

Building the European information society for us all

Final policy report of the high-level expert group

Employment & social affairs

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Members of the high-level expert group (HLEG)

Hans Blankert, President, Confederation of Netherlands Industry and Employers (VNO-NCW), The Hague, Netherlands.

Gerhard Bosch, Professor, Head of Labour Market Department, Institut Arbeit und Technik, Gelsenkirchen, Germany.

Manuel Castells, Research Professor, Consejo Superior de Investigaciones Científicas, Barcelona, Spain.

Liam Connellan, former Director-General of the Confederation of Irish Industry, Dublin, Ireland.

Birgitta Carlson, Senior Advisor, Telia AB, Farsa, Sweden.¹

Ursula Engelen-Kefer, Deputy President, Deutscher Gewerkschaftsbund (DGB), Düsseldorf, Germany.

Chris Freeman, Emeritus Professor, Science Policy Research Unit, University of Sussex, United Kingdom.

Lisbeth Knudsen, Chief Editor, Det Fri Aktuelt, Copenhagen, Denmark.

Yves Lasfargue, Director, Centre d'Etude et de Formation pour l'Accompagnement des Changements (Crefac), Paris, France.

Isabelle Pailliant, Professor, Institut de la Communication et des Médias, Université Stendhal, Grenoble, France.

Armando Rocha Trindade, President, Universidade Aberta, Lisbon, Portugal.

Jorma Rantanen, Director, Finnish Institute of Occupational Health, Helsinki, Finland.

Luc Soete (Chairman), Professor, Director, Maastricht Economic Research Unit on Innovation and Technology (MERIT), University of Maastricht, Netherlands.

Pier Verderio, Director, International Relations and Training, Federazione Informazione e Spettacolo-Confederazione Italiana Sindacati Lavoratori (FIS-CISL), Italy.

¹ Ms Carlson passed away on 17 February 1997, two days after the final meeting of the group.

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DG X/D.3 — Audiovisual policy

DG X/B.4 — Libraries

DG XXII — New technologies for education and training

Others

Participants at a meeting on 'The information society and gender' convened by the Equal Opportunities Unit (DG V/D.5) of the European Commission

Members of the European Commission's Information Society Forum

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Letter submitted by Professor Luc Soete, Chairman of the high-level expert group

Maastricht, 15 April 1997

Dear Commissioner Flynn,

On behalf of my colleagues, I am pleased to present you with this final report of the high-level expert group, setting out the collective thoughts, opinions and beliefs of the members of the group as agreed upon in the course of our deliberations over the last two years.

Since the publication of our interim report one year ago, the debate on the social aspects of the emerging information society (IS) has, we would argue, developed rapidly. We believe that our 'first reflections' of last year, in their own limited way, have contributed to this ongoing, dynamic debate, and hope that this final report will provide welcome additional input. It will be for others to judge how meaningful a contribution it makes. At all events its publication brings our work to an end.

We continue to recognize the variety of opportunities that the emerging IS could afford. As in our previous report, the importance of 'social embeddedness' remains central to our vision of a socially inclusive IS. In this final submission we have sought to take the debate a step further by proposing a policy framework that considers the broad range of opportunities and challenges the IS presents. In so doing we have endeavoured to sharpen our overall policy message and put forward some of the core policy recommendations which we believe are required to build an IS that improves quality of life for all Europe's citizens.

We thank you for the continued trust and confidence you have placed in our group and for the opportunity to contribute to the European Commission's debate on the social aspects of the IS. You have said in the past that you were looking for independent advice on the trends and challenges that the new information and communication technologies could offer: fresh eyes for new challenges. We hope our work lives up to your expectations.

Finally, we would like to gratefully acknowledge the commitment of our dear friend and colleague Ms Birgitta Carlson, who passed away shortly after the group's final meeting. Birgitta's professional and personal contribution to our work was of tremendous importance. Her expertise on a number of critical issues

was essential to the production of this report, and her optimism helped support the group through challenges along the way. We regret that she could not witness the project's conclusion.

For the high-level expert group,

*Professor Luc L. G. Soete,
Chairman*

List of recommendations

1. Actively stimulating the acquisition of knowledge and skills

- a. Establishing an education network
- b. New financial incentives for training
- c. Improving and disseminating knowledge on learning methods
- d. Producing high-quality, low-cost learning materials

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- a. Developing a high-quality multimedia industry
- b. Nurturing a multicultural Europe
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12. Transparency and democracy

- a. Maintaining pluralism
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Introduction

In May 1995, the high-level expert group (HLEG) was formed to analyse the social aspects of the information society (IS). Until that time, the debate on the emerging IS had been dominated by issues relating to the technological and infrastructure challenges involved and the regulatory economic environment most conducive to enhancing the dissemination and use of information and communication technologies (ICTs). As noted in our interim report 'First reflections', published in January 1996,¹ the relative neglect of the social issues was to some extent understandable.

The debate on the technological challenges posed by the digital convergence of ICTs follows a long tradition of concern that Europe is lagging behind in major fields of leading-edge technology such as semiconductors, microelectronics and other ICTs considered crucial for its overall competitiveness. Despite a succession of long-term research support policies (the framework programmes)² during the 1980s, European competitiveness in these ICT-related areas deteriorated often in those areas most strongly supported by European research and development (R&D) policies.³ In the 1990s, with the further harmonization of the internal European market, the policy focus gradually shifted to the economic environment and, in particular, to national regulatory frameworks in the telecommunications sector, which were becoming increasingly outdated as new information and communications services emerged.

Today, as policy discussions of the necessary deregulation and liberalization of the telecoms sector come to an end, the debate is entering a third phase, focusing on the many neglected and sometimes unexpected social aspects of the IS. In taking this approach we are not attempting to claim that no research or policy debate has taken place on these broader issues over the years. Nor are we asserting that the Commission has not addressed many of these points.⁴ Rather, we are suggesting that these issues have not been at the centre of the policy debate.

In our interim report we set out a vision which recognized the tremendous opportunities new ICTs could offer, such as the potential for substantial productivity increases and for the emergence of many new and improved products and services. At the same time, we warned that converting this potential into actual gains in productivity, living standards and quality of life would require a lengthy process of learning and institutional change. The technology in itself is neither good nor bad, we argued: it is the way in which any technology is used which determines

¹ 'Building the European information society for us all — First reflections of the high level group of experts', interim report, January 1996.

² What are known as the R&TD framework programmes have systematically focused on ICTs as the top priority for European research support. The fourth framework programme now under way allocates more than a quarter of total research support to ICT programmes (IT, Telematics and ACTS). For us, the IS implies more than just using these technologies.

³ See, for example, the recent report 'Enabling the information society: Supporting market-led developments', Ministry of Economic Affairs, Booz-Allen & Hamilton, January-February 1997.

⁴ Starting with the 1994 action plan 'Europe's way to the information society'.

both the nature and the extent of its benefits. Moreover, these benefits do not accrue automatically to all sections of society.¹

Since the publication of our interim report, the Information Society Forum (ISF), a broad-based user expert group also set up by the European Commission, has produced its first annual report,² arguing along similar and complementary lines. Their continued work will undoubtedly lead to more detailed proposals and recommendations in forthcoming contributions. Other European and national expert and advisory groups have also been established and some are in the process of formulating policy conclusions.³ At the end of 1996, the Commission adopted its own action programme 'Europe at the forefront of the global information society', pointing to the many social challenges brought about by the emerging IS.⁴ In other words, the field has expanded rapidly, with the social aspects of the emerging IS moving to the top of the policy agenda. We very much welcome this shift of priorities, and hope the HLEG's interim report and the ensuing debate may have made a modest contribution to bringing it about. Perhaps somewhat presumptuously, we conclude that one of the first tasks we set ourselves has thus been achieved.

While the above groups, and the others that are likely to emerge in the future, will develop new proposals, our work comes to an end with the publication of this final report. In our interim report we made a large number of detailed proposals, some of which have become a focus of debate in academic and policy circles. Rather than repeat them here, we have opted to sketch out what is in our view the essential broad policy framework within which the debate on the emerging IS should take place, and to present an action programme comprising a limited number of core policy recommendations.⁵ In so doing we hope to have somewhat sharpened our overall message and contributed to the ongoing European debate on the social aspects of the IS. This message, we should emphasize, is based on complete consensus among group members.

¹ 'Building the European information society for us all — First reflections of the high-level group of experts', interim report, January 1996.

² 'Networks for people and their communities: Making the most of the information society in the European Union', First Annual Report to the European Commission from the Information Society Forum, June 1996.

³ Such as the high-level industry advisory group of the information society (see their recent recommendations of January 1997), the Andersen-Ienm study 'Strategic developments for the European publishing industry towards the year 2000' (1996), and the KPMG study 'Public policy issues arising from telecommunications and audiovisual convergence' (September 1996).

⁴ Such as the need for lifelong learning (referred to as 'investing in the future') and the importance of the quality of life and work (referred to as 'people at the centre').

⁵ As the information-overloaded reader may have noticed, we have shortened our report, and would refer those interested to the various analytical chapters commissioned over the past year. These contributions provided the group with a framework for many of its policy recommendations; they are listed in the appendix and can be obtained from the European Commission.

1. The high-level expert group's vision: from an emerging information economy towards a knowledge society

How do we define the information society? The information society is the society currently being put into place, where low-cost information and data storage and transmission technologies are in general use. This generalization of information and data use is being accompanied by organizational, commercial, social and legal innovations that will profoundly change life both in the world of work and in society generally.

In the future there could be different models of information society, just as today we have different models of industrialized society. They are likely to differ in the degree to which they avoid social exclusion and create new opportunities for the disadvantaged. In referring to a European IS, we wish to emphasize, in line with the White Paper 'Growth, competitiveness, employment', the importance of the social dimension which characterizes the European model.¹ It will also need to be imbued with a strong ethos of solidarity — not an easy goal to achieve, since the traditional structures of the welfare State will have to undergo substantial changes. Furthermore, that concept of solidarity will need to be active, not passive, to adapt to these changes.

But before addressing these and other policy challenges we shall briefly develop two more conceptual features — the distinction between data, information and knowledge, and the requirement of 'social embeddedness' — which in our view are essential for any discussion of the IS and are at the core of our policy analysis.

A. From information to knowledge

First and foremost it is essential to make a clear distinction between data, information and knowledge. From our perspective, the generation of unstructured data does not automatically lead to the creation of information, nor can all information be equated with knowledge. All information can be classified, analysed and reflected upon and otherwise processed to generate knowledge. Both data

¹ As also acknowledged by the Commission, 'Europe is built on a set of values shared by all its societies and combines the characteristics of democracy — human rights and institutions based on the rule of law — with those of an open economy underpinned by market forces, internal solidarity and cohesion. These values include access for all members of society to universal services or to services of general benefit, thus contributing to solidarity and equal treatment.' (COM(96) 90 final, 28 February 1996).

and information, in this sense, are comparable to the raw materials industry processes into commodities.¹

One of the main effects of the new ICTs has been to speed up and cut the cost of storing and transmitting information a billion-fold, thereby 'energizing', in the words of the Bangemann report, 'every economic sector' ('Europe and the global information society', Brussels, 1994). However, these new technologies have had no such effect on the generation or acquisition of knowledge and still less on wisdom.² One would hope, of course, that society would be shifting more and more towards a 'wise society', where scientifically supported data, information and knowledge would increasingly be used to make informed decisions to improve the quality of all aspects of life. Such wisdom would help to form a society that is environmentally sustainable, that takes the well-being of all its members into consideration and that values the social and cultural aspects of life as much as the material and economic. Our hope is that the emerging information society will develop in such a way as to advance this vision of wisdom.

One of the main challenges for the IS will be to develop the skills and tacit knowledge required to make effective use of information. From this perspective, ICTs should be viewed as essentially complementary to investment in human resources and skills. In that sense they differ from previous major technological transformations. Most previous major new technology clusters complemented physical capital accumulation. The development of the railways, for example, prompted an investment boom in the necessary material and capital equipment inputs, and hence a strong upsurge in overall economic growth. Similarly, the mass consumption of motor cars, which 'induced' demand for better roads, easily accessible motorways and readily available petrol and car maintenance services, led to an upsurge of growth based both on the increase in end consumption and on demand for the many intermediate materials and forms of capital equipment.

Unlike previous technology clusters, new information and communication technologies are typically not so strongly linked to intermediate demand for physical, material goods and capital equipment. Indeed, it is precisely this that makes data very different from conventional raw materials. Consuming information does not involve 'usage' in the traditional sense. Not only is information reusable by successive users, but two or more individuals can use the same information at the same time. Whereas market economies have traditionally been geared towards solving the problem of scarcity, information will practically by definition lead to problems of abundance and questions about how tools should be developed to manage that abundance.

In hardware terms, it seems unlikely that the increased demand for computers, mobile phones, optical fibres and Internet connections will yield a strong impulse

¹ At the same time and as emphasized below, it is essential to point out the difference between the production and use of tangible raw materials and intangible information (data): the latter can be reproduced at little cost to the producer.

² Which we identify as 'distilled' knowledge derived from experience of life, as well as from the natural and social sciences and from ethics and philosophy.

for growth by 'inducing' demand for plastics to build computers and optical fibres or iron oxide to build semiconductors. Despite the major capital investment required for some of these products (e.g. semiconductors), material, physical capital accumulation is no longer the essential 'complementary asset' of these sets of new technologies. Rather, since the knowledge on how to use information typically depends on individual skills and what we have chosen to call 'tacit' knowledge, the new complementary asset to the growth and use of new ICTs is investment in intangible, human capital.¹

For this reason we stress that it is essential to view the information society as a learning society. The learning process is no longer limited to the traditional period of schooling, but is — as was emphasized in the Commission's White Paper on education, 'Towards a learning society' (1995), and the OECD report on 'Lifelong learning' (1996) — a lifelong process, starting before formal school-going age and taking place at work and in the home. Our point has, we believe, been widely accepted.² However, we are concerned that in Europe the incentives to invest in such lifelong learning activities are insufficient.³ Not surprisingly, therefore, we start our list of policy recommendations with those which address this particular challenge, going well beyond the traditional calls for multimedia software applications and infrastructure support for education and training.

B. From technological determinism to social embeddedness

The social integrationist vision which the HLEG espouses explicitly rejects the notion of technology as an exogenous variable to which society and individuals, whether at work or in the home, must adapt. Instead it puts the emphasis on technology as a social process which 'by meeting real or imagined needs changes those needs just as it is changed by them. Society, in this view, is shaped by technical change, and technical change is shaped by society. Technical innovation — sometimes impelled by scientific discovery, at other times induced by demand — stems from within the economic and social system and is not merely an adjustment to transformations brought about by causes outside that system'.⁴

An example illustrating the importance of such social embeddedness can be found in the recent history of the formerly Socialist countries of eastern Europe. Strik-

¹ After the rapid increase in the supply of more qualified and skilled personnel over the post-war period, leading to a rapid decline in the ratio of physical to human capital, that ratio has fallen sharply over the last 20 years and is now estimated at around two, as opposed to five in the 1920s or three in the 1970s (figures for Germany, Büttler/Tessaring, 1993).

² See amongst others the request to the Commission by the European Council at its meeting in Florence to draw up an action plan on learning in the information society. This is now one of the main components of the new action programme 'Europe at the forefront of the global information society'.

³ See also the Delors report 'Learning: the treasure within', report to Unesco of the International Commission on Education for the Twenty-First Century, Unesco, 1996.

⁴ In the words of one of the first OECD reports on the socioeconomic aspects of new technologies, known as the Sundqvist report: OECD, 'New technologies: a socioeconomic strategy for the 90s', Paris, 1989, p. 117.

ingly, these countries experienced very little growth and development, despite massive investment in science and technology and higher education, in the 20 years before the collapse of the Berlin Wall and the start of the transition process. Clearly, the lack of economic integration, and more specifically the lack of a market to separate the technically from the economically feasible, pushed science and technology into isolation. But the failure of the science and technology system in market terms was only one facet of that isolation. Another, which we highlight here, was the absence of any social and organizational integration of technological change. As a result, to a far greater extent than in the so-called 'capitalist' societies, science and technology came to be imposed on society in general and workers in particular, and consequently failed to produce efficiency improvements on the shop floor.¹ Technological disenfranchisement went hand in hand with political disenfranchisement.

At the process level, rather than an externally given factor for change, the technologically driven convergence of new information and communication technologies can be best described as a process of change which is 'flexible in use', that is, its actual implementation and economic success will be crucially dependent on the particular conditions of application and use. While such flexibility in use limits the process by which 'routines' can be set up to ease learning processes,² it highlights the crucial importance of social and organizational 'embeddedness'. Ultimately, the latter will be a prerequisite for economic success and the creation of new jobs. At the product level, it is clear that the commercial feasibility of a new process or product is an essential condition for successful economic integration. But other contexts, social, ethical and socio-political, also play an important part. Here too, the literature points to a lack of consideration of user needs as the single most important factor in the failure of innovative action.

If we accept the argument that developing technological capabilities does involve a complex, endogenous process of change, negotiated and mediated both within organizations and at the level of society at large, it is obvious that policies cannot and should not be limited to addressing the economic integration of technological change, but must include all aspects of its broader social integration. We thus reject the notion of technology as an external variable to which society and individuals, whether at work or in the home, must adapt.

In our interim report we emphasized the lack of social integration in the current European information society debate and criticized the technological determinism of much of the expert policy language as limiting the scope for policy

¹ Whilst the current debate on information highways and global information infrastructure has certainly been much wider and thoroughgoing in political democracies than any previous debates, certainly more so than debates ever were in the former Socialist countries, it is still in many respects confined to the experts.

² Which explains why the process of ISO certification has led to only very limited efficiency improvements; see amongst others Y. Lasfargue. 'ISO, SADO, MASO ...', *Le Monde*, 29 June 1994.

action.¹ We claimed that the apparent lack of public support for the information society was in part a reflection of the predominance of technological considerations in the European policy debate. We continue to view this as our main contribution.

Our group must illustrate that there are numerous social policy challenges associated with a future European information society, stress that these transcend the simplistic notions of rapid adjustment to a future determined by the 'external' force of technological change in which people have no influence and no chance to participate, and highlight the countless opportunities for engineering a European information society for us all.

¹ Which we summarized as follows: 'We are forced through international competition to adopt new information technologies as rapidly as possible. It is an illusion to think we would be able to govern the speed of such change. Consequently, the only relevant policy issue is one of liberalizing and deregulating. Any delay would be extremely costly. At the social level, while there could be "local" employment destruction, the cost of such destruction is minimal when compared to the aggregate employment "price" rigid societies might have to pay in terms of loss of competitiveness when failing to adopt the new ICTs quickly enough. In other words, these employment losses have to be accepted as a minimal cost, outweighed by the positive global welfare impact of the IS and the employment growth in new areas.' ('Building the European information society for us all — First reflections of the high-level group of experts', interim report, January 1996, p. 2).

2. Building a European information society for us all: the main policy challenges

In this policy section of our final report, we have grouped the policy challenges around a number of parameters which cut across traditional policy boundaries. Despite innumerable analyses on the subject, there is still insufficient recognition, in our view, that the new ICTs embody a radically different set of parameters for potential growth and development opportunities. Each of these factors represents major policy challenges. We have listed 10 such challenges: the particular importance of knowledge and skills acquisition; the changing role of public services; the emerging virtual value chain; the scope for decentralization and implications for work organization; the increasing need to manage time; the implications of globalization for employment growth and capital flows; the particular concerns regarding social exclusion; the potential for bridging geographical distance; the need to take advantage of European diversity; and last but not least the implications of growing transparency for democracy.

We believe these challenges constitute a broad agenda for policy action involving a range of actors, sometimes at local or regional level, sometimes at national or European level. The breadth of the agenda we present here, with only a limited number of specific recommendations, reflects our conviction that a global strategic vision is needed at this stage of the policy debate.

A. Acquiring knowledge and skills

The transformation of the emerging information society into what might properly be described as a 'knowledge society' calls for a major investment by both the public and the private sector in what we have described above as the essential complementary assets: training, education and lifelong learning. While the new ICTs, and in particular computers, offer no shortage of opportunities as new tools for learning for all age groups, we believe a concerted effort is essential, owing to particular disincentives which are increasingly taking their toll on traditional investment in education and human resources in Europe.

First, there is the simple factor of the 'greying' of Europe's working population. A gap is clearly emerging between the rate of renewal of the working population (estimated at some 2% per annum) and the rate of knowledge acquisition in society at large (estimated by some as doubling every 10 to 15 years). Without additional training and learning over the course of people's working lives, the lion's share of new knowledge acquisition over the next 10 years will fall to a minority of Europe's labour force. As the Green Paper 'Living and working in the information society: People first' puts it: 'The workforce is ageing and the technology is getting younger.' Acquiring knowledge and skills should therefore no

longer be limited to formal schooling (basic, secondary and higher education), but should involve all sections of society: youngsters, middle-aged and older people; people at all levels of vocational qualification; people in work and the unemployed.¹

Second, knowledge acquisition, particularly in the emerging information society, is not a simple incremental process of accumulation. In many information handling and processing areas, such as software engineering, the rate of obsolescence of knowledge is high. Knowledge acquired only 10 years ago and not maintained has often lost much of its value. This is why qualified people with outdated skills in the dole queue have become a fact of life in the 1990s.

Third, the increasing trend towards so-called 'external' labour market flexibility, with greater mobility and transparency on job markets, has undoubtedly made firms wary of investing in human resources if the investment is likely to benefit chiefly competing firms. The incentive to invest in general-purpose knowledge and human resources has declined in many of Europe's largest businesses. Countries and companies with a high labour turnover tend to invest little in human resources.²

Fourth, the budgetary consolidation set in motion as part of the budgetary convergence criteria for EMU has led many European countries to reduce the percentage of public spending allocated to education and research in the higher education sector. This comes precisely at a time when such intangible investment is, as argued above, an essential complementary asset for future growth and competitiveness in the emerging global information society.

Consequently, our first set of recommendations focuses on the way new incentives could be put into place to provide a powerful impetus for investment in skills acquisition, human resources and education. This might range from direct public investment in new ICT equipment, computers in particular, in schools and the education system more generally (not just in the hardware or networks) to public/private partnerships to design new maintenance and training systems. However, to be clear at the outset, we should state that we consider this acquisition of knowledge and skills a necessary, but not a sufficient condition for employment creation.

¹ See amongst others J. Delors, 'Learning: the treasure within', 1996.

² As highlighted by the OECD, data from France and the USA show a correlation between tenure/turnover and training across industries. Broadly, training increases with employment stability; see *Employment outlook*, OECD, July 1993, p. 148.

Recommendations

1. *Actively stimulating the acquisition of knowledge and skills*

There is an urgent need to reprioritize Europe's investment strategies in education, training and human resources, and knowledge and skills acquisition more generally. This calls for investment initiatives that combine public and private resources, each with their specific responsibilities and tasks, at regional, national and European level. In addition, new policies designed to increase the incentives for firms and individuals to invest in human resources are needed.

1a. Establishing an education network

With respect to education, a major effort is needed to: link schools across Europe, providing them with ICT equipment and preferential access; promote multimedia educational and training software development and production; and (re)train and involve teachers in the design and development of such programmes. This will need to be a concerted enterprise, in which both private and public institutions provide resources and content. As this is likely to increase the head start of certain regions, an intra-European process of learning and catching up needs to be set in motion. Whilst national and regional policies will continue to vary and differences in educational policy will often reflect cultural diversity, we propose that a European Learning Agency and Network (ELAN) be established to promote and disseminate knowledge on leading-edge applications of ICTs in areas of special interest to education and training across Europe.

1b. New financial incentives for training

With respect to training and human resource development, stronger incentives are needed for both firms and individuals, in the form of a range of schemes to support and set a value on private investment in the accumulation of such intangible assets. There is an urgent need for investment in intangible capital such as human resources to be more fully recognized as 'real' capital outlay, reflected in particular in the stock value of firms. We suggest that the Commission should take the lead in addressing the issues of linking the financing of lifelong learning to employment, as initiated by the OECD. As employees are more likely to change employers over their working lives, new forms of interaction are called for among higher education establishments, training organizations and individual firms. Maintaining and updating human skill resources will have to become the joint

responsibility of both public and private institutions.¹ The new ICTs provide many opportunities for dual training systems involving close partnerships of this kind to be developed and expanded over the course of a full working life. The new technologies also offer scope for the development of training programmes geared more specifically to the needs of the less highly skilled unemployed, who might have particular difficulty in acquiring computer literacy, and for all those groups needing to acquire basic ICT skills for use in the home, at work or in public places.

1c. Improving and disseminating knowledge on learning methods

With respect to lifelong learning, there is a need for more basic research on learning itself, including the ways in which ICTs affect learning. It is crucial to acknowledge that in the emerging information society the learning process or the acquisition of knowledge will not take place at school or work exclusively. Learning through consumption — including entertainment — through communication, through interaction and more generally through social and other non-work activities has increasingly gained in importance and often encompasses those general learning skills which fundamentally complement the more specifically work-related skills acquired on the job.

Research should address questions such as: how do people 'learn how to learn' rather than just remembering facts? What are the best means of teaching and developing a command of 'cathodic' abstraction, virtual images, interactivity and fragility, including teaching those who fear new technology? We draw attention to the important distinction between these various forms of learning because we wish to emphasize that distance learning should not be a substitute for the school environment at primary and secondary level. Schools serve a social and cultural development function which distance learning cannot. General communication skills, social integration and learning to use ICTs requires the physical presence of most pupils and direct contact with teachers and classmates. Collective learning and teamwork are often as advantageous as individual study.

1d. Producing high-quality, low-cost learning materials

The expansion of the education and training market requires governments to provide political and financial incentives to new operators in the field. This should combine a broad spectrum of learning and information materials, including news, entertainment, education, training and other cultural

¹ Some of the ideas put forward by Europace (G. van der Perre, 1996, 'Higher education: Matching the needs of the knowledge society with the tools of the IS', Dublin, People First Conference, October 1996) on the granting of degrees with 'maintenance contracts' by higher education establishments are pertinent here.

and leisure activities. Access to high-quality, low-priced self-study materials for all members of society is essential. However, in every field of education and training, the costs associated with the design and development of such materials are high: it is only through mass production that affordable end products can emerge. Particular efforts must be made to avoid generating new forms of exclusion linked to the cost of access to self-study material.

B. The changing role of the public sector

As the previous case illustrates, the role of the public sector in the emerging IS is as guardian of competition, 'creating the conditions in which investment, markets and services can flourish'. However, to leave the development of the IS to the private sector — an idea originally advocated in the Bangemann report (1994) and subsequently elaborated upon in numerous official EU reports — is, in our view, to take an excessively minimalist approach to the role of the public authorities in that process.

1. Regulating the emerging information society markets

Governments undoubtedly play an essential role in safeguarding competition in the emerging IS. The digital convergence between the technologies for broadcasting visual images (television) and transmitting data and voice messages (telephony) raises some fundamental new regulatory problems. The rate of market failure in the development, distribution and commercialization of information is typically high, leading in particular to market dominance and attempts at vertical integration between incumbents and new entrants across and within each of the various market segments: content development, service provision, distribution networks and hardware production. Regulating such a complex and fast-moving field is a difficult business. The Commission has played an important role in the telecoms liberalization process by removing many of the privileges of the monopolistic national telecoms operators and allowing competition in the provision of services via these conventional telecommunication networks. However, there are grounds for questioning whether the regulatory approach and available regulatory instruments at Community level¹ are sufficiently broad, capable and flexible to respond to the current and future technological challenges of inter-network competition. A clear trend can already be observed towards increased horizontal concentration among the various market segments mentioned above, encompassing the entire territory of the EU. To tackle these and many other potential issues of abuse of market power associated with the current broad convergence between audiovisual sectors and telecommunications, we would argue

¹ Directives based on Article 90(3) EC: once the exclusive and special rights which Article 90(3) directives are designed to deal with have been removed, traditional competition policy provisions and harmonization directives will have to be relied upon.

that the Commission should be granted additional power (e.g. in promoting 'services of general interest') and that some transfer of regulatory power to Community level will be required.

Recommendation

2. Coordinating regulation at EU level

To tackle the many emerging regulatory issues associated with the digital convergence between information and communication technologies, there is an urgent need for a European regulatory agency covering the broad spectrum of audiovisual content and service provision, distribution networks and more conventional telecoms provision. This should be equipped with the regulatory instruments to make it a genuine guardian of competition across the alternative information and communication networks and throughout Europe. We would argue for the immediate establishment of such an agency on three grounds: the rapidly growing threat of market dominance and abuse in particular ICT market segments; the way in which misconceived national regulation is putting a brake on technological development and ICT dissemination; and the way regulation directly affects the interaction between various IC market segments across the EU. A European (FCC-type) agency of this kind would imply that some regulatory power would pass from national regulators to the Community. Today, increasingly, regulation policy must fully reflect the new international agenda formed by the emerging global information infrastructure.

2. Public information services: the new engine of growth in the IS?

Developing an appropriate competitive and regulatory framework is certainly an essential 'enabling' role for governments. It is a prerequisite for an economically viable IS to emerge — as we argued above, the market will provide the essential conditions for the efficient economic integration of new ICTs. It is not, however, a sufficient condition. To limit the involvement of the public sector to an economic enabling function is, in our view, to grossly underestimate the role and importance of public agencies and services as information providers and processors in a multitude of economic, social and policy areas. We would rather view public services in their broadest sense, that is to say, including education, as one of the most promising engines of growth in the emerging European IS, for the following reasons.

First, as alluded to above, public administration, whether at national or local level, is first and foremost an information service, often involving many private and public information functions. This raises important questions about privacy, access and democratic control.

Second, because it is often so substantial, the physical and human capital investment in such activities provides valuable opportunities for improved connectivity, standard-setting, etc. Public administration might, in other words, take the lead in the IS given the high risks involved in investing in new, interactive information systems, and open up new market opportunities for private partnerships in the development, implementation and maintenance of such systems. Pilot projects could identify the many organizational bottlenecks involved and enable diversity at local administration level. Such projects, in the antechamber of government so to speak, are likely to be much more promising in revealing more immediate solutions and insights into some of the practical organizational and local problems associated with the emerging IS. Again, this does not necessarily imply that these services must be provided by public authorities: they should simply supply the initiative, establishing, where possible, partnerships between public administrations and private sector firms.

Third, many of the areas we have focused upon — education, health, culture, the media, and so on, are dominated by public authorities and public service providers. Many others which we have not explicitly discussed, such as social services, immigration, police, libraries and many other local services, are all bound by the geographical limits of country, region and town. Clearly, the lack of European, cross-border interconnectivity in such services is one of the greatest obstacles to the mobility of workers and citizens within Europe. At the same time, it is one of the most promising areas for European public procurement and new policy initiatives.¹ Within this context, we draw attention to the Delors White Paper proposals for trans-European networks, as the information infrastructure backbone for such public information services at European level.² Government as a leading-edge customer could become one of the hallmarks of the emerging European IS and the main contrast with US policy in the area.

Recommendations

3. Public services as an engine of growth in the emerging IS

The wide variety of public information services provides a number of opportunities for information-led growth, with such services as the potential 'killer applications' for new demand-led expansion. At the same time, the public sector can help to guarantee comprehensive and reliable information with a high degree of accessibility, user-friendliness and affordability for all sections of society.

¹ We look forward to the Green Paper on access to and the exploitation of public sector information in the information society.

² The telecommunication TENs 1996-99 earmarks ECU 250 million under B5 and some ECU 720 million for content.

3a. Shifting public services from infrastructure to content

We view the role of the public authorities in this area less as infrastructure providers than as content providers, opening up new market opportunities for private sector partnerships in the development, distribution and maintenance of new information systems while at the same time ensuring that information is both understandable and also available in non-electronic format, providing insights into concepts of user-friendliness and addressing particular fears with regard to electronic communications among the public at large or specific groups. We view the provision of such 'public' services as the potential engine for new, local, information-led, employment-intensive demand growth, on the one hand creating the minimum efficient scale for some of the new, upgraded, affordable information and communication infrastructures, while on the other, paving the way for more market-driven 'private' services to emerge. This ICT-driven process of local employment creation could be said in many ways to be the electronic pendant of the personal services-led job creation proposed in the Delors White Paper and now in operation in many EU countries; with the difference that the electronic version advocated here is likely to lead to more significant learning and reskilling opportunities.

3b. Making public services more effective: improved productivity for a better service

The public sector, as one of the most information handling and processing-intensive sectors, provides considerable scope for new insights into some of the organizational problems involved in the introduction of new ICTs, and into possible solutions. These include internal organizational issues about how to handle the traditional bureaucratic control and accounting functions, as well as more general questions about information handling across different services and geographical borders. In many public services (immigration, police, social security and pensions, local services, etc.), the lack of intra-European information handling appears to be one of the greatest obstacles to increased labour mobility and migration. Here too ICTs would seem, at least at first sight, to offer a host of new opportunities. We propose that a number of pilot projects be established across a range of typical public services, each focusing on one particular issue and shedding light on some of the practical organizational and local problems associated with the introduction of new ICTs. These could illustrate practical ways in which public services might work together with enterprises to incorporate other private sector services such as electronic commerce or electronic data interchange (EDI). At the same time, we propose that the productivity gains made in public services through the introduction of ICTs be reinvested in developing and upgrading other public, preferably local services, especially in education, health, the environment and culture.

3c. Public services as a model of service provision

The public service sector should be a model of service provision for the general public, particularly in combining remote access by means of communication technologies with the option of human contact for those citizens who so desire. Information access systems must be developed to be geared to the needs of the entire population. In other words, remote access information systems must be user-friendly, guarantee universal access, including to public records, and enable individual enquiries, etc. In addition, maintaining the possibility of direct access through human contact is vital to ensure that no one is excluded.

3. The case of health services

ICTs and related technologies are expected to yield a host of benefits for the development of health services, including the collection and analysis of information, the identification of high-risk groups, health services to remote and under-served groups, support for citizens' own health-promoting activities, and so on. The cost impact of ICTs on the health sector is not overly positive in view of the level of absolute investment required, but the cost-effectiveness is expected to be positive, i.e. coverage, better availability of services, new tools for health education and information, expansion and quality of services can be improved at a relatively reasonable cost.

Wider introduction of ICT-based technology in the health sector is therefore justified and should be encouraged with a view to improving the availability, coverage and quality of services. When implementing such technologies in the health sector, the feasibility, safety and cost-effectiveness of ICTs should be assessed and ensured, and with it the ability and competence of health sector personnel and other users to employ the new technology. Due concern needs to be given to the protection of confidential health data in ICT-based systems, and to the requirement of reviewing the ethical codes of health professionals in the light of ICT-based health practices.

Recommendation

3d. Improving health services

The opportunities afforded by ICTs, and telemedicine in particular, should be used as effectively as possible to improve the prevention of health hazards, promote health and enhance the coverage, availability and quality of services to all, especially to under-served groups such as people with special

needs, including the chronically ill, disabled and elderly, and to groups not covered owing to poor socioeconomic situations or unemployment. Health service cover in Europe is incomplete; there is variation between countries both in the quantitative coverage and in the content and quality of services. The need for training and education for potential users of ICT-based services requires consideration in order to prevent exclusion. The services should also be designed to encourage and support citizens' own initiatives to promote their own and their families' health, by means of health information, education and counselling, training material and self-care instructions, which can all be effectively provided with the help of telematic services and multimedia technology. Appropriate measures should be taken to ensure reliability and protect the confidentiality of health-related data and information in the new ICT-based health systems. The ethical codes for health practices should also be reviewed.

C. Exploiting the virtual value chain

A major feature of the emerging IS is the shift in value towards intangible production and consumption, sometimes also referred to as the trend of 'dematerialization'. This is characteristic of the process of technological change in the storage, handling and memorization of information and communication, i.e. in the ICTs themselves. It is not yet characteristic of the way we manage intangible production and consumption, which continues to be based on outdated and biased industrial concepts and measurements.

1. Measuring intangible production

ICTs play an essential role in what has been called the 'codification' of knowledge.¹ Codified knowledge is contrasted with tacit knowledge, which cannot easily be transferred because it has not been set out in an explicit form. As argued above, skills are one important kind of tacit knowledge.² The most important impact of new ICTs is that they shift the border between tacit and codified knowledge; it becomes technically possible and economically attractive to codify various types of knowledge which so far have remained in a tacit form. In terms of material goods, this embodiment of codified knowledge has been characteristic of the dramatically increased performance of many new capital and consumer goods, incorporating new electronic information and communications devices. The

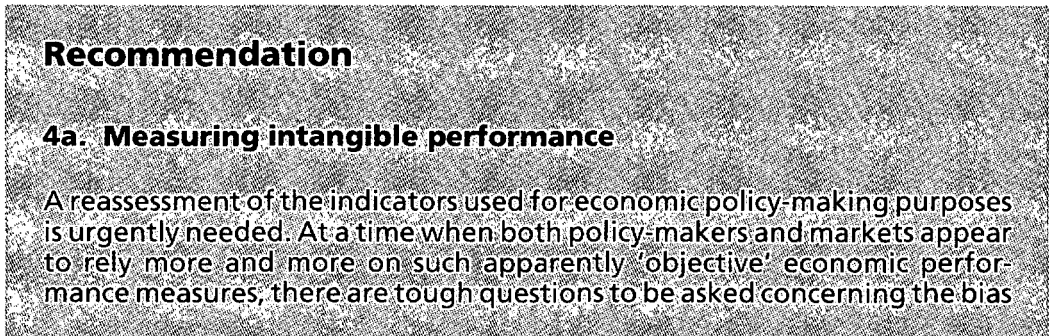
¹ This implies that knowledge is transformed into information, which can either be incorporated into new material goods (machines, new consumer goods, etc.) or be easily transmitted through information infrastructure. It can be best described as a process of reduction and conversion which renders the embodiment or transmission, verification, storage and reproduction of knowledge especially easy. See amongst others Foray and David, *STI outlook 1995*, and *Technology, productivity and job creation*, OECD, 1996.

² The skilled person follows rules he or she is not aware of, linked to activities acquired through learning but often of a non-routine kind.

resulting quality and performance improvements of these high-tech electronic consumer goods have been accompanied by sometimes significant price decreases. The computer is undoubtedly the most dramatic illustration of this dual impact of rapid technological change and codification, which may be described as a 'technology value paradox': as more and more codified knowledge becomes incorporated into such goods, nominal 'value' appears to evaporate.

In services, by contrast, while codification will make knowledge more accessible than before to all sectors and operators in the economy, the process can never be complete, owing to the intangible nature of knowledge in this area. Codification will rarely reduce the relative importance of tacit knowledge in the form of skills, competencies, and so on, rather the reverse. It is tacit knowledge that will become the main value of the service activity: the 'content'. While services may be based in part on purely tacit values such as talent or creativity, for the most part they will depend greatly on the continuous accumulation of new knowledge, i.e. learning.¹

The shift in value from manufactured goods incorporating increasing amounts of codifiable knowledge towards service-based tacit knowledge activities is typical of the emerging IS. It raises some fundamental issues about where value is being created, how it can be extracted, by whom, and how it is distributed. There is a strong presumption that much of this value is currently unaccounted for: it 'evaporates', at least in its monetary form. The policy challenge raised by the IS in this context is a formidable one. It questions the material-based accounting systems of most of our economic measures and the increasingly blind policy-making dependency on ever less reliable industrial-based economic indicators. Furthermore, it raises fundamental questions about the way the benefits of the new technologies are being distributed throughout the economy or throughout society. Some of these benefits are fully accounted for and realized in increased sales and income, including tax income; others are not appropriated effectively and the newly created wealth evaporates as a non-monetized social benefit.



Recommendation

4a. Measuring intangible performance

A reassessment of the indicators used for economic policy-making purposes is urgently needed. At a time when both policy-makers and markets appear to rely more and more on such apparently 'objective' economic performance measures, there are tough questions to be asked concerning the bias

¹ This will typically be based on the spiral whereby tacit knowledge is transformed into codified knowledge, and the process then turns back on itself as new kinds of tacit knowledge are developed in close interaction with the newly acquired codified knowledge. This spiral is at the very core of both individual and organizational learning.

implicit in the reliance on material production in constructing such measurements.¹ There must be an attempt to produce a more accurate measurement of 'real' inflation and 'real' output growth, taking fuller account of ICT-based quality improvements, as well as the rapidly growing number of information products and services.

2. Removing obstacles to electronic consumption

The growing convergence between manufacturing and services, coupled with the fact that the latter account on average for two thirds of economic activity in EU countries, have made service activities increasingly important in their own right. In fact, in a growing number of areas, services dominate over manufacturing rather than the reverse. In particular, the emergence of ICTs and their impact on the 'tradability' of many services have helped the latter to emerge as core value-added activities. However, it is evident that much of the expected growth potential of new services has been particularly slow to emerge within Europe. Numerous studies (McKinsey, 1995; OECD, 1996) highlight the problem of the restrictive regulatory framework which often prevents the development of new ICT-based services. While not disputing this viewpoint, we would nevertheless emphasize some of the intrinsic problems bound up with the exchange of information products and services.

Substantial barriers exist for both producers and consumers to the use of on-line services for electronic commerce. For firms, crucial issues related to security, privacy and encryption remain. In practice the robustness and reliability of ICT systems leaves much to be desired: technical failures, environmental hazards and intrusion by determined hackers can make them unreliable. The economic and social risks such threats represent cannot yet be fully assessed. The increased choice and availability of goods and services through information networks clearly increases consumer surplus. It provides consumers with more opportunities to acquire goods and services at competitive prices and to do so when and where they choose. But here too sizeable barriers exist: for one, consumers will have to invest in a service they do not know the value of, that can be gauged only after use. In other words, the new services are pilot products. Currently the highest growth rates are therefore in sectors where the customer does not have to learn new competencies and where a conventional product is replaced by a new one.²

Just how to create a flexible economy of information sharing and electronic transactions with the necessary safeguards is not fully understood for all sectors, goods and services. Whilst some sectors, particularly financial services, are a long way

¹ See amongst others 'Is inflation dead?', *The Economist*, 28 September 1996, and 'Towards a more accurate measure of the cost of living', Final report to the US Senate Finance Committee from the Advisory Commission to Study the Consumer Price Index, 4 December 1996.

² Such as the audio tape by CDs.

down this road, they are nevertheless experiencing considerable problems in developing new electronic products and services, due to practical understanding of how the information should be regulated and by whom in order to promote maximum confidence in the new world of on-line electronic commerce.

Recommendation

4b. Creating confidence in electronic commerce

We propose that the work of the various groups¹ set up to deal with information security, privacy, intellectual property and the potentially harmful and illegal content of on-line services should be synthesized and conclusions drawn for both SMEs and consumers. Action is urgently called for in this area to establish more flexible and dynamic systems of procedures, codes, standards, regulation and self-regulation. The aim should be to increase confidence in the IS among both producers and consumers by reducing and codifying the risks of sharing information and ensuring fair trade on electronic markets for information. In particular, the effectiveness of existing EU initiatives to encourage SME participation in electronic commerce should be assessed. Gaps in the provision of effective infrastructure for SME training and technology transfer need to be identified and filled. It is important that SMEs have the opportunity and expertise to foster electronic links with their trading partners which meet their own needs and suit their own information handling procedures, rather than having inappropriate systems imposed upon them by trading partners who are larger and more powerful or have more IS expertise.

3. Managing abstraction

Many questions can be raised about the impact of generalized abstraction on our lives. Human activities will increasingly be based on representations of reality rather than on reality itself. There are significant advantages to this evolution, but there are also risks. Virtual life is not real life and the representation of reality is not reality. There is concern that the abstract nature of much ICT use leads to a similar abstraction of reality.

¹ Such as the working group on illegal and harmful content on the Internet, and the communication on electronic commerce to be discussed at the Interministerial Conference 'Global information networks: Realizing the potential' to be held in Bonn in July 1997.

Recommendation

4c. Mastering the impact of virtuality

There is a need to gain a better understanding of the effect of 'virtuality' on people's lives. As more and more work, home and leisure activities become based on abstractions, questions can be raised about the overall social impact of this generalized process. More generally, investigation into the many diverse personal consequences of ICTs, not only in terms of their design but also in the ways in which they are used, is urgently called for. The aim should be to identify guidelines for the design and implementation of people-centred ICT systems and to raise general awareness of the need to consider the social context of ICT use in the home, in the community and at work. Another objective should be to identify how ICTs can increase conviviality and avoid isolation.

D. The changing nature of organizations and work

A particular feature of the new ICTs is the increased flexibility and transparency they highlight in the way firms are organizing production and the costs and benefits of particular working practices. The IS has often been identified with new, more flexible and decentralized forms of work organization, including new opportunities for self-employment (as exemplified in the concept of micro-businesses), the downsizing of large firms with a trend towards the outsourcing of particular functions and activities, and new forms of distance working, or what is known as telework.¹ Such changes in the organization of activities not only raise issues relating to organizational change and changing work patterns; they also pose policy challenges regarding the traditional organization and institutions of the labour market and negotiation between employers and workers.

1. Towards flexible organizations

Over the past 20 years, many European firms have invested heavily in new technology. However, for much of this period the widespread dissemination of technologies has not been accompanied by productivity gains, and there is a growing body of evidence that the application of new technologies alone is insufficient to secure such benefits. Many European firms have consequently been unable to improve their competitive position to any significant extent. Instead they have tended to make partial alterations to their working arrangements, leaving the overall organization of work unchanged. Indeed, it has been argued that industrial and public policy in Europe has too long been preoccupied with 'quick fixes'.

¹ For a detailed overview, see M. Castells, *The information age: Economy, society and culture*, Volume I: 'The rise of the network society', Blackwell, Oxford, 1996.

As argued above, purely technological visions of the organizational models of the future have clear limits. Costly mistakes have been made by organizations which have spent large sums of money on high-tech systems without realizing the importance of their human capital. More than ever, organizations are dependent on highly skilled and motivated workforces, and on securing their cooperation. Only a coherent and interactive process of innovation can release the full benefits of implementing new technology. Together with the introduction of hardware and software, organizational structures and practices need to be reviewed to ensure that innovation becomes an integrated process involving technological, organizational and social components.

To benefit from their investment in new technologies, European firms need to address not only the technological environment within which they operate, but also their relationships with suppliers, customers and other trading partners, systems of production, the physical configuration of machines, and the utilization and development of labour and skills. Organizational change in the IS should therefore ideally consist of a set of closely-related developments in the structure of firms, in production and work processes, in labour and in skill requirements, and in technological systems. Here we wish to re-emphasize the importance of considering these developments as a whole, and to voice concerns regarding strategies which focus purely on the implementation of new technologies and ignore their organizational contexts. Such strategies are not only ineffective, they are also very costly.

In this context, it is clear that ICTs have the potential to improve innovation processes within organizations. To date in Europe, firms and organizations have tended to concentrate on productivity improvements at the level of the shop floor. ICTs can, however, also support improvements elsewhere in the value-added chain and promote product innovations involving closer ties between R&D and manufacturing. This particular feature of corporate behaviour could well explain the aggregate differences between European and US productivity growth, product innovation and capital/labour substitution.

In addition to facilitating the development of new working arrangements, ICTs also alter existing forms of work and work organization. Here too, efficiency and the ability to innovate cannot be improved through isolated alterations to working patterns. For change to be successful, elements of flexible work organization such as staff versatility, training, flexible hours, new pay systems, more teamwork and flatter hierarchies must be embedded in the broader structures of the firm. Any changes, including the introduction of new ICTs, make sense only if they are consistent with the overall position and environment of the firm.

Somewhat paradoxically, however, the importance of person-to-person communication requiring physical proximity has not necessarily declined in the working world — rather the reverse. New management theory stresses the importance of interpersonal contact, and the decentralization of responsibilities has increased the need for direct communication.

Recommendation

5a. Collecting case studies of successful organizational innovation

The EU should further collect evidence on case and pilot studies of successful organization innovation. These should show how ICTs impact on the structure of firms across a wide range of industrial sectors, including some of the new cross-sectoral areas of activity, how internal IT networks change company communication and how employees and their representatives can use them for communication among themselves. In particular we look forward to the forthcoming Green Paper on work organization.

2. Coping with outsourcing

With the new ICTs, communication can take place in real time over vast distances, opening up new opportunities for outsourcing. Virtually all companies are reviewing their range of activities and transferring some to outside suppliers. There are several reasons why firms choose to outsource: some to form strategic alliances, some to concentrate on core activities, and some to exploit cost differences between in-house and external production. In the emerging IS, outsourcing will undoubtedly be a major growth factor for specialist new firms with a highly specialized workforce. On the other hand, however, some suppliers have been downgraded to mere suppliers of parts. Competition from low-wage economies is seriously threatening the viability of such organizations. Small and medium-sized suppliers are under particular pressure, and can survive only by developing expertise as partners in the production and development of new products and services. Such strategic expertise can be developed through cooperative relationships with other firms, allowing them to free themselves from 'electronic hierarchies' by building up their own networks. As argued below, organizational and technological innovation by SMEs is highly dependent on support within the region, for example through training and technology transfer centres.

In the course of the outsourcing process, employees are sometimes faced with a choice between dismissal without compensation or acceptance of their new self-employed status. In the latter case, that status is often illusory, as they have no opportunity to organize their working time and means of production. Almost all social legislation (regulations on working time, health and safety at work and social security contributions) is based on the concept of 'dependent' employment.

Recommendation

5b. Handling outsourcing

The relationship between outsourcing and ICTs needs to be examined in greater detail. The objectives should be to:

- promote a higher level of awareness and debate regarding the challenges and opportunities of telemediated outsourcing;
- analyse, with documentation, the experiences of industries which have pioneered ICT-based outsourcing, such as the automotive sector, as well as the more recent case of services;
- develop best practice models for the design and implementation of material flow systems to subcontractors which are both highly productive and accompanied by acceptable working conditions in supplier firms;
- create good conditions of work and pay in SMEs by supporting projects which enhance their independence and profitability through the establishment of telemediated partnerships and non-hierarchical electronic data interchange systems;
- identify ways of increasing the quality of working life for the new breed of externalized self-employed, by expanding the scope of labour and social legislation.

3. Flexibility and security

Flexible working arrangements, such as part-time work, working at or from home, self-employment, fixed-term and temporary employment, outsourced work, work relocation across borders and flexible employment contracts are becoming increasingly prominent in the shift towards the IS. While many flexible working structures have significant potential benefits for both employers and employees, there are, however, limits to flexibility, among them physical health limits. Flexibility for the firm may mean insecurity of employment and working conditions for the employee. It may also lead to new forms of occupational health risk, such as mental stress. The implications of such new forms of employment for the security of employees, in the sense of both employment tenure and occupational safety, will have to be carefully assessed. In particular, the effects on the human development prospects of female employees, for whom the growth of flexible employment has been particularly significant, requires consideration.

Innovative initiatives and schemes are emerging to encourage the establishment of new types of firm, especially small firms and micro-businesses. As these sources of employment develop, there is a need to consider their implications in terms of

employment status. The social security, legal and health and safety status of many nascent forms of employment is uncertain, and is particularly ambiguous in the case of the self-employed. In some countries of the EU, moves are being made to clarify the status of the self-employed, either by making it incumbent upon employers to demonstrate that the people who work for them are not direct employees, or by treating them as employees unless they are registered as self-employed.

These issues of status need to be clarified across the EU. Labour and social security law may need to be extended to cover self-employed teleworkers, or alternatively legislation specific to them may be necessary. It is not yet clear how this balance will be achieved, and the precise nature of the equation still has to be determined. Nevertheless, one of the foremost priorities of EU policy must be, through the Community's Structural Funds, to develop systems of worker protection in the context of flexible working practices.

Recommendations

5c. Towards security in flexible working arrangements

A balance must be struck between employment and worker security. In particular, new forms of contractual relationships, employment protection and worker participation need to be explored both by the European Commission and by the social partners within and across Member States. Their findings, together with the report of the European Parliament on the reduction and adaptation of working time, should be used to inform Commission policy in this area.

5d. Dealing with new occupational health risks

There is a need to adapt ICTs to the worker in the workplace and not the other way around. More broadly, the many occupational mental health and safety aspects need to be more fully integrated into the design and implementation of ICTs in any workplace, including the home, in order to facilitate smooth adjustment to the resultant changes in working patterns. When ICT-intensive work patterns are implemented, ways should be found to make full use of current research knowledge on occupational health and safety, including data on work organization, ergonomics and the psychology of work. Furthermore, the principle of participation should be duly considered with a view to facilitating the implementation of ICTs. The earliest possible involvement of users (and, in some cases, clients) has been shown to yield substantially higher rates of acceptability and productivity of ICT usage.

4. *The IS and forms of telework*

Teleworking is perhaps one of the most widely discussed emerging forms of work organization in the IS. It is based on the use of ICTs and can involve working from home or from a conventional office, mobile working using portable technologies or working from a telecottage. Teleworking offers many new opportunities. The Commission has, in recent years, undertaken a range of activities to promote its development. However, as this is one of the major new work modes which will be established in the IS, concerted action should be taken to ensure that it is fostered within a framework designed to reduce its negative implications to a minimum.

In general, we would like to see a much higher quality of debate on teleworking. The process of reexamining the legal and social welfare basis should be conducted in such a way as to raise general awareness of teleworking, with the aim of giving potential teleworkers and managers a better insight into the pros and cons of the different forms it can take.

Although various forms of telework are already developing without any special promotion, environmental considerations and the need to coordinate a wide variety of local, urban, regional and national initiatives are likely in the future to require more systematic policies for the growth and promotion of telework within the EU. Neither general government strategies nor the setting of quantitative targets are likely to be helpful, however. Ultimately, the development of telework will depend on the initiative of enterprises and individuals. The Commission can at best help by means of experiments to illustrate how it can function in practice and point to the importance of (re)establishing local social networks involving the social partners.

Recommendation

5e. From promoting telework to integrating it within society

We are calling for regulatory systems to be updated to encompass teleworkers, particularly those who are self-employed, providing the same protection as for workers in conventional workplaces. Legislation should create neutral conditions for various forms of teleworking from the standpoint of both the company and the individual. Collective agreements should be extended to telework, and the solidarity of teleworkers, particularly homeworkers, should be reinforced through innovative forms of collective organization. The convention and recommendation on the protection of workers in homework of the 1995 International Labour Conference should be examined as a potential model for European guidelines. We recommend that the EU should document best practice in collective bargaining and practical experiences and present this material to the social partners as part of the social dialogue.

We would like to see a detailed assessment of the numbers of men and women currently involved in telework, the activities they are engaged in, the skills required and the social consequences. This should inform practical proposals for preventing particular groups (e.g. women) from being concentrated in low-skill activities and more consideration of how training requirements are met, particularly in the context of lifelong learning.

5. *Negotiated change*

Social dialogue in the IS will be important in achieving a fair and sustainable balance between the interests of workers and the interests of management. The main areas in which such balances have to be found directly concern many of the subjects discussed above: the changing working roles and skills required of employees in the IS; the introduction of more flexible employment patterns; and participation in the implementation of ICTs. Effective social dialogue is essential if such changes are to take place smoothly and to the satisfaction of all parties. We view social dialogue not as a cost which firms have to bear, but as part of the process of working out approaches to technical and organizational change which seek to enhance both working lives and business performance.

Collective agreements will continue to be vital in the IS as a necessary counterweight to the increasing individualization of contracts. Individual contracts may be more in line with the new flexible working structures, but they can reduce solidarity between workers and make it hard to establish a clear idea of what constitutes best practice. Collective agreements, therefore, provide a valuable framework within which individual arrangements can be viewed, although their role will shift as new forms of work and working practices become more widespread.

Recommendation

5f. Social dialogue in the IS

As the IS develops it is important that the Commission should stimulate and support Community-wide social dialogue so that joint efforts can be made to overcome the negative effects of the changes in the structure of employment and labour markets. Employee participation and consultation must be central to the process of structural and organizational change.

We believe that employee participation, not marginalized representation, should be a key feature of the emerging IS. In addition, improved commu-

nication—central to our vision of organizational change in the IS—requires improved processes for keeping employees and their representatives informed. To that end, ICT facilities must be made available to employees to enable them to communicate with management and with one another.

E. From time to work to time to live

One of the most distinguishing features of the current ICTs is their enormous potential for the rapid transfer of digital information. This opens up many new opportunities for more flexible production and faster responses to changes in demand. In some service sectors the speed of response has become the essential ingredient of economic value.¹ In other sectors, interactivity, facilitated by digital communication, has created new trading opportunities. Time is also needed to develop and maintain human capital: workers will need more time for retraining. Now more than ever before, time has become a crucial and scarce production factor.

But time has unfortunately none of the traditional characteristics of a production factor. Time cannot be accumulated; it cannot in any real sense be saved. Time spent today is lost forever. This explains why, contrary to the simple, 'rational' economic view that as time is used more efficiently at work or in the home people will be better off, with every minute of saved time allowing them to produce or consume more, there could well be increasing evidence of a 'time paradox': as people in effect have more time available, living longer and working less, there is an increasing impression of time pressure and shortage.

The new ICTs certainly contribute significantly to this time paradox. Whether at work or in recreation, in production or in consumption, traditional patterns of time use are being brought into question, raising fundamental challenges for society, economic activity and the individual.

1. Time to work

In sectors dealing with the production, transportation and distribution of material goods, new ICTs enable a reduction in the time/storage dimension between production and consumption. Many of the most distinctive characteristics of the new ICTs are related directly to their potential to link networks of component and material suppliers, thereby cutting storage and production time costs. In addition, certain activities can be outsourced to places far removed from the point of assembly or final production. In transport and logistics, the new technologies facilitate

¹ The speed of response for a firm like Reuters is said to be six seconds or less.

greater efficiency and flexibility in the delivery and transport of goods. In distribution, the increased flexibility associated with the new technologies allows stocks to be more closely matched with demand, thereby reducing the firm's storage and inventory costs.

But the new ICTs do not only tend to restructure conventional forms of production; they also question the accepted conventions of workplace and working time. The nature and role of work is likely to undergo major changes. Although the nature and extent of these changes varies markedly from place to place, the general features are increases in part-time work, in the unpredictability of working hours, in more casual working conditions (temporary and fixed-term contracts, etc.) and in the proportion of women in work, and a decline in the expectation of a job for life.

In some aspects the increased use of ICTs both intensifies these trends and provides scope for new policies to improve the integration of working life into the rest of our lives. For instance, the much more rapid rate of obsolescence of existing skills is undoubtedly jeopardizing the employability of older workers and might increase unemployment among that section of the workforce. People who interrupt their careers, mostly women, are finding it increasingly difficult to keep abreast of the fast-changing skill requirements and often find themselves in peripheral jobs. An economy increasingly based on high-quality products and services cannot afford to have an increasing proportion of the workforce in peripheral and atypical occupations. If that occurs, human capital is unnecessarily wasted and social cohesion reduced, both of which we find unacceptable. Lifelong flexible work can increase opportunities for learning, to maintain employability and help reconcile the demands of work and family.

Recommendation

6a. Structuring flexible working time

Flexible working hours are needed to improve efficiency, boost job opportunities, promote lifelong learning and reconcile work and family life. We would encourage more proactive approaches to flexible working hours and believe that a set of measures can be found to make flexible working hours attractive to workers while simultaneously broadening job opportunities within a framework of negotiation. The Commission should collect information on successful case studies and measures, including:

- parental leave schemes to reconcile the demands of work and family;
- job rotation schemes, sabbaticals, training leave, etc. to promote lifelong learning;
- best practice examples of annualized working time contracts;

- new types of job-sharing, such as time off in lieu, for overtime, night and weekend shift supplements and temporary working-time reductions to prevent redundancies;
- adjustment of the welfare regimes and the labour legislation to encourage flexible working hours

2. Time to consume

In contrast to some of the traditional sectors involved in the production and distribution of material goods, simultaneous production and consumption is a feature of many service activities. It is this which has generally limited productivity improvements in such areas.

As argued above, ICTs, almost by definition, will enable service activities to become more readily tradable. By bringing in a time/storage dimension, information technology will make it possible to separate production from consumption. This is what lies behind the vast new potential for tradable communication and entertainment services reflected in the growth of multimedia: the fact that the consumption of such services need not take place simultaneously with production allows them to be much more widely distributed.

However, while the sort of capital embodied in new manufacturing technologies has traditionally been time-saving, this postponed consumption of services will be time-consuming. In other words, the new demand generated by ICTs does not only allow more immediate communication and faster response and interaction; it will often also require time consumption ('chronophagy').

Recommendation

6b. In search of time

The debate on the reduction of working time needs to be reviewed. The focus must shift from issues related to the distribution of work to the additional time required to consume new ICT goods and services, including training and reskilling. Despite the relative material affluence of European society and the availability of numerous forms of time-saving household equipment, there is still, in most households, a dramatic shortage of time (estimated at an average of some 20 hours a week) for non-work activities.

3. *Time to live*

The dramatic increase in the amount of information available and the time required to filter through it makes time management ever more important. According to most recent surveys, while patterns of consumption have not changed radically with the arrival of the new products, every choice seems to be facing more and more competitive pressure from alternative time uses. Time pressure is building up as all end goods are weighed up against the enlarged range of other new opportunities. Time constraints at times outweigh budgetary constraints — a typical pattern for the wealthy, but one which now seems to concern a far larger section of society. One example might be youngsters who have increasing difficulty managing time constraints between school education, home education, TV, multimedia entertainment, physical entertainment and household chores.

There can be little doubt that the opportunities offered by mechanization and automation at work and in the home (washing machines, dishwashers and other household electrical appliances) over the last two decades have cut down on physical work and saved time, eliminated a number of unergonomic practices, and protected workers from hazardous processes and exposure to dangerous substances with the help of remote controls. However, the new time pressures inherent in doing things in parallel and rapid responses, often requiring coordinated use of the visual and other senses, precise psychomotor functions (hand-arm systems) and almost all of the human brain, create new forms of stress.

One prominent characteristic of the IS, which could be called the 'screen and chair society', is the constant use of the cathode ray screen: at work, for leisure, in front of the television, for culture, banking, etc. Many, including those with physical problems such as backache, spend the greater part of their lives in one position: seated on a chair in front of a screen to view a virtual representation. The overall trend is towards more sedentary lifestyles with less time for physical activities and greater strain on the visual and musculoskeletal systems. Such lifestyles, which are often associated with 'unphysiological' time schedules, may, if widespread across a population, increase the risk of inactivity-related complaints such as obesity, musculoskeletal disorders and cardiovascular disease. The potential health impact of the non-ionizing electromagnetic radiation emitted by several ICT sources is not yet firmly established, but at present the risk would appear to be extremely low. And ICTs will enable the 'activation' of people through health information and education and can thus be used as a tool for promoting healthy living.

The problems associated with such changes can be partially solved by using the results of research into human physiology and psychology. This would boost endeavours to develop people-centred, as opposed to 'technocentric', forms of technology and work organization. To that end, more effective consideration needs to be given to user needs and views than has been the case thus far. It is worth noting that this will not only have health and safety implications but will also affect the acceptability of new ICTs and the productivity of ICT investment.

Recommendation

6c. Healthy living in the IS

The potentially two-edged sword of the IS's impact on public health warrants consideration. ICTs and the Internet have started to change people's time budgets and even time rhythms. These changes are comparable with those that occurred 40 years ago with the advent of television: reduced mobility, the spread of sedentary lifestyles and long periods spent in computerized or virtual environments, with all the adverse effects that can have on health as a result of inactivity, the overtaxing of the sensory systems, ergonomic problems related to the use of VDU screens, and information overload. Users should be effectively informed of these potential dangers and how to avoid them.

There is also a need for a better understanding of the many ways in which new ICTs consume time and are making people dependent on virtual time, such as:

- the implications of being constantly on call, the potential need to go off-line at times and the right to restrict access at times;
- the limitation and negotiation of intrusions.

More broadly, the many occupational mental health and safety aspects need to be more fully integrated into the design and implementation of ICTs in any workplace, including the home, in order to facilitate smooth adjustment to the resultant changes in working patterns. In implementing ICT-intensive working practices, ways should be found to make full use of current research knowledge on occupational health and safety, including data on work organization, ergonomics and the psychology of work.

The many benefits for health should be fully utilized, starting with better provision of health information, new tools for health education and information, and self-care. Finally, both the physical effects of the 'screen and chair' IS (stress, backache, migraines, eye problems, etc.) and the possible gradual diminution of certain senses such as touch and smell through the intensive use of virtual images must be investigated.

F. Globalization

One of the most radical features of the new ICTs is their ability to provide fast, interactive and cheap international access. While it might be something of a misnomer to talk about a 'global' IS in a world in which half the population has no access to public telephony, the trend towards worldwide access is intrinsically

linked with the capacity of ICTs to codify information and knowledge over both distance and time. Globalization has been most rapid in areas such as finance, where it has been accompanied by an institutional process of liberalization and deregulation and is nearly complete: financial capital has in essence become an internationally mobile production factor.¹ In traditional manufacturing, the decline in communication and information costs has further increased the international transparency of markets, thereby extending the scope for international relocation. And, in areas such as services, new ICTs are in many cases allowing cheap 'global' access to low-cost labour locations for the first time, which is facilitating the relocation of various routine service functions and activities. Firms and organizations have come to discover the benefits of international wage cost differentials in fields previously limited in their international tradability.

In other words, ICTs contribute both to economic transparency and, in so far as they bring the cost advantages of alternative locations to the fore, to international capital mobility and the international outsourcing of particular activities. Furthermore, and as argued at greater length in section C, ICTs have also had a positive impact on international access to information and codified knowledge. Codified knowledge, including the economic knowledge of markets referred to above, is to some extent becoming internationally available. While local capacity to use or process that knowledge will vary widely, the potential for access is there. ICTs, then, highlight the potential for catching up, based on the economic transparency of advantages, while stressing the crucial tacit elements and other competencies required to access internationally codified knowledge.

Combined with the significant educational efforts in many eastern European and some of the larger Asian countries, ICTs constitute a major structural transformation at global level. It is important in this context to emphasize at the outset that a more transparent, borderless global information society is likely to have significant benefits for the world as a whole. To some extent, the new ICTs correspond to the international economist's dream of a more transparent global economy, in which economic incentives enable countries to converge more rapidly and bring about a more even spread of development worldwide. However, at the same time, the speed of the globalization process is likely to raise some fundamental policy challenges, particularly in Europe. If dismissed as being of minor importance² or beyond national policy control, this process will either attract ever greater resistance, with all the dangers of a more closed and inward-looking Europe that implies, or alternatively leave what are often the weakest groups in the labour force bearing the brunt of the adjustment through dismissal or wage reductions. Recognizing the policy challenge which the increased globalization linked to the use of ICTs poses for Europe requires policy-makers to actively seek ways and

¹ For instance, crossborder transactions in bonds and equities have risen in the OECD countries from 10% of GDP in 1980 to between 150 and 250% of GDP in 1995. At the same time, the worldwide volume of foreign exchange trading has increased to a turnover of more than USD 1 200 billion a day. (BIS, Annual Report, 1996).

² As is the case when focusing on actual direct foreign investment flows in and out of Europe, which represent only a small fraction of the globalization concept discussed here and are therefore unlikely to be meaningful.

means of integrating the associated benefits within society, rather than presenting globalization as a threat to which society must adjust.

We draw readers' attention to two such policy challenges, which are in our view of fundamental importance to Europe: the implications for employment growth and the implications for national taxation and welfare systems.

1. Jobs in Europe and the emerging global information society

The use of new ICTs is likely to prompt radical changes in employment in Europe, especially in the service sector and in those fields and occupations which have hitherto been largely shielded from the forces of automation and computerization. The service sector, which today accounts for more than 60% of total employment in the EU, has traditionally been 'sheltered' from international competition and over the 1960s and 1970s absorbed the greater part of employment displacement in manufacturing and agriculture.

Some studies have predicted significant new employment creation with the rapid dissemination of ICTs and the liberalization of telecoms markets.¹ While we have no grounds to reject such 'guesstimates' out of hand, we see no reason why Europe's dismal employment performance over the last six years — effectively a period of jobless growth — should suddenly be reversed to any degree by the advent of ICTs. As *The Economist* put it recently, Europe's comparative advantage remains intrinsically in products and crafts of the past; its specialization in high-demand, high-tech sectors remains limited. To shift such comparative advantage to new ICT sectors will require prolonged efforts to revive entrepreneurial spirit, in particular by means of appropriate financial and tax incentive structures and support for the establishment and development of new SMEs in such sectors. The 'Green Paper on innovation'² has already highlighted the broad scope of these policy challenges.

The new ICTs actually provide plenty of opportunities for new forms of employment: in high-value, high-skill occupations; in new, information-intensive industries such as the multimedia sector; in new micro-businesses where creative entrepreneurship thrives; in new information-intensive jobs; and in many more traditional person-to-person occupations focusing on some of the communal and caring aspects of work and non-work. Many of the recommendations made in the previous sections should be viewed within this context of enhancing the creative employment opportunities of the IS.

But for these new employment and growth opportunities to emerge across Europe there is, in our view, also a need for a clearly agreed common minimum

¹ See Bipe Conseil, 'Les effets sur l'emploi du processus de libération dans le secteur des télécommunications', final report, October 1996. In the scenario of rapid liberalization and dissemination, a total gain of some 1.3 million jobs is predicted in the EU by the year 2005. A scenario of gradual liberalization and slow dissemination would limit the total gain to 228 200. The possibly more realistic European scenario of slow liberalization and dissemination has not been presented. One can only assume that the employment impact is likely to be negative.

² 'Green Paper on innovation', European Commission, 20 December 1995.

social framework in Europe. New ICTs and the increased transparency in production costs they are likely to bring about cannot be used first and foremost to delocalize production and service activities in order to avoid social costs — including social security payments and other tax costs in some locations — and take advantage of the lack of such provision elsewhere. Avoiding social and tax costs has little to do with comparative advantage. If unchecked, this is likely to lead to a vicious circle of downward 'adjustment' in social policy in Europe, with member countries and regions competing to downgrade welfare provision. Given the lack of any exchange rate adjustment in a future context of economic and monetary union, this would in effect, with the added advantage of low inflationary pressure, be the ultimate form of negative integration:¹ harmonization by erosion. The failure to achieve agreement on a set of common minimum social policy standards will ultimately bring about the erosion of the various social welfare systems in Europe.

Such concerns about the social impact of new ICTs are not, of course, limited to Europe. As noted above, the worldwide and cross-sectoral impact of ICTs is stepping up the pressure for structural change and what might be termed 'creative destruction'. Again, the liberalization of telecoms markets and the worldwide elimination of tariffs, as under the recent Singapore agreement, cannot be the only progress made at international level. The global 'level playing field' needed for the global information society to emerge also requires adherence to some minimum social rules such as the ILO's seven core conventions.

The monitoring and implementation of a social dimension to trade liberalization is, of course, an issue which has been at the forefront of many policy debates and one which goes beyond the scope of our report. However, here too new ICTs offer opportunities for more transparent and easy-to-implement instruments for monitoring and control. Indeed, why limit the advantages of transparency brought about by the new ICTs to producers? National consumers have over time become a powerful lobby, rejecting the manufacturing process or the materials used in a particular product with calls for explicit boycotts. Firms, on the other hand, have become wary about the subjectivity of the information disseminated by various pressure groups with respect to particular products. Just as this need for better, harmonized information has led to the widespread use of 'green' labels on products, one might imagine that a similar set of information on labour and social conditions could become codified into some form of 'social label' on products and services, allowing consumers to make a more informed choice.

Recommendations

7a. Enhancing employment growth in the IS

There is, in the view of the HLEG, an urgent need, first, to coordinate policies designed to reap the potential employment benefits of the new IS, from the many policy proposals for reviving entrepreneurial spirit to support for new

¹ As opposed to positive integration, which is integration on the basis of new common rules.

SMEs, and, second, to make rapid progress (e.g. within the IGC), at least in line with progress on EMU, on a common minimum framework for European social policy. This would give member countries, in accordance with the principle of subsidiarity, the freedom to have/keep/develop their own more sophisticated social policies, while at the same time creating a level playing field in terms of minimum social standards across Europe. Failure to achieve progress on this issue within an increasingly transparent IS is likely to lead to the erosion of the many diversified European welfare systems and progressively undermine social and regional cohesion.

7b. Towards a social global level playing field

While most international policy attention has focused on the need for global liberalization of ICT products and services to ensure more competitive, open and transparent markets, relatively little progress has been made since the Copenhagen social summit on establishing, monitoring and controlling a set of minimum social standards. This debate needs to be revitalized, using some of the scope for increased transparency which new ICTs provide in terms of consumer information on 'social' production conditions. Just as global transparency is likely to benefit economic welfare in terms of better international allocation of resources and lower prices, it might also increase social welfare by bringing about an improvement in social and working conditions.

2. National welfare and taxation systems and the emerging global IS

The emerging global information society not only makes international differentials in traditional economic production factors, such as wages, more transparent, it also points out international differentials in direct and indirect taxation and social security contributions. In a number of areas, such as electronic commerce, it may be questioned whether existing consumption and sales taxation systems (VAT in the EU) are still fully appropriate in a global IS. In the past, the material goods which distributed and consumed were traceable and taxable. With the emerging global IS, economic activity is becoming increasingly concentrated in intangible global information transactions, some of which are invisible and only a proportion are detectable and ultimately used or incorporated in material goods and services. There must be at least a suspicion that a share of the productivity and consumer gains from the new information and communication technologies have disappeared into the global networks and are not reflected in lower prices or higher profits or wages.¹ The HLEG takes the view that more research should be conducted into the feasibility of adapting existing tax regimes or deve-

¹ See our argument above on the evaporation of consumer surplus.

loping alternative systems more in line with the global nature of the IS and the increasingly intangible nature of the goods and services being traded. In areas of teleshopping where goods and services continue to be physically shipped and traded,¹ existing forms of consumer taxation may still be appropriate but in need of reformulation and/or harmonization. In the case of trade in intangible information services, where notions of value are difficult to estimate or to monitor, taxation may well have to be based on the intensity of electronic transmission, for example by means of a 'bit tax'.² And in areas such as the international relocation of financial capital flows there will eventually be a need for stricter tax haven clauses, if governments want to avoid the generalized and widespread use of potential for tax avoidance. In all three cases, governments could be confronted with a need to find new tax-collecting intermediaries to monitor information, goods and services while preserving and guaranteeing the privacy of individuals. Even in the first case, the traditional role of the local retailer or wholesaler as VAT or sales tax collector is likely to be considerably reduced in importance.

European governments should be concerned by the enabling role of new ICTs for tax avoidance. The tax revenue from income on capital has already fallen significantly across the EU. In many European countries, consumer tax (VAT and excise duties) revenues could now also be substantially eroded. At the same time many European governments are confronted with the fact that the financing of their social security systems, which has so far been closely linked to employment through contributions from employers and workers, is also being undermined.

Each of these areas requires investigation and research into alternative tax systems and adjustments to existing systems to bring taxation more into line with the emerging global information society, and in some cases policy action.

Recommendation

8. Maintaining national government revenues in an increasingly global environment

There is a need to adapt taxation to the changing economic structure of the information society and the increasing importance of information transmission. In the internationally mobile IS, member countries will have increas-

¹ Including the invoices for these goods and services.

² The proposal for a 'bit tax' applied to all interactive digital services (A. Cordell and T. Ide, 'The new wealth of nations', 1997) and based on a simple count of bits flowing over telecommunications lines follows directly from the 'information highway' analogy. As in the case of the automobile, where taxes on petrol and bridge tolls are paid on physical highways, on the information superhighway digital traffic is taxed per unit of electronic transmission, for example per bit. While the obvious difference is that in the case of the bit tax the compensation relates at first glance not to negative external effects such as environmental damage but to a simple broadening of the national tax base, it can be argued that the negative externality of 'free information' via the Internet could well be some form of 'information pollution' and congestion.

ingly to address the question of various forms of direct and indirect tax avoidance. As goods and services, including financial flows, become more mobile, the basis of national government revenue is being undermined in certain areas. While bilateral agreements between member countries can help tighten particular tax loopholes, in some areas, such as capital income tax, a more focused European approach is clearly called for. In the case of consumer (VAT) taxes, there is a need for more fundamental consideration of and research into alternative taxation systems. The bit tax might be one such alternative, although the detail and implementation require further study. As the European economies become ever more influenced by the global production, distribution and consumption of intangible goods and services, it seems pertinent to question how far our existing consumer tax systems are still appropriate.

G. Including everyone: the cohesion challenges

The issue of what we have referred to as inclusion is central to the emerging IS. We associate inclusion — what in Eurospeak is more commonly termed 'cohesion' — with the extent to which any individual is able to participate in society. Whether rich or poor, at a distance or at the centre, one would hope that in a future IS individuals will be able to play a full part in the social life of the community. Ideally, the IS should help to reduce exclusion, not increase it.

The Green Paper 'Living and working in the information society: People first'¹ expresses concern that new ICTs will reinforce rather than reduce existing inequalities, with the risk that a two-tier information society will develop, divided into the information 'haves' and 'have-nots'.

1. Social inclusion

The issue of social cohesion in the emerging IS is a broad and complex one. ICTs undoubtedly have an important role to play in supporting the emergence of more cohesive and integrated communities and providing opportunities to curb the exclusion of disadvantaged or peripheral groups. At the same time, however, many ICTs are still rather hard to use; social acceptance can be enhanced only through greater efforts to involve users in their design and implementation.

There is nothing automatic about the way various individuals of different capabilities or different educational qualifications will access or are likely to respond to new ICT opportunities. The fear of increased social exclusion is very much based on the many problems 'less favoured' groups (such as disabled and elderly people,

¹ See also the Green Paper 'Living and working in the information society: People first', COM(96) 389, July 1996.

the unemployed and immigrants) currently face in their daily participation in economic activity. In a relatively static way, this fear of increased social exclusion assumes that the current exclusion problems of these groups will remain by and large the same in the future IS. The optimistic view, in contrast, focuses on new ICT opportunities for currently excluded groups and attempts to identify cases where ICTs might become genuinely enabling technologies, allowing such groups to overcome their handicaps. What is not at issue in this debate, however, is that these opportunities will — with a few exceptions — not be forthcoming simply through the market. Excluded groups, as the term suggests, do not generally form 'consumer groups' of commercial interest.

At the same time, the danger that the IS might increase individual isolation must be seriously examined, although some evidence would seem to point to new forms of conviviality and human interaction centred around these new technologies. The way the virtual domain created by these new technologies alters our perception of concrete reality is, likewise, important. In both cases, more knowledge about the real effects of ICTs is needed, rather than more speculation.

In our view, it is essential that people, and excluded groups in particular, should not be forced to adjust to the new technologies. Rather, the technologies must become better geared to human needs. The IS should not create new categories of exclusion; they should improve social integration and quality of life.

Recommendations

9a. Increasing social participation

The various possibilities for increasing the rate of development and adoption of ICT applications to increase social participation and to improve quality of life should be examined in more detail and actively pursued. In particular, attention should focus on provision and adaptation in those areas where the market is unlikely to meet needs. The involvement of target groups in the design, development and implementation of technologies is critical, as is the participation by voluntary bodies and NGOs representing such groups.

9b. Avoiding exclusion/targeting specific needs

Particular policy emphasis should be directed towards those groups that currently face a high risk of exclusion and where the new ICT tools might provide opportunities for reintegration. Examples might be the elderly, early and 'actively' retired people, and the unemployed. However, before such major targeted policy action is launched, the specific needs of such groups must be analysed and better understood. In particular, adjustments to the education system are required to address their non-vocational interests and needs in adapting to the IS.

9c. Providing technological tools for the social partners

To permit the participation of all in the IS, a dedicated effort must be made towards the social partners. The Commission should encourage agreements between professional organizations and enterprises to facilitate the use of technological systems and company resources by employee representatives, union representatives in particular.

2. Enhancing employability

One of the particular features of the IS is that it has the potential to increase the accessibility of employment to sections of the community that are disadvantaged in a context of traditional workplaces and work systems. With the move towards increased use of ICT, as with the introduction of any new technology, there are, however, likely to be changes in winners and losers. Certain groups in society may have difficulties finding employment in the future IS. Generally, there has been decreasing demand for people with lower levels of skill, which is likely to increase as ICTs become more widely disseminated. Other trends, such as the increased restructuring of organizations and compulsory early retirement, for example, will also contribute to raising unemployment levels among certain groups. Action will be needed not only to reduce the impact of existing forms of exclusion but also to develop mechanisms for integrating the biggest potential losers. There are, of course, existing European funds, such as the European Social Fund (ESF), which could be redirected to address these 'new' issues.

Recent reviews of active labour market policies question the impact of mass training and work experience schemes on employability.¹ The evidence emerging indicates that these initiatives have to be accurately targeted to meet the different needs of different groups. In particular, mechanisms to integrate less well-qualified people need to be developed to allow an incremental upgrading of their skills so that they can break through to long-term employability.

As discussed under section 1 above, many employed people will also need help to remain employable in the face of rapid technological change, the decline of many traditional sectors and occupations and the emergence of new cultures of work. Firms might have difficulties upgrading workers' skills in time to remain competitive, and in many cases people may need help to make the transition from old practices and technologies to new. As emphasized elsewhere in this report, technologies are getting younger as the workforce gets older. What is needed here is not

¹ See amongst others OECD (1996), 'Enhancing the effectiveness of active labour market policies', May, mimeo, and Fay (1996), 'Enhancing the effectiveness of active labour market policies: The role and evidence from programme evaluations in OECD countries', OECD, mimeo.

simply continuing, workplace-based training, but a better integration of the internal and external labour market to improve the position of the individual members of the workforce.

The ultimate, long-term aim should be to create effective labour market institutions which adopt a lifetime approach to employability and mirror ongoing attempts to set up new systems of lifelong learning. Some countries are already emphasizing employment and training counselling at key transition points in people's careers. These systems should be provided in a more coordinated and systematic way with a view to developing people's capabilities throughout life so that they can meet the continuing demands for new skills which will typify the IS. Here the new ICT-based job matching services already being deployed should be encouraged, as they will make an important contribution to openness and flexibility. However, the introduction of these systems raises new issues of access and equity and we must emphasize the importance of the 'human touch' in helping people to plan their training and employment strategies. In the IS this guidance role is likely to increase rather than decrease in importance.

Recommendation

9d. Towards a European Social Fund focused on employability

In our view the European Social Fund should play a crucial role in the coming millennium by demonstrating how active labour market policies can adapt to the challenge of the IS. The ESF will be needed to support experiments designed to gauge how the employability of various social groups (such as redundant workers, the long-term unemployed, women returning to the labour market, older workers who are unfamiliar with the new technologies, under-qualified young people and so on) can be enhanced in the context of the IS, especially as regards: the development of new forms of training and learning using the new ICTs; the identification of emerging skill demands (which will include new basic levels of cognitive and social skills in addition to new technical competencies); the introduction of innovative ways of upgrading existing skills through training and work experience (especially by increasing the involvement of employers as partners in longer-term developmental approaches to learning); and the further development and promotion of new systems of study and accreditation which are incremental as well as more open and flexible. To make sure that labour market interventions have a strong positive impact on employability, however, we would call for systematic assessment of existing IS-related active labour market policies, especially training and work experience programmes, which are costly and not always very effective.

H. The death of distance

The 'death of distance' associated with the new ICTs leads quite naturally to a focus on the new growth and development opportunities in those regions which have traditionally been hardest hit by geographical development barriers. Within the framework of regional cohesion and the emerging IS, it is crucial to distinguish between less favoured and peripheral regions. Analyses of and policies for both sets of regions often seem to be consolidated under the heading 'regional cohesion', but we believe there is a clear distinction to be made between them. Less favoured regions face major problems of poverty and development. Peripheral regions, on the other hand, have problems related to their geographical position. Regional policies must address the specific difficulties of less favoured and peripheral regions.

As in the case of social cohesion, it is clear that, for both peripheral and less favoured regions, grasping the opportunities for regional cohesion offered by the IS will not happen automatically. For the benefits of the IS to be realized, a number of prerequisites will need to be in place, the most obvious being access to information infrastructure. In the past, the universal service obligation (USO) has been used in an attempt to resolve the problem of access to telephony. An updated version of USO, allowing affordable access to all for advanced telecommunication services, will need to be designed. This has been the central issue of much of the policy debate in Europe. However, in contrast to past experience, the issue is now much more complex, given the rapid pace of change in communication technology and the increasingly liberalized framework within which new information services are being provided. The simple extension of USO to include the new technological opportunities afforded by the IS, such as broadband to all premises, would not only be extremely costly, it would also soon be outdated. There is, in our view, a need for an alternative, less technical and more functional approach to universal service.

But the issue of liberalization and its possible adverse impact on regional and peripheral development will also need examination. The differences between less favoured and peripheral regions are also relevant to the issue of policies for information infrastructure access. Less favoured regions often have high population densities while in peripheral regions the opposite is true. The deficit in terms of information infrastructure and information use in less favoured regions is often integral to their development shortfall. The potential for catching up in information and communication infrastructure is often significant; new entrants might be willing to invest in view of the large latent demand associated with high-density areas. There is frequently substantial scope for recouping costs and securing a profit. The lack of development of these regions does not imply that there would not be significant economies of scale to be reaped. Liberalization is likely to make the potential advantages of scale and concentration far more transparent. Insistence on USO will, however, often undermine such commercial opportunities. Whereas connecting the central high-density areas in a less favoured region might hold commercial promise, the additional obligation to universal service might well render the whole process unprofitable.

Peripheral regions, in contrast, suffer first and foremost from their outlying geographical location. Here too the potential of ICTs to bridge distance could provide new growth and development opportunities. However, the active participation of these regions in a future IS will crucially depend on access and USO. Given their peripheral location and low relative population density, taking advantage of the 'death of distance' feature of ICTs will depend on the universality and quality of the information infrastructure available. Liberalization will not necessarily help. New commercial opportunities leading to more intense competition on price and quality will focus in the first instance on those activities with the most commercial potential — the 'cherries' of little relevance to these regions. In other words, the importance of universal access varies between regions. Seen from this angle, a generalized European directive on an extended USO is unlikely to contribute in any real sense to regional cohesion. Instead regional policies should focus much more on specific targets in the interests of increasing their effectiveness.

Recommendations

10a. Towards universal community service

Rather than becoming bogged down in discussions of minimum technical standards, we would argue that the universal service debate has to refocus on the functionality of services and alternative technologies. As in other areas, we favour a much more socially orientated debate over the current emphasis on technology. From this perspective, there is a need to investigate in greater detail whether, in order to avoid exclusion and preserve regional cohesion, the existing concept of universal service should not be shifted in the direction of a concept of universal community service, extending universal service provision to incorporate a basic level of access to new information services,¹ but limited in its obligation of universality to the educational, cultural, medical, social and economic institutions of local communities. This community-based concept of universal service provision would in effect signal a return to the historical concept of universality introduced in the last century in the US with the advent of the telegraph.

10b. Rethinking regional cohesion policy

More broadly, a fundamental rethinking of regional cohesion policies is called for within the framework of the emerging IS, from policies with respect to telecoms liberalization in outlying countries and regions to the development of programmes tailored to the specific needs of regions with a development shortfall. Community funds for regional development should be targeted more closely on those areas/regions where the benefits

¹ This could be specified in functional rather than technical terms such as scope for electronic networking, data and mail interchange, access to new business and information services worldwide and in core regions. etc.

of liberalization are unlikely to filter through. That means using such funds to support demand-led regional policies by filling in regional 'black holes'. In that way, the funds would bring more clearly to the fore the benefits of the increased transparency of costs in less favoured regions, particularly in the more densely populated areas, and become more effective instruments of regional cohesion policy, focusing support on relatively narrow targets¹ for specific groups in rural or remote areas.

I. European diversity — taking advantage of the many emerging information societies

Full recognition of the importance of the social aspects of the IS implies to some extent the need for a much broader policy shift away from the old industrial economies of scale and regulatory harmonization needs associated with economic and monetary integration. Clearly, achieving the minimum economies of scale will be an essential precondition for the commercial success of many information services and products. Such economies will often be even more dramatic and significant than in the case of manufactured goods. The lack of a harmonized European market in many of these services is a major barrier not just to the rapid dissemination of information services but also to the emergence of a competitive European multimedia industry.

Recommendation

11a. Developing a high-quality multimedia industry

Perhaps paradoxically, industrial policy in this field appears necessary for the development of a thriving European multimedia and content industry. Given the dramatic economies of scale in many of the most rapidly developing market segments, there is, we would argue, a need for 'infant industry' support in this area. Unlike traditional industrial policies, the new strategy should focus on an integrated approach which recognizes the need for a diverse and strong European production sector feeding into the distribution sector. The distribution channels might also need regulation at sub-European level to ensure access to high-quality media across the Union. More generally, the rapid development of the media industry now calls for a programme of rapid action to enhance the competitiveness of high-quality European media products while fostering economic and cultural pluralism in the sector.

¹ One example might be access to ISDN services in rural areas.

But the fundamental challenge of the European IS is undoubtedly the search for competitiveness based on cultural, educational and social variety. From this perspective, the emerging IS signals the need for a new and changed process of economic integration, where the emphasis is no longer solely on the standardization and harmonization of products and services, access to 'open' infrastructure and improved market transparency across Europe, but also on recognizing and nurturing the great variety of taste, culture and talent.¹

The extent to which the IS can turn the productive potential of Europe's enormous diversity into competitive advantage is the central question that must be addressed over the coming years. In addition, the degree to which the size advantage of the more than 350 million inhabitants is translated not only into the satisfaction of common material and information needs at lower prices, but also into a productive creativity potential and the satisfaction of the communication and exchange needs of diversity and variety, is also central. For that reason we hope to have this report translated into all the European languages, including the so-called 'lesser used' European regional languages.

Recommendation

11b. Nurturing a multicultural Europe

A multicultural vision of Europe could be supported within the IS through the use of ICTs — as a focus for cultural development; for the transmission of cultural ideas and artefacts; to foster direct contact between diverse (and often widely dispersed) groups; and to support the multilingual nature of European society. Cooperation with similar programmes outside Europe might be pursued along with the obvious need to coordinate policies with international bodies active in this area.

Evidently, within the European Union, the region or local community is the natural forum for variety to express itself most clearly. For this reason, we have emphasized the local and regional policy aspects of the emerging IS. Not only because of the newly created potential for bridging space and distance associated with the new ICTs but also because the local community and region is the foremost point at which diversity can be nurtured, enhanced and integrated within the global community. It is also the pool on which education and training institutions draw.

¹ In the words of Sir David Putnam at the 'People's first' Conference in Dublin, 'A leading businessman was enthusing that the true value of the single market lay in its having brought together 300 million customers. "Surely", I asked him, "the real value of the single market is that it offers us new ways of making Europe a more productive society? Our long-term future is not going to be decided by how much we consume but by what we produce, the way we produce it and the extent to which the process of production includes the 18 million of our fellow citizens who presently find themselves unemployed and therefore excluded both as consumers and as producers.'"

Recommendation

11c. Celebrating the local community

A vital step towards reinvigorating the spatial community is to promote cultural production and consumption at local level. This is important as part of helping to reassert a sense of place and pride, to develop people's natural creativity (especially in remote or peripheral areas) and as an educational process. It is important, therefore, that cultural services be designed so they counter, rather than reinforce, the forces of centralization. Once again, the natural place for cultural expression is in the public sphere, and policies for the IS should be expressly committed to developing public arenas and the shared celebration of culture.

J. Transparency and democracy

The scope for increased transparency brought about by new ICTs is not limited to economic variables. It also extends into many other areas, grouped together here under the heading of democracy. We have chosen to single out two particular areas for policy attention: the trend towards media concentration and its implications for pluralism and access to public information, and the increased opportunities for much wider public participation in political decision-making.

1. Media concentration

The media have always had an important role to play in supporting pluralism and open government. We are concerned, however, that the internationalization and simultaneous concentration of the media could create a democratic deficit. The internationalization of media operations increasingly transcends the regulatory capacities of national administrations, and the concentration of the media could leave a privileged group of effective lobbyists and political actors in a position to channel media — and thereby public — attention. At the same time certain media forms which have evolved, such as the Internet, promote the decentralization of expression, making it easy for an individual to convey a message or opinion to many others.

Public access to high-quality, neutral information is necessary for the proper functioning of democracy. Without unbiased news on affairs in the community, the country or the wider world, citizens cannot play an active part in the governance of society or make informed choices in elections. The information we receive, however, is not determined in a totally neutral and transparent manner. Ownership of the media is becoming increasingly concentrated: one media conglomer-

ate may control a range of newspapers, television stations, news programmes, etc. With only a few organizations deciding what information the public is exposed to and the lack of transparency about who owns what in the media, we are concerned that the result could be detrimental to cultural and political pluralism in Europe. The complexity of these issues raises the need for an organization to analyse the new issues arising in relation to the media, democracy and the IS.

Several EU countries have established legislation on media concentration; this legislation must be harmonized and coordinated at European level, first and foremost to avoid distortions of competition between Member States. The EU and the Council of Europe are among the principal international organizations that could provide a forum for discussing such issues.

Recommendation

12a. Maintaining pluralism

To ensure pluralistic media representation, maintain freedom of speech and strengthen the democratic debate within the EU, an independent European Media Council should be established. This body would have a number of roles, including observing developments in the media; ensuring complete transparency with regard to cross-ownership; promoting discussion and debate on topics related to the distinction between information, knowledge and entertainment; the media's influence on the young; and the impact and consequences of ICTs such as the Internet on the media and politics.

In addition, we support the draft media concentration directive in that it will help to enable member countries, despite trends towards the internationalization and commercialization of the mass media, to develop their media in their own languages and thereby safeguard national identity.

2. Including everyone: a broad democracy project

ICTs create new opportunities for greater public participation in and awareness of the political process. There are already examples of on-line government in which the transparency of government procedures and accessibility of government officials are increased. The new communication technologies can make surveys of public opinion easier and, with care, more comprehensive. However, the best ways of implementing such systems have yet to be identified and will vary from place to place, given the different democratic traditions within Europe. There is even a danger that too much information and debate, especially if presented more as media speculation, could detract from the serious business of government to create a 'confetti democracy'. As we have said before with respect to the confusion

between data transmission, interpersonal communication and the acquisition of knowledge, there is a danger of confusing data transmission with public debate. The new technologies harbour the potential for an enlargement of the democratic decision-making process. However, educational, financial and employment differences may create a social gap between those who are able to use the new technologies to acquire more information and those who are not. Participation in social debate is dependent on accessing information. For this reason we believe measures must be taken to ensure that the less favoured groups in European society have access to the information and services of the IS.

However, access to information alone is not sufficient. An essential task in the IS will be to use ICTs to bring government closer to all people, especially the young. The art of politics is often seen as remote, opaque and boring to young people. Yet decisions that affect all our lives are made in these circles. It is both desirable and necessary to find ways of making the democratic process more transparent and vital in the eyes of the young. In addition, the citizens of the EU need to acquire knowledge on how to make the best use of the new media. This should begin at school with an introduction for children and young people to both the world of politics and the role of the media in forming public opinion.

Recommendation

12b. A democracy project

To strengthen democratic development within the IS, the EU should implement a democracy project. The objectives would be to reveal how ICTs can:

- step up the interaction between politicians and citizens and increase the latter's participation in political debate and decision-making;
- clarify how issues relating to human rights, xenophobia, social values, etc. should be approached in the IS;
- improve our understanding and the transparency of the democratic process in both national and EU institutions.

Again we highlight here the need for a community universal service policy. This would ensure that all members of society have access to electronic information from public institutions and public service media. In addition, we suggest that education about the media be available to all members of society, especially the young. If properly introduced to the workings of the media sector, the special kind of 'edited reality' which all media present (through the electronic manipulation of texts, pictures and images), and the distinction between reliable and unreliable sources of information, future generations will be able to take a more critical approach in their use of media of all kinds.

3. Conclusions

As the previous section illustrates, the information society signals more than a major change in the technological paradigm that underpins our societies. ICTs have the potential to affect every aspect of the economy and large swathes of social, cultural and political life. The policy challenges they raise are similarly pervasive.

In this report we have concentrated upon the specific challenges associated with this broad shift, not because we wish in any way to refute the many opportunities the new technologies are likely to offer in terms of renewed growth and employment opportunities, but because the emerging IS raises major policy issues, and the sooner these are addressed the better. We strongly believe that these challenges transcend the simplistic notions of rapid adjustment to an externally, technologically determined future in which people have little or no say.

We hope that the vision presented here, with the list of major policy challenges society faces, will carry the IS debate beyond the futuristic, specialist descriptions of the new technological potential ICTs represent, and will help policy-makers in addressing the many and urgent issues involved.

Annex I

List of supporting research papers¹

'The use of ICTs in large firms: Impacts and policy issues'
Mark Hepworth and John Ryan

'Work reorganization'
Gerhard Bosch, Karl-Heinz Rödiger and Hans-Jürgen Weißbach

'Employment in the IS: Analytical and policy challenges'
Pascal Petit and Luc Soete

'Big futures for small firms? SMEs and the IS'
Mark Hepworth and John Ryan

'Towards the learning labour market: Labour market policy in the information society'
Hanne Shapiro, Ken Ducatel and Teresa Rees

'Gender and ICTs'
Juliet Webster

'Regional development in the IS: a review and analysis'
James Cornford, Andy Gillespie, and Ranald Richardson

'ICTs in education and training'
Gill Kirkup and Anne Jones

'Health and the information society'
Jorma Rantanen and Suvi Lehtinen

'The impact of the information society on the media'
Gabrielle Kreutzner

'The impact of ICTs on democracy'
Pierre Chambat

'Home ICTs and the information society'
Roger Silverstone and Leslie Haddon

¹ For further details on the above documents, please contact the European Commission — DG V/B.4, Rue Joseph II 27, B-1049 Brussels.

Annex II

List of European Commission documents relating to the information society¹

'Europe and the global information society'
Recommendations to the European Council, May 1994
(CD-84-94-290-C)

'Europe's way to the information society — An action plan'
Communication from the Commission to the Council and the European Parliament, and to the Economic and Social Committee and the Committee of the Regions, 19 July 1994
(COM(94) 347 final)

'Towards the information society'
Communication from the Commission to the Council and the European Parliament, and to the Economic and Social Committee and the Committee of the Regions on a methodology for the implementation of information society applications, 31 May 1995
(COM(95) 224 final)

'Networks for people and their communities: Making the most of the information society in the European Union'
First Annual Report to the European Commission from the Information Society Forum, June 1996
(CD-96-96-473-C)

'Standardization and the global information society: The European approach'
Communication from the Commission to the Council and the European Parliament, 24 July 1996
(COM(96) 359 final)

Green Paper 'Living and working in the information society: People first', 24 July 1996
(COM(96) 389 final)

¹ Complete and updated information on European Commission information society-related activities can be accessed via the Word Wide Web server set up by ISPO, the Commission's Information Society Project Office (<http://www.ispo.cec.be>).

'The information society: from Corfu to Dublin — The new emerging priorities'
Communication from the Commission to the Council, the European Parliament,
the Economic and Social Committee and the Committee of Regions, 24 July 1996
(COM(96) 395 final)

Communication from the Commission to the European Parliament, the Council
and the Economic and Social Committee concerning regulatory transparency in
the internal market for information society services, 30 August 1996
(COM(96) 392 final)

'Europe at the forefront of the global information society: Rolling action plan'
Communication from the Commission to the Council, the European Parliament,
the Economic and Social Committee and the Committee of the Regions,
27 November 1996
(COM(96) 607 final)

Proposal for a Council Decision adopting a multiannual Community programme
to stimulate the establishment of the information society in Europe, 12 December
1996
(COM(96) 592 final)

'Learning in the information society: Action plan for a European education initia-
tive (1996-98)'
Communication from the Commission to the European Parliament, the Council
the Economic and Social Committee and the Committee of the Regions
(COM(96) 471 final)

European Commission

**Building the European information society for us all
Final policy report of the high-level expert group**

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