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Strategies for jobs in the Information Society

1. INTRODUCTION

The developing Information Society has the potential to transform Europe into a society and economy in which advanced technologies are used to improve the living and working conditions of all citizens.

If Europe grasps the opportunities presented, the Information Society promises to deliver a range of benefits, including higher living standards, entrepreneurial opportunities to participate in new growth markets, changes to the ways in which existing products and services are produced and delivered with productivity gains, more fulfilling jobs using advanced technologies and flexible working arrangements. These same technologies will enable workers to upgrade their skills as part of a process of lifelong learning designed to improve their employment prospects and earnings, and enhance education and learning in schools.

For citizens and communities, the Information Society promises to provide better public services, as more citizen-centred services offering choice and convenience are developed by governments. Those living in peripheral regions and dispersed communities will also benefit from access to economic and social opportunities provided by emerging technologies.

At the special “Jobs Summit” in Luxembourg November 1997, Heads of State and Government highlighted the potential impact of the Information Society (IS) on jobs and requested the Commission to investigate this. A first response, “*Job opportunities in the Information Society*”¹, identified the potential for job creation which could be achieved if Europe attained a sufficient state of readiness. Priority areas for action were identified and the main actors were invited to take up the challenge.

Stimulated by the European Council in Vienna December 1998, a high level Group was established where Member States exchanged national strategies for the Information Society (updated in some cases). In addition and within the context of the European Employment Strategy, the National Action Plans (NAPs) for 1999 included actions for the Information Society. A dedicated web page has been set up for these national strategies and action plans and is updated regularly. Other contributions received from representatives of the Information Society Industries, Social Partners and, amongst others, the Disability Forum are also included.

In the context of the rapid progress being made towards an Information-based Society, this report widens the perspective from job opportunities to job strategies, building on successful initiatives in the Member States and stressing the strong linkage between enhancing Europe’s response to the Information Society and fostering employment in Europe.

¹ COM (1998) 590 final

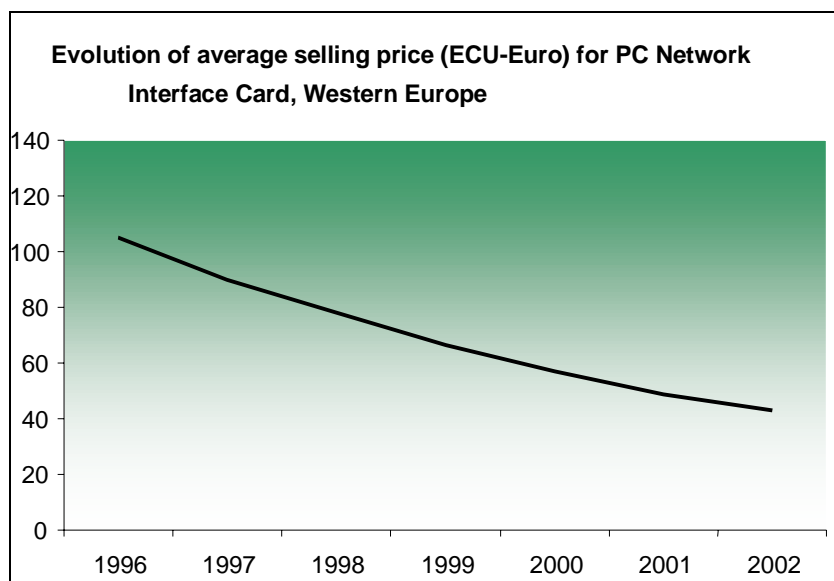
This report follows the pro-active approach developed within the European Employment Strategy. It addresses and elaborates the challenges of the Information Society across all four pillars of the Employment Strategy - employability, entrepreneurship, adaptability, and equal opportunities - aggregating the best practices of Member States in order to address the main objectives of the Employment Guidelines such as easing the transition from school to work, making it easier to start up and run businesses, exploiting new opportunities for job creation, modernising work organisation, supporting adaptability in enterprises, tackling gender gaps, reconciling work and family life, promoting a labour market open to all.

This report elaborates strategies for fully exploiting the employment potential of the Information Society within the frame of the European Employment Strategy, and serves as an important contribution to and support for the *e-Europe initiative* which is designed to enhance Europe's readiness for the digital era.

1.1. Job potential of the Information Society:

1.1.1. Information Technology, Growth and Employment

The economies of advanced industrial countries are currently undergoing substantial technological transformations. This process is exemplified by the rapid increase of the Information Technology (IT) share in the equipment capital stock. These rapid changes are unprecedented in economic history and are the consequence of huge technological advances that can be realised in the production of IT equipment. This can be seen from the tremendous fall in prices of IT goods, which has allowed the price of equipment investment to decline (relative to consumer prices) by about 40% in the US and about 30% in the EU. This process is likely to accelerate with a rising share of IT in capital formation.

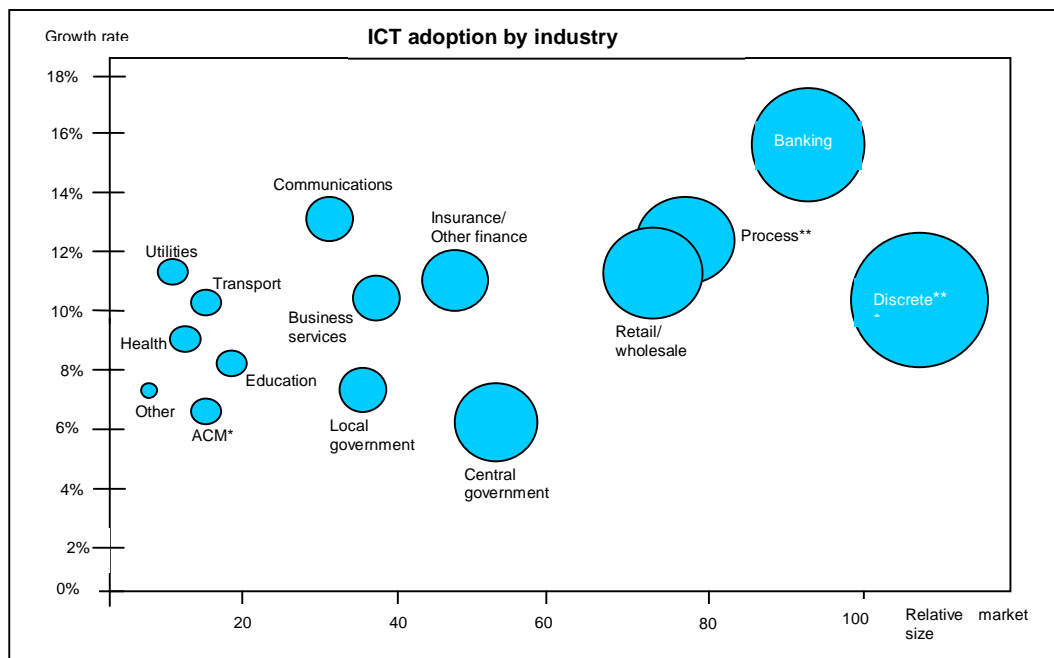


Source EITO 1999

The demand for workers with adequate skills to operate under this new technological environment is also likely to increase in all industries. On the other hand, this development also poses serious challenges to labour markets since it will make other products, production processes, organisational structures and skills obsolete and will require workers and firms to adapt to this new technological environment.

1.1.2. User industries provide biggest share of IS job opportunities

The real job potential due to the dynamics of the Information Society and its new challenges to existing jobs exceed the ICT-sector proper, as already more and more sectors of the economy incorporate IT applications and services. Business is affected by the Information Society – strategy, sourcing, production, marketing and internal organisation. While variances among sectors prevail, with banking - particularly stimulated by the introduction of the Euro - at the top, the adoption growth rate of ICT is about 10 % in most sectors. Therefore, there is a pressing need to adapt all businesses and workers.



* ACM: Agriculture, Construction, Mining ** Process manufacturing includes industries that transform raw materials into products or into substances with new chemical properties *** Discrete manufacturing includes industries that transform semi-finished products into final products
Source: EITO 99

In less than 10 years half of all jobs will be in industries that are either major producers or intensive users of information technology products and services. In "User industries" the demand for IT specialists will double in the next 3 years.

Thus, across all economic sectors, the adaptation of workers to the IS environment, transforming traditional skills and ensuring sufficient supply of IS expertise is a top priority.

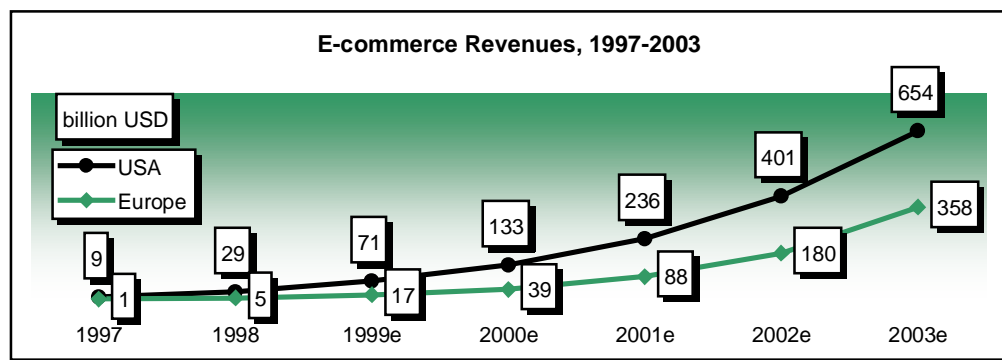
1.1.3. Services are driving job growth among IS producers

The ICT-sector (computer hardware, software, services, and telecommunications) is still the fastest growing sector and provides new jobs, dynamically creating, substituting, and developing them, both at the highly sophisticated and the less skilled levels.

The software, services and telecommunication sectors continued to increase overall employment by 10%. However, unfulfilled demand for highly qualified workers which will be exacerbated by the expansion of e-commerce, limits the true job growth potential.

1.1.4. Emergence of e-commerce in Europe

E-commerce in Europe, almost absent just two years ago, is experiencing strong growth. Total e-commerce in Europe is expected to grow from USD 17 billion at year-end 1999 to about USD 360 billion by 2003, approximately doubling each year.



Source: eStats 1999

Business-to-business e-commerce is expected to account for over 90% of total e-commerce, thus providing far greater opportunities than the business-to-consumer market. E-commerce directly impacts, substitutes and changes traditional business, adding about 6 % as “new business”.

Beyond its direct revenue impact, e-commerce will change business processes and organisational models on a large scale. To assure job growth and maintenance, new skills and forms of work organisation will need to be introduced alongside technological investment as well as ensuring a conducive legislative environment.

1.2. Still huge gaps to close:

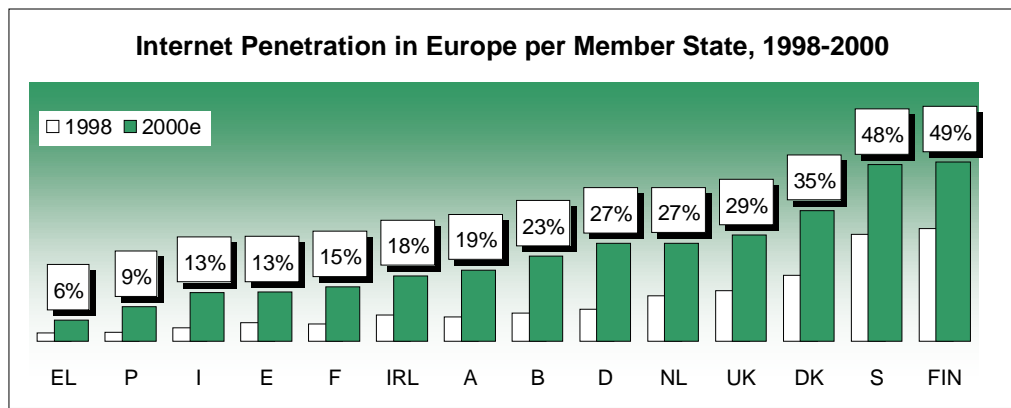
1.2.1. EU Internet penetration lags still behind US

Internet penetration in Europe - a strong indicator for the overall development of the Information Society - has made a huge leap forward. Europe is now the fastest growing market for Internet development. The number of Europeans using the Internet is about 50 million as of year-end 1999 and is projected to double by 2003.

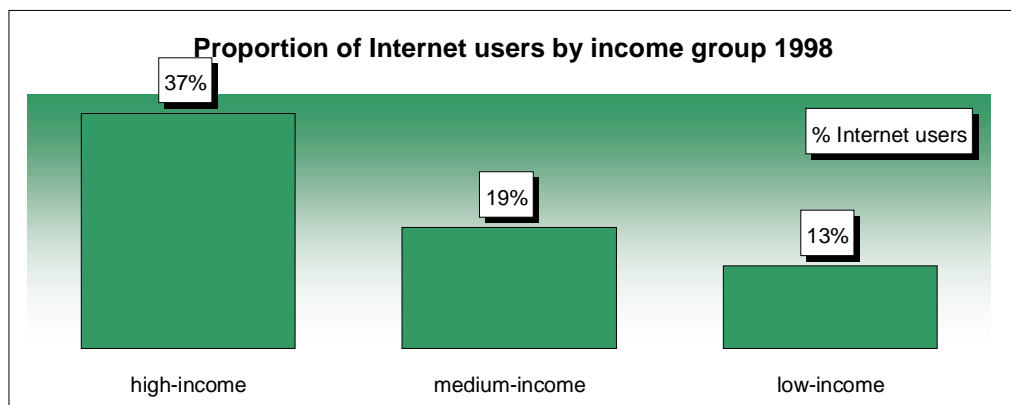
Nonetheless, European Internet penetration stands at only one third of the US penetration rate. European Internet users spend much less time online, less than a quarter of the rate of US users. Telephone charges are a barrier to Internet use in Europe, where telephone pricing is based on time usage, whereas, in the US, local calls are generally charged at a flat monthly rate. It is therefore important to promote competitive pricing of Internet access, including local telephone charges.

1.2.2. *European Information Society is still largely exclusive*

Not all Europeans have the same opportunity to access the Internet and, hence, to prepare and take Information Society job opportunities. Internet penetration rates vary widely among Member States as well as according to income and gender. The vast majority of European Internet users is still concentrated in the North of Europe, though all Member States are experiencing growth. High-income individuals are about twice as likely to be Internet users (37%) as medium-income individuals (19%) and nearly three times as likely as low-income ones (13%). At the end of 1998, only a quarter of Internet users in Europe were women compared to about 50% in the USA. Incentives like offsetting home computer purchase costs against personal tax in Portugal or, in Denmark, the abolition of taxes on home-based telework stations paid by the employer have helped to achieve a wider and more equal dissemination of information technologies.



Source: "The European Internet Report", Morgan, Stanley, Dean, Witter, 1999



Source: IDC

1.2.3. *Information Society skills gap*

Innovation has increased the demand for high-skilled workers (*e.g.* computer scientists, engineers) and created new Information Society occupations. At the same time, it has changed skill requirements for a wide range of non-Information Society occupations, and raised minimum Information Society skill requirements outside the ICT-sector.

While the vast majority of big European companies feel impeded by the lack of skills within their organisations, the skills shortage problem is even more serious at the small and medium business level. Furthermore, the shortage of IT specialists in Western Europe estimated at 500,000 “equivalent” IT jobs in 1998, could reach 1.6 million equivalent jobs by 2002 (*EITO 1999*), unless necessary training and adaptation initiatives are undertaken.

1.3. **An integral, co-ordinated strategy to Information Society challenges:**

An integral approach has to take into account the broader social and employment aspects of the transformation of the economy. Thus, as a complement to the Commission's "e-Europe" initiative, the strategies in this report are targeted at:

Learning - in order to prepare young people for their future, new forms of education and training incorporating the new Information Society tools need to be used by students and in schools. Teachers need to be trained, advised, equipped, and supported for this challenge, and curricula need to be modernised;

Working - as flexible, task-oriented and multi-skilled workers are in demand in the Information Society, all workers need to have Information Society skills reinforced by access to the Internet. Both short- and medium-term supply of Information Society specialists must be assured, otherwise job opportunities and growth will be lost. Equally, new forms of work organisation *e.g.* telework, enhance productivity and quality of life in the Information Society;

Public Services - public authorities can better serve citizens, with greater transparency, efficiency and quality, by offering the possibility of electronic access to public administration and by its own wide use of Information Society tools. As a leader in the adoption of new technologies, they can overcome the barriers of time and distance and enhance individual support of citizens;

The Enterprise - the competitive opportunities and innovative possibilities of the Information Society will provide jobs, especially in SMEs, provided a competitive infrastructure with clear regulation supports an entrepreneurial approach within business.

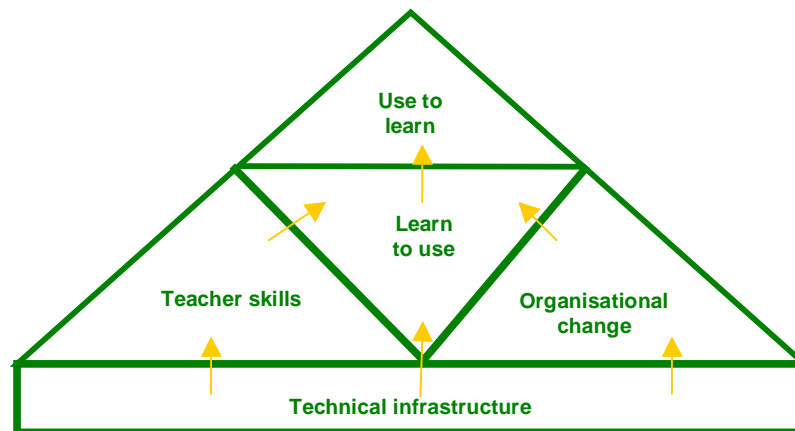
The following chapters set out specific objectives and indicate ways to attain them, which together will foster a sustained approach to make the Information Society integral to Europe.

2. LEARNING IN THE INFORMATION SOCIETY

Approximately 81 million out of the 117 million people aged under 25 in the European Union are in educational institutions. This is the future labour force, which depends on high skill, competence and adaptability. This 'Net-Generation', as it has been called, will live and work in a world where mobile phones, PCs, Internet etc. are ubiquitous.

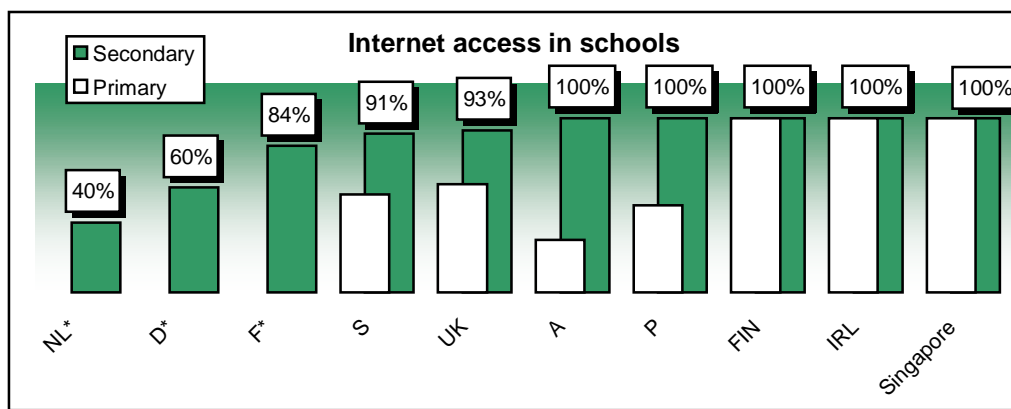
Today's educational system must prepare students for this reality. That implies first access to hardware and software and *learning to use* the technology. However, that alone is not enough. What is important, as a follow-on, is *learning to learn* with technology and learning to use information, to communicate and to innovate with these new possibilities. In addition, teacher training and support must be improved plus educational systems as a whole require a strategic rethink if they are to meet the challenges posed by the Information Society.

In line with the objectives of the European Employment Strategy which focuses on the transition from school to work, all Member States are preparing young people for the use of new information and communication technologies and have accordingly launched or prepared schemes to equip schools with these technologies, including in some cases special provision for the appropriate training of teachers. However, building on these first steps, the adaptation of education and learning to the Information Society needs to be accelerated.



2.1. Improve access to Information Society tools

The European Council meeting in Cologne in June 1999, expressed the determination that Europe should be a leader in the Information Society and that all schools should be linked to the Internet as soon as possible. The urgency of this need can be seen from the current position of Internet connections in schools in Europe. International comparisons illustrate the risk of the next generation of workers in Europe lacking key skills compared to their international counterparts. The proposal for the Employment Guidelines 2000 responds to this challenge, calling for schools to be equipped and for student access to the Internet by the end of 2002.



Source: European Commission from various sources
 (* no data included on primary schools)

In addition, the availability of e-mail addresses, the multimedia capability of PCs and local area networks are essential parts of infrastructure provision, if participation is to reach the critical mass required to ensure Europe's position as a world leader.

Best practice....

- In Germany, a federal government initiative “Schulen ans Netz” has been developed in partnership with Deutsche Telecom which links 8000 schools by the Internet and which is co-funded at the regional level.
- In Portugal, the *Program Nónio* is broadening Internet installation in all schools of basic education, libraries, vocational training centres and associations. The programme “Schools in the NET” is also playing an important role since it is this programme that has connected all 5-12 grade schools to the Internet as well as all public libraries.
- In France the government action programme for the Information Society focuses also on education. The programme has set an ambitious target to have all senior and junior high schools and 40% of primary schools connected by the year 2000.
- In the UK, the programme on the National Grid for Learning provides that all schools should be connected to a state of the art computer network by 2002.

| Recommendations to Member States | Timing | Indicators |
|--|----------|---|
| Link every school to the Internet | End 2002 | 1) No. of schools connected to the Internet 2) PC/pupils |
| Increase multimedia capability of PCs in schools | End 2002 | Proportion of PCs with multimedia capability |

2.2. Ensure that teachers have the skills and support

The lack of Information Society skilled teachers, along with the low level of modern technology equipment in learning centres, prevents an effective use of Information Society tools both by teachers and pupils.

The lack of targeted and on going local support services and the slow pace of change in the pedagogical, quality control, evaluation and accreditation systems compound this.

Teachers themselves need to be trained and have access to relevant training materials. Surveys² have reported that technology resources are key to raising standards with a higher priority than paper-based resources, although an important limitation is the lack of teacher confidence about their own skills to use Information Society tools and their inability to incorporate these tools in teaching.

An early step should be to ensure that all new teachers are fully equipped with the necessary Information Society skills for using the Internet and for incorporating the benefits of such learning into classroom.

For practising teachers, schools and the State should promote the acquisition of Information Society skills through lifelong learning. In addition, the acquisition of such competence needs to be demonstrated. A recognised general Information Society skills accreditation system, such as the European Computer Driving Licence (see the "Working in the Information Society" chapter for further details) is used in a number of Member States. Additionally, accreditation systems specifically suited to the needs of the teachers to teach the use of new Information Society tools should be identified, recognised and rewarded.

Best practice....

- France has created educational sites EDUCNET and EDUCASOURCE on the Internet providing a framework for actors in the education system to exchange among themselves a wide range of material and to extend dialogue.
- In Sweden, under the Tools for Learning Programme, special funds have been allocated for providing every student with an e-mail address, developing teachers' skills, providing student teachers with good Information Society skills and the capability of using these teaching aids in their teaching.
- In Germany, the two programmes "Teach the Net" and "Teach Multimedia", run by Siemens and IBM under the initiative "Fit for the Information age", in co-operation with the Federal Presidency, aim at preparing teachers and students for the transition into the information age.
- In Austria, the project "Virtuelle Schule Österreich" aims at the online-provision of education-relevant information, support of projects by individual schools and moderated discussion groups for teachers.

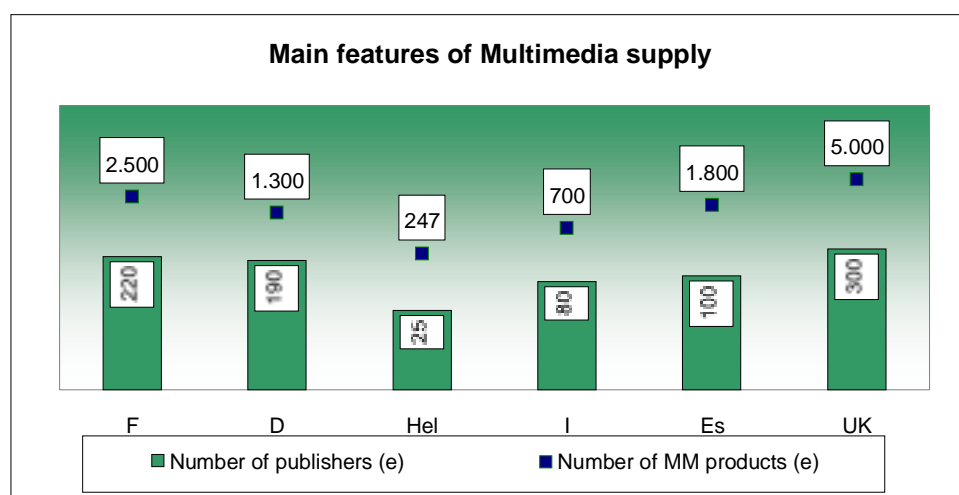
2 *Building Teachers' ICT Skills: The problem and a framework for the solution*, Technology Colleges Trust, 1997
The RM Report 1999: Computers in Literacy & Numeracy in Primary Schools, RM PLC, 1999

| Recommendations to Member States | Timing | Indicators |
|--|----------|--|
| Ensure all teachers are verifiably competent in Information Society skills | End 2002 | N° of teachers with Information Society skills |

2.3. Promote Multimedia use

Both the traditional education system and opportunities for independent, lifelong and special-needs learning, can be complemented by techniques which utilise the methods of distance learning, information networks, multimedia and electronic services.

Multimedia packages for self and group study in the language and reflecting the culture of the different types of user are still underdeveloped in Europe due to the shortage of demand and the relatively small-scale market. Whilst education and training usage are responsible for one third of the multimedia market, the combination of linguistic differences combined with heterogeneous curricula reduces uptake to non-viable levels. However, co-ordinated public-private initiatives could increase the potential of these markets for Europe.



Source: BASE survey 1998, MESO report

Public-private partnerships for the production of educational multimedia packages, involving teachers and the curriculum setters, supportive of, but not limited to the core curriculum, can increase the supply of relevant material for both teachers and students.

This would go hand in hand with an increased use of the web itself, with online educational platforms as a dissemination tool allowing web-based training schemes with extensive feedback for reinforcement of learning.

The Commission has, in the largest initiative of its kind, established a network of networks at national, regional and other levels in 19 countries

(EUN³). It provides a framework of co-operation with Member States, fosters school co-operation and provides high quality pedagogical and information services on the Internet. The awareness raising action Netd@ys Europe (initiated in 1997) encourages schools, vocational training centres, youth and cultural organisations to set up educational on-line projects. In 1998, Netd@ys Europe attracted 35,000 participating organisations.

Best practice....

- In Greece, “Logomathia” is an educational multimedia (CD-ROM) product for teaching Greek. Since 1993, it has been used in a growing number of public and private schools and is particularly important for schools in remote and border areas.
- France has defined a strategy for the development of the cultural content and a strengthened presence on the Internet. This includes assistance with multimedia publishing, the reinforcement of the network of multimedia culture spaces, consultation on copyright and launching research projects benefiting multimedia.
- In Ireland, there are over 45,000 multimedia PCs installed in the 4,100 primary and secondary schools nationwide, with extra PCs being continually added.

| Recommendations to Member States | Timing | Indicators |
|--|----------|--|
| Develop capability to integrate Information Society tools in education | End 2002 | N° of teachers using Internet or multimedia in the classroom |
| Support Information Society tools and multimedia integration within curricula, through public private partnerships | | Number and value of Public/private partnerships |
| Support content development networks in the educational sector | | Rate of growth of content development networks |

3. WORKING IN THE INFORMATION SOCIETY

Technological development and the globalisation of economies have permanently changed the character of both work and employment. Work in successful enterprises no longer follows the old industrial model with hierarchical chains of command, narrow divisions of tasks and a large component of unskilled labour: it requires flexible, adaptable and multi-skilled workers. Employment has become on average less stable and less certain than in the past and more dependent on high skills and adaptability.

The worker and workplace in the Information Society will be very different from those we are familiar with today. In the Information Society, an increasing number of people work in jobs centring on information and

³ <http://www.eun.org>

knowledge and will make use of Information Society tools and services, both at work and during leisure time.

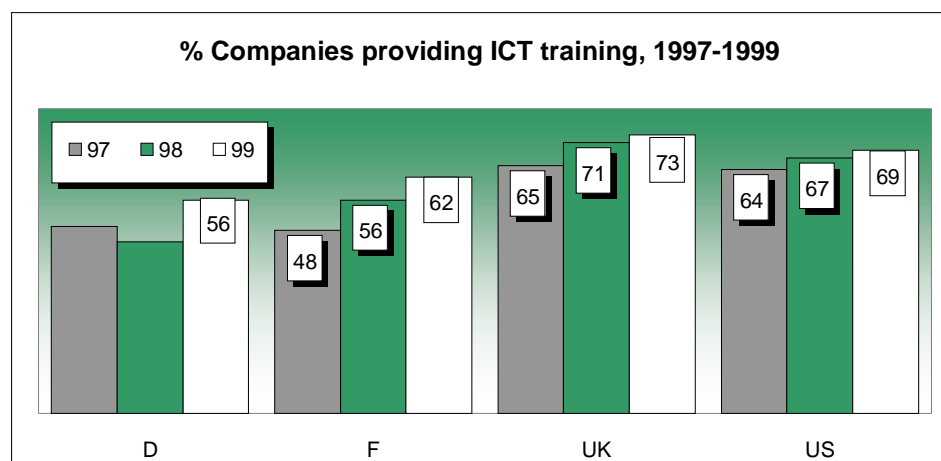
Workers in the digital age therefore need to be ICT literate, highly skilled, empowered, mobile and ready for continuous training (lifelong learning). Equally, the Information Society has a huge demand for Information Society specialists which is unfilled today. As the digital worker is as likely to be female as male and there are less constraints from disability, distance and time as a barrier to employment, the Information Society will be a world of greater access to work for all.

The European Employment Strategy has prioritised adaptability of businesses and workers, and urges social partners to take the lead through a process for modernisation of work organisation, training and retraining and the introduction of new technologies. However, the evaluation of the National Action Plans (NAP) indicates that there is still a considerable way to go in order that enterprises and workers can adapt to the challenges and opportunities of the Information Society.

3.1. Raise Information Society skills

The number of employees with Internet access at the workplace is forecast to grow from 29 million (28% of workers) in 1999 to 77 million (70%) by 2004. Internet-based businesses e.g. portals, intermediaries, Internet Service Providers (ISPs) as well as computer and telecom industries are fully dependent on ICT skills. Sectors that are inherently information businesses (banking, insurance, education, publishing) are already advanced. Retailing (books, clothing, music videos etc.) and services such as travel, information and assistance are all undergoing changes. In fact, *all workers* will need new Information Society skills for their continuing or changing role in the workplace. Information Society skills do not only refer to technical operations, but also to professional knowledge, social and organisational capabilities as well as cognitive and strategic skills.

Information Society literacy is a new skill which, for most workers, will be acquired at work. Whilst many companies offer in-house training, a recent survey suggests that there is still room for improvement.



A useful tool to demonstrate the achievement of basic proficiency in Information Society tools usage is a standardised and recognised certification of competence, such as the European Computer Driving Licence (ECDL). The ECDL has been established as a means of benchmarking computer literacy for business, education and the voluntary sector.

Best practice...

- Sweden: Within the company environment, VOLVO has adopted the ECDL as the means of accrediting the IT skills of its workforce.
- In Austria, the private-public-partnership initiative “Österreich ans Internet” is training 2,800 people as ECDL instructors. In a second phase, courses for about 50,000 participants will be included.
- In Denmark, Den Danske Bank has come up with an innovative way of ensuring that its 14,000 staff are trained to use computers. It has agreed to give a personal computer at a much reduced price to any member of its staff who passes at least four of the seven modules of the ECDL within one year.

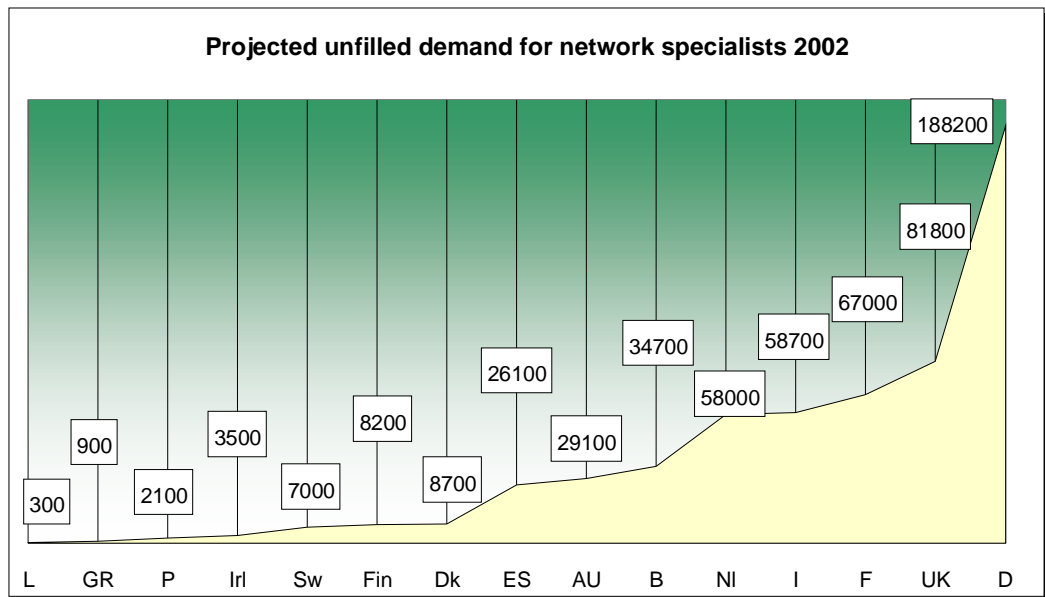
| Recommendations to Social Partners | Timing | Indicators |
|---|----------|---|
| Provide every worker with the opportunity to achieve Information Society literacy | End 2003 | N° of workers with Information Society skills |

3.2. Alleviate the “skills gap” for Information Society specialists

A very visible impact of the Information Society on the labour market is the increased demand for Information Society specialists. The consequence of convergence is creating the need for persons with new skills that cross over the barriers between traditional disciplines (computer scientists, information documentalists etc.).

There is a wide and growing “skills gap” because the strong demand for 3rd level/university Information Society specialists currently outstrips the supply of suitably qualified persons. New initiatives like additional third level capacity are needed in some Member States. Currently, far more men than women are attracted to Information Society professions. There is a need to encourage women to enter these occupations. Universities need to forge new partnerships with industry to ensure that courses deliver the skills needed in industry. An important initiative in this area involving some of the leading ICT players in Europe is aimed at a better (generic) description of skill requirements of the ICT industry.

A shorter term approach to closing the skills gap is the training of non-Information Society graduates (short conversion courses) in Information Society subjects.



Source: IDC survey for CISCO

Other Information Society specialists (2nd level education) are also in short supply, e.g. the demand for computer networking specialists far outstrips supply across Europe. Training initiatives in this area are frequently operated by Information Society companies and commercial vendors. School leavers, older workers and the unemployed could avail of many of these courses, particularly as the job uptake is high. However, a wider recognition and use of industry certified training schemes for technician level training is needed.

Best practice...

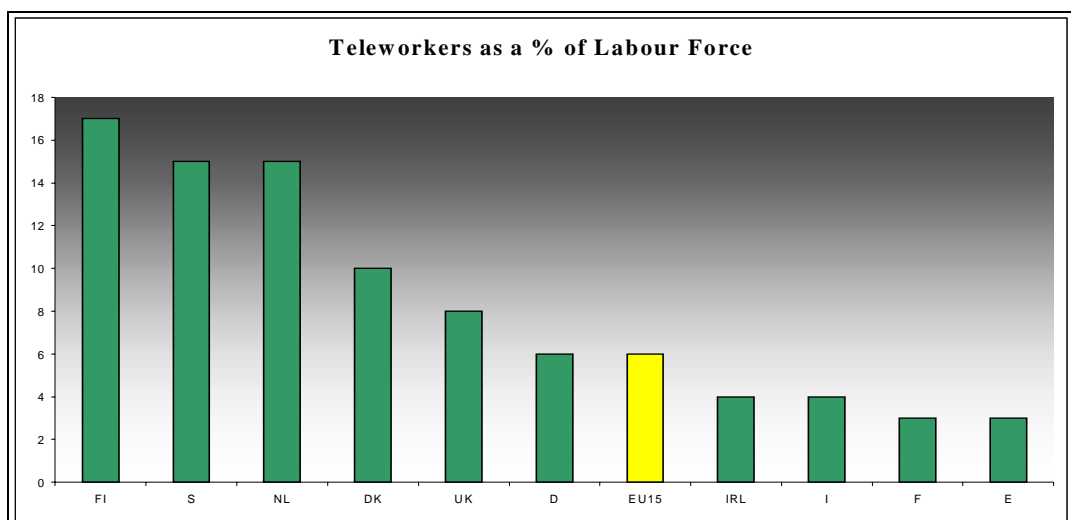
- In Finland, the government is raising by 30% the number of training places in the electrical, IT, electronics, communications and data processing sectors by the year 2002, mainly in universities and polytechnics, but also with conversion and transfer training within adult education, whilst paying special attention to female participation.
- Ireland has recently launched an industry-driven programme called "Fasttrack to Information Technology" under which 3,500 long term unemployed people will receive both technical and personal skills training and be offered full-time employment in the IT-industry.
- In Austria, the Public Employment Service (PES) is funding ICT training for the unemployed. In 1999/2000, about 3,000 unemployed will participate in two different schemes to obtain ICT skills.
- In Germany, four new IT-professions were introduced in 1997 (IT-Systems-Engineer, Information Technology Engineer, IT-Systems-Manager, IT-Manager/Analyst), followed by three new professions in 1998 (Manager for Audio-Visual Media, Specialist for Media and Information Services and Designer for Digital and Print Media). In a similar way, new apprenticeship schemes were introduced in Austria.

| Recommendations to Member States | Timing | Indicators |
|--|-----------|--|
| Increase capacity and uptake in 3 rd level education, maintaining gender balance and matching industry requirements | End 2003 | 1) N° of 3 rd Information Society course places 2) Proportion of women to men in Information Society education |
| Promote IT courses at 2nd level including the use of industry certified training schemes | From 2000 | N° of 2nd level training places |

3.3. Modernise work organisation in the digital workplace

The Information Society enables a changed relationship between employees and their employers to the benefit of both. To stay competitive, companies must become more responsive to their customers' needs and workers have the opportunity to have an enriched working experience including more empowerment and flexible work/home arrangements. It has also provided the opportunity for new types of employment relations. This new relationship potential has been recognised in a communication⁴ on modernisation of work and its follow-up establishment of the European Work Organisation Network (EWON) aimed at fostering competitiveness, employment and the quality of working life.

One of the more visible indicators of changes in work organisation is the use of telework. With an appropriate framework, which guarantees rights and obligations for teleworkers and their employers, telework will increase. A recent report indicates that the total number of Europeans in recognised telework schemes is about 6 Million with a further 3 million in informal telework arrangements.



Source: Benchmarking Progress on Telework and Other New Ways of Working in Europe, Empirica 1999

⁴ Modernising the organisation of work - A positive approach (COM(98)592)

Best practice...

- In Denmark, the government has issued guidelines for telework after consultations with the social partners.
- In Ireland, the social partners have jointly prepared guidelines for telework. Reports have indicated a sixfold increase in applicants for jobs advertising a telework possibility.
- In Austria, the trade unions have issued standardised contracts for teleworkers (“Musterdienstvertrag”). The social partners for the mineral oil industry and other sectors have signed collective agreements concerning telework.

| Recommendations to Social Partners | Timing | Indicators |
|--|---------------|---|
| Set-up framework conditions and practical arrangements to enable telework to take place on a wide scale. | End 2000 | Coverage of collective agreements on telework |

3.4. Promote employment of people with disabilities in the Information Society

Disability has traditionally been a barrier to employment for many persons. In the digital age there is much less reason for this. Rigid hours and geographical locations are giving way to flexible time and geographical location. Also the working skills themselves are less motor and more brain intensive. This opens the door to employment opportunities for many groups of disabled people who have been traditionally denied employment on grounds of accessibility and inability to perform the required tasks.

As part of their manifesto on employment issues, the European Disabilities Forum (EDF) believes that “information technology as a tool for employing new and hitherto unemployed groups of disabled people is an important aspect of the Information Society”. Equally, the group Information Society disAbilities Challenge (IsdAC) has stated that more than one in ten citizens of the European Union are disabled in some way that affects their ability to fully participate in society. As many as one in three people with disabilities could make a significantly increased contribution to society and the economy if they became empowered through the use of Information Society tools.

| Recommendations to Information Society Industries | Timing | Indicators |
|---|---------------|---|
| Ensure that standards for user-friendly equipment are applied to improve the employability of people with disabilities. | From 2000 | N° of people with disabilities in paid employment |

4. PUBLIC SERVICES IN THE INFORMATION SOCIETY

The Information Society will radically transform the way public administrations function. E-administration can overcome barriers of time and

distance to give citizens public information and services when and where they want them and in an accessible form.

This requires a determined effort by all public authorities to accelerate the use of Information Society tools in their everyday relations with citizens and business, thus increasing the efficiency and quality of their services. Priority should be given to access to public information, on-line transactions with administrations, digital procurement procedures, social and cultural services.

Where appropriate, this could involve a reallocation of resources to support investment in ICT. In so doing, public administrations should act as catalysts, thereby prompting an enhanced use of Information Society tools by citizens and businesses.

Public administrations have started to integrate Information Society tools in their internal operations. However, the new tools have been adopted on an ad hoc basis. In order to make the digital state a reality, a comprehensive transformation rather than piecemeal improvement is necessary, in conjunction with the training of public employees. Training for public employees is crucial and the objective should be twofold: to improve the efficiency of the administration and to make the best use of Information Society tools in the public interest.

This approach is needed to develop entrepreneurship as foreseen by the European Employment Strategy making it easier to start up and run businesses.

4.1. Make Online Services available to the Citizen

Priority should be given to online access to public information relevant to the daily life of the citizen, presented in a user-friendly way, with cross-references to other services so as to facilitate administrative procedures.



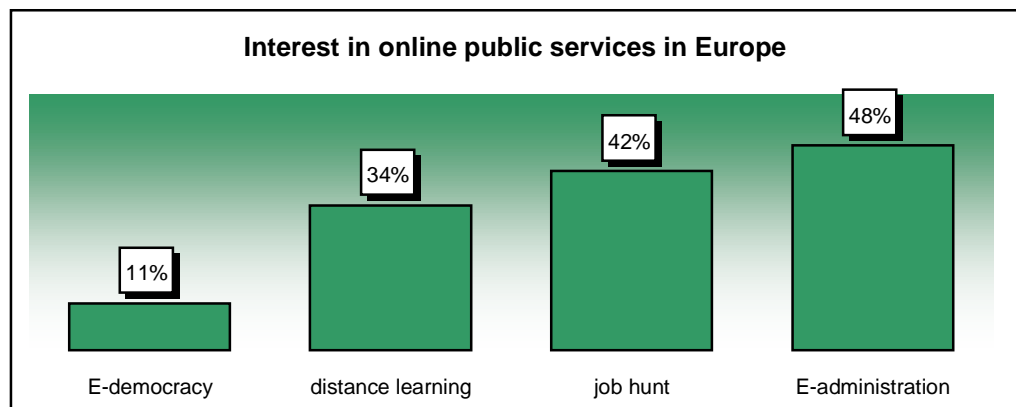
Danish life cycle website home page

Public administrations should enable online transactions for the most common administrative procedures, like income tax returns. A first step is to make all forms available online and then to allow for their electronic submission. One issue of importance in this regard is the adoption of a regulatory framework for the use of the electronic signature.

Public Employment Services (PES) are increasingly offering their services to jobseekers and employers online. Their objective is to create an electronic market where jobseekers and employers can be brought together without the direct intervention of the PES local office. All PES therefore, have Internet sites containing information about the PES and how their services can be accessed. In addition, many have moved further and now offer employers' job vacancies online and databases of jobseekers which employers can access.

At the European level the European Employment Services (EURES) network, which brings together all of the PES of the EU/EEA (European Economic Area), has the objective of facilitating the free movement of workers within the single market. In cooperation with the national partners EURES recognises the need to offer self-service backed-up by a human network of some 500 Euroadvisers. The EURES website⁵, therefore, offers information on the EURES network of Euroadvisers, the services they can provide, job vacancies and information on living and working conditions, with links to all of the national PES websites.

Another good example is the website which is at the heart of the Commission's "Dialogue with Citizens and Business". It provides full details of the rights and opportunities available to individuals in the EU⁶



Source: Eurobarometer, 1999

⁵ <http://europa.eu.int/jobs/eures>

⁶ <http://europa.eu.int/citizens>

Best practice...

- In Denmark, the "Life cycle" web page (see preceding) is a user-friendly web site providing the citizen with the necessary information on a great number of administrative procedures. The initial page presents the main events of a lifetime, e.g. finding a job, getting married or having a baby, and explains how to fulfil the necessary administrative procedures.
- In Austria, the "www.help.gv.at" website provides online information on public services in Austria, i.e. on which public authorities are to be contacted on various everyday life situations. Forms can be downloaded and used for applications.
- In the UK, the White Paper "Modernising Government" aims at providing the means for all transactions with the administration to be completed electronically.
- In Portugal, citizens can deal with the government via e-mail and over 100 administrative procedures (issuing of driving licence, registering of births, etc.) can be done online.
- In Germany, the town competition called [MEDIA@KOMM](#) selects the best concept for implementing electronic administration procedures using digital signature.

| | Timing | Indicators |
|--|---------------|--|
| In Greece, during the last three years, more than 10,000 public sector employees have received training in information technology at the National Centre for Public Administration. Recommendations to Member States | | |
| Set up citizen-friendly Internet Page ⁷ with a clear site map providing information about civil rights and offering links to the relevant public services. | End 2000 | Establishment of Central Government Citizen's pages |
| Make electronically available all public services capable of such delivery while reinforcing the human interface with the citizen | End 2004 | 1) N° of electronically available services 2) Number of public sector employees being trained in Information Society skills |

4.2. Provide Online services for business

Businesses need quick, clear and unambiguous procedures for administrative and other issues. A one stop shop to access forms and accompanying explanations go a long way to alleviating some of the frustrations of business (especially for small- and medium-sized enterprises with limited administrative resources). Relevance and ease of use is also important. A

⁷ as well as through other means (telephone and teletext service)

strong reason why some SMEs do not use the Internet is because they do not feel it provides them with information which helps them run their business. Major progress was recently achieved in this direction by the development of the European website "Dialogue with Business"⁸

Generally, the online provision of useful public information and the possibility of processing administrative procedures via the Internet will stimulate the use of the Internet and ICT by SMEs.

Best practice...

- In Greece, the Ministry of Finance is pilot testing a system for electronic filing, processing and payment of quarterly VAT tax forms.
- In Spain, the "Network System" of the Social Security allows for key administrative procedures in the development of a company's activities to be carried out electronically. This includes the recruitment of workers, the notification of changes in labour conditions and social security payments.
- In Austria, "Finanz.online" offers to licensed tax consultants and economic advisors online access to their clients' tax-files, while a private-public-partnership will allow the online access to some official registers.
- In Germany, income tax declarations can be submitted electronically and this system will be extended to VAT and other taxes. It has also adopted rules on public procurement to allow public authorities to use electronic invitations for tenders.

| Recommendations to Member States | Timing | Indicators |
|---|----------|--|
| Provide One Stop Internet Shop for Business answering questions about policies and legislation that affect business, and providing information about business news, trade shows, potential business partners, tendering opportunities, etc. | End 2000 | 1) Establishment of Internet sites 2) Proportion of calls for tenders registered on the Internet. |

4.3. Ensure citizens access to online information and services

In order that citizens can take advantage of the provision of online information and services, they must have easy access to them. Although more and more Europeans have access to the Internet either from home or work, there are still large numbers of persons without the means for such access. It is imperative to ensure that every citizen has the possibility to access online public information.

Training programmes in the use of Information Society tools are the necessary complement to the provision of electronic access points. In public access points the citizen should be offered ad hoc support when necessary, as

⁸ <http://europa.eu.int/business>

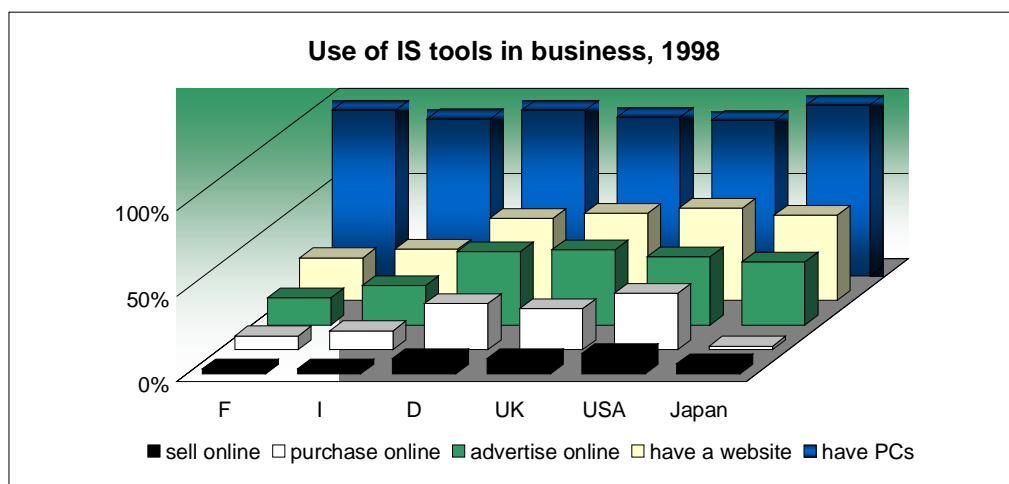
| Recommendations to Member States | Timing | Indicators |
|---|----------|---------------------------------------|
| Set up public Internet access points supported by on-site Information Society literacy training in all communities e.g. libraries, post offices, etc. | End 2001 | N° of access points /1000 inhabitants |

5. THE ENTERPRISE IN THE INFORMATION SOCIETY

The Information Society and electronic commerce will drive economic growth and create jobs, largely determining the standard of living in Europe. New business opportunities for new companies will be enabled by giving birth to entirely new classes of business intermediaries such as aggregators, auctions or exchanges⁹. Europe is in need of entrepreneurs willing to exploit these opportunities.

The Information Society not only opens new markets, but also changes the way business is done. For Europe continuous innovation facilitated by the application of Information Society tools will be of paramount importance to improve its competitiveness and to create jobs. Progress in this respect is, thus, a crucial aspect in achieving the objectives of the European Employment Strategy concerning the development of entrepreneurship.

Europe is lagging behind in developing and using modern information and communication technologies (ICTs). Too few European companies, in particular SMEs, fully exploit all the possibilities of the Information Society. For example, in the processing of payments there is evidence that there is still room for improvements. Many SMEs are less technologically advanced than large businesses and risk exclusion from the electronic marketplace with potential consequences both for the firm and the workplace.

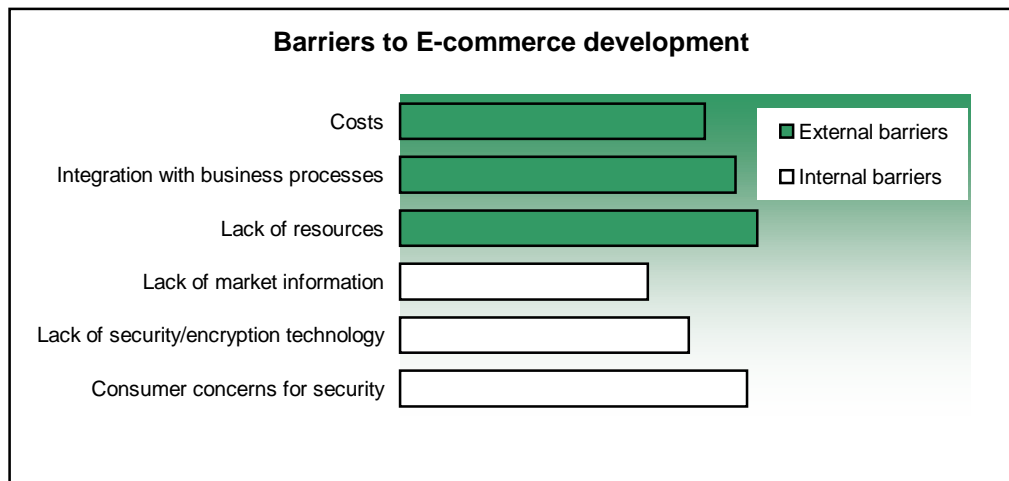


Source: Spectrum 99

⁹ Aggregators pool supplier content to create a searchable one-stop shopping mall for buyers within a business community; auctions pit buyers against each other to purchase seller surplus; exchanges provide vetted players with a trading venue defined by clear rules.

The development of the Information Society in Europe will create huge needs in terms of telecommunications infrastructure. European Internet traffic relies on telecommunications networks, which were designed for telephone traffic. Connections between Member States lack bandwidth (capacity) compared with the ones to the USA, i.e. it is often faster and cheaper to send Internet data to the USA and back, than to a neighbouring Member State. Ensuring appropriate telecom infrastructure and competitive pricing between and within Member States is a necessary condition for the development of the digital economy in Europe. For companies the quality of services available on the Internet (speed, reliability, security, authentication etc.) are essential elements in their decision to use the Internet.

Acceptance of e-commerce will be determinant for its take-up in Europe. Today concerns about the security of e-commerce appear to be a barrier. The fact that it is difficult to determine the applicable jurisdiction is a major issue for e-commerce in Europe. E-commerce, which adds a new dimension to the Single Market, requires a regulatory framework at the EU level.

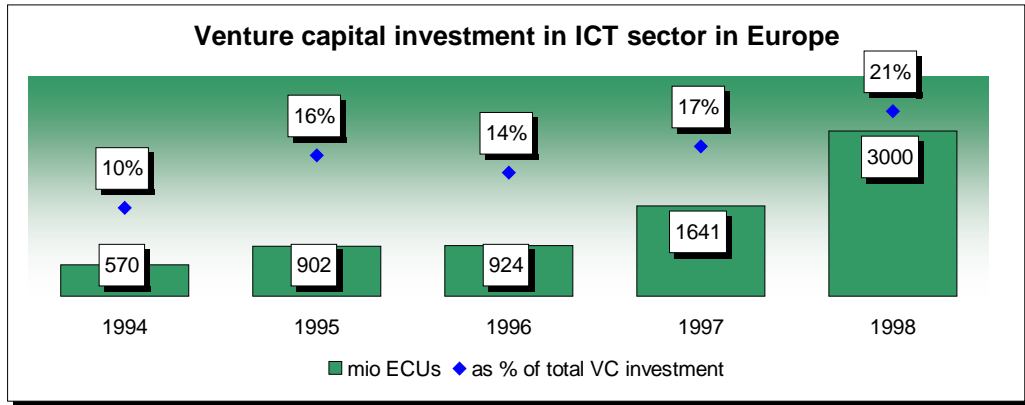


Source: Ernst & Young

5.1. Exploit new business opportunities

New business opportunities are essential for job creation and need to be promoted by encouraging greater entrepreneurial awareness across society.

The European ICT sector has benefited from growing investments from venture capitalists and is now the largest sector for venture capital. Investment in early stage technology however is still much more limited than in the US.



Source: EVCA 1999 yearbook

Although access to capital for some industries is still an obstacle to the launch of new type businesses, equally important is the shortage of ICT specialists due to the skills gap which is the stumbling block. Furthermore, start-ups suffer from competition by larger companies on the labour market. Stock options are a useful - and often the only - way to attract highly qualified people in these new companies and should not be discouraged by inadequate fiscal policies.

Best practice...

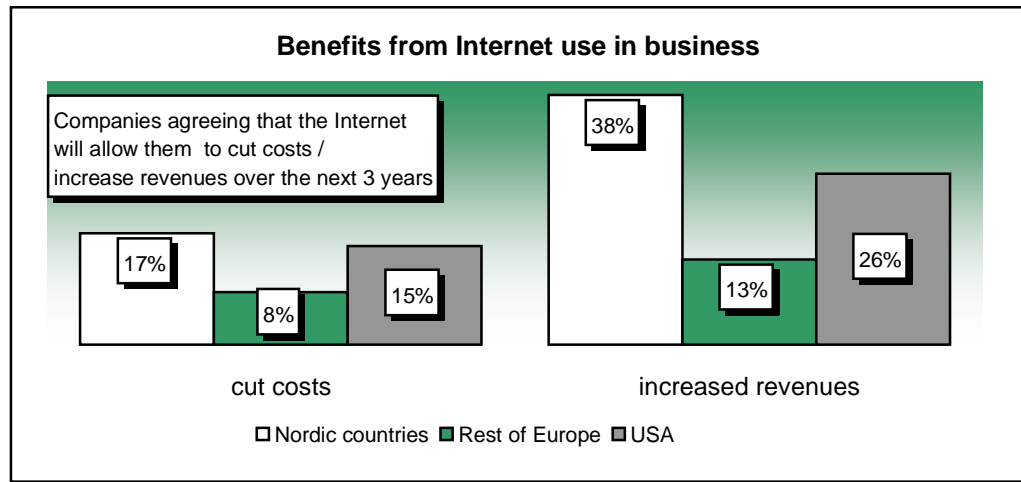
- In Belgium, equity participation of employees has been legally reinforced with favourable tax treatment for the allotment of shares below par rating or options on shares.

| Recommendations to Member States | Timing | Indicators |
|--|----------|--|
| Encourage entrepreneurship in new services and businesses through fiscal policies rewarding risk taking, especially concerning stock options | End 2000 | 1) % of venture capital into high technology 2) N° of start-ups |

5.2. Promote innovation and competitiveness

Innovation leads to the creation of completely new markets and services. It is a source of economic growth and job creation. Innovation brought by the Information Society will make businesses more competitive by being more flexible, more responsive and more cost-efficient. E-commerce will also allow businesses to compete on a world stage wherever they are based in Europe, thus overcoming the peripheral disadvantages.

European companies do not sufficiently recognise how the Information Society tools could improve their competitiveness, although it will fundamentally affect them over the next 2-3 years. Up to now, these tools have been applied primarily to cost cutting – the cost of operating business and the cost of reaching customers - rather than to innovation in new products and services markets. The true benefits of the Information Society will come from a dynamic and innovative use of these tools, improving quality of customer service and access to new customers and markets.



Public authorities have a major role to play in promoting innovation in Europe, through partnership with business. Public programmes should be used as springboards for private initiatives. The EU Action Plan on innovation and the European Fifth Framework Programme for R&D are both intended to stimulate innovation in Europe.

Best practice...

- In the UK, the Enterprise Fund unveiled in December 1998 aims to channel venture capital worth £150 million into small business over three years. It will focus on providing capital for early-stage, technology-based enterprises in the UK.
- In Denmark, a centre for IT-research, the “IT high-school” and the Research-Net give access to high capacity facilities for the strengthening of research and electronic research co-operation between universities and other institutions for higher education.
- In Germany, the Ministry of Economy and Technology supports "regional competence centers" improving access to information on e-commerce.

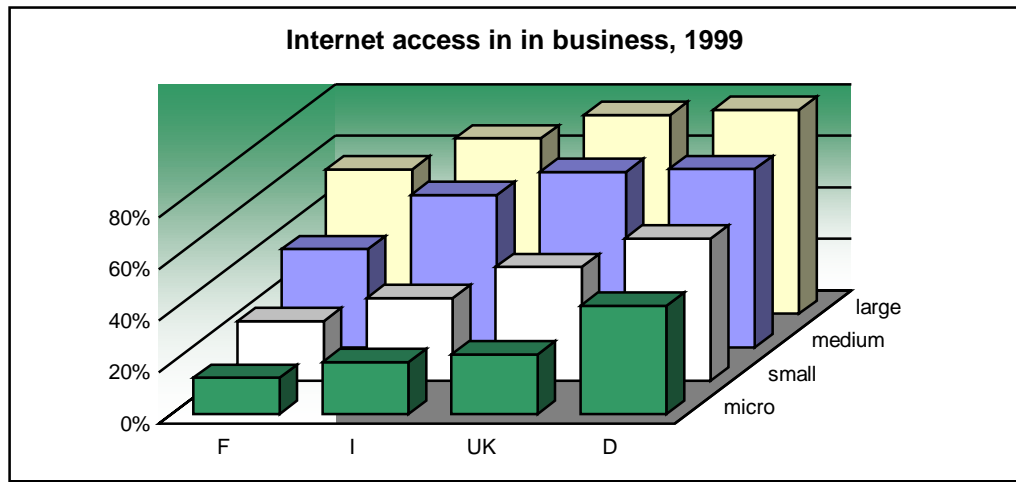
| Recommendations to Member States | Timing | Indicators |
|---|--------|----------------------|
| Enhance industry-research collaboration | 2002 | % co-funded research |

5.3. Promote the access of SMEs to the digital market place

While much progress has already been achieved, SMEs are still less advanced in using Information Society tools than large companies. SMEs tend to consider that their business processes are less complex and might not require the use of Information Society tools. They are also sensitive to cost of access and availability of infrastructure.

Publicly funded programmes need to actively promote the use of Information Society tools in a way which is suited to the needs of SMEs. Networking with other businesses, including those that create or disseminate such technologies should be stimulated by pilot actions. The specific dimension of

SMEs should be fully taken into account into all public programmes which promote the Information Society.



Source: Spectrum

Best practice...

- In the UK, under the White Paper “*Our Competitive Future: Building the Knowledge Driven Economy*” launched in December 1998, some £20 million are invested over three years to help triple the number of UK small businesses which are wired up to the digital marketplace to one million by 2002.
- In Greece, the Ministry of Development has supported a number of electronic commerce prototype applications that demonstrate the significance of e-commerce in specific sectors of the economy, as well as the creation of electronic commerce centres throughout Greece for the support of small firms in the introduction of e-commerce applications.
- Germany has launched a competition for newly founded multimedia enterprises with a view to doubling their number.

| Recommendations to Member States | Timing | Indicators |
|--|-----------|--|
| Mainstream the IS needs of SMEs in public programmes | From 2000 | % of funding to SMEs |
| Diffuse best practices and benchmark use of ICT by companies | 2002 | % of companies using Internet-based services |

6. CONCLUSIONS

This report sets out a strategy to prepare Europe for the future, a strategy focused on people and communities whose participation is essential to Europe's progress towards the Information Society.

The Information Society will stimulate economic growth and productivity, create new economic activities and jobs. It can also improve education opportunities, health care

delivery and other social services, and improve access to cultural and leisure opportunities. Unlike other technological changes, the rapid development and diffusion of the Information Society affects all economic sectors, organisational and work structures, public services, cultural and social activities.

Member States have set out national Information Society strategies for improving the quality of people's lives at work and in leisure. The high level Group has provided a forum of exchange of these strategies, and the opportunity to learn from experience in other Member States. The analysis and exchanges on the national strategies has led to the identification of a number of best practices (already tried and tested in at least one Member State) which set the achievement standard for moving Europe rapidly forward into the information age, thus gaining the benefits particularly in terms of employment.

Europe's advance into the Information Society is a shared responsibility requiring rapid action. Individuals, businesses and organisations, as well as social partners, have the responsibility for developing their know-how and availing themselves of the opportunities offered. Lifelong learning at all levels is a critical responsibility for all actors concerned. Adaptation to the benefits and changes of the Information Society can best be accommodated through a process of co-operation, a role for the social partners to take the lead.

Social partners and the public sector must create conditions for building an Information Society which meets the needs of both individuals and business through favourable conditions for competition and growth, including education, development of infrastructure and legislation.

The Commission must also contribute, orienting economic and framework conditions towards a cohesive society with high living standards. In a practical sense, the Commission will continue to host the high level Group, and expand its interaction to social partners, information society businesses, and civil groups.

The Commission therefore invites all parties to take up the following recommendations in order to hasten Europe's successful entry into the Information Society.

RECOMMENDATIONS

| | | | |
|--|--|---------------|--|
| Learning in the Information Society | Approximately 81 million out of the 117 million people aged under 25 in the European Union are in educational institutions. This is the future labour force, which depends on high skill, competence and adaptability. This 'Net-Generation', as it has been called, will live and work in a world where mobile phones, PCs, Internet etc. are ubiquitous. Today's educational system must prepare students for this reality. That implies first access to hardware and software and learning to use the technology. However, that alone is not enough. What is important, as a follow-on, is learning to <i>learn</i> with technology and learning to use information, to communicate and to innovate with these new possibilities. In addition, teacher training and support must be improved plus educational systems as a whole require a strategic rethink if they are to meet the challenges posed by the Information Society. | | |
| Actors | Recommendations | Timing | Indicators |
| Member States | Link every school to the Internet | End 2002 | 1) N° of schools connected to the Internet 2) PC/pupils |
| | Increase multimedia capability of PCs in schools | | Proportion of PCs with multimedia capability |
| | Ensure all teachers are verifiably competent in Information Society skills | End 2002 | N° of teachers with Information Society skills |
| | Develop capability to integrate Information Society tools in education. | End 2002 | N° of teachers using Internet or multimedia in the classroom |
| | Support Information Society tools and multimedia integration within curricula, through public private partnerships | | Number and value of Public/private partnerships |
| | Support content development networks in the educational sector | | Rate of growth of content development networks |

| | | | |
|---|---|---------------|--|
| Working in the Information Society | Technological development and the globalisation of economies have permanently changed the character of both work and employment. Work in successful enterprises no longer follows the old industrial model with hierarchical chains of command, narrow divisions of tasks and a large component of unskilled labour: it requires flexible, adaptable and multi-skilled workers. Employment has become on average less stable and less certain than in the past and more dependent on high skills and adaptability. The worker and workplace in the Information Society will be very different from those we are familiar with today. In the Information Society, an increasing number of people work in jobs centring on information and knowledge and will make use of Information Society tools and services, both at work and during leisure time. | | |
| Actors | Recommendations | Timing | Indicators |
| Social Partners | Provide every worker with the opportunity to achieve Information Society literacy | End 2003 | N° of workers with Information Society skills |
| | Set-up framework conditions and practical arrangements to enable telework to take place on a wide scale. | End 2000 | Coverage of collection of agreements on telework |

| | | | |
|---------------------------------------|--|-----------|--|
| Member States | Increase capacity and uptake in 3 rd level education, maintaining gender balance and matching industry requirements | End 2003 | 1) N° of 3 rd Information Society course places 2) Proportion of women to men in Information Society education |
| | Promote IT courses at 2nd level including the use of industry certified training schemes | From 2000 | N° of 2nd level training places |
| Information Society Industries | Ensure that standards for user-friendly equipment are applied to improve the employability of people with disabilities | From 2000 | N° of people with disabilities in paid employment |

| | | | |
|---|---|---------------|--|
| Public Services in the Information Society | The Information society will radically transform the way public administrations function. E-administration can overcome barriers of time and distance to give citizens public information and services when and where they want them and in an accessible form. This requires a determined effort by all public authorities to accelerate the use of Information Society tools in their everyday relations with citizens and business, thus increasing the efficiency and quality of their services. Priority should be given to access to public information, on-line transactions with administrations, digital procurement procedures, social and cultural services. | | |
| Actors | Recommendations | Timing | Indicators |
| Member States | Set up citizen-friendly Internet Page with a clear site map providing information about civil rights and offering links to the relevant public services. | End 2000 | Establishment of Central Government Citizen's pages |
| | Make electronically available all public services capable of such delivery while reinforcing the human interface with the citizen | End 2004 | 1) N° of electronically available services 2) Number of public sector employees being trained in Information Society skills |
| | Provide One Stop Internet Shop for Business answering questions about policies and legislation that affect business, and providing information about business news, trade shows, potential business partners, tendering opportunities etc | End 2000 | 1) Establishment of Internet sites 2) Proportion of calls for tenders registered on the Internet. |
| | Set up public Internet access points supported by on-site Information Society literacy training in all communities e.g. libraries, post offices etc. | End 2001 | N° of access points /1000 inhabitants |

| | | | |
|--|---|---------------|--|
| The Enterprise in the Information Society | The Information Society and electronic commerce will drive economic growth and create jobs, largely determining the standard of living in Europe. New business opportunities for new companies will be enabled by giving birth to entirely new classes of business intermediaries such as aggregators, auctions or exchanges. Europe is in need of entrepreneurs willing to exploit these opportunities. The Information Society is not only opening new markets, it is also about changing the way business is done. For Europe continuous innovation facilitated by the application of Information Society tools will be of paramount importance to improve its competitiveness and to create jobs. | | |
| Actors | Recommendations | Timing | Indicators |
| Member States | Encourage entrepreneurship in new services and businesses through fiscal policies rewarding risk taking, especially concerning stock options | End 2000 | 1) % of venture capital into high technology 2) N° of start-ups |
| | Enhance industry-research collaboration | 2002 | % cofunded research |
| | Mainstream the IS needs of SMEs in public programmes | From 2000 | % of funding to SMEs |
| | Diffuse best practices and benchmark use of ICT by companies | End 2002 | % of companies using Internet-based services |