14. A digital society for us all: ‘old’ and ‘new’ policy reflections*

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14.1 INTRODUCTION

The 1990s have witnessed a great proliferation of reports and papers on Information and Communication Technologies (ICTs) . . . The objective of this report is not to add one more document to this already over-subscribed field. Rather, it is to transcend this discussion from the outset, by making a separation between data and information, and by distinguishing between the notion of information and the need for knowledge. It is necessary to separate out the transmission of data from communication between people, and the acquisition of knowledge. Most present-day telecommunication systems are still systems of transmission of data. In this report, we focus our attention on ways in which information can be converted into useful knowledge, so that the ‘information economy’ may become a ‘knowledge-based economy’. The underlying ICTs provide the potential for great increases in productivity and many new and improved products and services. However, history shows that the ability to convert this potential into actual gains in productivity and improvements in living standards and quality of life depends on a prolonged process of learning and institutional change. (HLEG, 1996, p. 1)

These are the first, introductory sentences of a policy report written 10 years ago by the two of us as part of a so-called European ‘High-Level Expert Group’ (HLEG) on the social and economic implications of the information society. The report written in 1995 and entitled ‘Building the European information society for us all’ was published by the European Commission in January 1996 and was meant to redirect the policy concerns of the then responsible European policy makers from a sheer unilateral focus on the technological and regulatory aspects of the convergence of computer and telecommunications technologies, towards the broader social and economic aspects of the diffusion of new information and communication technologies. In contrast to the then main policy concerns, it addressed some of the broader macroeconomic growth, distribution and

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employment issues, as well as many of the social and organisational aspects of the information society, the then ‘buzz word’ for the digital society referred to in this book.

Ten years would appear, certainly when looking at a set of radical, general purpose technologies such as ICTs, to be a long period. From a policy perspective, it might even appear to be an eternity. None of the policy players, such as the then European commissioners Mr Bangemann and Mr Flynn are still there. Many of the civil servants in charge at that time at the European Commission have moved to other divisions, dealing with other policy issues. We though are still there. It seemed hence appropriate to ‘revisit’, 10 years later, at the end of this book containing a wide and rich variety of ‘new’ economic insights, the many policy implications of the ‘old’ information society. In doing so we will limit ourselves to the social, employment and work related policy implications of information and communication technologies. The original EU report dealt with a wide variety of potentially relevant policy topics from regional growth and agglomeration aspects, to implications for health, education, skills, the media, democracy and the quality of life.

The fact that policy reports remain suspiciously topical, even when dealing with at first sight radical new technologies such as ICTs, might of course seem odd. Yet, after reflection, it appears that there are many good reasons why this should not really be surprising.

First and foremost, there is a natural tendency, particularly with respect to policy studies, to have a shortened ‘policy’ memory span. Most policy reports are relatively quickly forgotten, except when they are widely off the mark. Combined with the other natural tendency: to have a shortened technology ‘history’ span, there will be an inherent trend to duplicate policy advice. To paraphrase Keynes: ‘policy makers new to the job, who believe themselves to be quite exempt from earlier policy advice, are usually the slaves of some defunct EU policy report’.

Second, there is a desire particularly in the over-politicised advanced world to direct policy interests to new phenomena, even if those latter have barely made any impact, or are as yet only part of a future imaginary world. This certainly has been the case with the set of digital ICTs at the heart of this book. The limited ‘real’, widespread availability of many of these technologies as opposed to the science fiction versions represented in movies, in prototypes, or in the early commercial versions for sophisticated beta users, was characteristic of the 1980s and 1990s. As a consequence the speed of diffusion as well as the broader social and economic impact of many new ICTs applications have often been overestimated – one may think of the paperless office or videophone. By contrast, other, sometimes more simple applications (mobile telephony, sms messaging) have taken off
and diffused much more rapidly than ever expected. In the same way that The Economist magazine once talked about 'the mystery of growth', one may talk about 'the mystery' of successful ICT applications. For policy reports such differences in the rates of diffusion are often by and large irrelevant. There is more concern not to miss out on possible relevant policy areas, less about a correct timing, even though the differences in the speed of diffusion might well be related to the existence of inappropriate policy frameworks.

Third, and to some extent as a direct consequence of the previous point, there is a strong pendulum trend in policy advice. Certainly with respect to the impact of new technologies on employment growth and displacement, policy concerns seem to re-emerge with each new rise in unemployment and disappear from public debate with each reduction. Over the past 25 years we have ourselves witnessed at first hand this sheer natural, cyclical policy interest. Our first main joint publication on the topic of technology and employment was in 1982, in the midst of the severest post-war EU employment and growth crisis. Entitled Unemployment and Technical Innovation (Freeman et al., 1982), it received a lot of attention and was widely publicised. As a result, we were even asked by a private firm (IBM) to prepare a detailed report, published in 1985, on the employment implications of information technologies (Freeman and Soete, 1985). Our second major joint publication on the topic was published in 1987 during a phase of European growth recovery and entitled Technical Change and Full Employment (Freeman and Soete, 1987). It passed more or less unnoticed, even though it provided a much more in-depth macro and sector analysis of the underlying structural changes. Finally, our third and last joint major publication on this topic, entitled Work for All or Mass Unemployment: Computerised Technical Change in the 21st Century was published in 1994 at the start of the new economy growth boom (Freeman and Soete, 1994). It was particularly noted for its strongly argued case on the significance of the computer technological revolution – 'the biggest juggernaut in history' – but far less for what it had to say about the likely employment and unemployment implications. In short, the timing of policy advice seems to be of the utmost importance.

This seems a good reason to revisit the employment policy part of a '10-year old' policy report. In the following two sections we reproduce some of the most relevant parts of the report dealing explicitly with employment, organisational change and the future of work. At the end of each section, we reflect on those policy conclusions '10 years after'.
14.2 THE INFORMATION SOCIETY AND EMPLOYMENT, 1995\textsuperscript{4}

The concerns about the employment and distributional implications of the diffusion of information and communication technologies are, as has been emphasised in many reports, not based on any historical precedents. There is large potential for the growth of completely new forms of employment in the Information Society (IS). New core ICT-intensive sectors are forming the basis of new industries, notably the multimedia-based industry, which is likely to be a high value, high skill sector with considerable labour intensity. On a positive note, therefore, there is clear potential for new knowledge-rich forms of employment to emerge, which could create highly satisfying employment. The prospect of new occupations based on information services that reinforce creative, collaborative, communal and caring aspects of work, is strong and should be an area that policies seek to build up, not only because jobs with these attributes are socially desirable, but also because in many cases these innovative services will form the basis of the emerging information economy in Europe, and thus also a major component of its competitive advantage.

However, we also feel bound to raise the question to what extent new technologies represent a threat to employment, a subject that has been at the centre of polemic debates among economists and sociologists for the last 200 years. What brings these concerns about the IS back to the forefront, despite the reassuring historical analogies and macroeconomic compensation arguments, are the particular features and characteristics of the new ICTs underlying the IS. We emphasise five, each of which has been insufficiently addressed in the present policy debate and warrants more research.

14.2.1 The IS and the Jobs of the Future

The use of new ICTs is likely to lead to major changes in employment in Europe, especially in the service sectors and particularly in those sectors and occupations hitherto largely 'protected' from automation or 'informatisation'. These service sectors, which today account for more than 60 per cent of total employment in the EU, have traditionally been 'sheltered' from international competition and have acted as the main absorber of employment displacement in manufacturing and agriculture. Furthermore, it was the public service sector that was the almost exclusive creator of new employment opportunities in the EU employment boom over the second half of the 1980s.

Many of the new employment opportunities created in the IS are likely to be in the private service sector, with the continuing growth of ICT-based
services and information-intensive services such as multimedia software and systems development, professionalised consulting services and so on. It is the likely impact on public service sector employment that raises the biggest issues of concern. Some traditional public services, such as public administration, are by nature informationally intensive. In addition, some public services are most subject to deregulation and liberalisation. There are thus likely to be substantial transitional and adjustment problems with many jobs facing the threat of rationalisation.

These problems will be complex and hard to tackle from a policy perspective, not least because of the striking disparity between the amount and quality of statistical information and economic analysis on productivity growth and employment trends in manufacturing as compared to the lack of analysis of trends in service employment, their link to productivity growth, and impact on overall competitiveness.

14.2.2 New ‘Regulation’ for New Employment and Growth

Both the overall macroeconomic climate and the regulatory institutional environment are of utmost importance in creating the appropriate conditions for rapid diffusion and use of new information products and services and as a consequence new employment creation. The Expert Group is concerned that on both accounts these conditions are not at present being fulfilled in the EU and that the European ICT industry, both manufacturing and services, is at a major disadvantage in developing new demand opportunities for information products and services.

First, in so far as the dramatic decrease in the cost of obtaining data and information with new ICTs can be compared with a macroeconomic disinflationary effect – an ‘oil shock in reverse’\textsuperscript{15} – the question can be raised whether our present statistical methods for assessing ‘inflation’ are still appropriate. There is at least a suspicion that, with the growing proportion of consumption being devoted to ‘information-intensive’ goods and services with rising quality characteristics, current inflation estimates overvalue ‘money illusion’ and are unlikely to pick up real aggregate price trends of the emerging IS. Little is known about the size of this issue, even less about its macroeconomic consequences.

Second, the proposed changes in the appropriate regulatory framework as presented in the present move towards liberalisation of the national European telecom operator markets do not sufficiently take into account both the speed and the scope of the required regulatory reform. The emergence of new markets for information services requires not just a more competitive framework, deregulation and open access, but also the development of new institutions setting out the rules of such new markets, including
those governing property rights, security, privacy, and so on. At the same
time, and as the case of the Internet illustrates, the speed of change goes
well beyond the ‘controlled’ liberalisation process pursued at the moment
in Europe, and involves a much more dramatic ‘creative destruction’
process, with a completely new communication pricing structure.

Furthermore, the IS will internationalise the communications media
industries, the production of media content, editorial matter and the cul-
tural industries in general. Traditionally, these industries operate and are
largely controlled at national level because of longstanding concerns about
the effect of communications industries on national sovereignty and secur-
ity, democracy and censorship. In the IS the communications sector is
becoming more ‘commodified’, with information being packaged and dis-
tributed internationally. In order to reinforce the growth and profitability
of this sector, it is necessary that anti-trust laws, which regulate the sector
at national level, should not be in contradiction in different countries.

14.2.3 Deregulation and Existing Jobs

Regarding the rationalisation effects that follow the introduction of ICTs,
there are two main areas of concern to which we wish to draw attention.
First, a major cost of the programme of telecommunications liberalisation
that is currently under way will be the loss of jobs in some parts of the
monopoly service providers and potential erosion of the social protection of
workers in these industries. Second, in the public sector, especially in public
administration, the ICTs provide an opportunity to offer direct services to
citizens in the form of on-line services. This could lead to rapid rationalisa-
tion of the front offices of the government, with an ensuing loss of jobs.

Established telecommunication service providers are often hindered in
their attempts to compete with the new private firms on two main grounds.
New entrants can try to ‘cherry pick’ the high value added areas of the
telecommunications market, while the established provider must continue
to guarantee USP. The new entrants can also take advantage of their fresh
start through operating very flexible industrial relations regimes, with
perhaps lower levels of worker protection and working conditions than
have been established over the years in the public sector telecommunication
providers. The pressure will therefore be on the established providers to
raise competitiveness challenges through a radical restructuring of the
workforce to lower wage costs and raise productivity. This process, while
inevitable, should be made as smooth as possible through engaging the
support and cooperation of workers.

Public administration has traditionally been an employment-rich sector,
aiming to serve citizens directly in their towns and villages, which has led to
the proliferation of administrative offices offering different levels of service in different places. ICTs now allow direct on-line access to many such services from the home. This could lead to a gradual rationalisation of such offices dealing with a large number of routine or paper form filling tasks. In the IS many offices could close, leading not only to the loss of many front-office jobs but also to government becoming more remote and impersonal.

14.2.4 The Social Distribution of Jobs in the IS

ICTs are informational technologies. As they develop they lead to increased memorisation, speed, manipulation and interpretation of data and information. Their development will increasingly make possible the 'codification' of large parts of the skills required of people in the workplace. At the same time new forms of 'tacit' knowledge and skills become ever more important. An increasing number of routine skills have already become totally codifiable. As large parts of present day employment involve such routine tasks, there is increasing concern about the distributional employment impact of the IS. Furthermore, confronted with the accompanying widespread use of various forms of information and computer technologies, 'skill mismatches' are likely to be of a much more pervasive and general nature, raising questions about the inherent 'skill bias' of new ICTs. These distributional concerns justify the particular importance paid to the labour market functioning in the IS and education and training. Here we raise the broader macroeconomic issue about whether and how to develop appropriate 'redistribution' policies.

Such policies address more generally the question of how governments will be able to continue to raise funds in an increasingly information-based world in which value is generated through systems and global networks, rather than through clearly identifiable material production and exchange. There is a need to refocus the many debates and discussions on work and income within the context of the emerging IS and to consider how governments can marshal the funds to pursue such 'redistribution' policies. The HLEG shares the view that there might be a need for a new tax base, more closely associated with information exchange, such as in the case of a "bit tax". Such a tax, preferably introduced on a worldwide basis so as to avoid distortions, could possibly be used to alleviate some of the distributional issues raised above.

14.2.5 Jobs and Globalisation

The possibility of ICTs to codify information and knowledge over both distance and time not only brings about more global access, it also enables
firms/organisations to relocate the sort of routine activities that can be codified and thus also internationally traded. ICTs contribute in other words to economic transparency and, in so far as they bring to the forefront the cost advantages of alternative locations, to international capital mobility and international ‘outsourcing’ of particular activities. While the benefits to the world as a whole of such a more transparent, borderless world, are undisputed, there is concern about the worldwide distribution of those benefits.

For the poorest, most peripheral countries/regions there is concern that they may become excluded. For the richer, technologically leading countries/regions, there is concern about the increasing erosion of the monopoly rents associated with innovation, and their implications for employment and wages. Here we raise some of the broader macroeconomic implications of the shift towards a borderless capital mobile world.

National welfare systems, which already face considerable pressures of increased demand in a time of budgetary constraint, are further challenged both by the global dimensions of the IS and its association with new, more flexible forms of work organisation. First, in most EU countries, the financing of the national social security system and, more generally, the welfare state has been closely linked to employment through the contributions of employers and employees. This close national-level relationship is becoming increasingly hard to sustain, given the heightened international mobility of capital and investment in the globalised and economically transparent IS. National administrations face choices between international competitiveness and/or the long-term sustainability of the national welfare system. Second, there are trends towards new forms of work organisation in the IS such as part-time or fixed-term contract work. Such changes challenge the edifice of traditional welfare systems, which, typically, were constructed in periods of much lower unemployment, younger demographic profiles and much more stability in employment patterns. From the point of view of both financing the welfare system and encouraging more flexible working patterns, reforms to the present social security systems are urgently needed.

However, the international growth and employment implications of the emerging IS do not stop at the borders of the European Union. The notion of the emergence of a ‘global’ IS, in a world in which approximately half the population has no access to public telephony, is somewhat of a misnomer. The huge present day concentration of access to global information infrastructure and use of ICT equipment in the industrialised world also illustrates, however, the huge potential for catching-up for the ‘other’ countries.
14.3 THE DIGITAL SOCIETY AND EMPLOYMENT, A 2005 REVISIT

As was noted in the HLEG report, the relationship between new technologies and employment has been the subject of a long tradition in economics. For the sake of simplicity one may today distinguish between four separate historical phases of economic and political debate. The first debate, probably the most 'classical' in its origins, took place during the economic depression of the 1930s. The main contributors included Hansen, Kaldor, Weintraub and Neisser (e.g. see Freeman and Soete, 1994 for an overview). Many of the issues and concerns raised by these authors sound very familiar today, particularly in the context of the notion of increasing returns in current 'new' growth models (e.g. Aghion and Howitt, 1992; already initiated by Young, 1928). The second, more neo-classical inspired debate focused mainly on the post-war United States and the fear of 'automation'.

In the 1960s, levels of unemployment were higher in the United States than in Europe, and many politicians blamed technological change. As a result, a National Commission on Automation was appointed and produced the famous massive six-volume report (US National Commission, 1966), with celebrated contributions from among others Bob Solow. The third debate, which began in the late 1970s, was particularly dominant in Europe. It focused on the emergence of the cluster of computer-based communication, information and automation techniques associated with microelectronics, which appeared at first glance to have great labour-displacing implications (e.g. David, 1991 and Katsoulacos, 1984). The fear that these displacement effects might dominate the compensating job creation effects for quite some time recalled in many ways the classical debate. Again it appeared to be a reflection of the times: there was the emergence of a set of 'revolutionary' new technologies on the one hand and growing and persisting high unemployment in Europe on the other. The final, most recent, debate focused much more on the global aspects of ICT and the possible erosion of employment and high living standards in advanced countries. It was this debate of which the HLEG report formed part.

Despite the controversial nature and the intensity of the old debates, the relationship between technology and employment at least from a closed macroeconomic perspective, appears today relatively straightforward. Either the introduction of new technologies leads to more efficient production processes, reducing costs by saving on labour, capital, materials, energy, or any other factor of production, or it leads more directly to the development of new products that generate new demand, or both. In either case, more welfare will be created; in the first scenario through more efficient production combinations that liberate scarce input resources; and
in the second case by satisfying new wants. The extent to which this higher welfare or increased productivity feeds back into employment growth depends on the extent to which, and the pace by which, firms succeed in translating productivity gains into lower prices and new investment, and consumers respond to lower prices in terms of greater demand. The job losses that might follow the introduction of a new labour-saving process, for example, will thus become compensated by the job creation associated with the output growth following the decline in prices, by additional employment creation in other sectors, particularly the new technology-supplying sector, and by the possible substitution of labour for capital following the downward wage adjustment that clears the labour market. As long as there are unsatisfied needs in the economy and as long as labour and product markets are sufficiently flexible, technological change, even in the form of new labour-saving production processes, does not reduce aggregate employment but generates higher growth rates and more jobs.

Most of the controversies that dominated the economics literature on this issue over the last decades have centred on the automatic nature of the various compensation effects described above. Since the functioning and flexibility of product markets depends in part on the firm's monopoly power, the degree of economies of scale and various other factors influencing prices, many contributors have questioned the way in which cost reductions are effectively translated into lower prices and are likely to lead to more output growth. Similar questions can be raised with respect to employment growth and the functioning of labour markets; they range from downward wage flexibility to the many mismatches typical of (heterogeneous) labour markets. In either case, it is less technology itself that is at the centre of the debate than the pace and clearing function of the product and labour markets. The relevant policy issues therefore fall primarily under the heading of improving the functioning of product and labour markets. The more recent contributions that were at the core of the concerns reflected in the HLEG report focus more explicitly on the international 'open economy' framework within which most of these compensation mechanisms operate today. As a result, the relatively straightforward linkages between technology, productivity growth, and job creation mentioned above are more complex. The trade, but also the effects of international spillovers of technology on productivity growth (OECD, 1996) or of international capital mobility, make it much more difficult to identify the key links between the introduction of a new technology and the ensuing domestic employment impact. Many of the concerns about the global implications of technological change for employment relate to these international compensation mechanisms and to the way that gains from technological change are distributed internationally. In the gloomy vision of some popular
writers: 'wages in the most advanced economies are being eroded owing to the emergence of a global market-place where low-paid workers compete for the few jobs created by footloose global corporations' (Rifkin, 1995, p. 15). The globalisation of industry and services casts a radically new light on the interaction between technology and employment in an open economic framework characterised by low transport and communication costs.

While it is still generally agreed that in a 'world' economic framework, input-saving technical change leads, through increases in productivity, to higher welfare, wages, and growth and thus generates new employment, the impact on individual countries is much more complex and is based on a broad range of macroeconomic and microeconomic adjustment mechanisms (e.g. Berman, 2000). This is especially true because positive and negative effects do not coincide either in time or in space: adjustment takes time, and the industries and types of workers that will benefit from technical change are different from the ones that lose from it. At the same time, the premium placed on the role of knowledge and on the acquisition of skills in this global environment implies that international differences in the pattern of employment and unemployment depend increasingly on the capacity of national economies to innovate, enter new, unregulated 'service' areas and/or absorb new technology more rapidly.

Viewed from this perspective, the policy analysis presented in the HLEG report appears, not surprisingly, as relevant today as it was 10 years ago. Global competitive pressures have only increased and the impact of ICTs on the international tradability of services has affected many service sectors hitherto sheltered from international competition. But the report also drew attention to issues that at the time were insufficiently recognised by policy makers as being key to both international competitiveness and long-term employment growth. Thus the report by the HLEG, as one of the first policy advising groups, focused on the crucial role of the diffusion of ICT in the public sector raising on the one hand substantial employment 'adjustment' problems, while on the other hand being a key factor in raising the long-term competitiveness of the European member countries. At the time, the focus was primarily, practically solely, on the private sector. Over the last 10 years it is only fair to say that under the name of e-government a widespread number of government services have been gradually transformed to use digital service delivery (e.g. tax services, customs, social services, passports). In most European countries this process is as yet still far from complete. Furthermore many other typically information intensive services such as the health sector have been struggling with privacy and security problems (such as in the case of patients' medical records), so that the diffusion has been much slower than originally thought. The deregulation and liberalisation of network services such as public utilities has, with
the exception of the telecommunication sector itself, barely taken off. Viewed in retrospect, one should acknowledge that here too the speed of the likely diffusion of ICT was overestimated.

By contrast, there is little doubt that the 'global' competition dimension has significantly rekindled, as expected, the policy debate about the long-term employment implications of digital technologies. Current policy discussions about the continuous outsourcing and off-shoring of both industrial and information intensive service activities, including R&D, probably top the list of employment concerns today. At the same time, there is an impression that the full scope of new job opportunities associated with ICTs has been insufficiently realised in Europe.

On the employment loss side, the fears of a significant displacement of employment from the public sector, including the old state telecom monopolies, towards the private sector seems in retrospect exaggerated. The European national telecom incumbent firms have generally speaking succeeded well in their step-wise transition towards a liberal, privatised environment. The new mobile communications opportunities have been instrumental in allowing for such successful adjustment, the rapid growth in demand for such services having enabled the terrestrial telecom operating companies to gain access to large cash flows to carry out their own internal adjustment.

More broadly, the shift in policy concerns over the last 10 years highlights the temporary nature of the technology-employment policy concerns. Over the last 10 years, many million jobs were created in the European Union. At the same time the total working population increased substantially, of which immigration accounted for the largest part. Over the next 10 years, the balance between the number of elderly people withdrawing from the active labour force and the new cohorts of youngsters entering the labour force will turn negative. The policy concern will then shift from lack of job opportunities and employment displacement towards labour shortages and productivity growth. As such labour shortages translate themselves into labour market frictions, they are likely to lead to much stronger incentives for increased labour participation than active labour market policies ever achieved in the 1990s. They are also likely to raise wages for those labour-intensive activities, high and low skilled, which can not easily be automated or transferred abroad: nursing and other health caring activities, and personalised service activities. As a result of such increasing labour shortage pressures, there could well be a further leap in household activities based on insourcing and automation at home.

In short, it appears clear that the employment concerns of the introduction of new technologies need to take fully into account the supply side of the equation. That side is likely in Europe to show a declining trend,
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...brining again to the forefront the many opportunities to save time and labour through more effective use of the new digital ICTs.

We now turn back 10 years to some of those organisational and future of work aspects of ICTs as they were discussed in the 1995 report.

14.4 ORGANISATIONAL CHANGE AND THE FUTURE OF WORK, 1995

The rapid rate of globalisation of production and competition, partly brought about by new ICTs, has put new demands on firms, organisations and employees. Such increased pressure for change has often been identified with a demand for an increase in flexibility at work and at home. It is this feature that leads to downsizing of large firms and the growth of many different forms of networking with small firms. These organisational and managerial changes are likely to have major consequences for the world market, although the assessment of the scale and impact of the new flows of investment and trade associated with ICT-based production and services is far from adequate. The IS is likely to have major impacts on intra-firm relationships through intensified competition and the need for accelerating innovation and rapid adjustment to new market trends. As a result there will be a further search for organisational structures and methods that are more flexible and innovative – 'lean' production, outsourcing, industrial networks – whereby big highly integrated organisations tend to be divided into more independent units.

A number of issues can be raised here: first, internal restructuring issues within firms and other organisations; second, external restructuring issues and in particular various new forms of networking; third the changing nature of work; and fourth the balance between work and time.

14.4.1 ICTs and Internal Restructuring: Towards the 'Flexible' Firm

Innovations in ICTs continue to occur with remarkable rapidity and frequency. Also, they are unprecedented flexible technologies, with the same technical system being used to create a wide range of continually upgraded and highly differentiated products. It is for these reasons that the most constant feature of production in the IS is likely to be change. Such unending change allows for the possibility to put in place new work practices and structures of organisation. Many existing organisations reflect the more stable operating conditions of the recent past. Functional boundaries between the departments in organisations have often been created which can be barriers to rapid and flexible innovation and change. In particular,
hierarchical bureaucracies were established to enable consistent decision making and control. With the shift towards the existence of immediate electronic information flows, many people are now questioning the need for hierarchical organisations in which middle management mainly deals with routinised filtering of information and highly codified decision making. Many such routine activities can be devolved to workers with access to decision support systems on-line information. ICTs can be used within traditional structures or lead to new patterns of work and management. ICTs do not, however, determine the future. It is their use that allows for new patterns of work and management.

In other words, new ICTs will allow enterprises to introduce more flexible systems of coordination and management – the so-called flexible 'firm' – both in the private and the public sector. However, such new systems require major changes in practice and culture among both workers and management. Any technical or organisational innovation which substantially alters the way people work will be risky for enterprises. A clear cost advantage cannot always be identified, especially in the short term, and there is likely to be resistance from workers and managers alike, who are accustomed to existing work practices. In such cases, some may be deterred from taking the risk of innovating, preferring instead to learn from the (sometimes costly) mistakes of others.

Managers may also be rightly cautious about innovations that alter systems and procedures which currently deliver an acceptable level of performance, compared to entering an unknown realm in which there is great uncertainty about how to successfully complete the process of change, how long it will take, and so on. Increasingly, also, it is seen that with ICTs there are no 'turnkey' solutions. The very flexibility of the technologies means that they must be embedded in the social organisation of the workplace in order to achieve a competitive combination of productivity, performance and quality.

The new ICTs are an important factor in the restructuring of hierarchical layers; they are also a restructuring factor of certain distribution channels. For instance, through the possibility of guaranteeing direct contact between the enterprise and the client (telemarketing and teleshopping) and between the public administration and the user (administration at a distance), new ICTs might also bring about the reorganisation of certain traditional activities (shops and counters).

14.4.2 The IS and 'External' Restructuring: The Growth of Networking

There is a well-documented trend towards greater externalisation of services and production. As far as services are concerned, there is little doubt that the increasing 'outsourcing' of service activities has been a major
factor behind the growth of the service sector. On the one hand, there has been a growth of highly specialised professional services, such as advertising, informatics support and management consultancy. On the other hand, many externalised services are in relatively routine and lower skilled areas such as catering, cleaning and security.

As far as production is concerned, many large organisations have undertaken major programmes of rationalisation and downsizing. Much attention has been on re-establishing a focus on the core business, so non-core activities have often been hived off. In addition, many larger firms now use sub-contracting chains of producers of goods and services to provide a more flexible ensemble of suppliers to meet their need to respond rapidly to changes in the level and type of demand.

ICTs are one of the major factors behind this 'external' flexibility. ICTs contribute to a greater rate of change and uncertainty in the business-operating environment, thus making the use of a more flexible configuration of production resources more attractive. ICTs may also contribute to the development of outsourcing through electronic integration of inter-firm links. In essence the transaction costs of finding appropriate suppliers in the market place are reduced through such inter-firm networks. Automated billing settlement systems can directly lead to lower cost and more efficient trading, but the integration of information systems between firms also blurs the boundaries which divide them, leading to more of a partnership relationship than an arm's length trading relationship.

ICTs certainly make networking and outsourcing more likely and attractive for firms. There are also good economic reasons why firms will increasingly seek to outsource production. While such outsourcing might imply higher quality and the use of highly skilled specialised workers, we have some concern that one of the reasons for the growth of outsourcing is the lower wage rates and working conditions in the sub-contractor organisations. There is undoubtedly a potential that major firms, particularly multi-nationals, may be attracted by the idea of using sub-contracting to avoid what they consider to be high levels of social costs in the core businesses in their home regions.

In addition, we are concerned that the rapid growth of single-person and micro-businesses may imply a form of self-employment in which employees are given a stark choice between redundancy and selling their labour back into the firm on a freelanced, piecework or other casualised basis. As we note below, there have been fears that some forms of home-based telework might fall into this pattern, where workers are denied the protection of the status of employee but are in effect on contract to only one client.

ICTs are only one factor behind the drive towards 'outsourcing'. By permitting easier management of the international and inter-organisational
coordination of flows of goods and services, however, they make it much more feasible. The extent to which ICTs really reinforce such effects is not established. To our knowledge no definitive studies have been carried out. Rather, it seems that, as with so many features of the emerging IS, there are choices about how ICTs are used, for better or worse. Thus we are concerned that the promotion of the benign aspects of the IS should be promoted over approaches which are not favourable to the pay, security and conditions of workers.

14.4.3 The Changing Notion of Work

In its most extreme vision, the increasing use of ICTs makes it possible to bring work back to the home. It is as if work can be returned to the local community or even placed back into the home environment, as it was in the days before the industrial revolution. These changes could be significant, if they ever become widespread, as urbanisation has totally changed the concept of home and village, from its origins when most people lived in agricultural communities to the model of house and neighbourhood as a small domestic maintenance unit. The changes in social relationships associated with a shift of the workplace back to the home could be substantial. Such changes have clearly both positive and negative dimensions. On the one hand, there is a possibility that more people can integrate their private and work lives more satisfactorily. On the other hand, there is a greater chance that work duties will interrupt the flow of family activities by impinging on the space, time and attention spans of the household. Also, such changes have many social and economic consequences. With home-based teleworking, for instance, the employee is expected to invest in his or her workspace, but in return avoids the costs associated with commuting. With teleworking, traditional remuneration methods based on time at work will need to be adjusted. It is essential for the social partners to negotiate new systems of remuneration, which can avoid a return to some of the injustices associated with ‘piecemeal’ wages. However, whatever the remuneration system, teleworking will require from the worker certain self-discipline in the capacity to distinguish professional from family activities.

The ways in which these changes will impact on the cohesiveness of the family unit are not clearly understood, nor are the psychological pressures. For instance, could the impact on the family be an increase in quarrelling and divorces? And how will it be possible for information workers to concentrate in the midst of family life?

These examples of home teleworking are just the extreme examples of the types of issues that could become apparent if workplaces are less often seen as outside the home and neighbourhood. With the ‘go anywhere’
technologies of the Digital Societies, many traditional boundaries of space and time are blurred.

### 14.4.4 The IS and Working Time

The notion of working time will also change as ICTs pervade all workplaces. Relatively few workers will be ICT technicians. A larger number of workers will be expected to operate or work with these technologies, while almost all workers will experience changes in the pace and rhythm of work as a result of the influence of new ICTs on organisations.

As a result we expect two key types of change. First, many workers will be expected to work over a more extended working week. This is not to say that they will work longer hours, but rather that the old regular shift patterns or the reliable '9 to 5' work pattern is less and less likely to be the norm in the future. Second, work will become more abstract in nature. Information work is brainwork requiring conceptual and analytical skills rather than being based on intuitive skills or physical actions.

At the same time, the high rate of innovation in the Digital Society will undoubtedly lead to a high rate of obsolescence of ICT systems. This will drive managers to seek highly intensive utilisation of their capital stock, in order to reinforce competitiveness. In essence, this will lead to extended plant operating hours, especially in the manufacturing industries, but also increasingly in the technologically intensive service sector. Extended operating hours for capital inevitably mean more extensive working times for workers. In other words, there is more and more evening, night and weekend work – with the attendant adverse health risks associated with shift work patterns for workers, especially older ones.

By the same token, as we noted above, there is a trend in the IS towards more volatility of demand associated with the increased rate of technological change and a much tighter integration of demand and supply. In zero inventory systems there is not much opportunity for matching work flows to the needs of workers. Rather, they must be there when the demand exists and not otherwise. Firms are increasingly using variable working hours to deal with such fluctuations.

### 14.5 ORGANISATIONAL CHALLENGES IN THE DIGITAL SOCIETY, A 2005 REVISIT

Even more than in the previous section on employment, the policy concerns dealing with ICTs and organisational change as expressed in the HLEG report appear strikingly valid today. In Chapter 10 by Borghans and ter
Weel in this volume, more detailed attention is paid to the aspects dealing
with the presumed 'skill bias' of the use of ICTs. We limit our critical revisit
here to some of the organisational aspects and changes in the nature of
work following the widespread diffusion of ICTs over the last 10 years.9

Undoubtedly, as has been amply illustrated over the last 10 years, ICTs
have dramatically facilitated and accelerated various kinds of networking
arrangements at both the inter-firm and the intra-firm level. The potential
for radical changes in the organisational set-up of firms has been an intrin-
sic feature of the new digital technologies. At the same time though,
and despite the wave of creative organisational de- and reconstruction
which took place in the 1990s in the ICT industry itself, it seems worth-
while noting today that these many forms and novel opportunities of
re-subcontracting various parts of production, of design and service activ-
ities, or their transfer to exchange agreements with other independent firms,
did not really weaken the role of the large multinational firm in most other
sectors.

Today, it even seems reasonable to express some scepticism about the
notion that the 'network' has been displacing the large firm as the basic unit
of economic organisation in our economies. Whereas over the last 10 years
many economists and sociologists emphasised the role of small and
medium-sized firms in the new digital economy and the huge new oppor-
tunities offered to them by the Internet, after the financial dotcom collapse
the emphasis has to some extent swung back to demonstrating the advan-
tages of the large global firm. In the ICT industry itself, ICTs did of course
weaken, sometimes even destroy, the old monopolistic power positions of
the large, national state monopolies, as in the case of telecommunication
discussed in the previous section. This did facilitate the rapid development
of many new services, new firms and new technologies, particularly in
the mobile communication segment. However, neither privatisation nor
de-regulation led to the disappearance of large oligopolistic firms. On the
contrary, if there is one sector characterised by very large firms and an
increasingly oligopolistic industry structure it is the ICT sector itself.

By contrast, with respect to the future of work and working time, the
policy relevant changes associated with the use of ICTs might well have
been underestimated. The central feature of the Digital Society, which
probably received insufficient attention in the HLEG report, might well be
the emergence of a more mobile information society. The impact of com-
munications technologies on the reduction in the costs of distance was of
course well known and the notion of the 'death of distance' had subse-
quently been popularised in a striking way by Frances Cairncross (1998,
for updates see http://www.deathofdistance.com) but the full implications
in terms of changes in behaviour had only been analysed with respect to
the rather traditional boundaries of work with, for example, telework, and other home or leisure activities. But such a notion of a mobile information society appears too narrow and too much based on the notion of physical distance and the particular new digital broadband technological opportunities of physical terrestrial wired communication networks. In a broader sense though, mobile communication represents much more the ultimate form of reachability. Physical access to the infrastructure of the network is no longer necessary; communication can effectively take place from any location, anywhere. It is this additional dimension of communication, 'reachability', which explains the originally unexpected boom in mobile telephone communication in the 1990s. It is also mainly from this perspective that the technological developments in the area of communication technology differ from previous breakthroughs in the area of network technologies, such as electricity. Apart from being dependent on the much higher capital costs of the various 'network stations', an electricity network is also much more dependent on high quantities of energy loss over its own network. In other words, distance continues to be an important cost factor in such a network so that it is extremely unlikely that there will ever be a worldwide electricity web such as the Internet, or a mobile electricity network beaming down megawatts of energy to individual users.

The behavioural implications of the mobile IS were barely studied 10 years ago, yet once the notion of 'reachability' is incorporated into economic transactions some obvious implications emerge – first with respect to production and distribution and in particular the physical mobility of goods, services and persons, second with respect to consumption. In the first case, through better tracking, as well as quick and easy 'reachability' of the physical goods and persons on the move, whether on the road, at sea or in the air, ICTs will enable better utilisation of transport vehicles and transport infrastructures. Mobile communication appears in this sense a complementary technology to existing distribution and transportation systems. While the term e-commerce seemed to imply a process of substitution of physical commerce, ICTs are instead increasing the efficiency of the distribution and transport delivery systems through a reduction in delivery time and transport costs, and better usage of transport equipment and infrastructure. Such use of ICT to increase the rate of return to the existing infrastructural space, as in the case of transport systems, will enter decreasing returns once the physical and safety limits of the existing infrastructure are reached. The only possible way ICTs can push those limits further will be through more radical mobile communication applications allowing ultimately the 'blind' movement of vehicles (or persons) through sensor technologies interacting with 'smart' surroundings, on roads but
also in the home. In this sense, the next challenge for future applications of mobile person–machine interaction lies in the replacement of the eye–hand coordination that is essential in, for example, driving, by communication technologies: effectively allowing a blind person to drive.

At the consumption end, mobile communication technologies also offer interesting opportunities as a complementary technology. The rapid diffusion of mobile phones and mobile equipment over the last decade can at least partly be explained by the increasing time and the growing uncertainties with respect to travelling (congestion delays) most commuters and individuals have been confronted with. The ‘reachability’ of others has rapidly emerged as a new consumer need. From this perspective, the growing demand for mobile communication corresponds, as did the motor car in the previous century, to an individual need for freedom. And whereas in the twentieth century it was the individual freedom to bridge physical distance, exemplified by the ownership of a private motor car – ‘the machine that changed the world’ in the words of the famous MIT study on the motor car industry (Womack et al., 1990) – today it is rather the individual freedom to communicate over physical distance, exemplified by the mobile phone, that represents this new freedom.

14.6 CONCLUSIONS

At the time of writing of the EU HLEG policy report we noted that ‘a large proportion of public opinion’ appeared, ‘sceptical about the new opportunities offered by the Information Society and even fearful about the job losses, employment displacement and work insecurity associated with a future Information Society (HLEG, 1996, p. 82).’ We claimed that this lack of public support was primarily a reflection of the ‘technology dominated’ nature of the European IS policy debate. The last 10 years have certainly changed public awareness of the importance of ICTs. The use of computers, be they mainframe, laptops, or hand computers, of the Internet and of mobile communication is today a normal, fully integrated feature of our societies. The actual final convergence between the old information technology symbol, the computer, and the old communication technology symbol, the telephone, is taking place before our eyes. At the same time the digital skills acquired at work have been further exercised at home and vice versa. The Information or Digital Society is a reality today, even though it is still characterised by further radical changes.

As argued 10 years ago, the emergence of such an Information Society is first and foremost an endogenous process. ‘The technology in itself’, we argued ‘is neither good nor bad. It is the use which human beings make of
any technology which determines both the nature and extent of the benefits. We were, we insisted:

attempting to put forward a more balanced approach to a future IS vision, in which societal 'embeddedness' plays a central role. Such interdependence with the social and societal dimension is in the first instance based on economic arguments. Without any doubt, new ICTs provide tremendous opportunities for new growth and employment creation; for a more efficient use of inputs, not just of labour but also of energy, materials and capital, contributing to a potentially, more sustainable development path; for higher income and more broadly higher welfare; for more decentralised organisation forms, whether on the shop floor or in terms of work sharing; for more consistent regional and urban development patterns; for individual enrichment as well as more democratic decision making. All of these opportunities for higher economic and productivity growth crucially depend on congruence between the technological, economic and social dimensions. None is predetermined. Thus, just as in the case of industrial and commercial enterprises where the adoption of new technologies will be the subject of cautious analysis and rarely be based on speed only, so too should the societal adoption of new technologies be based on policy debate and on the search for measures necessary to achieve an economically and socially integrated IS. (HLEG, 1996, p. 83)

A conclusion that is still as valid today as it was 10 years ago. But we also claimed that:

in the future there could be different models of Information Societies, just as today we have different models of industrialised societies. They differ in the degree in which they avoid social exclusion and create new opportunities for the disadvantaged. A strong ethos of solidarity should also characterise the European Model of the Information Society. This is not an easy goal to achieve since the traditional structures of the welfare state will have to undergo substantial changes. (p. 84)

Compared to the radical transformations the digital technologies have brought about in the organisation of production, of work, of the distribution of goods and services, in consumption, in leisure, and in activities in the home, the institutional changes in Europe's welfare systems have been piecemeal at best. Only in some of the smaller Scandinavian countries has the more rapid diffusion of ICTs been accompanied by significant adjustments in the flexibility of social welfare systems. The case made 10 years ago in favour of an active rather than passive concept of solidarity remains hence as valid as ever.

To conclude let us repeat the four features of such an active solidarity we choose to emphasise:

First and foremost, it is essential to view the IS as a 'learning society'... putting the central emphasis on the learning society, rather than the IS per se, provides
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a more positive route forward for the IS debate. In particular, the more appropriate emphasis on learning illustrates that, although access to the information super-highway is and will continue to be important, it is insufficient to ensure the rapid development of a knowledge-based economy.

Second, as information is assuming a much more important position in our lives, a crucial additional characteristic of a human IS is that people should be in control of the information, rather than it being used to control them. There are observable trends towards the individualisation of various aspects of life: individual contracts of employment, targeted benefits, consumer profiling, personalised health care, individualised insurance planning and so on. There are obvious advantages in terms of effectiveness of such systems in that, it will be possible to make services really responsive to individual needs – but there are also major risks in terms of the invasiveness of such systems and the likely reductions in social solidarity. Third, human activities (work, leisure, contacts with administrations, banks, etc.) will occur more and more through the intermediary of telecommunications networks. These activities will be increasingly based on representations of reality (that is, abstract and virtual images of reality), rather than reality itself. There are significant advantages to this evolution such as, for example, faster delivery of products and services, fewer accidents and, perhaps, lower physical stress but there are also risks. Virtual life is not real life and the representation of reality is not reality. Fourth, in any period of major social, economic and technological change, the balance of social costs and advantages shifts. The Information Society is no exception. Changes in the industrial structure are leading to job destruction, as well as new job creation. There are great challenges in terms of adjusting to the IS at the sectoral level, at the firm level, at the level of individual skills and occupations, and within both public and private service provision.

Furthermore, there are similarly dramatic changes in the organisation and quality of work. Organisations have to be flexible to perform in the new paradigm of competition of quality, customisation and rapid innovation. Workers are increasingly required to be flexible in terms of the skills they have, the tasks they perform, and the new forms and structures of employment. New relationships between paid employment, work and activity are emerging. These raise questions about the place of work in people’s lives, particularly for the large numbers of people faced with unemployment, under-employment, or unstable employment patterns.

The Information Society is a society in formation. The decisions we make now, and the opportunities we take now, to construct a strong social dimension for the future of Europe may well be with us for a long time. We can afford to miss out in the global stakes nor can we afford to weaken the solidarity of Europeans in a rush for a rapid move into the IS for some, but not for all. (HLEG, 1996, p. 52)

NOTES

1. Such as the needs for inter-operability technical standards, the appropriate R&D framework support policies, information infrastructure support policies, etc.

2. As summarised in the Bangemann Action Plan: the central role of the private sector in the development of the IS; the rapid liberalisation of the telecommunications infrastructure and services; and the limited role of the public sector in stimulating the development of applications and the creation of a stable and transparent competitive
regulatory framework. Issues such as intellectual property protection, privacy, security and broadcasting are gradually woven into the regulatory framework. Again, we will only address these issues here in so far as they can be related directly to the broader social and societal context.

3. One may e.g. remember the OECD McCracken report written in 1975, analysing the 1973 oil crisis primarily in terms of a Keynesian macroeconomic demand management crisis, or the EU Cecchini report predicting significant output and employment growth in Europe following the single market reforms in 1992.

4. The following text is an exact reproduction of pp. 5–12 of the HLEG Interim report 'Building the European information society for us all', published by the European Commission in January 1996.

5. The word 'shock' is probably not fully appropriate, as the changes to which we refer are neither sudden nor short-lived. They involve long-term and permanent decreases in prices for continuously improving ICT-related products.

6. Cordell developed the proposal for a 'bit tax' which could be applied to all interactive digital services (Cordell and Ide, 1994). It is based on a simple count of 'bits flowing over telecommunications lines. The argument in favour of such a new tax is based on the way globalisation has undermined traditional national tax bases. At the same time, the disincentive to the diffusion and use of new information and communication services can be assumed to be marginal, because these new services offer, generally speaking, a new bundle of product or service characteristics.

7. As von Mises put it: 'Lack of wages would be a better term than lack of employment, for what the unemployed person misses is not work but the remuneration of work. The point is not that the "unemployed" cannot find work, but that they are not willing to work at the wages they can get in the labour market for the particular work they are able and willing to perform' (as quoted in Gourvitch, 1940, p. 88, Footnote 14).

8. Both the OECD Jobs Study (1994) and McKinsey Global Institute (1994) can be said to have focused primarily on these market issues. The former emphasised the functioning of labour markets, the latter the functioning of product markets, particularly in services.

9. See Brynjolfsson and Hitt (2000) for an overview of the research on the interplay between organisational change and ICT adoption. Borghans and Ter Weel (2004) provide a very interesting theoretical and empirical analysis of how far one can go in explaining differences in the division of labour across firms as a result of computer technology adoption. They find that changes in the division of labour can result both from reduced production time and from improved communication possibilities.

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