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COMMUNICATION FROM THE COMMISSION

TO THE COUNCIL, THE EUROPEAN PARLIAMENT,  
THE ECONOMIC AND SOCIAL COMMITTEE  
AND THE COMMITTEE OF THE REGIONS

**“The competitiveness of the European Information and  
Communication Technologies (ICT) Industries”**

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## **1. Introduction**

The Information and Communications Technologies (ICT) Industries (fig.1) are a critical component of the European economy, they are:

- a major and growing part of industrial activity
- one of the keys to future competitiveness of all industrial processes, products and services
- the platform for the emerging Information Society in the 21st century

It is essential that Europe possess a competitive dynamic ICT industry in order to:

- avoid excessive dependence on key technologies
- participate in expanding global markets
- contribute to the creation of new employment
- be at the forefront of future innovation

Europe cannot afford to miss the boat. There are worrying signs of:

- slow market growth
- declining relative shares for European producers
- uneven response to market and technological evolution

Urgent action is required by all actors (Industry, Member States, Commission) to force the pace and ensure that European ICT industries are at the forefront of market and technological evolution. Many are already under way, and now need effective and urgent implementation. Others need to be developed.

The Netherlands Government and the recent informal Industry Council have launched the debate. This Communication is a first contribution from the Commission, updating the analysis and identifying the main challenges and areas for attention. A tripartite exercise should be pursued over the coming months to carry the work forward towards priority setting and implementation.

For the purpose of this communication, ICT industries are defined as comprising: consumer electronics, computer and office equipment, telecommunication equipment, components, software (either as component or product, or services associated to the provision of software). Other sectors, such as broadcasting or content industries, often included in the definition of ICT industries, are not covered here.

## **2. The ICT Industries: global structures, European competitiveness**

### **2.1. Market structure**

Over the past 5-10 years technological, economic and social progress has transformed the industries and their markets (often referred to as “convergence”). There are three main segments to the market: infrastructure, commercial and consumer. The different features of these markets impose different structures and modes of operation on the enterprises supplying them (fig. 1), and imply different legislative and policy interests for public authorities.

*Infrastructure*, comprising large-scale systems with long product life-cycles and relatively slow growth, are being affected by downsizing and deregulation. Although traditional European-affiliated suppliers enjoy strong competitive positions in some areas such as telecommunications, they are under extreme pressure to adapt themselves to the progressive liberalisation and deregulation of their sectors.

*Industrial and commercial markets* attract numerous new entrants addressing niche markets which in many cases have grown to very large segments. Producers tend to be technology oriented and depend heavily on venture capital in their early phases. US industry generally enjoys very strong positions in these markets.

*Consumer markets* demand constant innovation and product reliability, and suffer constant price erosion. Consumer products are increasingly the technology drivers of the ICT industries. These features have driven industrial concentration to the point where global markets are dominated by a small number of recognised brand-names supported by complex dynamic global production structures. Japanese, and more recently Korean, producers are prominent, though European-affiliated producers maintain significant presence. US producers are gaining importance as PC-related products expand into consumer markets.

The growing *globalisation* of these markets has driven industry to spread out its manufacturing operations seeking the most cost-effective structures and resulting in a truly global network. The relative absence of trade barriers and the universal nature of market demand for ICT products is, of course, the underlying factor in providing the volume necessary to obtain the economies of scale which drive this evolution. In Europe, as elsewhere, a large proportion of manufacturing activity is carried out by transnationals with US, Japanese or Korean capital affiliation.

The *employment* situation in the ICT industries is the result of two opposing trends (see Fig. 2): on one hand the effect of high productivity gains in manufacturing methods and in some cases relocation, have resulted in substantial reductions in sectors such as consumer electronics, computers and terminals. On the other hand, the spectacular growth in software and services has increased employment. The net result is a balanced situation of overall moderate growth in the long term, which however require important changes in the skills structure. Over the past ten years, jobs have moved from manufacturing to R&D and sales/marketing, as well as from blue collar and clerical workers to white collar.<sup>1</sup>

## **2.2. Competitiveness of the European ICT industries**

The ICT industries represent an important and growing proportion of manufacturing industry in Europe (see Fig. 3.1): 8.3% of turnover (up from 4.3% in 1981), 6.5% of employment, 7.8% of production, 9.1% of total gross value added (up from 6.1% in 1991). On all these measures except employment, the ICT industries provide higher contribution than either the chemical or the automotive industries (see Fig. 3.2). Their relative share will increase in the future as the Information Society in all its forms takes hold. These figures do not take account of services industries (including software) which, for ICT, show significant employment growth. Market growth rates are of the order of 7%, and are expected to continue at this rate over the next few years (see Fig. 4). This is an impressive figure, considering that unit prices are in general decreasing - even drastically for some products - and each new generation of products provides significantly increased performance.

Despite this positive macro picture, there are causes for serious concern.

High as they seem, these *growth rates are consistently lower than those of the USA and the growing Asian economies*. Of particular concern is the fact that since 1990 Europe's

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<sup>1</sup> Employment in the ICT sector - Study by BIPE for the European Commission - DG III - July 1996

share of world-wide IT markets has declined from 35% to 28% (see Fig. 5). During the same period, US IT markets have grown from a similar starting point to represent about 41% of the world-wide market in 1996. IT expenditure in Europe represents 4.5% of GDP, compared with 5.7% in the USA. The *per capita* IT expenditure is 797 ECU in Europe, compared to 1,285 ECU in the USA (see Fig. 6). Within the Union, large differences exist between Member States, expenditure being generally lower in peripheral and southern States. In addition, the *trade balance*, with the exception of telecommunications equipment, *is worsening* in most ICT industry sectors (see Fig. 7). Imports have increased five-fold since 1980 to 143 BEcu in 1995, and now represent *circa* 50% of consumption in some areas (office equipment and computers, and consumer electronics) - this is to be compared with *circa* 11 and 17% in the chemical and automotive sectors respectively.

Success in ICT is mostly the result of a combination of access to excellent research and availability of risk capital in early stages, and strong focus on markets once established. This is typically the case in *software packages*, where US suppliers have captured leadership. In this area, the European successes are limited to *niche* applications, in particular in sectors where it has been possible to build application excellence on experience from leading edge users, *e.g.*; in engineering or design packages.

In *semiconductors*, European manufacturers have been able, through international strategic alliances and important R&D efforts, notably by JESSI and the Esprit programme, to maintain a competitive position, which ensures a European production base, access to key manufacturing technologies and ability to provide critical supply to the downstream user industries.

The *electronic assembly* sector, both for consumer electronics and for computers, is where Europe, as a production area, shows the heaviest handicap, due largely to the high cost of labour. This disadvantage has led to complex combinations of delocalisations, in Asia and more recently in central and eastern European countries, and installation of some manufacturing functions in proximity to the destination markets.

In the *telecommunications equipment* sector, the global structure of the main players and constant efforts in technology have ensured to Europe a leading position, exemplified by the GSM success. The importance itself of the European telecommunications equipment industry shows the need to face adequately the ongoing technological revolution.

### **3. Main challenges for the European ICT industries**

**Improve market take-up:** European markets lag behind those of other regions. First, the commercial market is less forward-looking; too many companies perceive investment in ICT primarily as an element of cost, to be reduced when business confidence declines. The contribution of ICT towards improving competitiveness, streamlining business processes and enabling innovation is underestimated or ignored. Second, the take-up of ICT by individual consumers is slow. With some exceptions, notably in Nordic countries, the number of Internet users is comparatively low in Europe (see Fig. 8). Third, public administrations are slow to make innovative use of ICT, this is particularly important in education, but affects many other areas where potential gains in efficiency and quality of service are very significant. Finally, the uneven pace of telecommunications liberalisation throughout the Union has probably been the single most important brake. Such structural delays represent serious handicaps for the European ICT industry, both in the context of the movement towards the Information Society, and the development of industrial competitiveness policies. Suppliers must work harder to seek means to convince the

market of the benefits of ICT and to stimulate accelerated take-up. An open and functioning single market is essential for the diffusion of ICT products and the development of related services. Divergent standards and regulations persist, imposing obstacles to the expansion of the ICT industries. These issues are dealt with elsewhere<sup>2</sup>, but they must be resolved if Europe's full market potential is to be realised.

**Transform industrial structures:** European ICT industry has been slow in restructuring itself to meet the new challenges. They have not kept pace with the trend of outsourcing, developing networks of competitive component suppliers, *cross-national production networks*, which is so much a feature of the US and Japanese producers and their Asian supply networks<sup>3</sup>. The opportunities presented by the economies of the central and eastern European countries, and their eventual integration into the Union, to enable restructuring should be seized by industry - and facilitated by public authorities. Industrial cooperation in global markets is essential in order, not only to participate in the creation of standards and be present in the markets, but also to ensure access to key technologies and components and to avoid excessive dependency.

**Develop fast-growing companies:** Europe has also failed to foster the sort of dynamic growth of *new entrants* which is so much a feature of the US industry. The conditions surrounding SMEs and start-ups must be improved; their role is critical in introducing new technology, in supporting competitive improvements in large enterprises and, most importantly, in the creation of employment. Industrial restructuring inevitably means changes in employment, which can be facilitated by instruments to create a flexible educated work-force. If ICT production in Europe is to remain competitive, industry also has to commit itself to the continuous upgrading of its skills.

**Enable European excellence in software:** No amount of restructuring can change the fact that Europe is a high-cost region for manufacturing. European manufactured products must compete in global markets on design and quality, and in some cases do so very successfully, for example GSM mobile telephones and digital satellite TV. The role of *software*, particularly embedded software, in conferring competitiveness and providing added value, is so important as to merit particular mention. The *traded* software area is relatively well understood, including package software, custom software and services. But this represents only a fraction of the total industrial activity: every significant manufacturer has some software activity in-house, developing, adapting, servicing and maintaining. Indeed for many businesses, core competence is expressed in software. Much of the product of financial services is software; software already constitutes a significant part of the value of modern aircraft and provides an increased share of the functionalities which make several industrial products competitive in the marketplace. Securing adequate understanding of the contribution of this element of economic activity to competitiveness, added-value and employment is now long overdue. Only with adequate understanding of the structures and economics of this industry can policy be developed at company or government level to exploit the benefits software offers. It is all the more important because the development of the myriad applications of the Information Society will require a massive effort of software development and content production. The linguistic fragmentation of the European software market represents an

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<sup>2</sup>COM(96)359 of 24.7.1996- Communication from the Commission on "Standardisation and the global information society: The European approach".

<sup>3</sup> "Wintelism and the Changing Terms of Global Competition" Professors M. Borrus and J Zysman, University of California 1997.

additional challenge but also an opportunity for specific European solutions: a large part of development and marketing costs depend on the number of language versions of the product, while the size of language market addressed first constitutes an important competitive advantage.

**Optimise technology development and diffusion:** ICT industries need to remain at the forefront of technological developments. Not only are R&D costs rising as a result of shorter product life-cycles, but in addition the interactive innovation process requires that industry react more in tune with customer requirements. Further, for the ICT industry to profit from R&D investment, technologies should be diffused as timely and as widely as possible. This is not an automatic process; it requires significant effort for the take-up of new technologies by all classes of users: industry, services (private and public) as well as private citizens.

**Exploit the potential for employment growth:** The diffusion of use of ICTs will have a profound impact on quantitative and qualitative aspects of the employment. A recent study<sup>4</sup> identifies three types of effect of ICTs on employment: direct effects on the ICT and related industries; indirect effects on other branches of the economy such as increases in productivity and changes in production structures; and other effects triggered by the increased “tradeability” of services and the resulting changes in the international division of labour. The same study estimates long term effects for Europe over ten years between a loss of three million jobs (negative scenario) and a gain of six million additional jobs (in the positive scenario of expeditious ICT diffusion). It is however clear that the direct effects on jobs in the ICT industries show a positive trend. The experience of the USA, where ICT industries’ restructuring started earlier, indicates that more than 150,000 jobs were created between 1988 and 1995 in the Personal Computer sector alone (for example one US company, starting up in 1985, grew to nearly 6B\$ t.o. and 15,000 employees by 1995). The Union must encourage the growth of such companies financed through dynamic pan-European secondary capital markets. European IT companies will create the high quality jobs of the future.

#### **4. Priority areas for policy initiatives**

Broad consultations with industry and the Member States, as well as the recommendations from various consultative bodies and studies show remarkable consistency. They fall into two categories. The first comprises those recommendations, such as telecommunications liberalisation, which are already the subject of action or reflection in the Commission and National administrations. These are summarised here in order to bring attention to the importance of implementing a range of key policies for the competitiveness of the industry. A second set of issues is identified which concern the ICT industries more specifically, or which would benefit from future priority examination. These are dealt with in the second part.

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<sup>4</sup> IFO Institut für Wirtschaftsforschung. München, 1996

#### 4.1. Policy initiatives under way which require urgent implementation

The adoption in November 1996 of a comprehensive action plan for the Information Society<sup>5</sup> has served to fine-tune the Commission's priorities. It addresses the need for rapid progress and provides a sense of urgency to the EU's policy commitment for an effective implementation of all aspects of the IS. The priorities are:

- The *effective* implementation by all member states before 1.1.98 of the *telecommunications markets liberalisation* is vital. The Commission is determined that the commitments made will be implemented and it will be monitoring carefully the legislative development in the Member States.
- *Electronic commerce* is the first practical implementation of the IS, the first "massive application" of the future. In the communication "Putting services to work"<sup>6</sup>, a European initiative on electronic commerce was announced. To launch this initiative, a framework communication to the Council has been adopted by the Commission listing the key priority areas that have to be resolved.
- Strengthening and acceptance of *internationally agreed principles and rules* covering competition, intellectual property rights, privacy and individual rights, information security, interoperability and standards.
- *Take-up actions* and *awareness initiatives* need to be established or expanded to encourage European industry and society to increase ICT usage.
- *Satellite-based broadband communication systems*: the action plan submitted by the Commission addresses the regulatory adjustments and R&D actions needed in order to ensure significant European presence at international level.
- In the *transport sector*, new applications in trans-European networks (TENs), new air-traffic control systems and numerous consumer applications are emerging which will offer growing markets for the European ICT industry. Action plans for *Intelligent Transport Systems (ITS)* and *Location and Navigation systems (GNSS)* are being prepared.
- *The Framework Programme for R&D* is especially important in making the best use across the EU of the substantial investment in R&D which is required in order to maintain competitiveness. The 5th Programme due to start in 1998, will focus particularly on the participation of users in R&D activities, essential to ensure that actions meet real needs in line with the requirements of the market. In parallel, the support of the development of key technologies will be integrated into one programme and will be structured in four areas: services for the citizens, electronic commerce, multimedia content and key technologies. Responsiveness and flexibility will also be enhanced.
- *Education and training* are critical in providing employees with the necessary skills and flexibility to use new technologies. Educational infrastructures must be upgraded by equipping schools and cultural institutions with ICTs, providing them with network

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<sup>5</sup> COM(96)607 of 27.11.1996 - Communication from the Commission on "Europe at the Forefront of the Global Information Society: Rolling Action Plan".

<sup>6</sup> CSE(96)6 of 27 November 1996 - "Putting Services to Work", a Communication to the European Council.



access (in particular Internet). This should be accompanied by improved teacher training in ICT applications. In cooperation with the Member States, the Commission will stimulate actions at national level to offer European citizens training appropriate to the Information Society. The action plan "Learning in the Information Society", approved by the Commission in December 1996, will bring together the most important players in order to provide better access to skills needed in the future. The implementation of the action plan runs in parallel with the work undertaken by the Task Force "Educational software and multimedia", *i.a.* a joint call between several Commission services, thus facilitating access to Community support in this area. The measures will be renewed next year.

- The *language* issue, particularly important in Europe for software, is addressed in the Information Society and Language Engineering programmes<sup>7</sup>.

#### **4.2. New areas requiring attention**

Action in these areas should be targeted at improving either conditions in the supply side, such as benchmarking and training, or opening up the demand side, for example market access or take-up measures.

**Improve global competition:** The positive conclusion of the Information Technology Agreement (ITA) at the WTO Conference in Singapore in December 1996 and the WTO telecommunications Agreement in February this year are very important steps in this direction. The abolition of tariffs on all IT products by the year 2000 accelerates the process started in the last round of GATT negotiations. It will contribute to reducing the costs of producing ICT equipment in Europe, while providing European manufacturers with better opportunities for exporting to foreign markets. The ITA must be implemented immediately, while at the same time launching the review mechanism to extend product coverage. Action should be initiated to extend the country coverage to those non-participating WTO countries (notably in South America), while participation in the ITA should be required of candidates for accession to the WTO, notably China and Russia. With the removal of tariffs following the ITA, attention will shift towards the elimination of non-tariff barriers in our main trading partners, notably by pursuing Mutual Recognition Agreements (MRAs), and greater harmonisation of standards and conformity assessment procedures. The first priority will be to build on the work of the TransAtlantic Business Dialogue to conclude an MRA with the USA, exploring in particular the possibilities of extending the principle of manufacturers declaration of conformity. In parallel, operational activities will be developed in the context of the TransAtlantic Small Business Initiatives (TASBI). These and other trade policy instruments should be applied in a coherent manner ensuring that European industry operates under optimal conditions both within the Union and in global markets.

**Accelerate ICT take-up and promote awareness:** Public administrations can and should do more to stimulate the take-up of ICT, both within their own services and with the public at large. In the first place, education authorities must improve the provision of ICT to schools in order to pave the way to the Information Society. Moreover, they must respond to public demand for better, more cost-effective services. And in the broadest

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<sup>7</sup> COM(96)456 of 2.10.96 - Multi-annual programme on Multilingualism in the Information Society. Adopted by the Council on 8.10.1996

context, the furtherance of National and Community policies in many domains would benefit by accelerated greater innovative use of the means offered by ICT. For example, fig. 6 demonstrates the relative lack of investment in IT in southern and peripheral Member States, despite the fact that IT is a powerful tool to promote Cohesion by linking regions and reducing barriers. A number of Member States are now in the process of establishing innovative fiscal and other incentives aimed at accelerating the take-up of ICT in homes, schools and businesses. These schemes point the way, and should be emulated and expanded upon broadly throughout the Union.

**Create new markets by timely standards:** The creation and use of standards has become one of the key strategic levers used by industry to establish new markets. Consumer markets, particularly, depend on establishing purchaser confidence in products, hence the importance of establishing cooperation between suppliers to support universal standards. To participate in the benefits of such cooperation, producers must bring contributions to the table, in the form of technologies, standards or markets, and be active in the international standards creating process if they are not to fall behind technologically and commercially. The regulatory side of standardisation also needs attention to simplify and accelerate procedures (*e.g.* manufacturers declaration of conformity) in order not to hinder new product marketing. Standards in ICT are generally global in nature, but often multiple standards, based on regional specificities, will compete for market acceptance. European companies should therefore should not only participate in the standardisation of technical specifications via international consortia, but should also use, when possible, European platforms. The European Commission supports the creation of a flexible and open workshop structure enabling European companies to participate in the international ICT standardisation process. They should trigger internationally recognised standards using European specificities. This calls for agreements at the strategic level between the principal actors on the main user requirements<sup>8</sup>. To translate user requirements into technical specifications, pragmatic and flexible delivery mechanisms need to be developed by industry in close collaboration with European standardisation organisations. The European Commission supports the creation of flexible industry-led standardisation procedures to develop - besides the adoption of formal European standards - technical specifications for European market operators. To ensure consistency and an optimal use of the European standardisation resources, a “guichet unique” under the umbrella of the European standardisation organisations should be considered as a matter of urgency.

**Exploit the potential of enlargement:** The enlargement of European Union offers the European ICT industry an expanded and growing internal market, improved economies of scale, as well as new development locations to site cost-sensitive operations. The European ICT industry has the opportunity here to re-engineer its manufacturing supply structures, similarly to those of US and Asian producers, and so sharpen its global competitiveness. Much of the industry is in the process of setting up various forms of co-operation in these countries, which offer also skills availability and competitive manufacturing conditions. European producers are relocating activities back from the Far East in order to take advantage of these, often better, conditions, releasing Far East plants to concentrate on growing and increasingly open local markets. Particular attention will be given to the facilitation of co-operation between the industries of the EU and the CEEC. This is already under way in the consumer electronics industry. The Commission

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<sup>8</sup> An example of such agreements is the MoU on “Open Access to Electronic Commerce for European SMEs”.

supports this initiative, and its expansion and extension to other sectors of the ICT industries. Actions proposed by industry include benchmarking suppliers, supplier conferences, in-plant training, and quality workshops. The Commission would support the establishment or strengthening of active industry representation in the CEEC. The pre-accession strategy provides a solid framework to establish conditions for fair competition and to create a level playing field which will benefit the European industry.

**Promote industrial cooperation:** Numerous other important industrial co-operation initiatives are under way or proposed, notably in the Newly Independent States, in the Mediterranean area, South America and Asia. Several export promotion activities are also proposed. In so far as the ICT industries are concerned, and particularly the SMEs, more effort needs to be made to raise industry's awareness of the opportunities offered and to help them to prioritise according to their circumstances. In addition, transborder industrial co-operation activities could benefit largely from enhanced co-ordination with existing Member States' programmes.

**Facilitate the emergence of SMEs:** <sup>9</sup> Small and medium enterprises (SMEs) are critical for employment generation and a key element of the ICT industry (particularly in the software and multimedia content areas) because they often play the leading role in the development of new technologies and the creation of innovative products. European industry lags far behind the US in high-tech IT start-ups. This is a serious handicap, as can be seen from the fact that many of today's leaders in ICT were SMEs in the USA less than 20 years ago. Policy initiatives aimed at creating favourable conditions for fostering and financing innovative start-ups is of the greatest importance. Policy initiatives should pay particular attention to facilitating the provision of venture capital and co-operation should be sought with financial institutions, in order to develop mechanisms such as technology "rating". Efforts should also continue to reduce the administrative burden, often a prime source of discouragement. The environment surrounding in particular starting new businesses, should be considered as the subject of a benchmarking analysis, by comparing the situation in Europe and in other regions, particularly the USA (Silicon Valley). These problems have long been evident, but the situation remains critical. There is *urgent* need for the Commission and Member States to develop rapid and effective action. The Commission also intends to use the G7 project "Global market-place for SMEs"<sup>10</sup>, as the basis for encouraging the exchange of experiences at global level and facilitating other forms of co-operation.

**Focus on employment: skills, education and training:** As earlier noted, European ICT industry must restructure continually in order to remain competitive, upgrading its products and processes to provide increased added value while relocating less profitable cost-sensitive operations. Skills upgrading are at the heart of the process. The implementation of a "skills standards" scheme could go a long way to fulfilling this objective. Establishing skills profiles related to the main activities on an industry wide basis provides a reference for building a competent workforce, improving performances and defining training programmes. Such standards will also contribute to a better functioning of labour markets by providing a clear basis for matching employers' needs and skills offered. Moreover, standards offer a practical basis for improved co-operation between industry and schools and colleges, and a set of criteria to help education

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<sup>9</sup> Specific features of SMEs are addressed in the "Action Plan for Innovation in Europe", adopted by the Commission on 20.11.1996 - COM(96) 589

<sup>10</sup> Project launched at the G7 Ministerial Conference in Brussels in February 1995

authorities in Member States in their efforts to tailor curricula to the 21st century digital economy.

**Promote benchmarking:** The European Commission considers benchmarking to be an effective and powerful tool for improving competitiveness and intends to promote its use by enterprises, in particular SMEs. Because of its economic importance and global nature, the ICT industry is among the first to be singled out for the application of benchmarking, and the Netherlands Government has had carried out a benchmark study of the industry. The Commission intends to promote benchmarking at sector and framework condition level. The competitiveness of the European economy as a whole benefits from improvements in the ICT industry. Systematic review of industrial performance, identification of relative weaknesses and adoption of corrective measures contributes to progress. The Commission will review its current information sources to determine whether they are adequate for the purpose of providing appropriate benchmarking indicators, and will revise them if necessary. It will work closely with the Member States and industry to identify critical framework conditions for industry and to identify best practises. Areas already identified here for consideration include SME start-ups and embedded software.

## **5. Conclusion**

A number of key areas for action have been identified in this Communication. The longer their effective implementation is delayed, the more difficult it will be to hold a leading position for the European ICT industry. Telecommunications liberalisation is critical, but others are also necessary as described above.

The Commission proposes to follow up on this Communication by working together with the Member States and Industry to draw up specific actions responding to these key areas, to establish a work programme for their execution by all concerned parties (Commission, Member States, Industry), and a mechanism for regular review of progress.

**Annex I**  
**The Council resolution of 18.11.1991 and its follow-up**

Since the resolution of 1991<sup>1</sup>, the launch of the 4th Framework Programme for R&D has successfully addressed industry requirements for R&D in ICT. User and market needs have guided the relevant R&D programmes (Esprit, ACTS and Telematics), and the technologies developed as a result are having a direct market impact.

Best use of results and active international co-operation have been two key elements in programme action. Attention has been focused on SMEs. Synergies with the Eureka programme have been strengthened.

As explained in the resolution of 1991, multilateralism is the basis on which access to markets should be sought. This approach has been pursued in the GATT where significant reductions in tariffs were obtained in the Uruguay round negotiations. These were followed by the Information Technology Agreement (ITA) which will result in the elimination of tariffs for most IT products by the year 2000. Of similar importance is the success achieved by the conclusion of the WTO agreement in February 1997, opening markets for telecommunication services world-wide.

The multilateral approach does not preclude bilateral actions where appropriate. Contact has regularly been made with the US and Japan to protest against bilateral agreements which discriminate against the EU (e.g. the US-Japan Semiconductor Arrangement).

A "Centralised Point of Information" was established in order to collect information and analyses concerning market access to and competitive practices in the main industrialised countries. A report<sup>2</sup> was issued covering anti-competitive practices, distortions in procurement, state aids, including examples of discriminatory practices and structural impediments.

A number of industrial co-operation initiatives have been undertaken. An important example is the parts and components industry supplying consumer electronics producers, whose production practices have been compared with those of similar Japanese companies. This has been done in a co-operative benchmarking project jointly organised by the European and Japanese consumer electronics industries, with the support of the Commission and MITI. This exercise has produced many useful suggestions, as well as helping suppliers and users to understand each other's requirements better and resulting in improved performance and increased business. The programme is now being oriented to the countries of Central and Eastern Europe.

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<sup>1</sup> Council Resolution of 18 November 1991 concerning electronics, information and communication technologies.

<sup>2</sup> Report presented on 11 March 1994 to the Directors General of Industry.

Figure 1: ICT industry structural trends

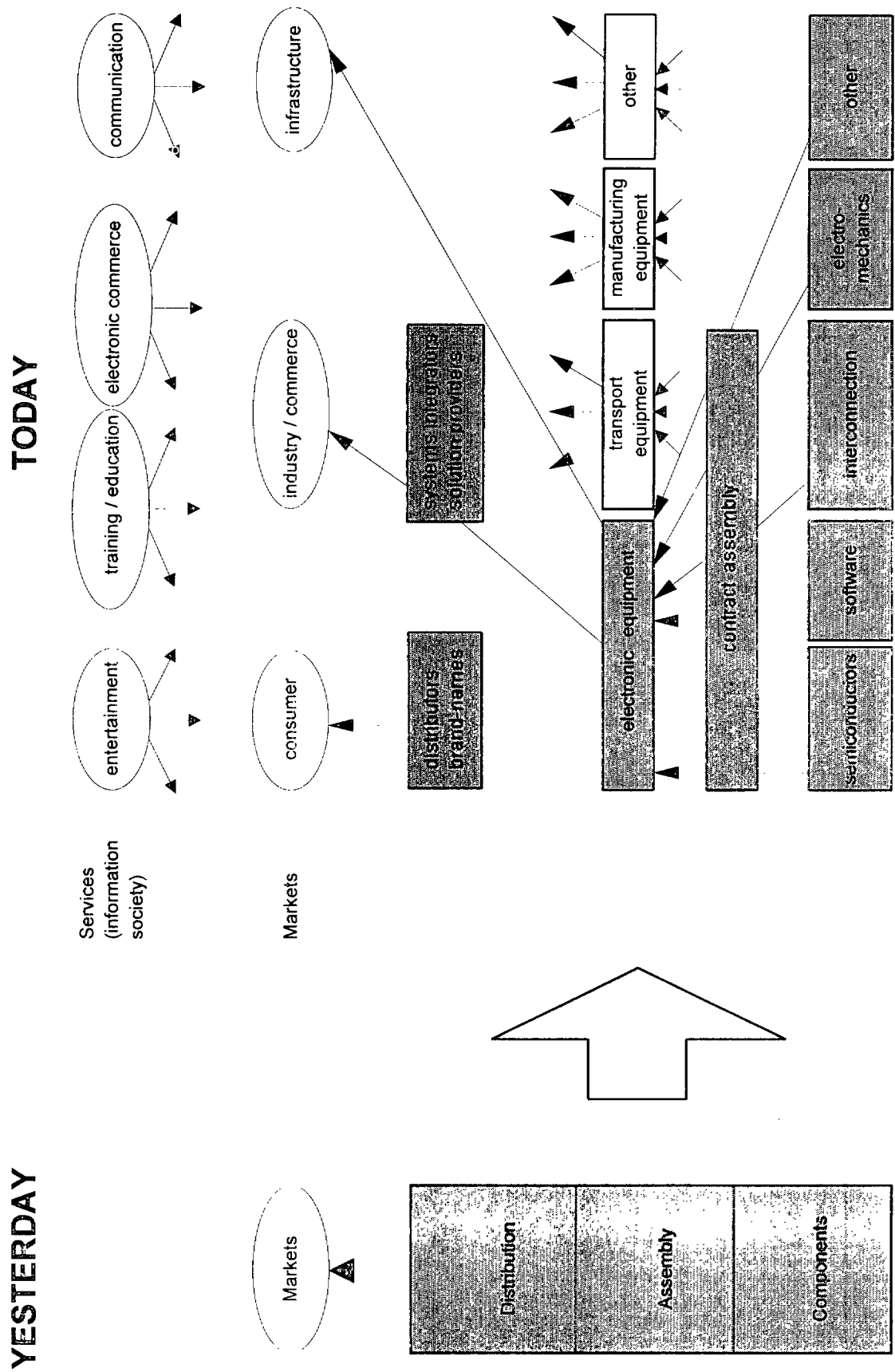


Figure 2

**EU employment in the ICT industries  
(thousands of employees)**

	1980	1990	1994
Computers	242	284	175
Components	258	243	224
Consumer electronics	230	181	110
Telecom equipment	493	392	361
Software and services	270	612	732
Total	1493	1712	1602

Source: BIPE

Figure 3.1

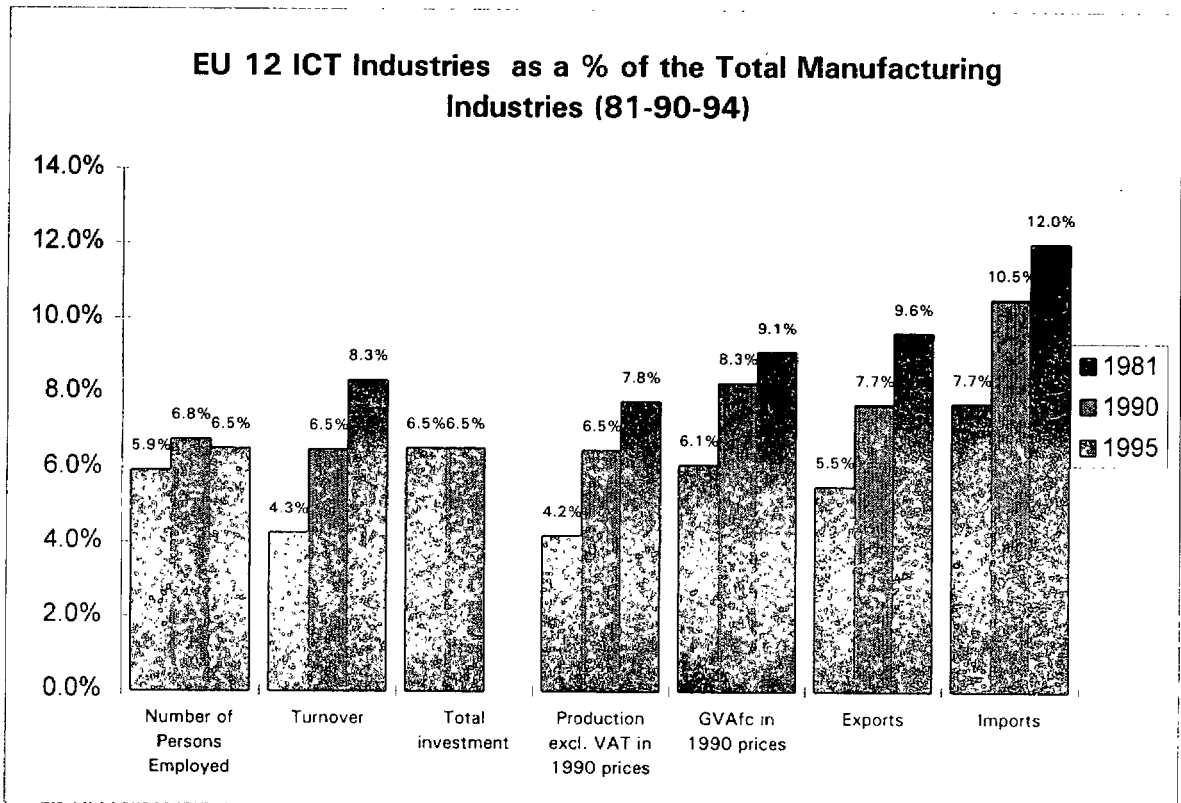


Figure 3.2

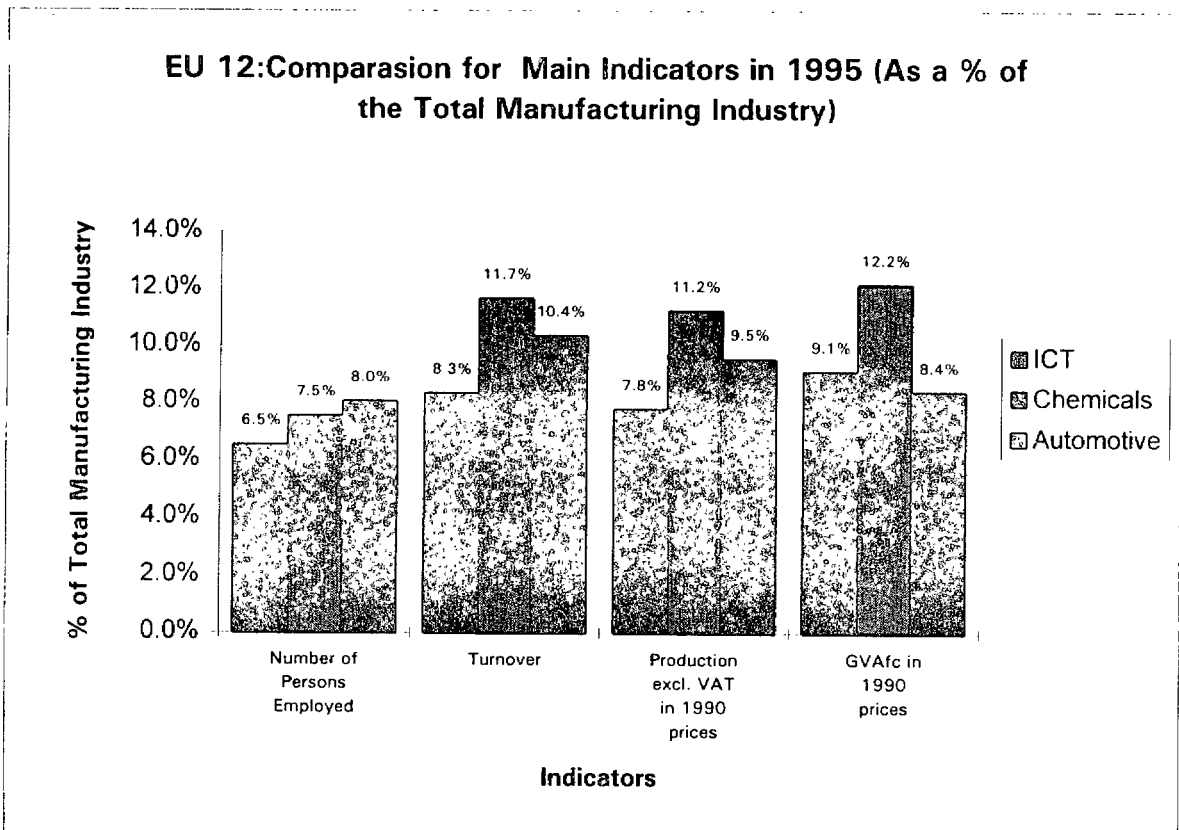
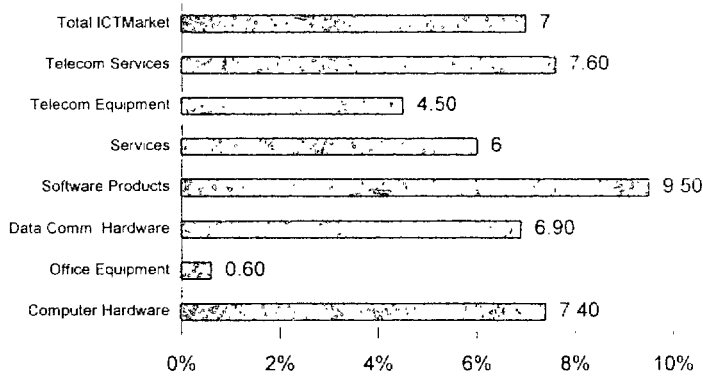




Figure 4.1

**ICT Market Growth, CGAR 1996-98**



Source EITO 97

Figure 4.2

**Western European Information and Communications Technology (ICT) Market, 1996 Billion ECU\*\***

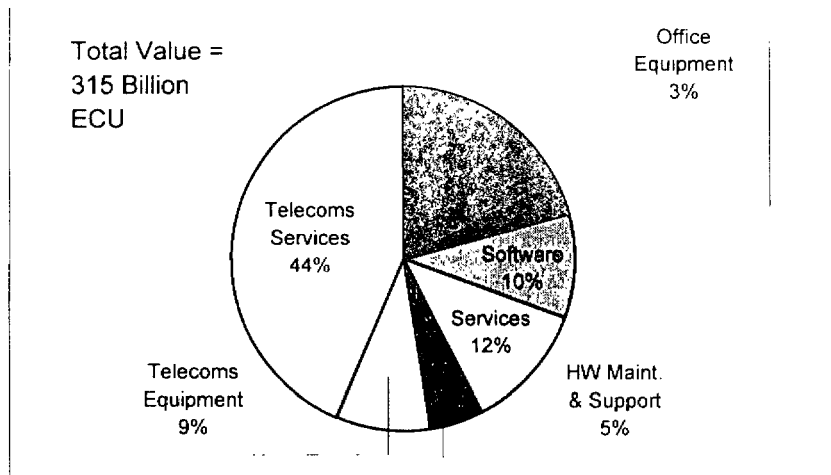
	1996 Value	% of ICT
<b>Total IT</b>	<b>148</b>	<b>47.1</b>
Computer and Datacom Hardware	58	18.4
Office Equipment	8	2.5
Software	31	9.9
Services	37	11.6
Hardware Maintenance and Support	15	4.7
<b>Total Telecommunications</b>	<b>167</b>	<b>52.9</b>
Telecommunication Equipment	29	9.1
Telecommunication Services	138	43.8
<b>Total ICT</b>	<b>315</b>	<b>100</b>

Note: \*Western Europe includes the 15 EU and 2 non-EU countries (Switzerland and Norway)  
 \*\* It should be noted that all figures have been rounded to the nearest billion ECU at 1996 constant exchange rates. Total and percentage may not add up due to rounding.

Source: EITO 97

Figure 4.3

**Western European Information and Communications Technology (ICT) Market by Product, 1996**



Source: EITO 97

Figure 5.1

**Worldwide IT Market by Region: Percentage  
Breakdown Calculated on Market Values.  
1995-1997. Billion ECU**

	1996 Value	1995 %	1996 %	1997 %
Europe*	154	29.4	28.3	27.5
US	225	41	41.4	41.8
Japan	92	16.9	16.8	16.6
4 Tigers**	16	2.7	2.9	3
RoW***	57	10	10.5	11.1
<b>Total</b>	<b>544</b>	<b>100</b>	<b>100</b>	<b>100</b>
Note: * Europe includes Western and Eastern Europe ** 4 Tigers = Hong Kong, South Korea, Singapore, Taiwan *** RoW = Rest of World				

Source: EITO 97

Figure 5.2

**Worldwide IT Market by Region. 1996**

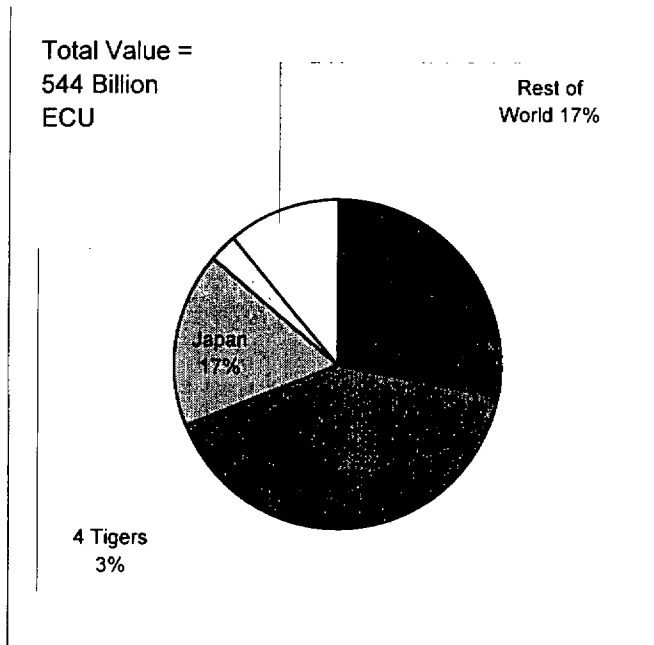
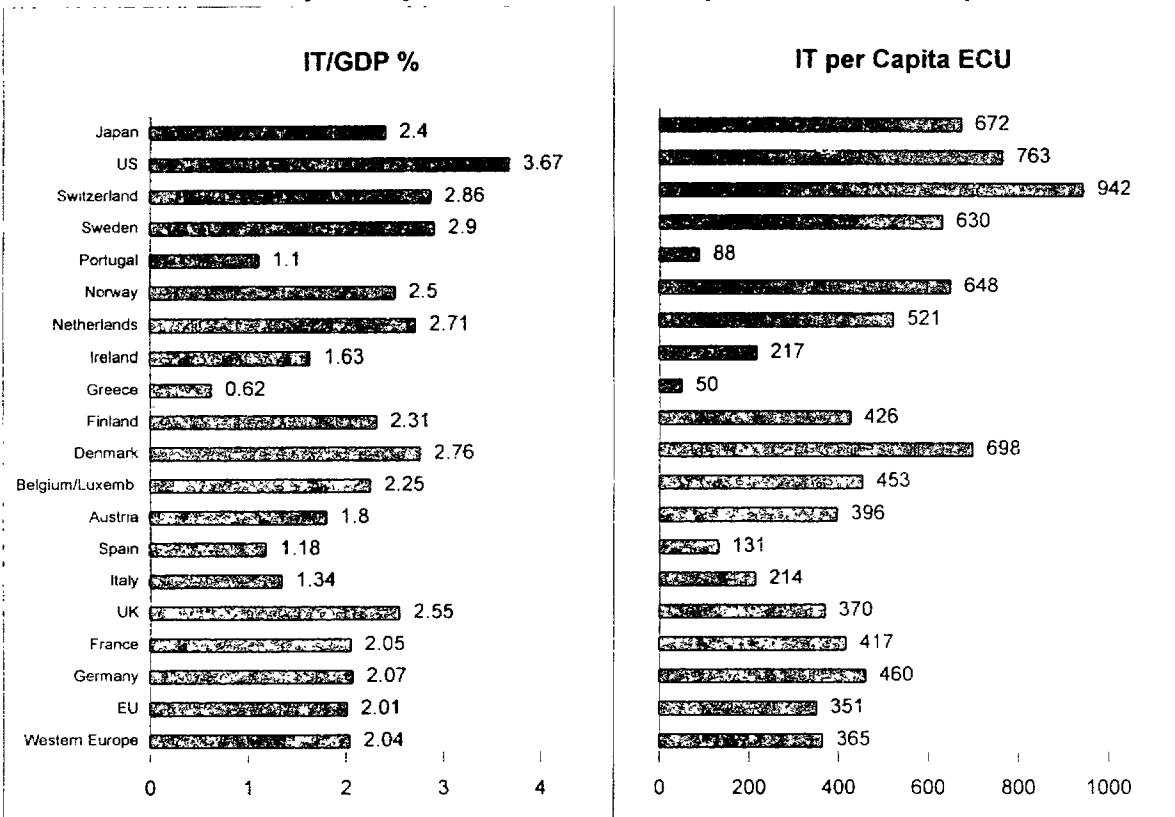


Figure 6

IT/GDP and IT per Capita in Western Europe, the US and Japan. 1995



Source: EITO 97

Figure 7

EU 12: Trade Balance for the ICT, Chemical and Automotive Industries

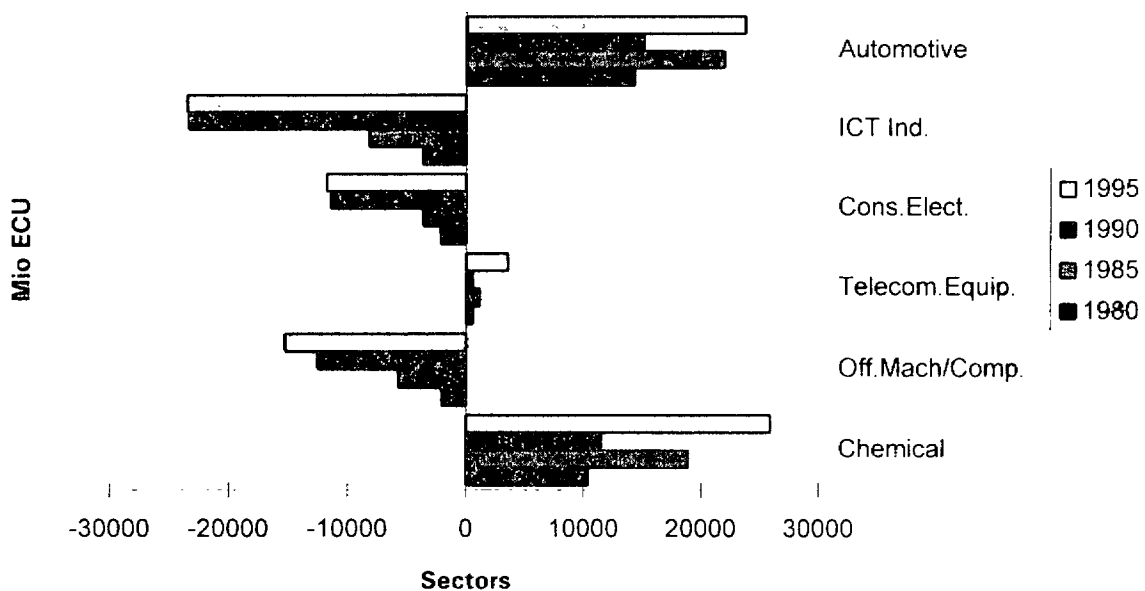
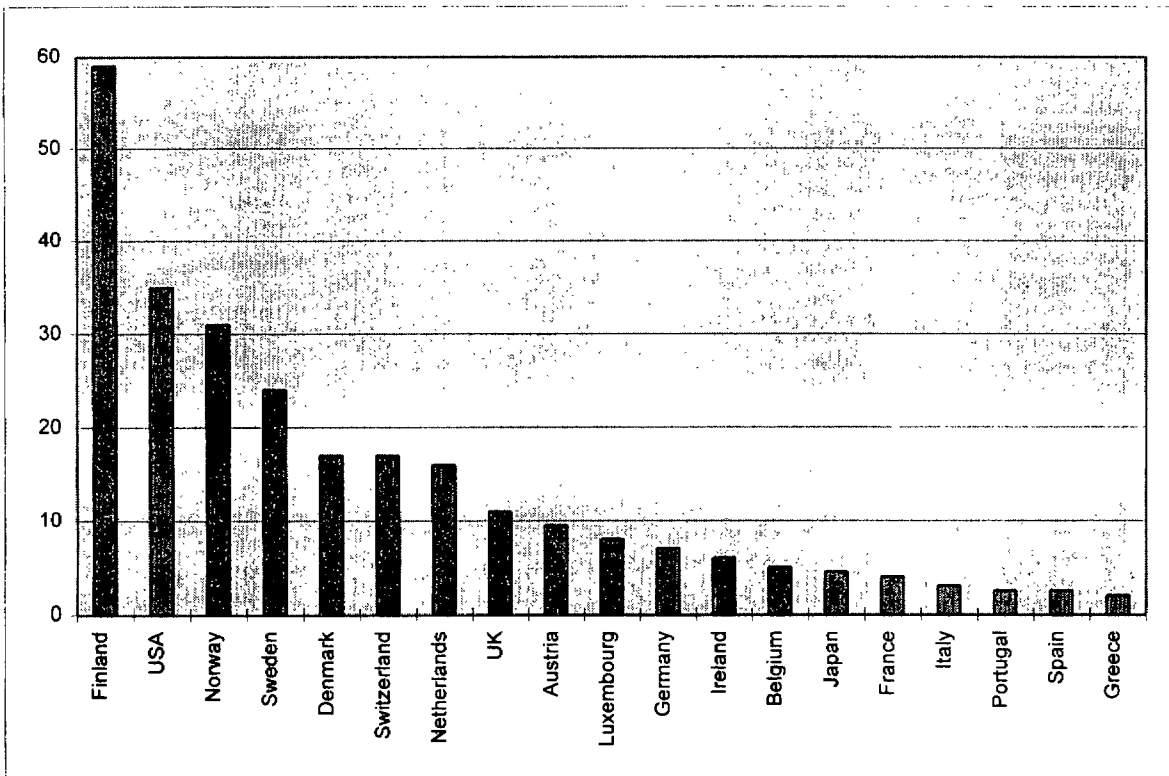


Figure 8

Penetration of Internet Hosts per 1.000 People, July 1996



Source: EITO 97 / Network Wizards, <http://www.nw.com> and Analysys

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