America's is to comprehend the future prospects of the third region, which is currently falling behind Western Europe. Hence, the number of Internet users in the third region of developing countries can in future be expected to exceed that of both North America and Western Europe.

Picture 3: *The Internet penetration by world regions*



Consequently, it is imperative that talks of globalisation starts including all of the three regions and not just North America and Western Europe. Contrary to the current practices of cooperation

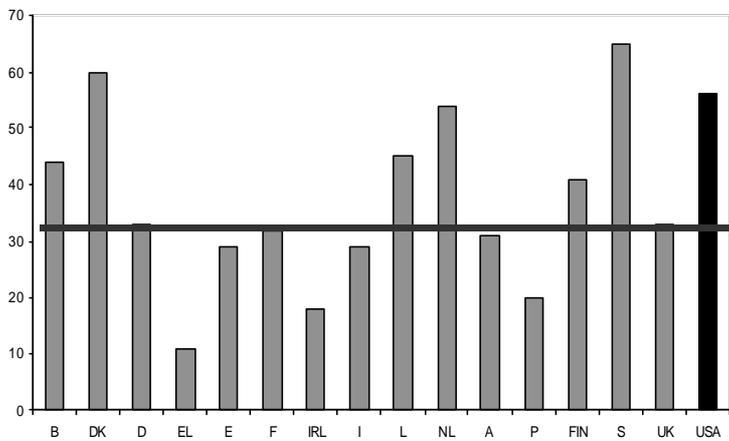


between Brussels and Washington, future global cooperation and relations will necessarily need to be truly global in order to survive.

Access to the Internet

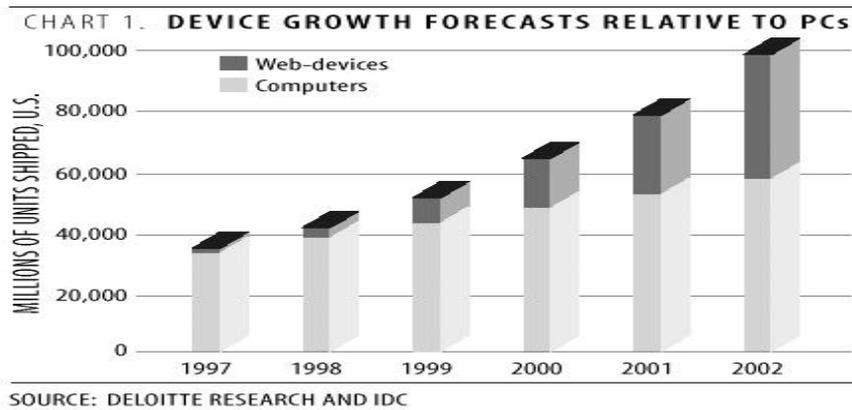
An important indicator for progress of the information society is the level of PC penetration in homes, as this implies access to the Internet. Yet, the importance of PCs as the one and only access point to the Internet is in fact destined to decrease concurrently with the emergence of new, alternative channels. As demonstrated by the chart: Device Growth Forecast Relative to PCs (slide 6), web-devices that substitute PCs as access point to the Internet is forecasted to become very competitive relative to PCs within a few years.

Picture 4: PC penetrations in homes in October 1999



Source: European Commission / EOS Gallup Europe

Picture 5: Device growth forecast relative to PCs



When assessing the consequences of the increase of alternative channels, the prospects for an enlarged number of Internet users look bright. Thus, in many cases the reason for people not using the Internet is simply that it has to be accessed by a computer. The computer is in fact the main problem and barrier to participation regarding use of the Internet because of too high prices and the amount of time it takes to get access via this channel. Moreover, the computer can be

complicated to use, and especially elderly people seem to have difficulties in understanding how to use the computer.

Picture 6: *Barriers to participation*



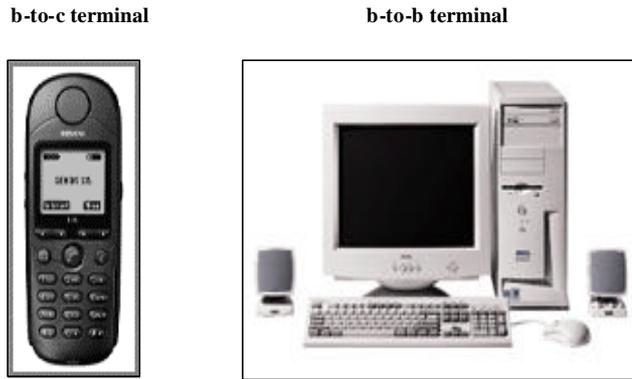
In sum, the emergence of new channels may therefore help to resolve the problem of info-exclusion, as more people will be capable of using the opportunities offered by the Internet. The debate on info-exclusion has to change in accordance with the aforementioned developments because new ideas on how to support the inclusion of more people will be needed.

E-commerce

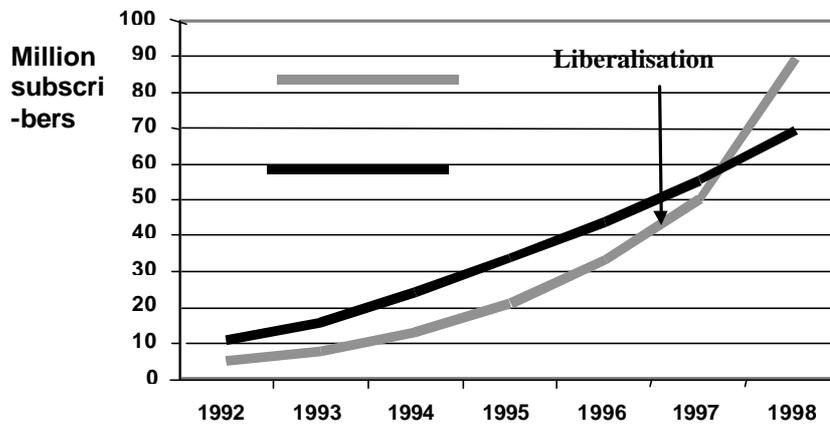
E-commerce is yet another example that illustrates the emergence of new channels functioning as alternatives to the computer. In this case, the EU has managed to set up the GSM system that allows for/supports the use of mobile phones as the access point for e-commerce, or in other words the Business-to-Consumer terminal. It is fair to stress, that the GSM is a European success story, that in effect came about because, and not in spite of, the fact that the EU acted differently from the USA. Thus, the EU has succeeded in setting a common European standard that allows for the mobile system to work over greater distances in Europe than is the case for the US system. As a result, the number of mobile subscribers in the EU has for the last years exceeded the US number, which is a reversal that has coincided with the liberalisation of the Telecom area. However, even though liberalisation and the corresponding competition are important in a network economy, it is equally important that cooperation takes place as well. The importance of cooperation is indeed very well illustrated by the success of the GSM and setting of a common European standard.



Picture 7: *E-commerce with and without Computer*



Picture 8: *GSM: A European Success Story*



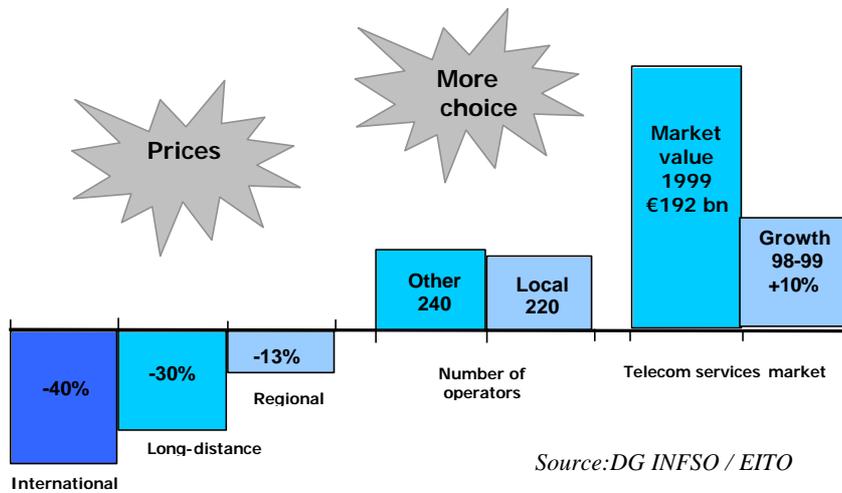
In fact, if the development is not to be blocked as seems to be the case with the mobile situation in the US, cooperation between industries and between industry and governments must be sustained in order to make the network work.

Price reduction and penetration

The price reductions in 1998-99, the offer of more choices and the marked booming of Telecom services may illustrate the European success in the Telecom sector. So far, the most significant price reductions have taken place on the international and the long-distance level, while, in comparison, there have not been strikingly high price reductions on the regional level. Indeed, the local level has not improved very much.

Still, the number of both local and other operators has increased leaving the consumers with more choice. Simultaneously, the Telecom services market has boomed in 1999 as the market value has reached (Euro) 192 bn, while there has been an annual growth of 10% on the Telecom services market from 1998 to 1999.

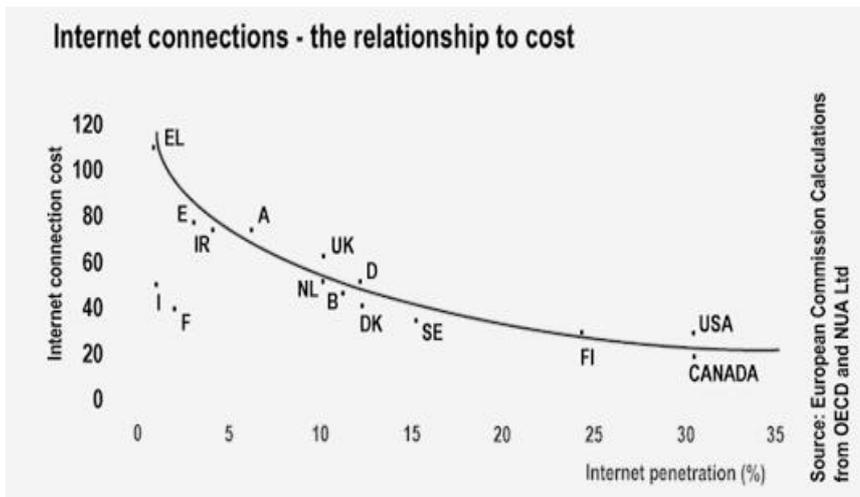
Picture 9: Telecoms Liberalisation: A European Success Story



The relations between Internet connections and cost very well illustrate the importance of making price reductions. In fact, statistics demonstrate that the Internet penetration is very sensitive to prices, and the economic mechanism of falling prices leading to higher demand by consumers appears to be highly applicable in this field. Thus, in countries where the cost of Internet connections are low the Internet penetration is much higher than in countries where the costs are high.

Picture 10: Development of the Internet prices

Internet prices too high





1. Cheaper and faster Internet
2. Faster Internet for researchers and students
3. Secure networks and smart cards

4. European youth into the digital age
5. Working in the knowledge-based society
6. Participation for all in the knowledge-based society

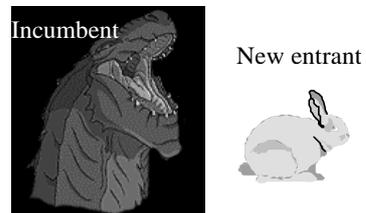
7. Accelerating e-commerce
8. Government on-line: electronic access to public services
9. Intelligent transport systems
10. Health on-line
11. Digital content for global networks

A variety of actors will be responsible for implementing the action plan, as the Commission cannot do much on its own. What the Commission, will do, however, is to head the benchmarking by measuring progress and what the Member States do to reach the fixed targets of the action plan. The process of listing any given progress is an important part of implementation since it provides valuable incentives and ideas for other Member States.

More room for new comers

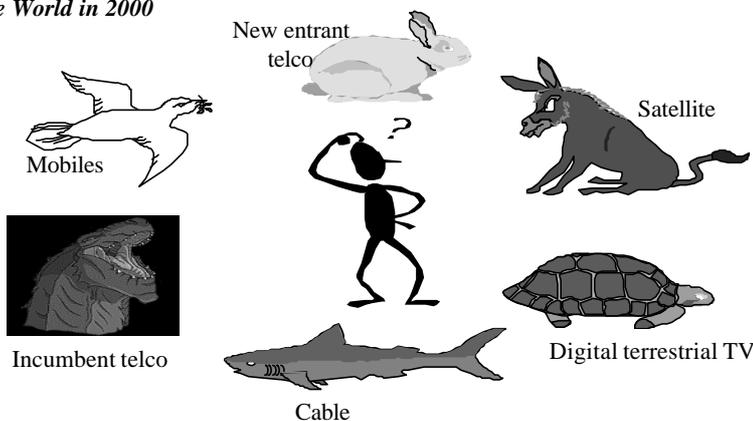
European regulation is vital for the promotion of the new economy. Yet, any regulation must be adapted to the special requirements of the time and the phase of development. In 1998, there was a need for regulation that offered protection for the new entrants of the Telecom market from the economy. Subsequently, the situation has changed as the new entrants have established themselves and in some cases grown very big. There is a whole range of new entrants, who are now in competition with each other as they all take part in an overall network.

The World in 1998



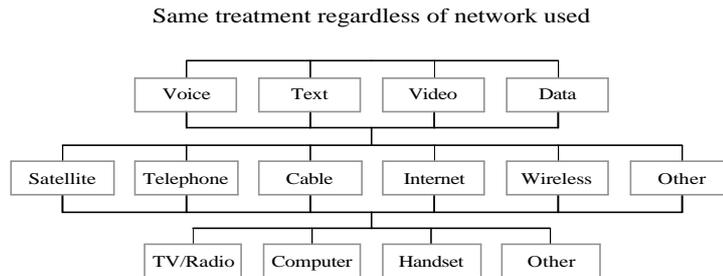
Picture 12: "New comers"

The World in 2000



As the world has changed and the overall network has grown bigger and more diversified, it has become increasingly important to make regulation more horizontal. The problem is that while most regulation has been sector oriented, information does travel across the different networks. New regulation should reverse the current situation of some issues being forbidden in some places, but legal in others. Hence, the same regulation has to apply regardless of the given network.

Picture 13: *Horizontal regulation*



In order to address the problem of making the regulation horizontal, a new package has been proposed by the Commission 12 July 2000. This new Telecom package will provide a more horizontal and flexible regulation, the ambition being to reduce the level of regulation on a long-term basis. Reducing the regulation already began with the liberalisation in 1997. Future reductions will, however, allow for more competition, which will become the main source for determining the price levels. The remaining regulation will be mostly concerned with regulating the rules of competition.

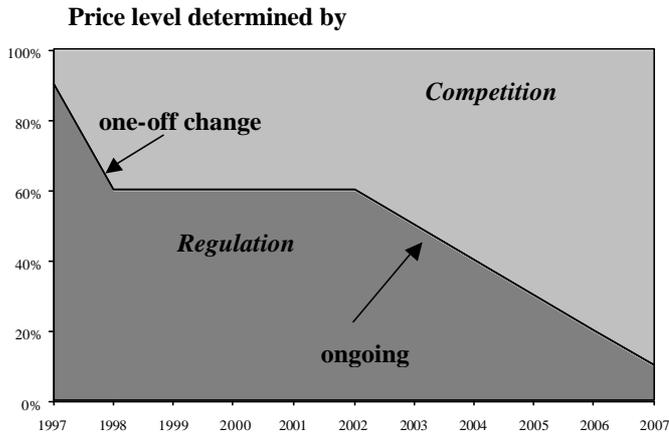
The New Package

(Proposed in July 2000 by the Commission)

- Framework Directive
 - Directive on Licensing
 - Directive on Access and Interconnection
 - Directive on User's Rights
 - Directive on Protection of Privacy
-



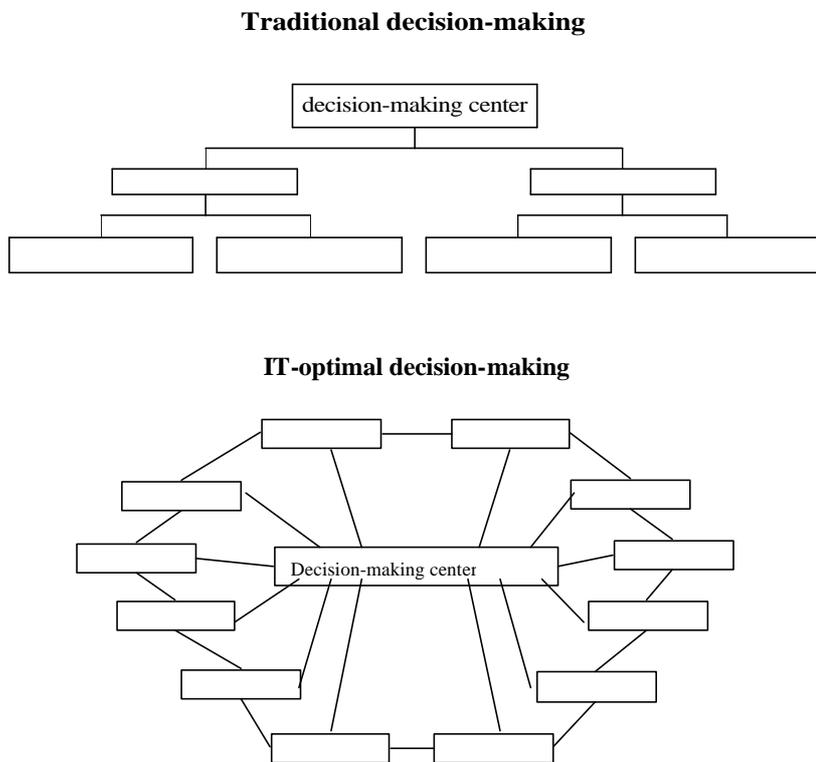
Picture 14: Price level determined by regulation and competition



Change in decision-making

As a consequence of the developing information and knowledge society, it must be recommended to change the decision-making procedures. Thus, information flows increasingly through various links that do not conform to hierarchical structures, which means that hierarchical decision making structures are not sufficiently efficient.

Picture 15: Change in decision-making

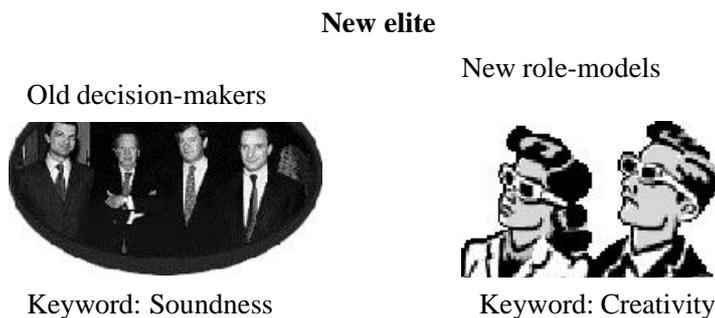


In order to perform the IT-optimal decision-making, the structures must be adapted to match the structures of information flow, which implies that the decision-making should become more flexible and horizontally linked.

New elites

The introduction of new elites is, yet, another feature of the new economy. This development corresponds to the changing decision-making structures in-as-much as new qualities are being praised. Instead of the old keyword, soundness, more emphasis will be on the keyword, creativity.

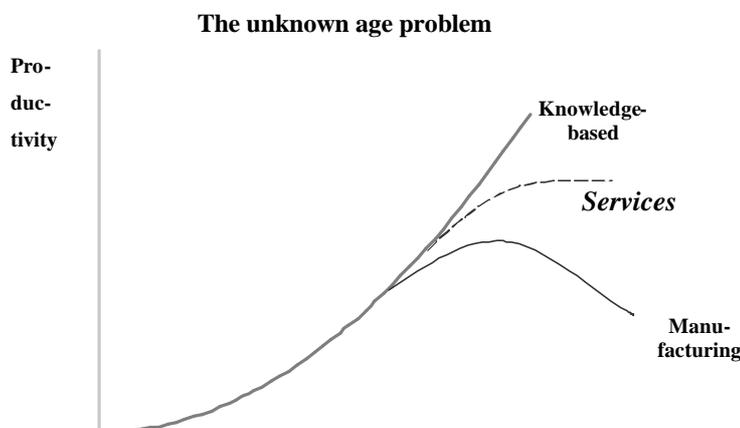
Picture 16: *Old and new elites*



Age problem?

Although the prospects associated with the knowledge society are good in, it is also to be expected that there will be an unknown age problem. This problem does not refer to any difficulties of elderly people to update their skills. On the contrary, the problem seems to be that in future the younger generations will find it difficult to compete with the elder generation. The explanation is that in the knowledge society there will be a higher correlation between experience and productivity than was the case when work was more physically oriented. Thus, productivity will increasingly depend on the accumulated knowledge and the knowledge networks that are being built over time. This means that it might in future be an advantage to be elderly, which is a reversal of the previous dependence on physical strength that gave youth the competitive advantage.

Picture 17: *The unknown age problem*





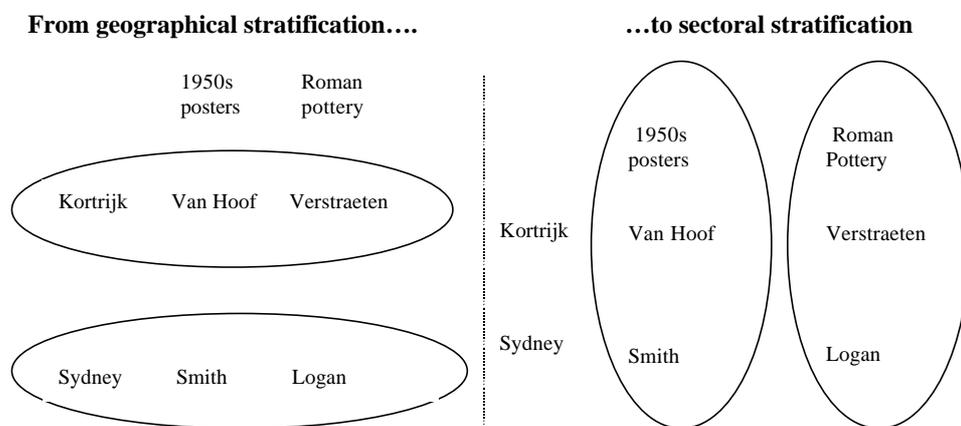
The danger is that the younger generation will have difficulties in entering the job market because all jobs are being occupied and held on to by an elder generation. It has to be stressed that the problem is not alarming at the moment. It is, instead, a problem, that is expected to strike the next young generation, with the current young generation being the one that blocks the entrance to the job market.

From geographical stratification to sectoral stratification

Within the societal sphere a change from geographical to sectoral stratification may be expected as well, as the Internet becomes more widespread. This change implies that

people are expected increasingly to bond and socialise with people that are not part of the same neighbourhoods, or even countries, but people with whom they share more interests.

Picture 18: *From geographical stratification to sectoral stratification*

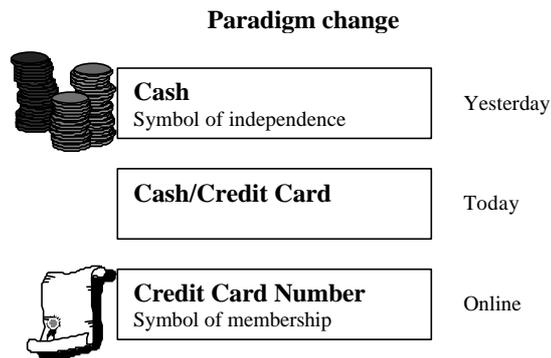


Thus, the Internet enables people to communicate with more people than merely their neighbours. The positive implication of this might be that people find it easier to create new and sustain old social structures when they move to a new place. So far a major barrier to mobility has been that people have found it difficult to move because that would involve the establishment of an entirely new social structure.

Trust relationship in ecommerce

A most important concept for the future is: TRUST because trust is the very foundation for networks. Thus, exchanging data, such as i.e. credit card information, and trading on the Internet necessitates that the user can trust that there will be no exploitation and that requests will be completed as intended and in privacy. To accommodate the need for trust, it is vital to prioritise the issues of data protection, the reliability of the network - not least concerning ecommerce - and the accuracy that ensures that data are saved correctly.

Picture 19: *Change of paradigm*



The importance of trust in the new economy is accompanied by a change of paradigm. Whereas cash as a symbol of independence has been at the centre of transactions until very recently, the current situation is that cash is increasingly supported by credit cards as means of transaction. In future, however, cash will not be a significant substitute for credit cards. Instead there will be a higher dependence on databases, as transactions are made online where the credit card number is all that is required. Consequently a change of paradigm will imply that the means of transaction - the credit card number - is regarded as a symbol of membership.

Much information on the aforementioned can be found on:

www.ispo.ccc.be



Strategies for jobs in the information society

Michael Morass, Employment and Social Affairs DG

The presentation concerned the contribution by the Employment and Social Affairs DG to the information society policy development in the context of the eEurope Action Plan, agreed upon at Feira in June 2000. In accordance with the key objective of investing in people and skills, the Commission has outlined three key objectives:

- European Youth
- eLearning, working in the knowledge-based economy and
- Participation for all in the knowledge-based economy

The presentation focused on the following issues:

- eCommerce
- Demand and Supply for IT Skills in Western Europe
- Two speed labour market
- Differences in employment rates in EU and USA
- Internet penetration in the EU
- Strategies for jobs in the Information Society
- Learning challenge
- Basic ITC Literacy
- Modernisation of work organisation



The Japanese technology foresight

Terutaka Kuwahara, Director, Fourth Policy-oriented Research Group,
National Institute of Science & Technology Policy (NISTEP), Japan

The Japanese foresight activities are covered by the Government's R&D budget that reached 3,16 trillion yen in 1999. Approximately one quarter of this amount was allocated to STA, which is responsible for basic research in governmental areas, work, energy, special developments, and building projects. MITI, which is responsible for the field of industrial technology, received 16,1%. Yet, the Japanese government's share of R&D expenditure has been lower than the shares in the USA, Germany, France and the UK. Dropping from the heyday of ca. 30% in the early 1980s to below 20% in the late 1980s and early 1990s, the governmental share has increased slightly during the later years of the 1990s. At present, the government's share is above 20% of the total R&D investment, while more than 75% is invested by industry.

The Japanese foresight activities are structured so that STA DELPHI operates the holistic foresight activities. Ministries manage the macro-level, while groups of companies make their own foresights on the meso-level. Finally, individual companies and research institutes run the foresight activities on the micro-level.

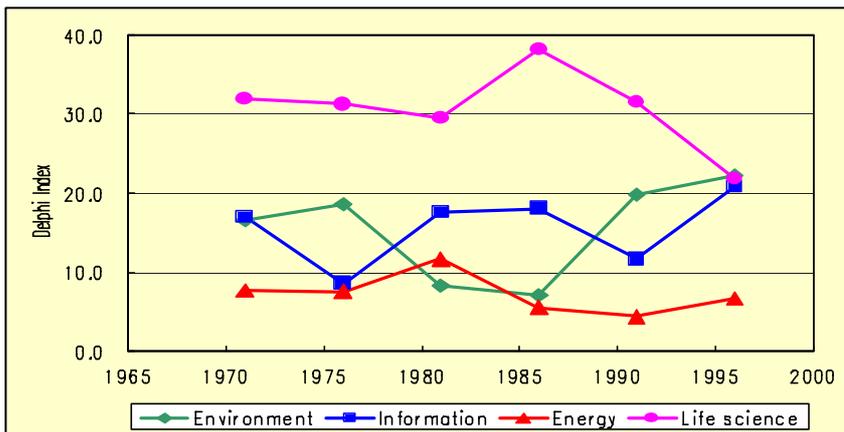
The holistic foresight activity of STA DELPHI is organised by the National Institute of Science and Technology Policy (NISTEP) Science and Technology Agency, which has submitted a large survey every 5th or 6th year since 1971. Each survey has been characterised by the engagement of a large number of experts and a wide coverage of S&T. Moreover, the surveys have been based on DELPHI, which is a method that consolidates experts' views by repeatedly giving the same questionnaire to a large number of people.



The latest and 6th survey was made in 1997. It covered 14 fields and 1072 topics such as life science, IT, materials, environment, production, urbanisation, and so on. As in previous surveys, experts were invited to join the process, which meant that ca. 4000 experts were involved in the 1997 survey. 37% of the 4000 experts represented industry, 36% the universities, and 27% the public sector. The survey parameters were as follows: Degree of importance, Expected effect, Time of realisation, National R&D level, Effective measures of government, and potential problems.

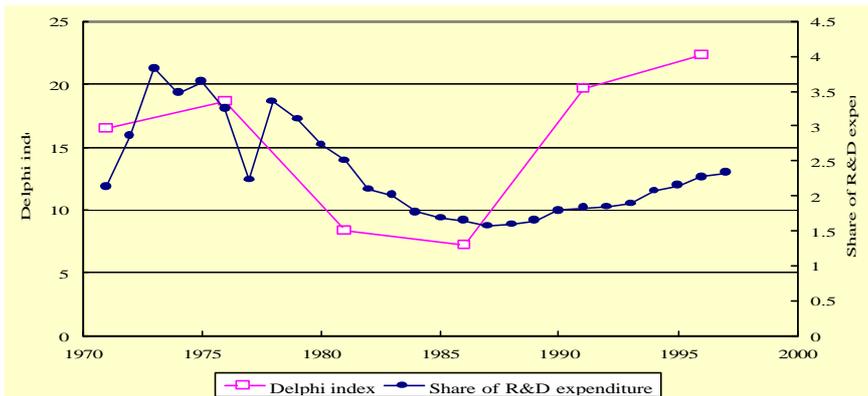
To find which field of technology to promote, trends in the Delphi Index by area (environment, information, energy, and life science) were analysed and compared with the share of R&D expenditure allocated to it. As illustrated by the Delphi index below, the area of life science was for many years considered to be the most important. In 1997, though, the high emphasis on life science had decreased to a level similar to the environmental and information area, which are areas on which the focus has fluctuated but eventually risen from 1971 to 1997. The energy area kept a lower score throughout the period.

Picture 1: Trends in Delphi Index by area

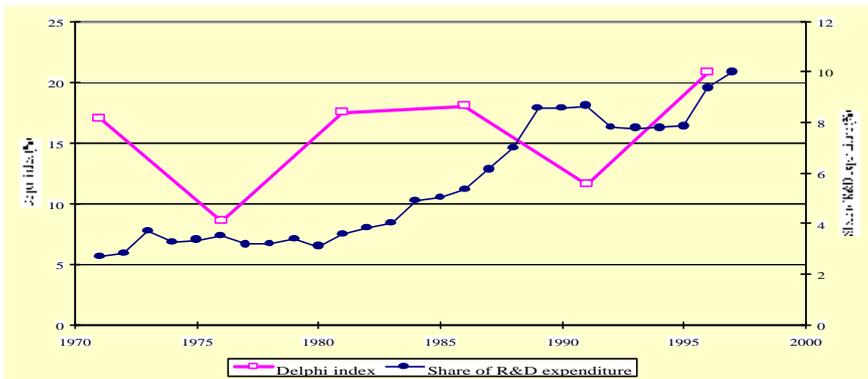


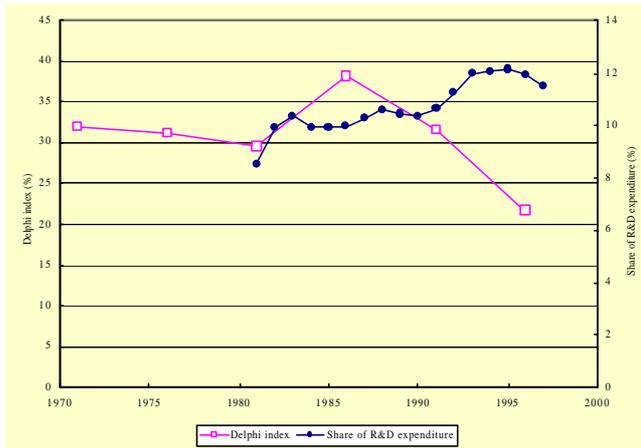
Although environment according to the Delphi index has been considered to be increasingly important in recent years, the share of R&D expenditure has not risen to the same extent. Within the area of energy, the Delphi index and the developments in the share of R&D expenditure demonstrate more similar trends, although the share of R&D expenditure has stagnated and the Delphi index increased in the 1990s. Regarding information, the share of R&D expenditure has increased steadily from 1971 to 1997 while there have been high fluctuations in the Delphi index. Yet, both parameters have demonstrated trends of increase in the 1990s. Regarding the area of life science, the share of R&D expenditure has recently shown a trend similar to the trend in the Delphi index, as real investment has decreased in recent years.

Environment



Energy





Information

Life Science

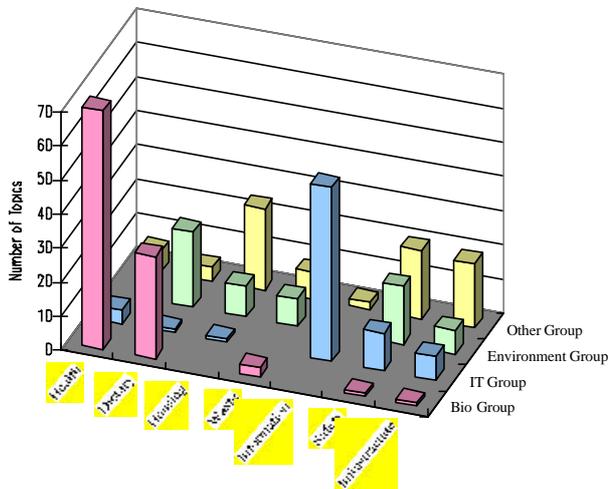
The Japanese technology foresight also made a long-term analysis of peoples' needs.

Long-term analysis of peoples' needs	
Term: next 20 years	
Considered conditions:	demographic change and environmental restriction
Social background:	household income/expense, hours of living, education, equal opportunity, social security
Needs and Technology:	health and medical care, dietary life, housing, urban waste, information, safety, infrastructure

Seven categories of needs and technology (which are outlined in the textbox above) were analysed to find the relation between people's needs and technological topics listed in Delphi. It was found that some categories of needs were accommodated well by the number of topics in Delphi while others were less. As for needs related to health there was a number of topics in relation to the Bio Group. Likewise there were a high number of topics from the IT group that related to the area of information needs. The IT Group did not, however, provide a high number of topics of Delphi that would accommodate needs related to areas such as infrastructure and health.

In total the results were as illustrated by the figure below:

Relation between Peoples' needs and Technological Topics of Delphi



The recent Political Developments regarding S&T

In 1995 a science and technology basic law was passed, which in 1996 led to the first agreement of a science and technology basic plan for 1996-2000. The 1996-2000 plan entailed:

- A doubling of the government's R&D expenditure
- Reinforcement of S&T fundamentals
- Non explicit priority setting to technological fields

IT Initiatives Made by Japanese Prime Ministers

- Millennium project (from 2000 FY) initialised by former Prime Minister Obuchi.
 - R&D for Information Society
 - R&D for Aged Society
 - R&D for Environment
- IT strategy council initialised by Prime Minister Mori to start next year.
 - Investment to IT Infrastructure

The Seventh Technology Foresight

The seventh in the row of Japanese Technology foresights has following objectives:

- Explicit introduction of "needs approach"
- Setting up of service sectoral panel
- Rink between needs and technologies
- Introduction of non-technological topics (institutional issues, lifestyle etc.)



Based on the needs approach, 'a socio-economic system panel', 'an aging society panel', and 'a safety and security panel' discussed the items for the seventh technology foresight and developed the relevant topics. In addition to the panel discussions, input was provided by civil surveys. While questionnaires were sent out in August 2000, the plan is to publish the final in Spring 2001. The hope of NISTEP is that this report will provide the basis for the decision-making of the new ministry and general council for S&T.



Information Society Commission of Ireland

Brenda Boylan, Information Society Commission (Ireland)

The Information Society Commission was established in 1997 by the Taoiseach (the Irish Prime minister). The Commission (ISC) works as an independent advisory body to the Government. Its three main functions are to:

- Conduct research and benchmark Ireland as an Information Society
- Provide advice and guidance to the Government on policies to develop Ireland as an Information Society
- Promote awareness and understanding of information and communications technology

The ISC advises on actions, which need to be taken in order to make sure that the country progresses in the right direction.. It is, in addition, the Prime minister who appoints the 10 members of the ISC's commission, who represents the IT industry and the social partners. Yet, the ISC works with a number of advisory groups that are informally created in accordance with the subjects in focus at any given time. At the moment five groups are looking at the issues of connecting communities, connected government and legal issues, infrastructure and life-long learning.

Opportunities and threats

When analysing the effects of the Information Society, it is highly important to define, on the one hand, the positive aspects regarding the opportunities and, on the other hand, the potential threats of divides and gaps opening up within the information society.



In theory, one of the strengths of the ideal information society that include equality of access to all is the implication that those who are at present marginalized will be the ones to gain most from the technological revolution. In sum, the noteworthy opportunities and potentials of the information society are as follows:

Opportunities

- Empower people through access to: information, knowledge, communications capacity
- Revolutionise operation of organisations and institutions - flexible working
- Create new economy and employment opportunities
- Opportunity to learn new skills and consequently self-development in different new ways

On the other hand, the effects of the information society involve threats as well. For instance the aspect of empowerment may be reversed and contain a risk of people being enslaved in certain sectors of community. Thus, the people in the marginalized sections of society, who are said to be ones with most to gain, are at the same time the ones that most likely are in the worst positions to take advantage of the new developments. Another risk, which has huge implications for people who are through the educational system and now in work, involves the danger that former relevant skills become outdated. To further complicate matters, there is already a short supply of some specialised skills. Yet another risk concerns potentials of higher job insecurity, which can be considered as the downside to the opportunities related to the creation of flexible jobs. Finally, the smaller businesses and the indigenous industries are in danger of being left behind in the new economy, as they might be unable to take advantage of the developments

It is therefore important that the below categorised issues are addressed as they constitute big challenges for government and society in general.

Threats to be dealt with

- Enslavement - further disenfranchise marginalized
- Skills becoming outdated
- Skills shortages
- Job insecurity
- Smaller businesses being left behind

Lifelong learning

Both the ISC and the European Commission have focused on realising the advantages, while minimising the downsides of the information society. Accordingly, one of the three key objectives of the eEurope 2002 Action plan concerns the issue of "investing in people and skills" - working in the Knowledge-based economy. The fulfilment of this objective involves a number of sub-objectives, one of which implies giving priority to lifelong learning.

In an ISC report published last year the importance of lifelong learning in the information society was stressed. A main lesson to be drawn from the report is that there is a need to take a broad view of learning in the Information Society. This implies that the focal point goes beyond the aspect of just learning how to use IT. Thus, the importance of lifelong learning is not merely that people learn to use IT, but to empower people to use the IT tools as a means to learn more and as such enable people to take advantage of the Information Society.

Another important aspect of lifelong learning in the information society addresses the need to develop learning in all parts of society and not just within the formal educational system of primary schools, colleges, and universities. The ideal is accordingly that lifelong learning will take place in the community and in the workplace as well as in the formal educational system.

Lifelong Learning

- Learning in the Community
 - Promote a framework for adult and "second chance" education
 - Target disadvantaged groups
- Initiatives:
 - IT access in public libraries, Community Projects,
 - ISC IT Training Roadshow

The significance of providing lifelong learning in the community is elevated where people did not get full advantage of the educational system. Although free education is provided, the fact remains that some people have not been served well by the formal educational system. For example, there are actual problems of adult illiteracy and cases of people who leave school with low levels of literacy. Since such people might associate the institutional framework with negative experiences and might feel intimidated by the formal educational system as such, the community within the Information Society is destined to be a crucial supplier of adult and "second chance" education.

In addition, it is noteworthy to bear in mind the experience that cooperating with community and voluntary organisations has proven very efficient when targeting disadvantaged groups. The reason being, that those organisations have a valuable understanding of the needs of the disadvantaged groups and work together with them on an eye-to-eye level.

As ways to promote learning in the community two initiatives has been made. First, IT access in public libraries has been prioritised, while community projects have been launched. The guiding principle of the community projects has been to let professional community groups reach out to disadvantaged groups. Hence, the organisations provide training for people in the community and use IT to teach young people that left school early. Secondly, the ISC has started an IT Training Roadshow. The roadshow is based on a mobile computer unit that travels around Ireland to interact with people in the community who have a need for basic IT training that will afford them the necessary skills to start using the IT tools. The fundamental objective of this initiative is, thus, to provide facilities for free basic IT training.



Up-date education

As a provider of adequate and up-dated education, the formal education system has a huge obligation to deliver valid skills to people. Thus, education cannot rely on traditions that served well in the past, but must be adjusted to meet the demands of today and the future. This means that there must be a focus on the aspects listed below if learning in the formal educational system is to be promoted.

Learning in formal education system

- Computer literacy
- Adequate connections: pupil ratios
- ICTs used as part of teaching process
- Appropriate content

For example, the issue of integrating IT to the teaching process is an important part of future improvements, which it will be crucial to pursue. The actual problem is that today a number of teachers are at a disadvantage because they were educated at a time where the technology known today was not applied. Consequently, this particular objective is critical and its fulfilment does pose a challenge.

To meet this and the other objectives mentioned above, two recent initiatives have been undertaken.

Initiatives

- Schools IT2000
- Scoilnet www.scoilnet.ie

The first of the two initiatives focuses on deploying PCs and Internet access throughout the schools in Ireland. The result is that now every school has at least one PC with Internet connection. It is recognised that more technology must be introduced, but further improvements will take place. Moreover, teachers are being trained to use the IT tools provided. Secondly, the Scoilnet has been created. It is a network resource build for schools and can be used to get information and inspiration.

Learning at workplaces

Regarding learning and the workplace, a number of issues must be addressed. For example it must be ensured that educational institutions are providing graduates whose skills are in accordance with the demands of the work place. Likewise, it is crucial that employers do invest in their employees in order to up-grade the skills of the labour force. Another important issue will be to target groups with special needs, as they will be able to benefit immensely from the new technology. Also the economy would benefit from such targeting since this might generate skills that are presently in short supply.

In fact, the latter issue is being addressed by the FIT initiative, which is based on a private and public partnership comprising multinational companies and governmental departments in Ireland. The ambition is to provide a "fast track to IT" for people who are long-term unemployed. Thus, the plan for the next three years is to offer a second chance training opportunity for approximately 3500 long-term unemployed. The training consists of a rather demanding course, which will result in significant earning potentials for the participants, as their achieved skills are needed in industry.

- Learning and the workplace
 - Determine future skills needs for industry
 - Respond to market demand
 - Re-skill existing employees
 - Develop standards
 - Target groups with special needs
- Initiatives
- FIT (fast track to IT) - www.fit.ie

Following the ICT developments, there is a high potential for changes of work practices and attitudes, which in principle will involve improvements of working conditions. There is, certainly, a possibility for more flexible working arrangements and for ways of organising work that support greater balance between work and home life. Yet, there is at the same time a risk related to the otherwise positive aspects of teleworking/e-working. For example, there is a danger that the division between work and spare time dissolves to the extent that people never really stop working.

Changing Work Practices - Attitudes

- ICTs allow new, more flexible working arrangements
- Teleworking/e-working can allow for greater balance between work and home life
- Distance/disability become less of a barrier

Business research

The ISC annually conducts Business Research to measure both the developments of adopting and deploying technology in business and the attitude towards IT among the general public. The overall result of the 1999 research, which was based on a MRBI survey for ISC, reveals that the theoretical forecasts and opportunities does not correspond well with the way people think and act.

The results of the Business Research, which are listed in the text box below, demonstrate that there is a gap in the logic of business people. On the one hand 75% agreed that IT skills are essential or very important, while only 30%, on the other hand, were providing IT training either frequently or quite often. The results also showed that there is a divide in the adaptation and integration of IT depending on the size of the company. Overall, only 10% of the companies had organised some amount of e-working.

**Business Research (MRBI survey for ISC)**

- Almost three quarters of Irish business felt IT skills essential/very important
- 43% felt were readily available
- But only 30% providing ICT training frequently/quite often
- Gap between smaller and larger companies
- 10% of Irish businesses have e-working (Source: e-work survey)

The survey on public attitudes found that people in general appeared to consider the ICT impact on society as positive. Yet, it is alarming that nearly 2/3 of the respondents - aged 15 and above - felt that their children and not themselves were the ones who were really to benefit from the developments. It appeared that many took the stand that they were happy the way they were, and that it was merely of importance to their children.

The fact that people were interested in more training once they had received some, and that people were likely to use technology when access was provided, does however offer hope that this generation will be able to take advantage as well.

General public Attitudes (MRBI survey for ISC)

- 90% of people agreed that ICT can help those at disadvantage in society
- 60% felt that full impact of ICT will be felt by next generation rather than them
- People who had already received some training were interested in more
- Where access to technology is provided - usage likely to follow

The ISC has produced a report that stresses the importance of access for all. As guiding principle a broad definition of access has been applied. This reflects the insight that when pursuing the objective of access for all, one cannot just rely on providing access to equipment per se. Instead the focus must be on the full range of support that is needed to enable someone to become proficient in the use of IT and derive the benefits from it. Consequently, the definition of access encompasses a number of aspects, which are all listed below.

Importance of Access for All

- Broad definition of access
 - Awareness
 - Physical accessibility
 - Usability and user-friendliness
 - Ability to use -tuition & guidance
 - Reliability of technology -technical support

Access to all

Following its research, the ISC recommends the government to make use of existing networks. There is no point in building new structures in order to provide access to IT throughout society, as it is more reasonable to make use of existing networks in organisations such as those mentioned below. In fact it is better that people make use of new technology within environments that are comfortable and familiar to them. While libraries, post offices and schools are being persuaded to make use of their networks, action is taken in government offices at the moment. Also the community and voluntary sector is slowly beginning to take advantage of IT.

Importance of Access for All

- Make use of existing networks
 - Libraries
 - Post Offices
 - Schools
 - Government Offices
 - Community and Voluntary Sector

The ISC has also recommended that government promote the relevance of using IT. The impetus for this recommendation has been the many results collected by the ISC through surveys and consultations. These results have repeatedly demonstrated that people will not use technology for its own sake. On the contrary, people need to know why and how the technology as a tool is helpful to them if they are to use it. Therefore, it is essential that government services are provided on-line and that people are made aware of this and the potentials and benefits related to IT developments.

Equally, it is important to promote IT and educate people to use it. Several initiatives have been made to make people aware of the issues related to IT and to enhance the appetite for using the tools.

Promote Relevance

- Provide government services on-line
 - Revenue-on-line service
 - E-broker
 - FÁS jobs on-line
- Promote & educate
 - E-commerce campaign
 - Dot.what?
 - Internet venue directory
 - IT training roadshow



In sum, the ISC has the following conclusive remarks:

- Development of Information Society having profound effect on our lives
- Ireland's IS initiative aims to involve all sections of society
- Challenge to ensure that everybody has access to ICT and is equipped to take advantage
- Need to drive the social debate



The new economy and employment

Pascal Petit, CEPREM/CNRS (France)

The New Economy has become a highly speculative topic in the media following the rapid diffusion of the internet in the business sector and the impetus given to stock markets by the sharp rise of the shares of dot.com firms. This sudden interest of the media was all the more striking when the emergence of an information society had been presented as a major challenge by most administrations and scientists for at least a decade. Somehow, only at the very end of the 90s did the notion of a New Economy 'go public', in the sense of reaching the business world.

Beyond that recent fame, the real fabric of the new growth regime of industrialised countries does not seem to have become much clearer. A good reason is that social scientists, not to speak of economists, do not agree on the answer. This disagreement stems in the first place from the fact that much of the evidence does not show up in a straightforward way in the standard statistics commonly used to assess economic growth. Changes primarily concern such intangibles as the availability and interpretability of information, which have decisive impacts on the decision making of agents, but are mainly valued in subjective ways. Secondly, part of the uncertainty also stems from the open nature of the evolutionary processes being observed; they may follow different paths depending on the countries involved. They may also occur in different ways according to the domain and the social group concerned. Much depends on the policies, which each society chooses in order to monitor the risks and inequalities with which they are confronted.



Only a few structural changes underlie the economic transformation taking place, eg:

1. the diffusion of information and communication technologies;
2. the rising level of formal and informal education of the populace;
3. the sophisticated and expanding grid of contemporary international transactions.

It is anticipated that much in the characterisation of the new economy will effectively rely on new private and collective means of handling information and knowledge, but the above three structural changes give some concrete ideas about the factors that are likely to be employed in this process. However, all these mechanisms for conveying, storing or processing information may produce opposing results, by inducing or inhibiting actions accordingly.

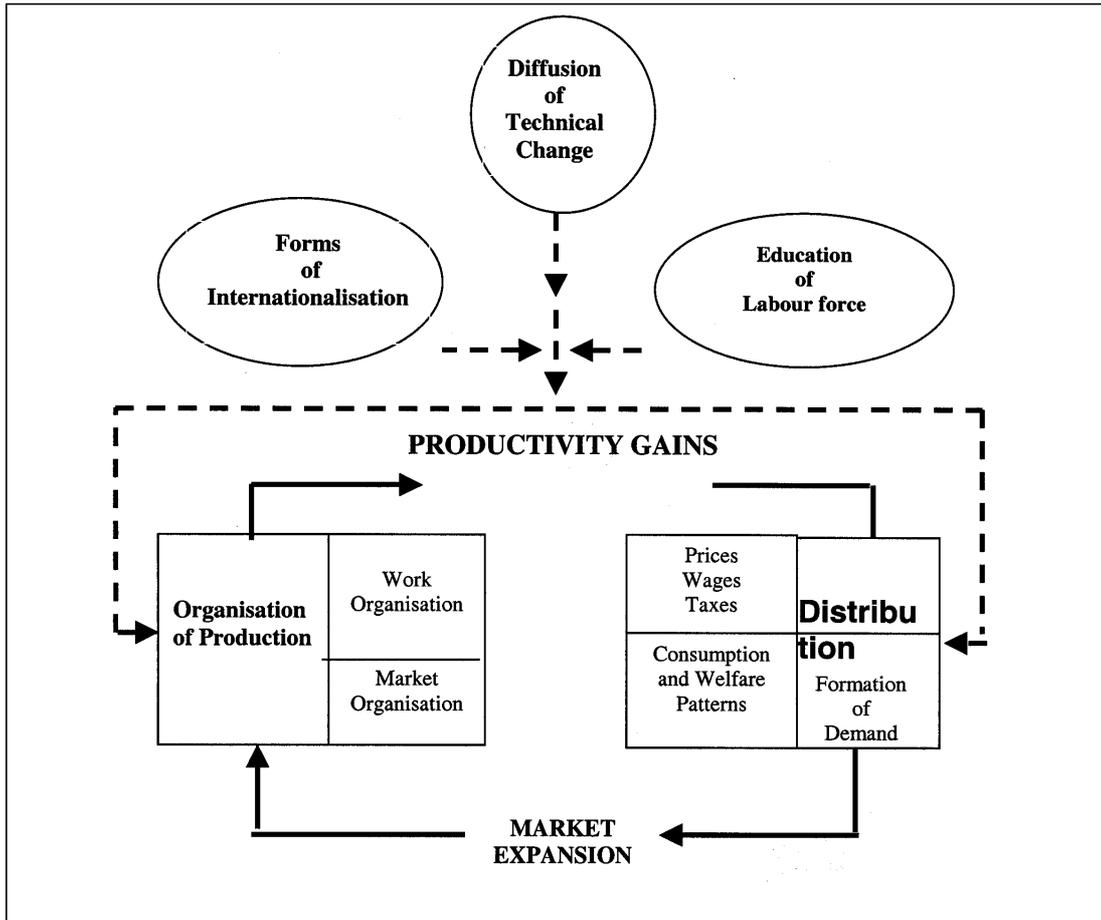
Conclusion and perspectives

It seems that the tendency of the New Economy to fuel a certain dualism, at least during this first phase of its diffusion, when combined with an apparent inertia in taking remedial action to reduce this split, may restrict it to slow growth. The New Economy would then be responsible for a double failure:

- ethically: by consolidating severe social divisions,
- economically: by reducing the growth potential of a dynamic which would clearly benefit from the interconnection of the two worlds (based on the standard argument that connected networks are much more effective than the sum of separated ones).

This gloomy picture stems largely from the erroneous assumption that the advancement of the New Economy depends intrinsically on a laissez faire economy, whilst public intervention inevitably will be counterproductive. Ironically, this is the fallacy that could condemn the future of the New Economy. If, however, the proper structural policies could be designed that would help to avoid the segregation that could spontaneously emerge in many areas (such as health, education, leisure), then the future of the New Economy would not be restricted to slow growth.

Principles of intervention could be derived from our theoretical framework (shown in the diagram). Economic agents at all levels must be provided with access to information and knowledge relevant to his own field, thereby facilitating the setting up of the relevant learning processes, as well as the various phases and intermediations required. This access may be adapted to the specific needs of each activity, and also may take place at various geographical levels. In this new paradigm, there is a clear opportunity for local communities to redefine their growth potential. Clearly, it should also concern the service industry, especially the large network services whose activities represent a large share of GDP and whose transformation will ultimately define the true face of the New Economy. Although it will not be easy to innovatively redefine products in these trades, it must be recognised as the necessary condition for improved growth rates. Finally, it is essential that these interventions should be carried out in a concerted and democratic way in order to display a level of social responsibility that seems to be lacking in commonly portrayed visions of the New Economy.



Note: The presentation was based on "Transition to the Knowledge Economy" edited by Kjell RUBENSON and Hans SCHUETZE at UBC University of British Columbia Press, 2000.



The German Action Programme on innovation and jobs for the information society of the 21st century

Dr. Rudolf Gridl, German Federal Ministry of Technology

The three main goals of the German Action Programme are:

- Creating a leading position for Germany in Europe's Information Society
- Building an Information Society for all
- Seizing the opportunity for more and sustainable employment

With its "Action programme for innovation and jobs in the information society of the 21st Century", the Federal Government aims to make Germany one of the world leaders in the digital age. The central concern of economic policy and thus of the Federal Ministry of Economics and Technology (BMWT = Bundesministerium für Wirtschaft und Technology) is to lay the foundations for economic prosperity in Germany spread broadly throughout the population. Derived from this overriding interest are various objectives that stand as guides for economic policy measures. These include:

- a high level of employment
- sustained opportunities for the German economy to grow and compete with other economies
- social security
- the promotion of new technologies and innovation to maintain the economy's competitiveness
- the linking of economic and ecological goals
- intensification of the worldwide division of labour and a free system of world trade
- economic assistance to Germany's new states.

Strategic fields of the Action Programme are:

- Ensuring broad access to the new media
- Creating innovative jobs
- Improving the legal framework
- Taking a leading position in technology and infrastructure
- Advancing State modernisation
- Improving European and International co-operation

The Action Programme aims to provide broad access to the Internet by reducing Internet costs with the introduction of a flat rate for telephone connections and also by actions aimed at encouraging integration of all sectors of society. As part of a public-private partnership with Deutsche Telekom and AOL, about 20,000 schools have been provided with Internet access in 2000. Furthermore, the creation in 1996 of the "Information Society Forum" has been specifically aimed at women and senior citizens.

Other activities are carried out in order to support SMEs in developing e-commerce by creating competence centres and facilitating the access to seed-capital for starting to work with the internet (Neuer Markt, VC). An annual internet price for SMEs has been set up and will reward innovative internet services and developments.

Training for new media and IT jobs has been increased by 60,000 from 1999 to the end of 2000. The original target in 1999 was 40,000 by the end of 2002.

Germany is one of the first countries to create a legal framework for the Information-Society. The ICT-Services Act in 1997 includes regulations on Digital Signature, Data Protection and E-commerce. The aim of the Government is to implement European Law in a short time and it is foreseen that the transposition of the EU Directive on Digital Signatures will be in place by the beginning of 2001, while the Directive on E-commerce will be transposed by mid-2001.

The Government is also encouraging self regulation by supporting the creation of a catalogue of quality criteria for e-commerce with its D-21 initiative. As part of this initiative it will introduce public-private partnerships as a new mechanism in IT policy.

A process of modernisation of public administration is underway. The year 2000 saw the introduction of on-line tax declaration and publication of public tenders on the internet.

Other projects are:

- Promoting virtual municipalities: "The Media@Komm"-project
- Online employment placement service (since 1997)
- Federal Administration Information Association Bonn-Berlin (since 1999)



International co-operation is being promoted both in Europe, eg:

- Commission e-Europe Programme
- Regulatory frameworks

and world-wide, eg:

- G7/8 (Okinawa Charter)
- WTO
- Council of Europe (Cyber crime)
- OECD



Insights and recommendations from the July 2000 Seminar

Timo Kauppinen, European Foundation for the Improvement of Living and Working Conditions

Bob Day, University of South Africa

Since the knowledge society is still emerging, and is likely to be hard to define for many years to come, it is frequently misunderstood and misrepresented at all levels of society,

and therefore its importance is usually significantly underestimated by citizens and leaders alike. It requires much more than incremental adjustments to the mental models and policies of our current leaders. It requires a major paradigm shift across all sectors of society. Some examples of the components of this paradigm shift may include:

- The role and nature of competition is changing rapidly, with the advent of 'non-zero-sum' strategies (or 'co-operation'), where one organisation's success does not rely on the failure of another.
- Most labour organisations resist ICT since they equate it with automation, which has been a major taker, not maker, of jobs. This confusion of the knowledge society with automation perhaps can best be addressed by fully including labour at all levels in future developments.
- Innovation and growth usually stem from individuals, not large organizations. Yet, historically, these individuals have often been viewed by the authorities as dangerous mavericks. Instead of marginalisation, we need alternative ways to appreciate and manage these mavericks.
- Manuel Castells describes the emergence of the 'fourth world', made up of multiple 'black holes' of social exclusion, not only in Sub-Saharan Africa and the developing world, but also in every developed country (ghettos, ethnic enclaves, unemployed youth, etc.). He argues that the use of ICTs in the current global economic paradigm is responsible for the social exclusion of millions of people, and their resulting unemployability and poverty, painting a new dimension to the 'digital divide'.



Short Summary of July 2000 seminar

In the July 2000 workshop was discussed on the Commission information society projects, technology foresight projects and new economy. Participants could have a joint view what was the joint framework of the projects, what were the used methodologies and how foresight projects were implemented. Also there was joint view that implementation varied from country to country. This short summary deals mainly with technology foresight projects.

Joint Framework

Six National Technology Foresights were reviewed: Sweden, Denmark, Japan, Germany, South Africa and Ireland. The workshop participants agreed that ICT will have significant economical, political, legislative and social impacts, eg:

- Increased competition, economic growth, productivity and employment.
- Changes of working conditions, ie work independent of space and time, but risking increased stress.
- Changes in living conditions, ie the need to reconcile work and family life, but risking social exclusion and bottlenecks caused by skills gaps.
- Changes in Industrial relations, ie flexible working time, flexible employment relations, new types of work organization, new ways of working, but risking reduced security at work and emerging new problems.

Methodology

The variety of methodologies used in the national projects provided valuable insights into their appropriateness for further research:

- Bottom up/Social Dialogue/Group work technique - Sweden
- Survey technique/Delphi - Japan and Germany
- Scenario technique + Multiple methods - South Africa
- Concept analysis - Denmark
- Top-down/State-driven Commission approach - Ireland and Germany

A conclusion was that it is not easy to say which of the method was better than another. All of them had their good and negative sides and much depends on the purpose and available resources how to make foresights. One principle, however, was clear that the best results will be reached if the methods will be used in the mixed and creative way.

Implementation of Technology Foresight Projects

Each national project had similar targets to increase competition, growth and employment, mainly by promoting the use of ICT. The measures used include:

- Economic - reduction of users' costs
- Legal - adapting laws to allow for more competition and flexible environment
- Political - more resources for research and training in schools, universities, and workplaces

- Scientific - national and international research projects, new education and training programmes, new IT-University
- Social - training programmes and discussion groups
- Social partners - collective bargaining to implement ICT in the workplace and to improve appropriate skills
- ICT-language - both by training and 'learning-by-doing'

Recommendations

At the end of the workshop, the following recommendations were made to the European Foundation:

- Find more specific areas of research within the three main topics of living conditions, working conditions, and industrial relations. Agree on a methodology to narrow each focus.
- Increase the emphasis on the emerging significant changes in the concepts of work and work organization, and their erosion of the relevance of 'industrial relations'.
- Investigate and measure potential negative impacts of ICTs within the knowledge society paradigm, and the preservation of current value systems.
- Investigate and analyse the mechanisms involved in self-exclusion at the individual, group, and societal levels.
- Organise a follow-up meeting of experts to identify specific areas of future research of the European Foundation.
- Organise a seminar for high level representatives of private sector organizations to identify and clarify their perspectives of the emerging knowledge society. The Foundation's proposed research projects, may then be benchmarked against these perceptions.



Preparing for the knowledge society

Luis Martin-Oar, European Parliament

The role of the European Parliament is not as a research centre, but to echo the major European issues of the day, and to transform them into appropriate policies. For example, when the new parliament was established in 1994, employment was the main issue. This emphasis has changed dramatically in the past 5 years. Now, the new commission, parliament and Portuguese presidency are developing an holistic approach toward the emerging knowledge society, including the following issues:

- We need affordable access to broadband, high efficiency telecommunications for everybody in Europe. We are trying to develop a mechanism to avoid any marginalisation of a part of the population in the access to these new instruments.
- Europe is determined to preserve its cultural diversity, including its many languages. However, for full participation in the global economy this needs to be balanced by much wider general literacy in at least one of the world's 'global' languages, eg English, Spanish, etc. Therefore, it is essential that every European student should complete secondary education, including a global language.
- We need to develop a new business approach, culture and philosophy, supported by appropriate information and education, to cope with the new technologies associated with the internet, particularly digital television and mobile telecommunications.
- We need to develop majority voting mechanisms to enable Europe-wide progress in such crucial areas as education, social aspects and macro economic non-monetary policies. This requires an additional formal integrated decision making instrument, not at the Brussels level, but designed to create greater coordination of the national approaches and policies of member states.

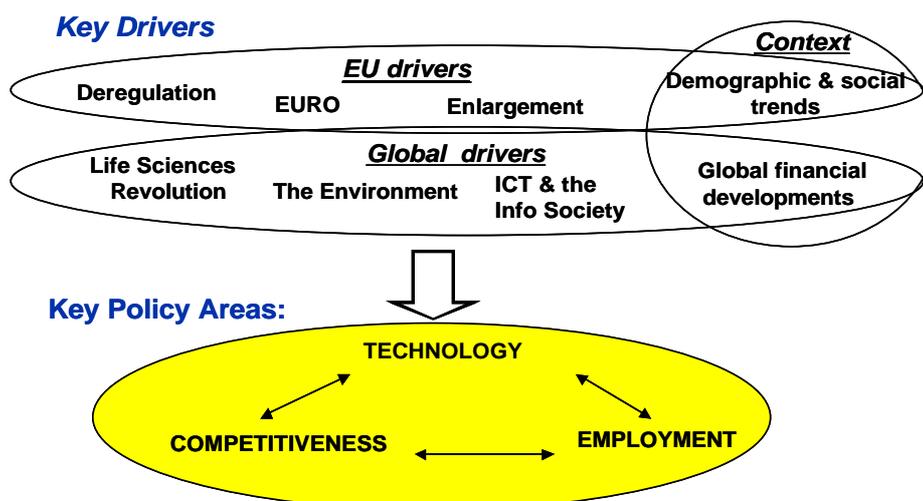
The parliament is making large efforts in this area, as illustrated by the disappearance of the industrial directorate general and the appearance of the information society in the commission. The old institutional committee in the parliament is now a constitutional committee, showing that the global approach is seen as essential to enable Europe to cope with the dramatic, high speed changes accompanying the emergence of the knowledge society.

IPTS futures project

Eamon Cahill, Irish Productivity Centre

"The next 10 years may well turn out to be the fastest changing years for Europe in its history during peace-time".

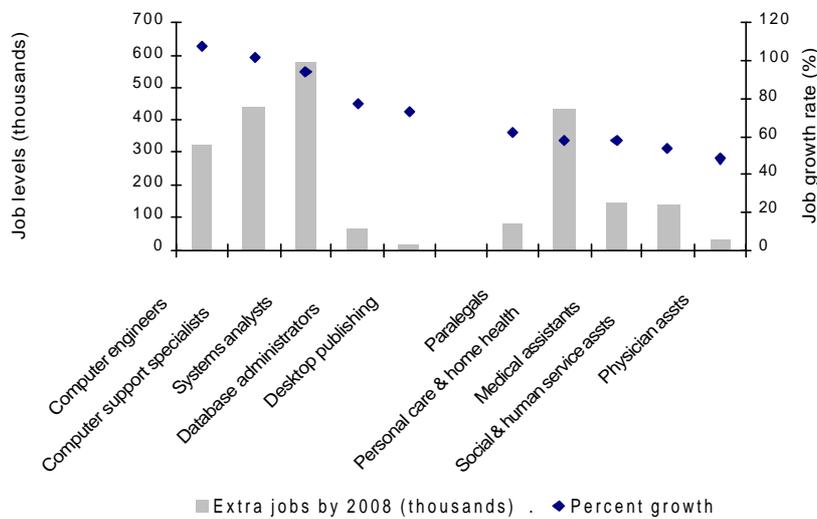
The Rationale of the IPTS Futures Project (see diagram below) was based on the identification and differentiation of European and Global drivers, focusing on European demographic and social trends in the context of the changing global economy. The approach to the futures project was to focus on 3 policy areas: technology; employment; and competitiveness; and to call on the best available expertise from industry, academia, and policy.



The Main Outputs of the Project included four panel reports on: Demographic and Social Trends; ICT and the Information Society; Life Sciences and the Frontiers of Life; and Natural Resources and Environment. Three cross-cutting issue reports were also produced on: Knowledge and Learning; European Enlargement; and the Societal Bill. Maps proved to be a useful way of reformatting much of this interrelated information, for example to clarify areas of strengths and weakness. Three were produced: a Technology Map; a Competitiveness Map; and an Employment Map

An important finding is that the fastest growth in European employment occurs in ICTs and Health, as represented in the following diagram:

Picture 1: *Employment growth in different sectors*

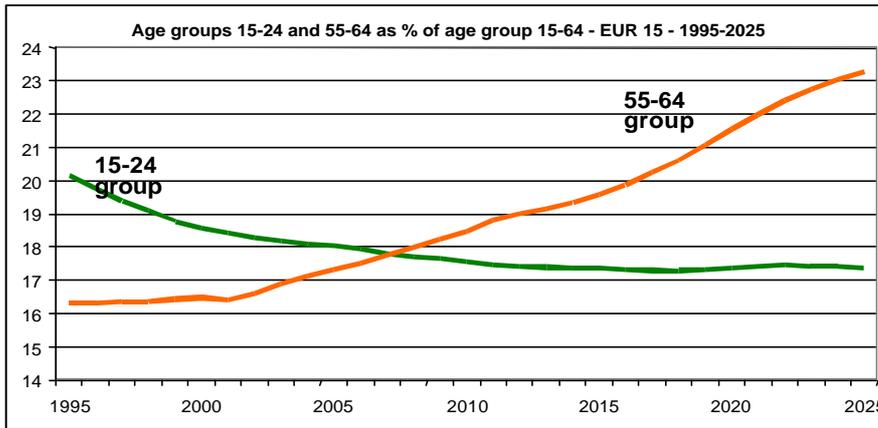


There were 500,000 unfilled ICT vacancies in the European Union in 1999, expected to rise to 1.6 million by 2002 (IDC, 1999). The greatest skill shortages in the ICT sector are in the areas of application design, user support, and content production. The emerging shortages in the biotechnology sector include specialist clinicians, gene therapy counsellors, and technical support (particularly programmers).

Another important factor is the current demographic transition in Europe, with the 55-64 age group expected to grow from 16% to 23% of the active population by 2025 (see diagram), complicated by major regional differences in the year in which the active population starts to decline.



Picture 2: Demographic transition in Europe in two age groups



Source : Eurostat 1997 Demographic Projections (baseline scenario)

majpopreg/eur15awa

As the knowledge society emerges in Europe, the combination of the above skills mismatches and the ageing workforce is creating a complex challenge of 'life-long learning'. Knowledge and learning must permeate ALL business operations in the EU, and should be promoted via increased inter-firm co-operation. These essential requirements for a successful EU knowledge system indicate three important areas for research.

Achieving and Maintaining Excellence, particularly in the areas of:

- The knowledge frontier - ICTs and Life Sciences
- Better Management of Human Capital
- Better Management of Knowledge Infrastructure

Achieving and Maintaining Internal Balance, by avoiding the "knowledge split" between the centre and the periphery.

Recognising and Exploiting the Diversity of Knowledge and Learning Assets:

- Knowledge and learning is much more than the combination of old style R&D and formal training.
- Knowledge system and human capital development also include such areas as: social networking; knowledge brokerage (consultancies, professional services, etc.); and entrepreneurial & risk culture.



The Swedish technology foresight project

Lennart Lubeck and **Lars Grönkvist**, NUTEK, Sweden

It is important to point out that this project involved many organizations representing all sectors of Swedish society. It was conducted jointly by:

- The Royal Swedish Academy of Engineering Sciences (IVA)
- The Swedish National Board for Industrial and Technical Development (NUTEK)
- The Federation of Swedish Industries
- The Swedish Foundation for Strategic Research ... in collaboration with the Swedish government, companies, public agencies and other interested parties. A major objective of the project was to strengthen a futures-oriented approach in Swedish companies and organisations.

The project was overseen by a steering committee, under which most of the work was performed by a series of panels, each dealing with one subject area, eg Society's Infrastructure; Production Systems; Information and Communications; Education and Learning. All panels were required to consider the impact on their subject area of the following issues:

- Ecology and environmental aspects;
- Economy and the market;
- Values and attitudes;
- The man-system-management interplay;
- Information systems, computer systems and mathematical-statistical methods;
- Energy;
- Boundary-breaching scientific and technological developments;



- Long-term basic research;
- Regional development.

Amongst the outputs of the process, two main driving forces were identified, ie Individualisation, and Borderlessness. In addition, three dominant pioneering technologies were highlighted, ie: ICT; New Biology; and Materials Technology. Some of the most important future trends identified included:

- Environmental imbalances;
- The growth of knowledge capital;
- New working methods and living patterns;
- More and more older people;
- Migration to cities;
- Threats to ethics and privacy.

In looking into the future, particularly the role of technology in the service of man, the panelists highlighted the following paradoxes:

- A richer and freer life will develop, but will it be at the expense of leisure time and security?
- A healthier life for everyone will develop, but will it be at the expense of higher health care costs and a range of ethical problems?
- Successful regions and cities will be created, but will it be possible to continue living in other parts of Sweden?
- Flourishing new business concepts and services will continue to emerge, but can Sweden keep up with rapid international developments?

The Panels' conclusions for the future fell under three headers:

- Attitudes: We must plan for the future, with the most important factor being a mindset welcoming change, both in individuals and in societal structures. We must not think we can predict the future with certainty, but we must be willing to continue to learn and experiment.
- Knowledge: Schools must be in the frontline, with additional efforts in supporting life-long learning. However, the emphasis must change to the individual learning experience rather than courseware, with a new focus on multi-disciplinary approaches.
- Infrastructures: Traditional infrastructures will remain important, but the rapid convergence of technologies and types of telecommunications traffic must be catered for. Clear regulations and guidelines will be needed, but they must be highly flexible to accommodate the rapid change, and to allow for appropriate incentives for continued growth.



The knowledge society: a challenge of life-long learning

Robert Cloarec, OECD

Knowledge management in the learning society

An OECD-report defines learning as a process, in the context of the learning economy. The core is the acquisition of competence and skills that allow the (learning) individual to be more successful in reaching individual goals or those of his/her organisation. This is also the kind of learning most crucial to economic success. It differs from some definitions of learning in standard economic theory, where it is synonymous either with "information acquisition" or treated as a black box phenomenon which is simply assumed to be reflected in productivity growth. Important insights include:

- Learning is a social not just a technical process
- The education/learning systems must be more aware of each individual
- The education systems must, like all "production" systems constantly be under development
- The link between education (the production) and research in the field need to be reinforced to improve the innovation within the education/learning sector
- The education systems must also increase the relation with other sectors to learn how things are done "outside the school gate"
- In a learning economy it is of course of most importance to improve the systems of learning for adults and at the workplace.

Knowledge based industries

The production, diffusion and use of technology and information are key to economic activity and sustainable growth. Knowledge and innovation have always been at the foundation of any advancing society. What distinguishes the current era is the speed with which new knowledge is now generated, diffused, assimilated and acted upon. With the advent of ICTs in the 20th century,



knowledge has become increasingly transferable across businesses, within nations and around the globe, leading to significant increases in the rate of technological innovation, together with improving levels of education and skills in the populace.

According to some analysts, the adoption of ICT, combined with increased economic integration among countries, is transforming the economic system, much like the "electricity revolution" in earlier episodes of the development process. It is evident that countries most successful in creating employment are those where multi-factoral productivity has grown faster, thereby confirming that there is no trade-off between productivity gains and job creation, but a mutually reinforcing relationship.

Knowledge, ICT, work organisation and performance

The increased role of knowledge and ICT is having a range of effects on production and the workplace:

- There is a rise of the demand for workers that generate ideas, ie "knowledge workers". In the USA between 1990-1998 the number of knowledge workers rose by 2,5 million, ie over 18% of the net employment gains recorder during that period. The workplace has to be organised in a way so the skills of the knowledge workers are used, so that he/she is generating ideas and as a result is improving both the production and his/her own knowledge. This is the "on the job-training" or "learning by doing". Therefore, there is a need for new incentives, especially financial ones, to retain knowledge workers: eg bonuses, stock options, royalty fees and partnerships.
- New workplace practises are emerging to maximise the benefits of both knowledge workers and of ICT. Some researchers argue that the observation of a lack of productivity gain resulting from investments in ICT is due to insufficient re-organisation of work practices. But this appears to be changing in the new economy where an increasing number of enterprises are implementing new organisation of work, followed by the successful use of ICT measured by improvements in productivity.
- There is a close connection between a well functioning training system, ICT and new organisation of work. Training is needed to introduce ICT and new work practises, and ICT and new work practices are the best supporters of training.
- New relations between management and labour are under development. The new work practices show a relatively high degree of co-operation between labour and management, flatter management structures and increased recourse to team work. They also show changes in labour compensation, training and labour practices, which may significantly alter wage distribution and job stability.
- Six crucial, cyclically interdependent factors have been identified: ICT - Work re-organisation - Learning - Innovation - Development - Productivity -...

Lifelong learning

Lifelong learning is a basic component of the learning society, and a major area requiring development is adult learning. There is a need to improve the financial resources of enterprises and individuals to support lifelong learning, to improve access, and to make the potential benefits of such an investment more apparent. Currently, in most OECD-countries, employers are responsible for competence development, and are rewarded by a variety of subsidies, especially if there is a risk of redundancies. For the unemployed, there are re-education initiatives organised and funded by governments.

However, for the employed with a need or just a desire to improve their professional capacities there are very few support systems, with the exception of initiatives in the UK and Sweden. The development of such systems is likely to transform the education market. Changes in demand will drive reforms of the supply side, resulting in new and much more (cost) effective education/learning programs. Distance learning will improve and ICT will be a key factor in these new products.

In conclusion, to optimise improvements in all aspects of development and productivity, all parts of the above systems must be strengthened, with the major factors of ICT, re-organisation of work practises, and learning all feeding back constructively on each other.



Managing cultural diversity: a challenge for future working life

Reijo Keurulainen, University of Jyväskylä, Finland

Several factors are driving a growing trend in Europe (and globally) of the internationalisation of work, accompanied by more multi-cultural and inter-cultural issues impacting on the working environment.

In Finland, three components of internationalisation can be identified:

- Expatriates - Finns moving abroad to work for fixed periods;
- Society & Team Building - integration of foreign workers into Finnish society;
- Coordination - management of multi-national projects from Finland.

In this context, it is proving of vital importance to create new training, learning and assessment tools for intercultural competence building. In Canada, Prof Kealey has provided a strong basis for such tools by categorizing factors for 'overseas effectiveness' as follows:

- a. Professional effectiveness in the target culture(s);
- b. Inter-cultural interaction (including non-verbal communication, and tolerance and openness);
- c. Personal and family adjustment (including acceptance of environment).

Historically, recruitment decisions have been almost exclusively based on group 'a', yet the other groups are thought to be at least as important.

The 'Developmental Model of Intercultural Sensitivity' (DMIS) has been created by Professors Bennett and Hammer as a framework to explain the reactions of people to cultural differences.

DMIS is based on the theory that "As one's experience of cultural difference becomes more complex and sophisticated, one's competence in intercultural relations increases". It therefore provides a tool for the assessment of 'cultural sensitivity' (or 'international orientation'), with six identifiable stages:

- The first 3 stages are ethnocentric, where own culture is perceived as central to reality:
 - Denial: other, 'unreal' cultures are avoided by psychological/physical isolation.
 - Defence: other cultures are seen as 'them', as threatening, and hence perceived in a very critical light.
 - Minimisation: own culture is expected to be universal, hence dis-similarities in other cultures are trivialized and romanticized.
- The other 3 DMIS stages are ethnorelative, where own culture is perceived and experienced in the context of other, legitimate cultures:
 - Acceptance: One expresses curiosity about and respect for a number of equally complex worldviews (cultures), not necessarily with agreement.
 - Adaptation: One has ability to view the world 'through different eyes', and to intentionally change behaviour to suit other cultures.
 - Integration: One's experience of self is expanded to include a range of cultural worldviews (often seen in non-dominant minority groups).

The University of Jyväskylä, Finland, is exploring possibilities to create research based tools to assess country and culture specific factors. The aim is to integrate this more specific information with that produced by the above, more culturally generic assessment methods, to build a more holistic package of assessment tools for cultural adjustment. They suggest that this should be a research theme for European institutional cooperation.



Decent work in the information society

Claire Harasty, ILO, Geneva

Technologies can both enhance and threaten the quality of our lives, livelihoods and institutions. Examples of enhancements include:

- A new balance of work and family needs
- A new freedom from the constraints of time and space
- More rewarding, intellectual work, which can be favourable to women

Examples of threats include:

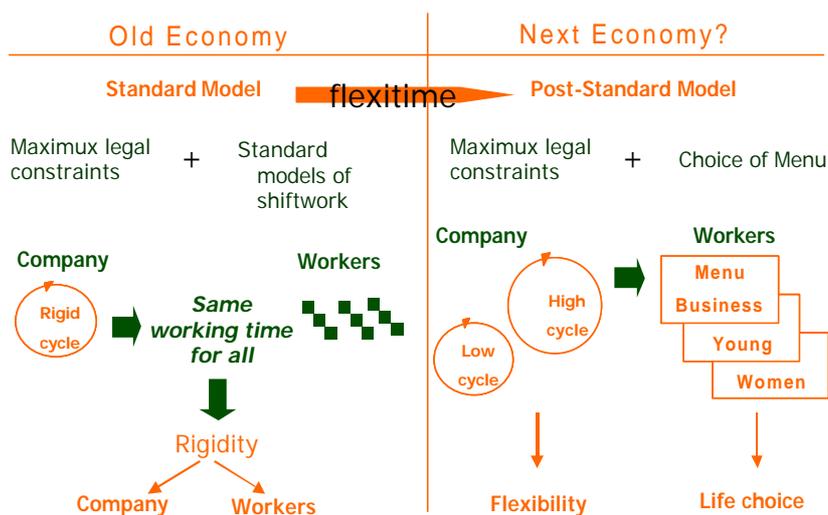
- blurring of work and non-work hours
- New invasions of privacy, and sources of stress
- New gaps in social protection and possible skill polarization

For decent work to be secured in the knowledge society, civil society has to play an active role in choosing how to maximise the enhancements and benefits and minimise the threats and costs of change. In response to the concern that the "new economy" gives the appearance of bypassing collective representation, Trade Unions and Employer Organizations need to organize and deliver value in new ways.

Decent work in the new economy

Luciano Pero, Fondazione Seveso, Milan

The Information Society will have a high impact on work from the dual viewpoint of opportunities for improvement, versus risks of worsening working conditions. Whereas the old economy focused on competencies around a "nucleus of technicalities", the new economy focuses on managerial and relationship competencies. In particular, significant changes to working time scheduling are anticipated, reflecting increasing organizational process flexibility, and a growing respect for individual life choices, as represented in the following diagram:





The resulting impact on the possible forms of organization, working time, and working location of each individual carries a variety of risks and opportunities which suggest the following action research projects (see table below):

- development of knowledge and competencies model;
- development of post-fordist models of working time;
- appropriate regulation of networking and tele-working;
- health and safety issues in post-fordism.

Impact on work	opportunities	risks	Innovation and Regulations
Forms of organisations	Teamwork <ul style="list-style-type: none"> • autonomy • quality • professionalism 	<ul style="list-style-type: none"> • Over identification with business • anxiety, stress, risks 	<ul style="list-style-type: none"> • post-fordist models of competencies and vocational training
Working Time	Flexibility <ul style="list-style-type: none"> • flexibility for companies • individualised working hours 	<ul style="list-style-type: none"> • Rigid scheduling and extreme working hours 	<ul style="list-style-type: none"> • post-fordist working time model
Location of Work	Net-working at distance <ul style="list-style-type: none"> • workers • companies 	<ul style="list-style-type: none"> • Gap in social protection for networking, independent work 	<ul style="list-style-type: none"> • regulation of networking and teleworking • post-fordist health & safety



Impact of knowledge society on living conditions: human beings, technology and ethics

Lynn Akesson, Lund University, Sweden

Focus on abilities, possibilities and challenges for the survival of democracy.

Important for any Social Foresight to:

- go behind rhetorical statements and look for what people actually do.
- to look through and behind the culturally created icons and the 'taken for granted' perspectives to expose how things really are.

This is because cultural icons of the day, rhetorical statements, and things taken for granted also contextualise and constrain our thinking of the future.

We must be aware of parallel systems: technical, administrative, judicial, and cultural, and of the discrepancies in the speed with which these systems change. Technology changes fast, but people usually change slowly.

Four themes: knowledge, work, choice, narratives.

Knowledge: What is knowledge, and what does it mean? It's a paradox in terms of the emerging knowledge-society that ignorance is a 'cultural icon' with the man in the street as a hero representing a contempt for knowledge. Society has a history of expressing knowledge as a way of patronizing people and a culture of simplification rather than of education. Therefore, perhaps the knowledge-society should be less connected with traditional, formal education, and more connected with social or cultural knowledge or skills.



Work: People are working too much. Some see work as an oasis, a quiet and peaceful zone away from the chaos of family life. Loyalties are moving away from the company tradition towards personal networks fuelled by freelance and project-based work. Labour unions need to reform since the old principles on which they were based are eroding. But what are the new principles? Are personal relations becoming more important than unions, even reformed unions?

Choice: Freedom to choose is a highly valued cornerstone in western culture. But choice demands responsibility, and without understanding can become a tyrant, particularly with the growth of the web. People can be overwhelmed by too many choices; electronic interactions are creating new ways to secretly manipulate people and invade their privacy. On a daily basis, the danger of making wrong choices grows. We need to understand the 'geography of choices' and the potential for marginalisation. Which decisions are made during 24 hours in a family, in one month... a year? What will happen to individuals who for different reasons (language, education, health, social circumstances) cannot, or do not want to make choices?

Narratives: Major driving forces for social change are not only economical and technological. The power of the 'social imagination' (even fantasy) of crisis, depression or success is underestimated. Interpretation of these social images is an important political issue. Which conditions have historically created hope for the future (images of utopia), and which ones have not (images of dystopia)?

Social Foresight: In light of the above, a range of questions (abilities, possibilities and challenges) need investigation. Focus and choices should be centred on those variables that could so easily be overlooked, and which particularly risk further marginalisation of the disadvantaged. The relationship between the individual and society is posing new challenges to such fundamental issues as integrity, social awareness and self motivation.



Knowledge society and its impacts on work organisation

Lars-Erik Andreassen, EWON Project, European Commission

The European Work Organisation Network (EWON) has been a high priority of the Commission over the last four years in recognition of the importance of its people-orientated focus. The new paradigm is the fundamental re-organisation of enterprises centred on finding ways to release the knowledge of the workers.

Three years ago, the Commission launched the Green Paper on partnership for the new organisation of work, intended to stimulate debate throughout Europe. It proved clearly that the ongoing development of innovative forms of work organisation benefits enterprises by improving productivity and creating better working conditions. It also highlighted that appropriate new work structures need to be created prior to the successful implementation of ICT.

EWON was created because organisational innovation is seen by the Commission as a crucial factor for competitiveness, quality of working life and to support adaptability. The network has four main roles:

- strengthening European organisational research and development;
- identifying best practices;
- promoting cooperation; and
- supporting disadvantaged sectors and regions.

The Commission has selected one institute in each member state to join EWON. It is important that these institutes have an operational rather than an academic approach, primarily by assisting enterprises to create innovative forms of work organisation. The mandate of the network is to investigate trends in European work organization and to promote and disseminate new ideas via the internet, workshops, seminars, newsletter, etc.

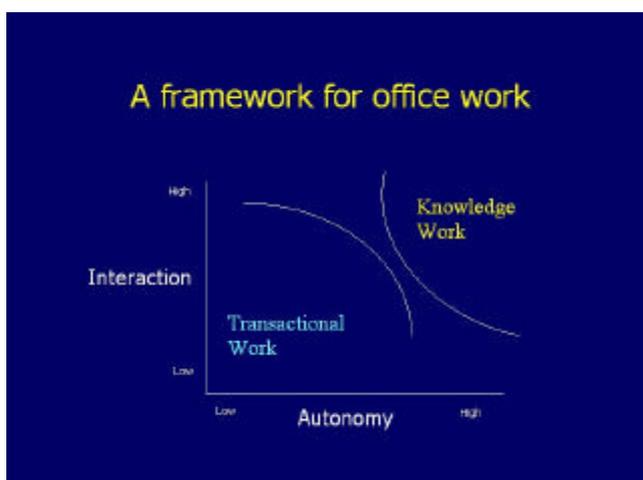
Community-based planning

Robert Daniels, Steelcase, USA

Telework should not be considered as a threat to the office. Instead of reducing the importance of the office as the working place, it will increase the pressure on the office to support both mobile workers and people who are working from remote locations. Face-to-face interaction will continue to be important for a good organisation of work.

User-centred research ie observing how people work and then looking at work patterns which are repeated, has provided insights into what the remote worker needs.

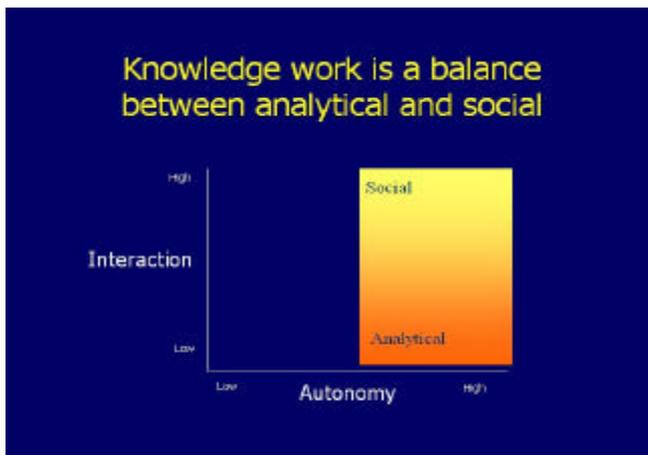
Picture 1: *Transactional work and knowledge work and their relation to interaction and autonomy at work*



Many teleworking initiatives have started among transactional workers, who focus on a single task e.g. processing paper work, entering data etc. They have less autonomy and are seen as needing low interaction. Nevertheless, these workers would frequently talk to each other between phone calls, share stories, and ask each other for advice. Social relationships are based on trust that develops only through face-to-face interaction. If the social relationships are weak this will be evident in time, as employees will show a feeling of poor connection with the organisation.

It is among knowledge workers where telework has the potential to break this mould. This is the fastest growing job category in the most developed countries. Knowledge workers do not fall in the "high interaction" or "low interaction" category; they instead are required to balance different kind of activities. Although initially location appears irrelevant to telework, physical presence is critical, eg when discussing, negotiating, persuading and dissuading. Telework allows people to be where they need to be. Whilst analytical tasks can be performed anywhere, social tasks are location dependant. But how do knowledge workers predict when they need to interact with each other?

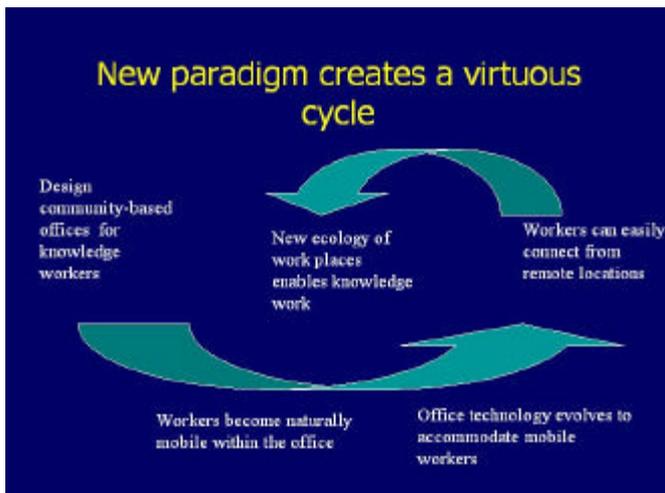
Picture 2: Knowledge work demands analytical and social skills



The frustration of knowledge workers and the on-going pressures to reduce costs tend to create a vicious cycle in the office. In the last ten years a great number of office plans and designs have not succeeded in meeting the extreme and various needs of the knowledge workers, because they have focused on the individual work station as the only working tool. The office must be seen as the healthy core of a complex system. The paradox of this situation is that in order for telework to be successful, the office itself has to become a better place in which to work.



Picture 3: *Knowledge work, new paradigm and a virtuous circle*



The opposite of the vicious circle becomes the virtuous cycle, which requires an understanding of knowledge work. In the knowledge economy people have to learn faster than their competitors, so offices must encourage fluent interaction and nurture personal networks. This leads to a new way of planning offices, which encourages mobility within the building, and considers the collective "we" rather than the individual "I".

More face-to-face interaction leads to stronger networks. In this type of office organisation it is assumed that remote workers will sometimes connect electronically to the central office. The office designed for mobile/remote work can easily evolve from being an isolated place and become connected to other work places. As these locations truly become an ecology of work environments, work happens everywhere, and telework breaks the mould.

This solves that paradox: the more technology allows people to work from home the more the company needs the office as a place for interaction. The office helps people make their community stronger. For telework to really break the mould the office needs to be designed in such a way that a remote worker can connect to any place the team might gather.



From technology foresights to the European social foresights

Ian Miles, University of Manchester, UK

General Foresight Issues

Foresight should be recognized as prototypical of the emerging knowledge economy, moving on from the inadequacies of linear forecasting to the more flexible management of an ever more complex, inter-related society. Given this growing complexity, it is useful to subdivide the Knowledge Society into 3 areas:

- *Technological - Information Society*: Characterised by technological innovations in the context of, for example, social constraints, social adaptation, and relevant social trends for skills market, etc.
- *Economic, Working Conditions - post-Fordist society*: Characterised by the techniques, institutions and structures involved with organizational innovations in the context of, for example, "realizing the full value of technical innovations", applying technology to organizational innovation, etc.
- *Sociological - postmodern society*: Characterised by social innovations in the context of, for example, the social shaping of technology development and choice, applying technology to social innovation, etc.



Experience gained from a range of Foresight initiatives has revealed some important generic lessons, falling into the areas of practical, methodological, and political:

Practical:

- Need to enlist, and mobilise a wide range of relevant communities, to access relevant knowledge and form effective networks. This is also essential for gaining legitimacy and a broad basis to increase the likelihood of successful implementation.
- Difficulties in accessing regions, SME and other "peripheries" need to be addressed, not ignored.

Methodological:

- Formal methods can be valuable team-building inputs - but implementation needs a great deal of preparative and participative care to avoid "transplant rejection".
- The online Knowledge Pool method, if used too generally, can be counter-productive. Examples of problems include: difficulties in enlisting participation in open-ended, asynchronous loose networks (because of a low sense of community & ownership); and difficulties in demonstrating a clear route to priorities.

Political:

- It is essential to construct "implementation" processes and "marketing" of results early in Foresight. But be flexible, and be prepared to augment and amplify, to use team resources opportunistically and sensitively.
- Need to build a range of bridges to avoid such hazards as being neutralised by governmental change; losing momentum through appropriation of results; being captured by vested interests.

Social Foresight Issues

These insights were gained from the high priority placed upon social understanding in the UK Technology Foresight process. It appears that various methods are equally useful in identifying the (technology-driven) issues cited below - e.g. from Delphis, from qualitative analysis of Panel reports, and from Foresight evolution itself.

Cross-cutting Themes are useful, and are likely to include:

- Ageing populations;
- Future Cities;
- Crime Control;
- Social Cohesion;
- Education, skills and training;
- Sustainable development.

Challenges - a great deal of effort is often necessary to find the best, long-term routes, rather than the easiest, short-term routes, for example:

- Find the most appropriate expertise - not just engineering, but multidisciplinary, 'street-wise', etc.
- Ensure that the much broader innovation community is represented - the professional researchers are only a subset.
- Avoid politicized discourse preventing full analysis of all relevant, competing Paradigms.
- Avoid problems of dialogue which may create problems, for example: suspicion, arcane jargon, "exploitation" gaps.

Possible Approaches to Social Foresight - no 'right path' has yet been identified, but three options were described:

- Link to existing Technology Foresight material. Re-evaluate with new emphases, eg Social Innovation, Social Contingencies and Constraints.
- Drive a separate Social Science Foresight process. A conventional disciplinary approach could be used, or a more holistic approach could be based on Themes and Visions e.g. the 'Risk Society'.
- Finally, the foresight could be directly focused on national (or higher?) Issues and Goals, e.g. Democracy, Social Inclusion, Quality of Life.



Summaries of presentations

Timo Kauppinen, European Foundation for the Improvement of Living and Working Conditions

Bob Day, University of South Africa

This section summarises the major issues and experiences presented by a variety of experts during the workshops. The intention has been to represent the most important points raised by each speaker as accurately as possible. This process has also enabled us to identify those major issues where there appears to have been pre-workshop consensus, as well as those issues causing the most confusion.

Areas of Consensus

The global approach is seen as essential by the EU Parliament to enable Europe to cope with the dramatic, high speed changes accompanying the emergence of the knowledge society. With the advent of ICTs in the 20th century, knowledge has become increasingly transferable across businesses, within nations and around the globe, leading to significant increases in the rate of technological innovation, together with improving levels of education and skills in the populace. Some issues seem clear:

- We need affordable access to broadband for everybody in Europe;
- The rapid convergence of technologies and types of telecommunications traffic requires clear flexible regulations and guidelines compatible across the EU (and world);
- We need to develop a new business approach, culture and philosophy;
- As the knowledge society emerges in Europe, the combination of the skills mismatches in ICTs and Health coupled with the ageing workforce is creating a complex challenge of 'life-long learning';
- For decent work to be secured in the knowledge society, civil society has to play an active role in choosing how to maximise the enhancements and benefits and minimise the threats and costs of change.

- To optimise improvements in all aspects of development and productivity, all parts of the learning and knowledge systems must be strengthened, with the major factors of ICT, re-organisation of work practises, and learning all feeding back constructively on each other.

Areas of Confusion

The presentations seem to emphasise that the contentious issues are not in the technical areas, but in the inter-related and complex ways in which these already are, and will to an even greater extent, impacting on a wide range of social factors. Here are some examples of the uncertainties and apprehension that currently reigns:

- What is the knowledge society? Can it ever be clearly defined for all purposes, and is it important to only the elites, or to all members of society?
- Do we have to redefine knowledge and learning, with a much greater individual, multi-disciplinary and tacit flavour?
- Can the existing education systems adapt incrementally to cope with 'life-long-learning' and the rapid, dramatic changes anticipated? If not, how do we replace and/or supplement them?
- Can and should Europe try to retain its cultural diversity, and how can it balance this with full participation in the global economy.
- How will Europe cope with the advent of 'borderlessness', when it is struggling to move to majority voting mechanisms?
- How can we ensure that the labour fears about ICT (job taker, not maker; and only for the rich elites) do not become self-fulfilling prophecies?
- Are personal relations becoming more important than unions, even reformed unions?
- Significant changes to working time scheduling are anticipated, reflecting increasing organizational process flexibility, and a growing respect for individual life choices. But is this really possible in Europe's current, highly bureaucratic, large organizations in both the public and private sectors?
- What will happen to individuals who for different reasons (language, education, health, social circumstances) cannot, or do not want to make choices?

Outputs of Break-away Sessions

The three Foundation areas of living conditions, working conditions and industrial relations were accepted by all participants as providing a useful structure for a fertile range of future research initiatives at various levels. However, it became clear in the second seminar that there are several areas of confusion and apprehension common to most presentations that appear to cut across these three categories. It seems, therefore, that an initial, much broader investigation into the knowledge society should be carried out, both to clarify joint concepts and minimise confusion. This is recommended in more detail at the end of the report. First, however, we present summaries of the findings of the break-away groups, each of which focused on one of the three areas.

Knowledge Society and the Future of Living Conditions Group

The group spent much of its time defining the 'transaction citizen' and 'knowledge citizen' ideas, which are dealt with in more detail in the 'Recommendations and Insights' section, below.



However, using these definitions the group was quickly able to identify two further areas for research projects, ie:

Project on Exclusion:

This deals with the issue of "isolated people" and their exclusion from the emerging knowledge society. The group discussion indicated that there are several types of isolation with related characteristics which need further research, and gave this category of people the label: 'transaction citizen'. Under this header, the group identified the need to explore how we might encourage social cohesion and inclusion by:

- working on 'tolerance levels':
 - individual vs social dynamics (where should the dominant voice be?);
 - the role of mavericks, with emphasis on their potential for generating growth.
- developing shared responsibility (including the private sector) for dealing with exclusion:
 - the need for appropriate reward mechanisms;
 - how do we promote, define and create cross-sectoral partnerships?

Project on impact of knowledge society on living conditions:

This deals with the circumstances of the group in the 'knowledge citizen' continuum (see diagram in 'recommendations' section below). Understanding of the differences across the sub-continuum are very important, otherwise a digital sub-divide could easily develop.

Under the 'knowledge citizen' header, the issue of inclusion raised the need to explore how we might manage (without stifling) significant changes in:

- households;
- relationships;
- social systems (both physical, and increasingly virtual);
- education;
- consumption;
- community.

It was emphasized that there is a wealth of experience in societal responses to major changes in the past (industrial revolution, advent of radio and TV, etc.), and that this should be re-assessed in the current knowledge society context.

Knowledge Society and the Future of Working Conditions Group

The group had an intensive discussion and pointed out some crucial items concerning the impact of the knowledge society on working conditions. Even though they were able to point out these issues they thought there is a need to define and spend more time on future discussions. Their primary advice is that the Foundation should start to define a research framework to establish priorities.

Given these constraints, however, the group created a preliminary "shopping-list" of potential research projects focused on how new technologies effect:

- work organisation
- skills (upskilling /downskilling), training, life long learning/competence management. Also how different types of employment contracts (e.g. long-term versus short-term contracts) affect the access to training and life-long learning.
- time (working time and leisure time)
- health (particularly stress)
- social inclusion/exclusion
- mobility and dealing with multicultural issues
- legal framework (to what extent does the current framework suits the emerging knowledge society).

Another important issue is to spread good practices and also shared learning from 'best failures'.

Main comments:

- The group was concerned that it had focused too much on the impact of ICT and new technologies, at the expense of other important aspects relevant to the impact of the knowledge society on working conditions.
- It is important to clearly define the groups we are dealing with, and the relative numbers of people/workers in each group.
- It is important to define which skills are necessary for users of ICT compared with people working in the ICT sector. (ie Are there always big barriers for e.g. older people to become ICT literate?)

Knowledge Society and the Future of Work and Industrial Relations Group

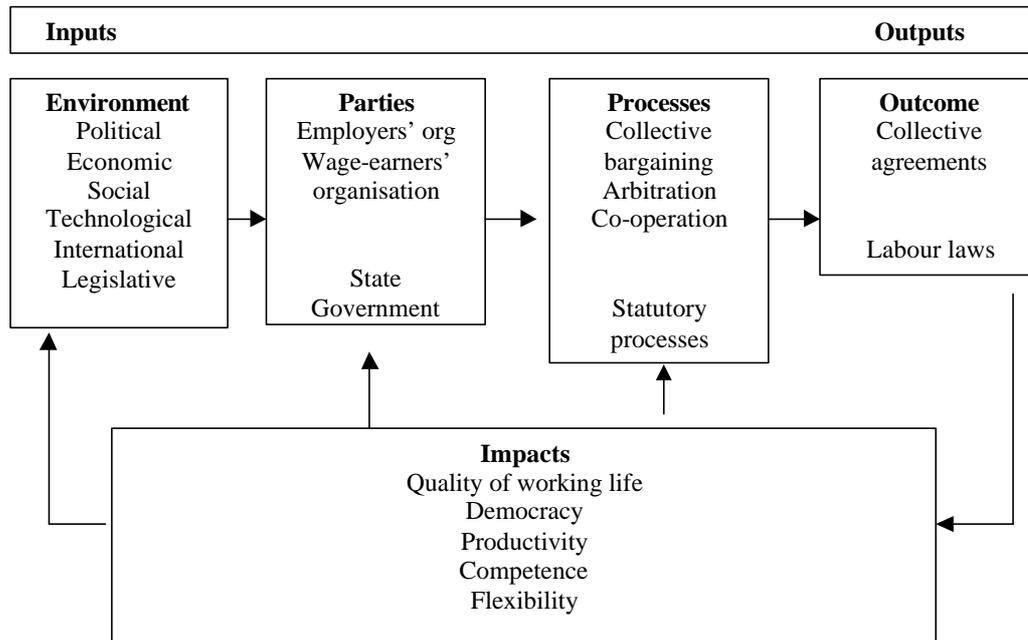
The basic theory of the group was that the shift from an industrial economy to a knowledge-based economy will have a strong impact on current systems of industrial relations as represented in the following diagram:

The group argued that the way the issues represented above will change in the knowledge society needs to be investigated, particularly the way they are expected to broaden and become more inter-related. The focus of this investigation should include:

- Identify the social partners, and the types of relationship.
- Identify the range of potential working conditions, and their properties.
- Suggest the range of ways that information rights might change.
- Suggest models for the flexibility of working hours.



Picture: *System model of industrial relations in the Industrial Society challenged by the Knowledge society*

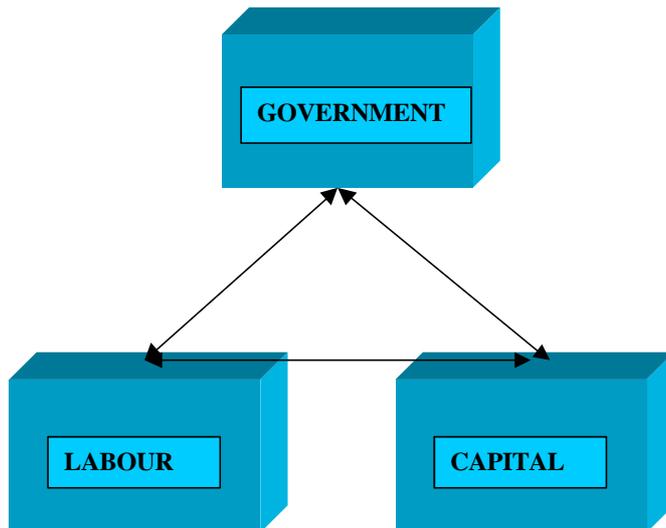


In each of the above cases, the appropriateness as the knowledge society evolves of a range of industrial relations processes should be investigated, particularly from the viewpoint of their likely outcomes.

Plans for 2001:

The group identified the immediate need to examine the Knowledge Society from the following angles:

- Trends, particularly in the areas of employment and skills.
- Role of outsourcing and the resultant changes in contractual practices.
- Transformation of all sectors towards services sector.
- New forms of working, ie: tele-working; mobile working; knowledge management.
- Broadening of the concept of 'professional workers'.
- Impact of the knowledge society on traditional business practices, including life-long learning (ie people's ability to adapt), and working time.
- The types of new services that will emerge, and their impact on public sector.



The changing relationships (see diagram above) between government, labour (Trade Unions), and capital (employer organizations) should be used to examine:

- Growth of professional workers
- Increase in professional associations
- Phenomenon of "knowledge workers"
- From collective regulation agreements to more flexible, more customized employment relations
- Worker (or citizen?) rights
- Multi-level contracts

Methodology:

The group identified the need for a panel with expertise in studying the Future and its impacts to investigate:

- a. Trends
- b. Look at vanguards (interesting cases)
- c. History/past analyses/cycles combining empirical observation with expert knowledge
- d. Systemic surveys - seeking 'turning points'
- e. Scenarios: giving a positive future, an 'average' future, and a negative future, to allow concept analysis of the information society compared with the knowledge society, and related issues in new industrial relations:
 - Training
 - Health and safety (stress)
 - Equal opportunities
 - Freedom of choice in view of the impact of tele-work.



Recommendations and insights from the seminars

Timo Kauppinen, European Foundation for the Improvement of Living and Working Conditions

Bob Day, University of South Africa

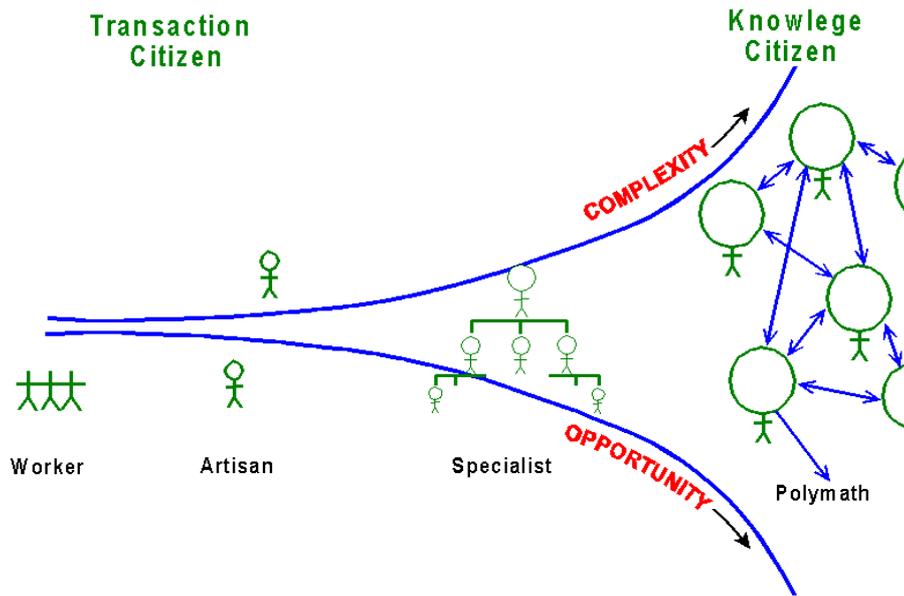
By the end of the second seminar it was evident that there are several commonly held areas of confusion and apprehension which are not primarily about the technical areas in themselves, but rather about the inter-related and complex ways in which these already are, and, increasingly, will be impacting on a wide range of social factors. The most fundamental areas of uncertainty and apprehension were identified as:

- What is the knowledge society? Can it ever be clearly defined for all purposes, and is it important to only the elites, or to all members of society?
- Do we have to redefine knowledge and learning, with a much greater individual, multi-disciplinary and tacit flavor?

Therefore, it was agreed at the end of the second workshop that the first priority should be a much broader investigation into the meaning of knowledge and the knowledge society. The related need was emphasised for a much fuller understanding of the issues of exclusion and its relationship with the 'digital divide', particularly in the context of the restrictions associated with migration from the industrial to the knowledge paradigms.

During the plenary discussions on the final day, the concept of the 'knowledge citizen' was developed, and generally accepted as being significantly more useful and holistic than the jargonized term of 'knowledge worker'. This new idea stimulated some further insights, which are summarized below.

Picture 1: *The Knowledge Citizen: Some preliminary thoughts on a definition*



The diagram above represents the extremes of the 'knowledge citizen' concept compared with that of the 'transaction citizen'. It emphasizes (by head size) that a worker in the still predominant industrial paradigm is used primarily as an unthinking physical "doer", with little hope for future development, or influence on organizational strategy. At the other extreme, the knowledge citizens are polymaths whose value is defined by the use of their brains in conjunction with their networking and communications skills. Is it inevitable that only a small elite in any society can work and live in this way, or is it attainable by all? Is it really what most people would aspire to if they could have it?

The specialists, like the polymaths, but to a lesser extent, have more emphasis on their brain power than their muscle power. However, in the industrial paradigm the majority of these specialists are collected within large, hierarchical organizations. One major concern is that below the first two or three levels of most large hierarchies the influence of these valuable brains is usually stifled to insignificance. Is it generally the case that, eventually, the best brains find their way to the top of these hierarchies? Just how wasteful are these structures of human capacity and potential?

The artisans appear to have a natural balance between the use of their muscle and brain power, and tend to work as individuals, or small, poorly coordinated groups. Interestingly, this definition seems to fit the original hunter-gatherer role of our forebears prior to the agricultural revolution 12000 years ago. Perhaps there are some important issues here related to possible deep-rooted norms for 'quality of life'. What this also indicates is that the almost brain-irrelevant 'worker' status is a relatively recent creation. It probably appeared first in the military context - ie the foot soldier in organized armies whose duty it was (is?) to obey without question. However, as the industrial paradigm developed, this concept was expanded into one of the most common human conditions



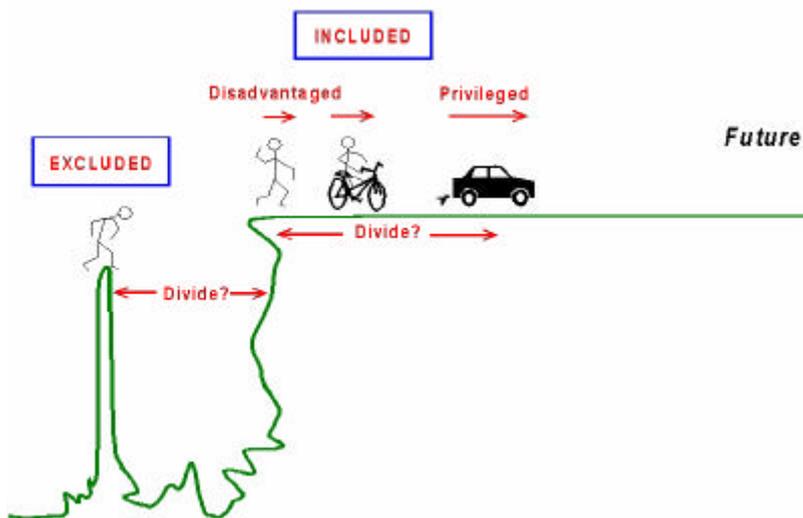
in industrialised societies. Does this represent a retrograde step in human development? Is it essential for the creation of wealth that so many people have to lead such unfulfilling lives? Is this still the price the majority of people in the under-developed world must pay for their countries to become wealthy?

The diagram also attempts to depict the growth in complexity of society associated with the different types of citizenship. The dramatic increase in interactions between individuals, groups, organizations, nations and global institutions is one measure of the interdependence of the emerging global knowledge economy. It emphasizes the need to work with entities having the relevant abilities whoever and wherever they may be, rather than trying to "go it alone". And it indicates that this growth in interdependence is mirrored by the development of new service industries, and the related wide range of opportunities for sustainable employment (rather than 'job') creation.

Exclusion and the Digital Divide: one concept, or many?

The next diagram attempts to surface some of the complexity often hidden by the labels commonly used to discuss these issues. It suggests that the 'knowledge citizen' in reality is not a single point in a continuum, but itself may be seen as another continuum. This allows us to consider the 'transaction citizen' as being completely excluded, not able to move at all towards the knowledge society, and hence creating a growing 'digital divide'. By contrast, even those at the back of the 'included' knowledge continuum are moving 'in synch' with knowledge society developments. Hence, they are not being left behind, are not excluded, and are not part of the growing digital divide. They are, at least to some extent, empowered. However, they ARE disadvantaged, and this is in itself an issue that requires elaboration and investigation. A major concern is that the Foundation's researchers do not confuse these disadvantaged, but not disempowered people with the large numbers of genuinely excluded people who are often less conspicuous and vociferous. The remedies for each condition are likely to be significantly different.

Picture 2: *Exclusion and the Digital Divide: concepts and development*



The often over-simplified concept of 'access' raises an important question in defining the knowledge citizen. Is anyone a knowledge citizen as long as they simply are using (including having access to) ICTs for societal and/or work purposes? Or is knowledge citizenship more related to the activities performed by a person with or without ICTs, ie does that citizen perform activities which are valuable and useful both to himself and to public and private society, which either cannot, or preferably should not be automated? It is interesting to consider this question in the work environment compared with the social environment.

Work environment: With the commendable goal of increasing employment, societies often create more 'jobs', which are mostly automatable (boring, demeaning, unfulfilling - see worker above). Even though they may include intense ICT use (eg cashier), are such jobs accelerating the development of the knowledge society and its anticipated empowerment and increase in fulfilling employment for all? Or are such well-intended initiatives not entrenching the old industrial paradigm, wherein workers are:

- expendable and replaceable (creating the primary need for industrial relations?),
- secondary in value and importance to products and production lines?

By this definition, perhaps a gardener, ie an artisan with no ICT access is much further towards knowledge citizenship than a 'connected' cashier.

Social environment: By contrast, it is difficult to see how any individual can approach knowledge citizenship if they do not have adequate access to fully interactive ICTs for their social activities. These activities beyond consumerism include:

- financial transactions and advice,
- education (formal and informal),
- a wide range of local and national government interactions (voting, taxes, social security, health, policy development, decentralization....).

In some cases such lack of access is by choice (intimidation, withdrawal, etc..), ie self exclusion. In others it is due to lack of physical facilities, training, and support (as in ghettos, remote and rural areas, etc..) ie societal exclusion. Often, it is a combination of both. However, the net affect is to entrench exclusion and isolation of these citizens compared with those who readily and easily interact with a wide range of electronic services at their own convenience (any time, any place, any way...).

It seems likely that many analysts and researchers have been assuming that the only (or most likely, or most effective, or..) way that a citizen can move from being a transaction citizen to a knowledge citizen is by moving from being a transaction worker to a knowledge worker? Isn't there significant potential in exploring much more thoroughly the 'social environment' alternative above? Here, it is very possible that although the 'transaction worker' may continue to be exposed



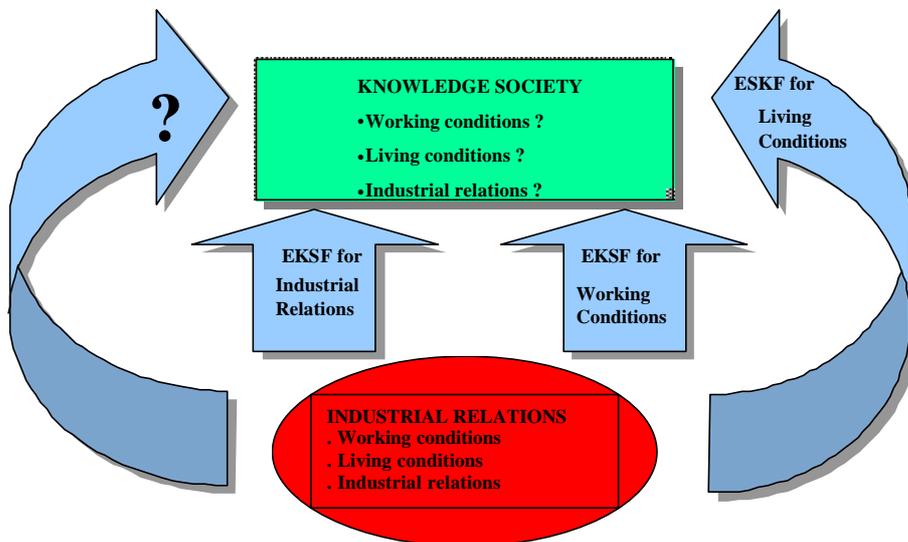
to little or no 'knowledge work' in their work environment, they could and should be developing and enjoying strong knowledge citizenship capabilities in their social environment.

Main Recommendations:

1. In the context of the above preliminary discussion, a joint concept analysis should be carried out to understand, define and clarify the knowledge society by exploring the concepts of 'knowledge citizenship' compared with 'industrial citizenship' and 'transaction citizenship', and by ensuring that the many, often non-intuitive manifestations of exclusion are not neglected.
2. Once better defined, we need to investigate how best to migrate from the industrial to the knowledge paradigms whilst maintaining a balanced society.

It is anticipated that these initial, broad investigations will:

- Lead to a much clearer, more holistic and more robust definition of the knowledge society, and its complex, interdependent, global dynamics.
- Create an enabling framework for further, coherent research projects leading to the production of European Social Foresights (ESFs) for Living Conditions, Working Conditions and Industrial Relations, thereby removing the question marks in the Foundation's introductory diagram, ie:



Appendix 1

Programme and participants list:
13-14 July 2000

**THE IMPACT OF THE KNOWLEDGE SOCIETY ON
LIVING & WORKING CONDITIONS AND
INDUSTRIAL RELATIONS**

European Foundation, Dublin, 13-14 July 2000

AGENDA / PROGRAMME

13 July 2000

Chairperson: Timo Kauppinen

14.00 **Welcome** - Raymond-Pierre Bodin, Director

14.15 **General introduction to the workshop** - Timo Kauppinen, Research Manager

14.30 **The Knowledge Society and Europe 2000 Action Plan** - Martin Ulbrich, Information Society, Policy Planning Unit DG

Invited comments:

- Oliver Richard, UNICE, Advisor Social Affairs, Belgium (Employers)
- Renato Rizzo, Mirti European Project, Italy (Unions)

Strategies for Jobs in the Information Society - Michael Morass, Employment & Social Affairs DG



16.30 **Knowledge Society in the Light of Technology Foresights Projects:**

The Swedish Technology Foresight - the process and highlights - Lars Groenkvist, NUTEK

The Danish Technology Foresight - the concept, programme and implementation - Erik Meineche Schmidt, Computer Science Unit, Aarhus University

The Japan Technology Foresight - the concept & implementation - Terutaka Kuwahara, National Institute of Science & Technology Policy (NISTP)

Technology Foresight in South Africa - R (Bob) S Day, Information and Communications Technology, University of South Africa (UNISA)

German Action Programme on Innovation & Jobs for the Information Society of 21st Century - Rudolf Gridl, Ministry of Economics & Technology

18.30 *Conclusions*

14 July 2000

Chairperson: Christian Welz

9.00 *Introduction* - Timo Kauppinen and Christian Welz, European Foundation

9.10 *Information Society and its Impact on Living & Working Conditions in Ireland* - Brenda Boylan, Information Society Commission

9.30 *The New Economy & Employment* - Pascal Petit, CEPREM/CNRS

9.50 *Workshops addressing the following questions:*

1. **Impacts of the "Knowledge society" on**
 - living conditions
 - working conditions
 - industrial relations
2. **Lessons to be drawn from national technology foresights regarding policies, R&D and social partners**
3. **How can research contribute to the success and competitiveness of the KS?**

11.30 *Feedback from the workshops to the plenary and general discussion*

12.30 *Conclusions for future development*

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Appendix 2

Programme and participants list:
27-28 November 2000

**THE IMPACT OF THE KNOWLEDGE SOCIETY ON LIVING & WORKING
CONDITIONS AND INDUSTRIAL RELATIONS**

FROM TECHNOLOGY FORESIGHTS TO EUROPEAN SOCIAL FORESIGHTS

European Foundation, Dublin, 13-14 July 2000

Objective of the workshop

To discuss the Parliament's and the Commission's projects and national technology foresights/knowledge society projects in order to identify and develop future research projects on impacts of knowledge society on living and working conditions and industrial relations in the framework of the four-year rolling programme of the Foundation. One of the challenges is move from technology foresights to European social foresights.

Outcome

Outcome from the workshop will be action plans for research and development projects on European foresights for living conditions, working condition and industrial relations.

Participants

Participants are representing the Commission, social partners, the national states, technology foresight projects, the researchers and the European Foundation. Total number of the participants will be about 35 persons.



Organisers

The workshop is organised jointly by the European Foundation for the Improvement for Living and Working Conditions and the Swedish Technology Foresight/Teknisk Framsyn, project.

AGENDA

27 November 2000

Chairperson: Timo Kauppinen

14.00 *Welcome*

14.10 *Objectives of the workshop* - Timo Kauppinen, Research Manager

Summary of the July 2000 seminar - Bob Day, University of South-Africa
- Camilla Galli da Bino and Tanja Christiansen, European Foundation

14.30 *Preparing for the Knowledge Society* -Luis Martin-Oar, European Parliament
Secretariat of the Committee on Industry, External - Trade, Research and Energy

15.00 *IPTS Futures Project* - Eamon Cahill, Project organised by Institute for Prospective
Technological Studies IPTS, Spain/ Irish Productivity Centre (project of European
Commission)

15.30 *Swedish Technology Foresight Project: process, methods and implementation*
- Lennart Lübeck, Project Manager, Swedish Technology Foresight Project

16.30 *Knowledge Society, a Challenge of Life-Long Learning* - Robert Cloarec, OECD
- Comment by Reijo Keurulainen, University of Jyväskylä

17.00 *Decent Work in the Information Society* - Ms Claire Harasty, ILO, Geneva
- Comment by Luciano Pero, Fondazione Seveso, Milan

17.30 *Impact of Knowledge Society on Living Conditions: Human Beings, Technology and
Ethics* - Lynn Åkesson, Lund University, Swedish Techn. Project, Panel Health and
Health Care

18.00 *Knowledge Society and Its Impact on Work Organisation* - Lars-Erik Andreassen,
European Commission, EWON project

Invited comments:

- UNICE
- ETUC

Discussion

19.00 *Conclusions*

28 November 2000

Chairperson: Christian Welz

9.00 **Introduction** - Timo Kauppinen and Christian Welz, European Foundation

9.10 **Community-based planning** - Robert Daniels, Steelcase, USA

9.40 **From Technology Foresights to the European Social Foresights** - Ian Miles,
University of Manchester

10.10 **Formation of three groups:**

1. Knowledge Society and Future of Living Conditions chaired by
Robert Anderson, European Foundation

2. Knowledge Society and Future of Working Conditions chaired by
Pascal Paoli, European Foundation

3. Knowledge Society and Future of Work and Industrial Relations chaired by
Timo Kauppinen, European Foundation

10.15 **Workshops are addressing the following question on its own area:**

From Technology Foresights to European Social Foresights

- living conditions
- working conditions
- work and industrial relations

11.30 **Panel Discussion**

12.45 **Conclusions for future development**



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Appendix 3

List of documents distributed during the workshops

Job opportunities in the Information Society - Exploiting the potential of the information revolution - Report to the European Council - EC 1998

Communication from the Commission - Strategies for jobs in the Information Society - EC, 4 February 2000, COM(2000) 48 final

Presidency Conclusions - Lisbon European Council, 23-24 March 2000

Communication from the Commission - e-Learning - Designing tomorrow's education - EC, 24 May 2000 COM(2000) 318 final

eEurope 2002 - An Information Society for All - Draft Action Plan prepared by the European Commission for the European Council in Feira, 19-20.6.2000 - 24 May 2000, COM(2000) 330 final

Presidency Conclusions - Santa Maria da Feira European Council, 19-20 June 2000

Commission launches First Stage Consultation of social partners on modernising and improving employment relations, EC, DG Employment and Social Affairs, 26 June 2000

Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, Social Policy Agenda, 28 June 2000, COM(2000) 379 final

Information Society Technologies - Creating a user-friendly Information Society, June 2000


Appendix 4**List of Foundation's publications on telework****Telework: impact on living and working conditions**

WP/85/01/EN

Télétravail: impact sur les conditions de vie et de travail

WP/85/01/FR

An integrated report providing information on the state and characteristics of telework in Europe and the United States, with a forecast of developments. The studies for France, Italy, the United Kingdom and the United States are particularly extensive.

Telework: women and environment

WP/88/14/EN

This report is based on a survey of 62 real-life teleworkers in five countries and an in-depth case-study of telehomeworking in rural Ireland. It looks at tele(home)work from two distinct but interrelated perspectives: the difference of attitude between women and men, and social and architectural psychology as it relates to the distinction between private domains (home) and public domains (work).

Telework: the views and standpoints of the social partners and the workforce and the potential for decentralised electronic working in the European office

WP/88/15/EN

Telearbeit: Meinungen und Standpunkte der Sozialpartner und der Erwerbstätigen sowie das Potential dezentraler-informationstechnisch gestützter Büroarbeit in Europa

WP/88/15/DE

This study was undertaken in conjunction with DG XII-FAST Programme: the Foundation had the role of insuring coverage of the social partners' views and DG XII financed the large quantitative surveys of employers and employees which were published under the auspices of the FAST programme. The question as to whether any political action is necessary in connection with telework is answered in opposing ways by the unions and employers. While the unions in all four of the countries studied see an urgent need for action, including on the part of the legislator, the employers advocate in the main the retention of "the free interplay of forces".

The electronic home - Interactive telecommunications of the future: the social impact of telemedicine at home

WP/92/12/EN

The report investigates social aspects of telemedicine and telehealth systems in the electronic home. It was conducted in co-operation with DG XIII-AIM and is a companion report to the case studies undertaken at the same time under the title "Telematics in medicine" by Gott Associates.

The electronic home - Interactive telecommunications for the future

WP/94/56/EN

Das elektronische Heim: Interaktive Telekommunikation der Zukunft

WP/94/56/DE

This study is divided into two sections: the first explains the technical basis and principles of the telecommunications instruments used in the "electronic home" and gives a comprehensive portrayal of what is available in the field of interactive telecommunications; the second part looks at two alternative scenarios for the future, accompanied by consistency analyses and sets of alternatives for the technology in each of the two. These scenarios describe two possible extremes in the development of the "electronic home", based on changes in legislation, social structures, education and other environmental factors.

The electronic home - Social and spatial aspects - A scoping report

EF/93/22/EN - ISBN 92-826-6225-X - Price (excluding VAT): ECU 10

This reports contributed to overcoming the lack of theoretical and empirical research in the domestic sphere as far as the impact of electronic telecommunications and other modern technologies are concerned. Among other things the report recalls the debate around the possible invasion of privacy, the need for user-friendly systems and the impact on gender division in domestic tasks.



Telematics for health: the role of telehealth and telemedicine in homes and communities

EF/94/24/EN - ISBN 1-85775-023-3 - Price (excluding VAT): ECU 22

The application of telecommunications and informatics to medicine and health has demonstrably brought improvements in the quality of life. As many cases studies reveal, a low technology approach can contribute significantly to the care of those with special needs, such as the elderly, the young, pregnant women and people with disabilities. This book draws on the experience of pilot schemes in seven countries to produce clear recommendations on the policy, development and practical implementation of telematics in health promotion. It is a seminal work of vital importance to all those responsible for developing high-quality, cost-effective health care in both urban and rural areas.

Telehealth and telemedicine - Executive summary of a European Foundation research project

EF/94/14/EN - ISBN 92-826-8589-6

This brochure is a summary of the above co-publication between the Foundation and Radcliffe Medical Press Ltd., which deals with the role of telehealth and telemedicine in homes and communities.

Telelifestyles and the flexicity

EF/93/24/EN - ISBN 92-826-6311-6 - Price (excluding VAT): ECU 8.50

In this study the Foundation explores the development potential and possible impact of interactive telecommunications in the electronic home on telelifestyle, the local community and urban functions. The study constitutes a broad brush based on opinions, intentions and plans of important actors of the European society. See below the companion publication "L'impact de la domotique sur les fonctions urbaines" (The impact of the electronic home on urban functions).

L'impact de la domotique sur les fonctions urbaines

EF/93/24/FR - ISBN 92-826-6310-8 - Price (excluding VAT): ECU 13.50

This study reflects the Foundation's desire to explore the impact of this "automation of the private urban household" on society and its living space, in terms of the management of space and time, the evolution of social interaction, and the way in which functions are redistributed between private home, municipality and city.

See above the companion publication "*Telelifestyles and the flexicity*".

European guide to teleworking: a framework for action

Guide européen - Le télétravail: un cadre d'action

Europäischer Leitfaden für Telearbeit: Kriterien für Aktionsprogramme

Guida europea al telelavoro: un quadro d'azione

EF/94/32 - ISBN 92-826-9286-8 - Price (excluding VAT): ECU 11.50

This information booklet looks at teleworking from a practical perspective, from questions on safety and health to hardware and software selection for the potential freelance teleworker. This is supplemented by practical tools for evaluating benefits/disadvantages of teleworking.

Flexispace/mobility of work: a problem study on the future of spatially-flexible forms of work

WP/95/29/EN

Flexispace/mobility of work: Problemstudie zur Zukunft räumlich flexibler Arbeitsformen - Ein Diskussionspapier

WP/95/29/DE

This study provides an insight into the highly-complex concept of "flexispace" - starting from general comments on the history and flexibilization of labour - in order to arrive at a definition which serves as "working hypothesis" for this study. It also aims at demonstrating the potential variety of forms in which flexispace can be manifested.

Telehomework case study : Empirical study of the conditions and effect of telehomework

WP/95/58/EN

Fallstudie Teleheimarbeit : Empirische Untersuchung der Bedingungen und Auswirkungen von Teleheimarbeit

WP/95/58/DE

The object of this case study was to examine the effects of telehomework - as well as its benefit and problem potential - on the basis of a specific case example. The subject of the case study is the pilot scheme conducted by IBM Deutschland GmbH: since 1991 this scheme has monitored telehomework arrangements with the aid of an IBM Works Agreement on "Workplaces outside company premises". An essential component of the case study is a survey conducted at IBM by Professor Dr. Wilhelm R. Glaser and Dr. Margit O. Glaser at the Institute of Psychology of the University of Tübingen.

The legal and contractual situation of teleworkers in the Member States of the European Union

WP/97/28/EN



The social security position of teleworkers in the Member States of the European Union

WP/97/27/EN

Teleworking, health and safety issues in the Member States of the European Union

WP/97/29/EN

A summary of the three studies:

The social implications of teleworking

Les implications sociales du télétravail

Die sozialen Folgen der Telearbeit

De sociala konsekvenserna av distansarbete

EF/97/23

These reports consider three different aspects of the social dimension of telework : the legal and contractual situation, social security aspects, and health and safety issues. The conclusions have been summarised in a brochure on the social implication of teleworking. Each of the three reports is the consolidation of three studies carried out by the Foundation together with the Commission in all 15 EU countries. The national reports, all in English, are available free of charge upon request from the Foundation.

European Guide for Virtual Companies - A framework for action

Europäischer Leitfaden für Virtuelle Unternehmen - Handlungsansätze für die Praxis

This interactive guide is intended for individuals and companies who are already working as decentralised network companies or are contemplating the possibility of so doing. Examples from real-life virtual firms help the user to learn about advantages and disadvantages, pitfalls and potentials of this type of business organisation. Furthermore the guide features checklists for assessing the users' capacity to operate in such an organisation and gives a number of recommendations.

Deployment of telework in European public administration: An overview

EF/99/16/EN

This report is based on a pan-European study undertaken to identify public administrations as telework practitioners on local, regional and national levels in the 15 Member States and at EU institutional level. It is also designed to serve as a guide for potential subscribers.

Transborder teleworking - Towards the formulation of an international research agenda

Transborder telework is an area of increasing attention for policy makers at national and local level as well as businesses seeking to reduce costs. This reports summarises discussion results of a joint meeting organised by the Foundation and the International Labour Organisation on 14-15 January 1999 in Dublin.

Work Life 2000 - Telework, Labour Market, Health and Well-Being

Proceedings from a workshop held at the Foundation on 22-24 November 1999.

European Foundation for the Improvement of Living and Working Conditions.

Living conditions, working conditions and industrial relations in the knowledge society

2001 –97 pages – 21 x 29,7 cm