



## 2. The Frameworks and The Structures

*The majority of all communication is still local, but the scope of the future users may be growing.*

Source: Anon

This chapter of "The TELDOK Yearbook 1997" gives general information about the global frameworks and structures that govern the information society, of which Sweden is part, Sweden being one of the countries under scrutiny in a report made by the British Department of Trade and Industry, DTI, in 1996, "The Development of the Information Society – An International Analysis", cited below. According to this report, *"the adoption of new products and services is growing quickly — some relatively long established services such as mobile telecommunications are growing at rates of between 50% and 100% each year, while new services such as the Internet are growing in some markets at even higher rates."*

Following chapters give detailed information about telecommunications and information technology developments in Sweden. The reader is encouraged to cross connect as she sees beneficiary.

- \* In 1997, all the inhabitants of the world will spend approximately **US\$ 683 billion**, buying information and communication technology (ICT) equipment and services. USA and Japan will be the biggest spenders, all according to the research firm IDC.
- \* *The World Trade Organisation's, WTO's, agreement to deregulate world trade in information and communications technologies was signed by 68 countries — among them Sweden — in December 1996 in Singapore, representing 90% of the world telecommunications and information technology markets. In short, the agreement allows free competition in each one of the 68 national markets as off January 1, 1998. Some countries, like Japan and France, have included limitations of foreign ownership of some services. China is not among the signatory countries.*

In the short run, the agreement will give the average consumer lower cost international telecommunications, at least according to some analysts. In the long run, the agreement will make communications technology available to a large part of the world population, at affordable price.

The Stockholm based morning paper Svenska Dagbladet reported on 15 December 1996, that *"five days of negotiations had resulted in a new agreement on information technology. 68 countries have accepted an*

*agreement to abandon custom charges on computers, software, semiconductors, and telecommunications equipment, starting in July 1997, and having to be completed by January 2000. Once implemented, more people worldwide will have cheaper and better access to the Internet, according to one delegate. The WTO estimated the world IT trade in 1995 to a total value of 600 billion US \$. Negotiations are to continue during 1997. WTO has ambitions to attract more countries to sign the agreement.”*

*(Translation by the author)*

The WTO agreement may be regarded as an important step towards the Global Information Infrastructure, GII, (see chapter 8), and the Global Information Society. In a report made by the British Department of Trade and Industry, DTI, in 1996, *“Development of the Information Society — An International Analysis”*, it is stated, among other things:

*“Information and communication pervade all aspects of society. While no-one knows what eventual form the Information Society will take, the benefits of its emerging products and services are manifest.”*

Technology, investment, and mass distribution are three of the driving forces behind the Global Information Society. Improved productivity was one of the major incitements promised early on by suppliers of information and communication technology. However, to what extent this promise was fulfilled, turned out difficult to prove by traditional academic research, until recently, when studies carried out at, for instance The Sloane School of Management at Massachusetts Institute of Technology by researchers Brynjolfsson and Hut, have proven substantial productivity gains over a long period of implementation of information and communication technology. These researchers demonstrate that over a period of four years capital investment in information and communication technology contributes more to productivity gains than any other form of capital investment. Research in the banking sector has shown that this kind of investment rendered 100% return on investment.

The British magazine *“The Economist”* sums up the importance of the WTO agreement as follows:

*“It is increasingly the case that service businesses, such as telecoms, transport, and financial services such as banking and insurance, are the industries that make a modern economy go round. For that very reason, a remarkable number of governments in the developing world, and some in the rich world too, argue that these industries are too vital to be exposed to international competition. Actually they are too important not to be. If a country’s telephones can be made to work properly, or its financial sector becomes better able to allocate capital where it is most needed, the benefits for the economy at large can hardly be exaggerated.”*

*Source: The Economist February 22 1997*

## 2.1. The Frameworks

*"In 1996, the slow-down of the European economic growth was reflected in the performance of the Information and Communication Technologies Market. However, the 7 per cent growth rate experienced by the European ICT market, despite being lower than that of 1995, is nevertheless higher than most sectors of the economy. This is an impressive result for a broad and diversified industry, whose market in Europe in 1996 exceeded 300 billion ECU."*

*Stefano Micossi, Director General Industry, EC, in "European Information Technology Observatory 1997"*

### **\* In 1996, The West European IST Market Reached 2 693.25 Billion SEK**

According to the international market research firm IDC, the West European IST market had a total value of 2 639.25 billion SEK (equivalent to 315 billion ECU) by the end of November 1996. Western Europe is identified as the 15 EU member countries, Norway and Switzerland.

Telecommunications answered for 1 427.85 billion SEK (167 billion ECU), while information technology answered for 1 265.4 billion SEK (148 billion ECU). This represents a growth of 7.9% for the telecommunications sector, and an overall growth of 6.5% for the IT sector.

*Source: IDC*

### **\* The European IT Industry Needs Help**

According to the European Commission, the European IT industry needs immediate help, if it is ever to participate in the global IST top list. Since 1990, the European market share of the global IST industry has dropped to 28% from 35%. In Europe, IST expenditure represents 2% of GDP, compared to 3.7% for the USA. The IST expenditure per capita in Europe during 1996 was 365 ECU, while the Americans spent the equivalent of 763 ECU per capita. Part of the problem is the high labour costs and the inflexible labour market conditions in Europe.

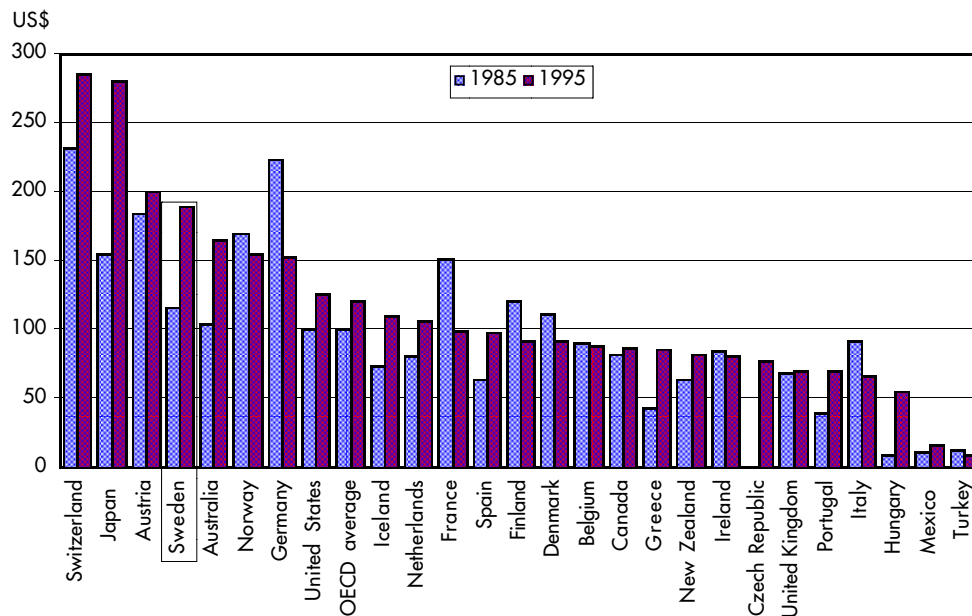
*Sources: EITO/EU/Computer Sweden, April 18, 1997*

### **\* OECD Information Technology Investment is Increasing**

Since 1987, the OECD countries have increased their investments in information technology between 4 and 12% annually. See the following diagrams.

*Source: SCB: Data om informationstekniken i Sverige 1996*

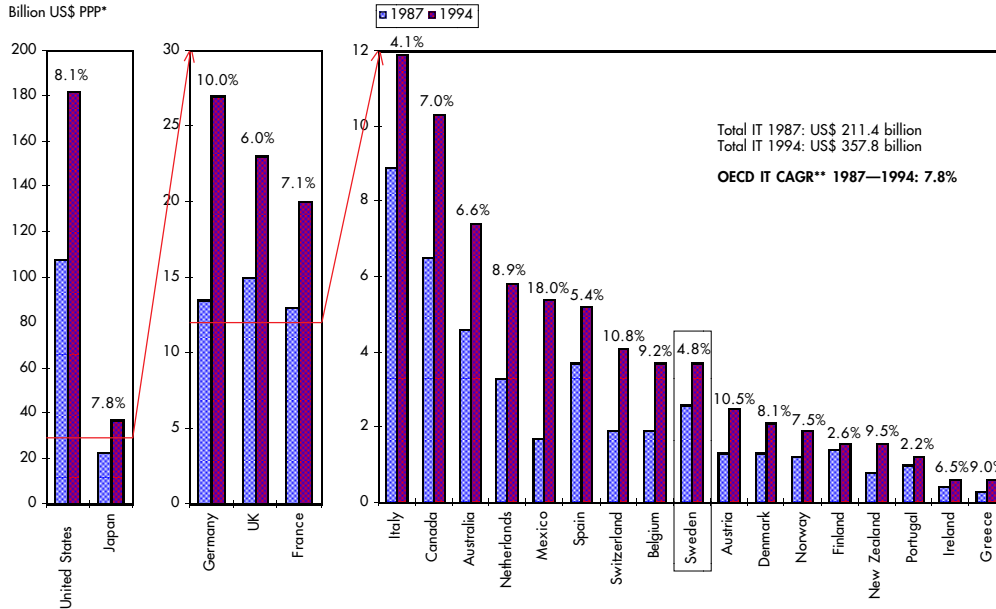
## Public Telecommunication Investment Per Capita in OECD 1985 and 1995



*Fig. 1/22 april: The diagram shows the public telecommunications investments per capita in 1985 compared to 1995 in the OECD countries. It is evident that some of the heavy investors of 1985, invested considerably less in 1995, Germany, France, and Italy being the best examples of this. Other countries, Switzerland, Japan, Australia, and Sweden, invested considerably more in 1995 than in 1985. Switzerland and Japan invested most, almost US\$ 300 per inhabitant, while Sweden invested not quite US\$ 200 per capita, in 1995. The OECD average in 1995 was US\$ 98.04.*

*Source: Communications Outlook 1997, vol.1, © OECD, Reproduced with the permission of the OECD*

## IT Spending in Selected OECD Countries 1987 — 1994 CAGR 1987 — 1994 in percentages



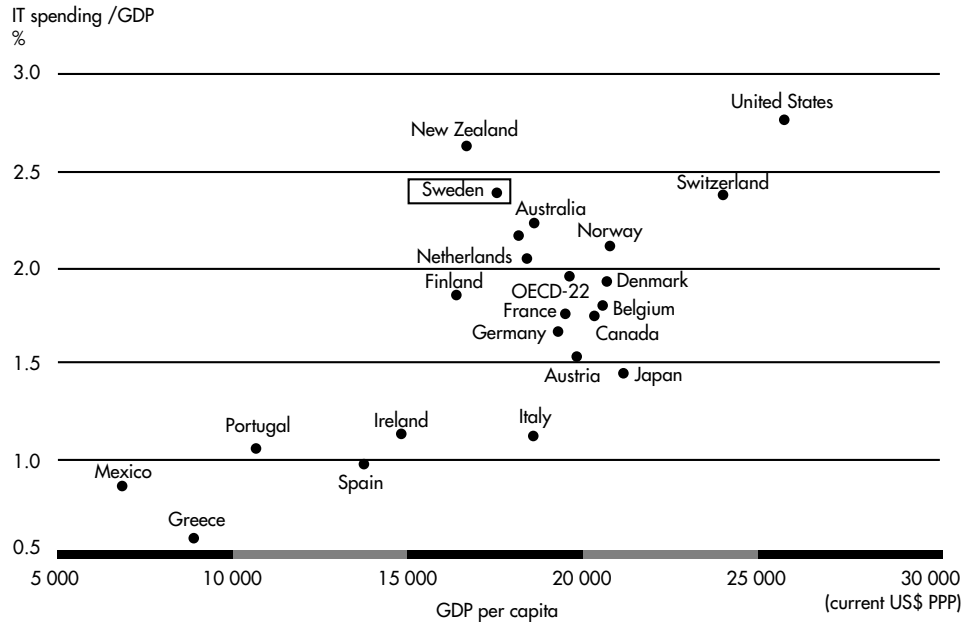
\* PPP = Purchasing Power Parities

\*\* CAGR = Compound Annual Growth Rate

*Fig. 25 Feb 14: In 1994, the total spending on information technology by the 22 OECD member countries amounted to US\$ 357.8 billion. 81% of the total were spent in five countries — USA, Japan, Germany, UK, and France. In general, IT spending outpaced GDP growth between 1987 and 1994 in the OECD countries, with the exception of Spain, Italy, Finland, Ireland, and Portugal. The United States, Switzerland, New Zealand, and Sweden, while already having some of the highest OECD shares of IT consumption related to GDP, nonetheless increased those shares over the period.*

*Sources: IDC/OECD Secretariat/OECD: Information Technology Outlook 1995, © OECD, Reproduced with the permission of the OECD*

## IT Spending/GDP Versus Per Capita GDP 1994



*Fig. 25 Feb 15: United States has the highest IT spending/GDP in relation to the per capita GDP. Average growth in IT spending in the OECD area was three times faster between 1987 and 1990 than between 1990 and 1993, while 1994 seems to have brought an upswing. Note, that this fact is not made clear in this diagram. Also see previous diagrams.*

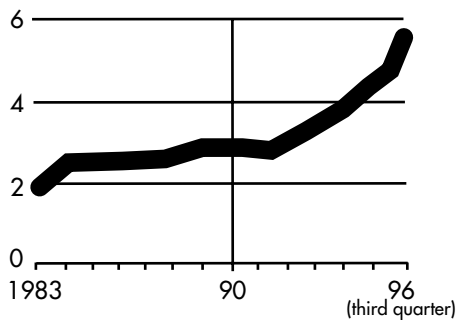
*Sources: IDC/OECD Secretariat/OECD: Information Technology Outlook 1995, © OECD, Reproduced with the permission of the OECD*

### \* IT Investment in USA Third Quarter 1996

The US economy is booming not least in comparison to the European one. Million new jobs are created, almost no unemployment. The currency is strong and the country has almost no inflation. The annual growth rate is 2 — 3%, and USA is the world leader in a number of industries, information technology among others. During 1996, US companies increased their investment in information technology to almost 6% of GNP — see diagram below.

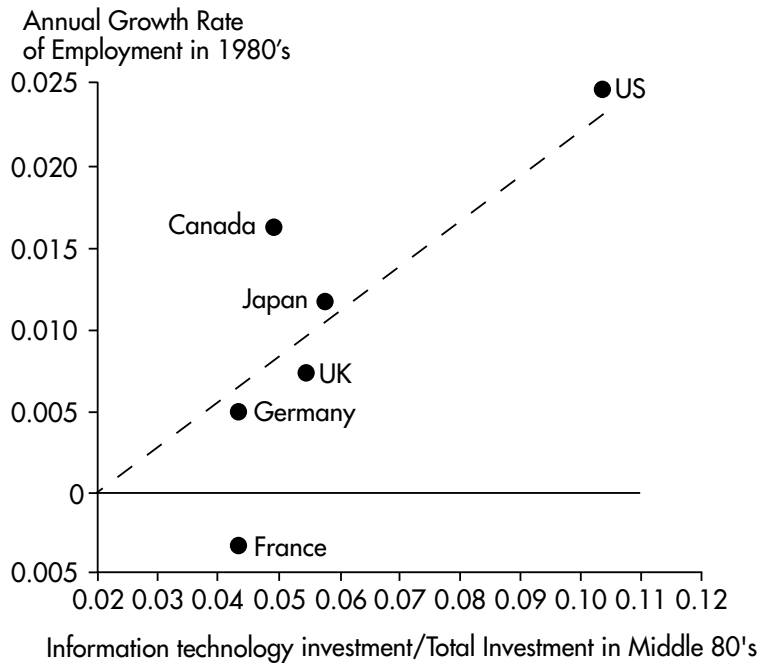
### US Information Technology Investment as Part of GDP Third Quarter 1996

In percent



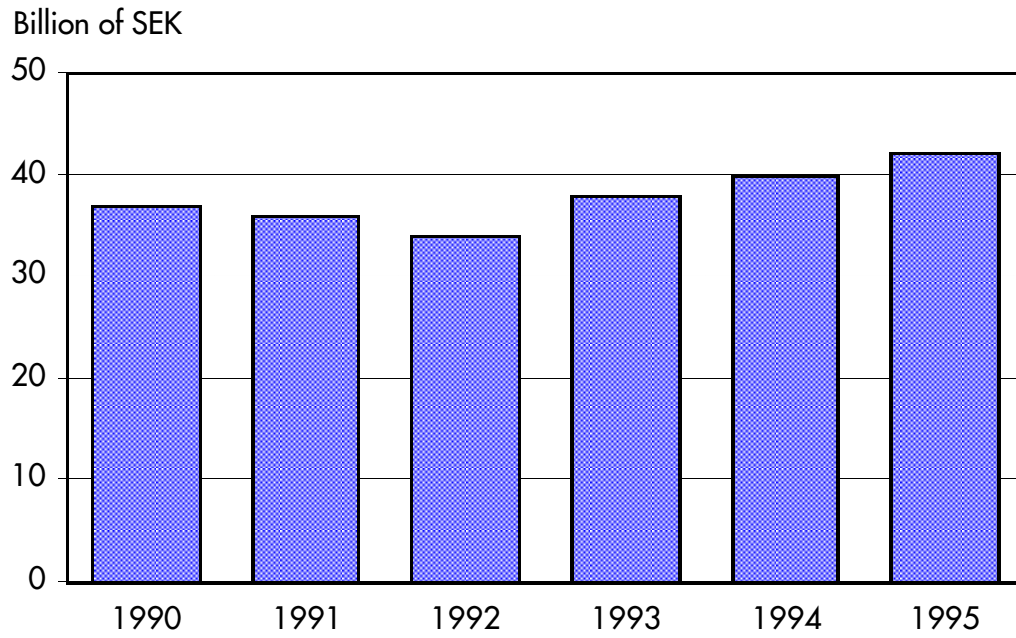
*Fig. 25 Feb 6: In September 1993, US vice president Al Gore launched the National Information Infrastructure, NII. Its aims at bringing the new developments in information and communication technology to all Americans. The project has grown into a Global Information Infrastructure, GII, and a number of countries have followed suit and launched their own versions of NIIs and GIIs. One important backbone structure in the GII is the Internet. Since the Net has become available also for commercial activities, US corporations in particular, are looking into new ways to increase business in the global structures. This is one of the reasons behind the increasing investment in IT in the US. Another reason is, that a number of studies recently have shown that increased efficiency is a result of using IT. Also see chapters 6 and 8.  
Sources: OECD/Business Week/The New York Times/The Washington Post/The Washington Times/Svenska Dagbladet 22 February 1997.*

## Investment and Job Creation in Selected Countries 1980 — 1990



*Fig. 25 Feb 19: The DTI report mentioned at the beginning of this chapter is confirming that analysis of macro-economic data from OECD tends to support a positive correlation between growth in information technology investment and overall productivity growth, as well as a positive correlation between information and communication technology investment and employment growth, as shown above. See also Fig. 25 Feb 15 and Fig. 25 Feb 6 above. Sources: OECD 1996 ITC Standardisation in the New Global Context/Department of Trade and Industry & Spectrum Strategy Consultants: Development of the Information Society — An International Analysis, 1996*

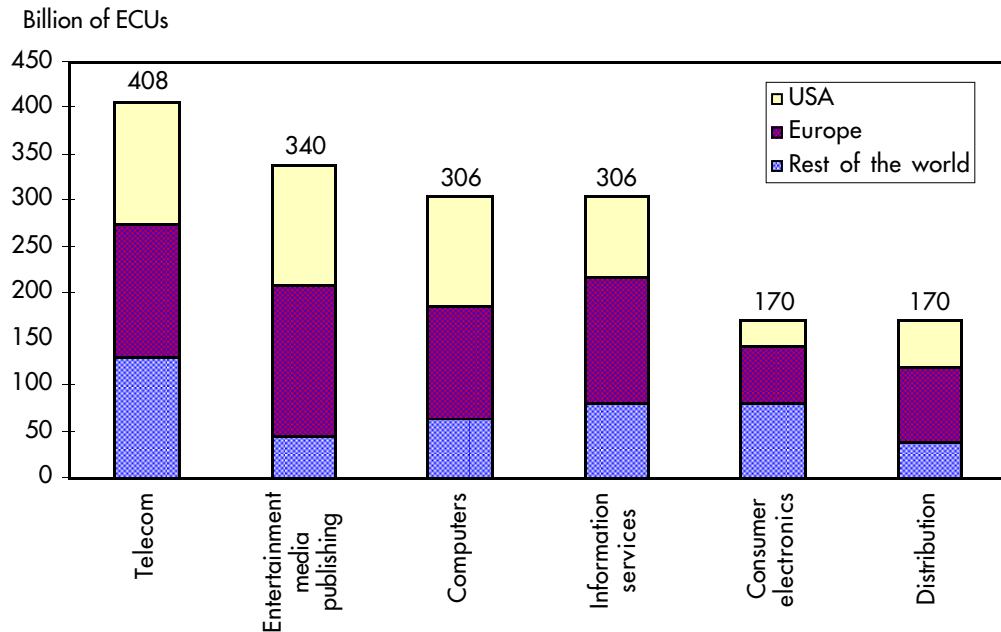
**Information Technology Investments in Sweden 1990 — 1995**  
**In billion of SEK**



*Fig. 2/22 april: This diagram shows investment in Sweden in information technology, which includes computer hardware, software, and services, but excludes telecommunications and fax.*

*Source: IDC/SITO*

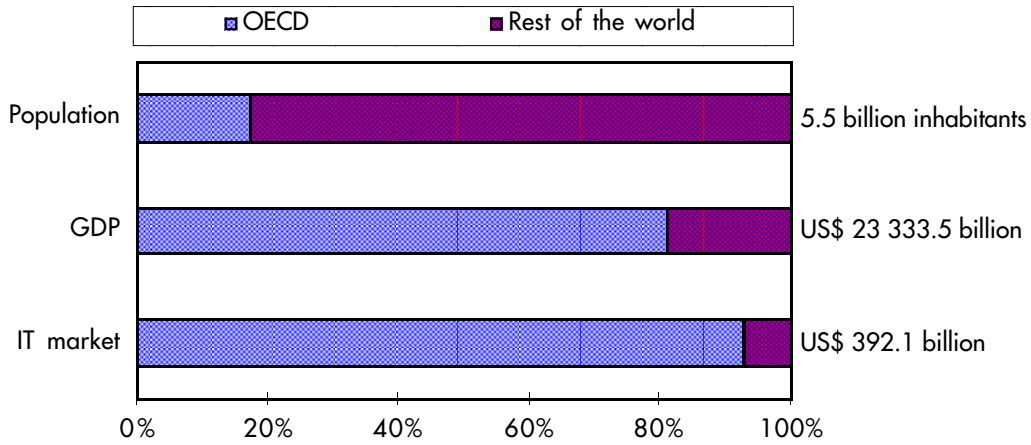
## The Global Information Industry Market in the 1990s



(Diagram 1:A:8): In the early 1990s, the global information industry had an appreciated total value of 1.7 trillion ECUs. This diagram shows the relative size of each market segment, as it can be related to the information society. The telecom industry is still the largest one, but the so called content industry, i.e. information, entertainment, media, publishing, film and video making, games, data bases, and maybe education, sometimes related to as edutainment, etc. is the one industry with the largest prospects of growth. According to a study by Veronis, Suhler & Associates Inc. in 1995, the US content market is growing by some 5% annually. Of these 5%, interactive digital media answers for more than 30%, and recorded music for almost 13%. Subscription video services represents almost 9%, while newspaper publishing not quite 2% of the total. Sources: Telia/SMG

\* According to the OECD (see Communications Outlook 1997, vol. 1), the public telecommunication services market produced estimated revenues of US\$ 519 billion in 1995, which should be compared to US\$ 458 billion in 1994. Between 1985 and 1995, the telecommunications services market grew by 3 — 4% per year, the pace accelerating in the latter half of the decade. **The global ICT market had a total value of US\$ 1 399.5 billion in 1996**, according to IDC. Telecommunications services generated 43% of the total value, computer hardware 20%, IT services 17%, telecommunication equipment and programs 8% each, networking hardware, and office equipment 2% each.

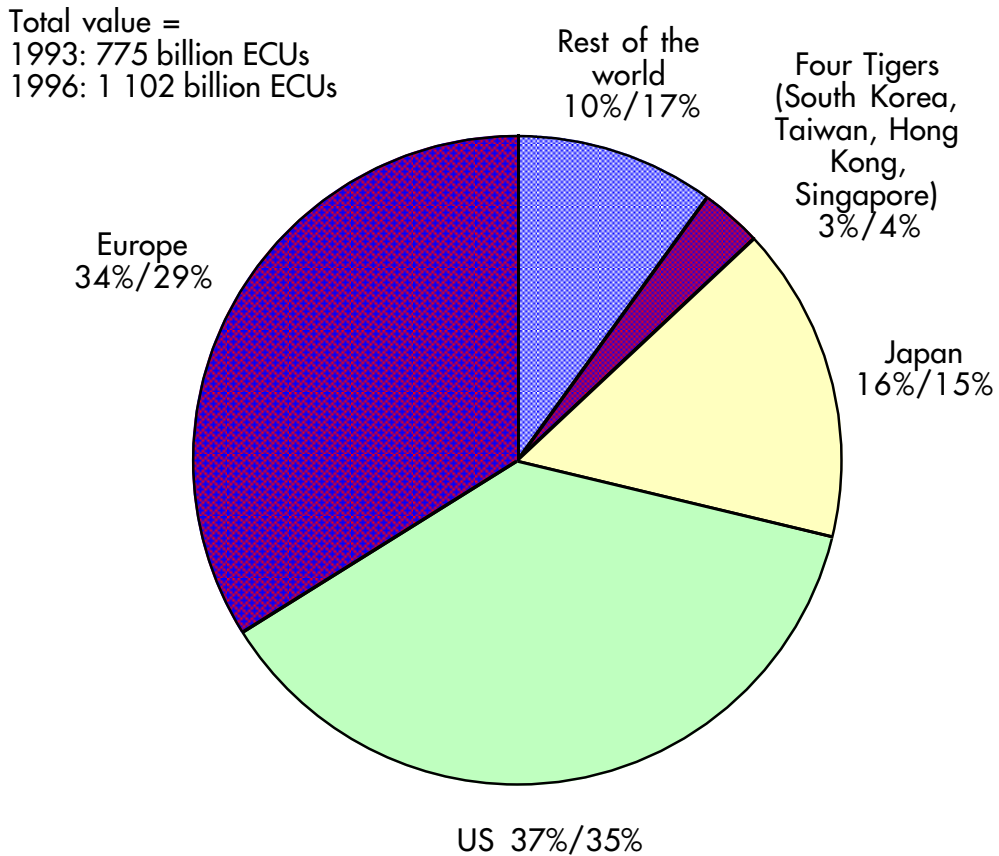
**OECD Member Countries as a Share of the World IT Market, in Percent 1993**



(Diagram 1:A:2): The world IT market, (IT defined as computer hardware, software, and services) as measured by the revenues of primary vendors in 1994, has been estimated to US\$ 432 billion by the OECD. The figure in this diagram, US\$ 392.1 billion, is based on an estimate made before the 1994 spending count, but the percentages remain unchanged. As can be seen from this global comparison between the percentages of the population related to the percentages of GDP and IT market, the OECD member countries correspond to 17.4% of the global population, to 81.1% of the global GDP, and to 92.9% of the IT market. For 1996, the discrete figures in this diagram have changed, but the relations expressed by the percentages of the global figures remain the same. The 68 signatory nations of the WTO agreement in December 1996 represent 90% of the global IST market.

Sources: Information Technology Outlook 1995/OECD Secretariat, based on IDC, IMF and OECD data, © OECD, Reproduced with the permission of the OECD

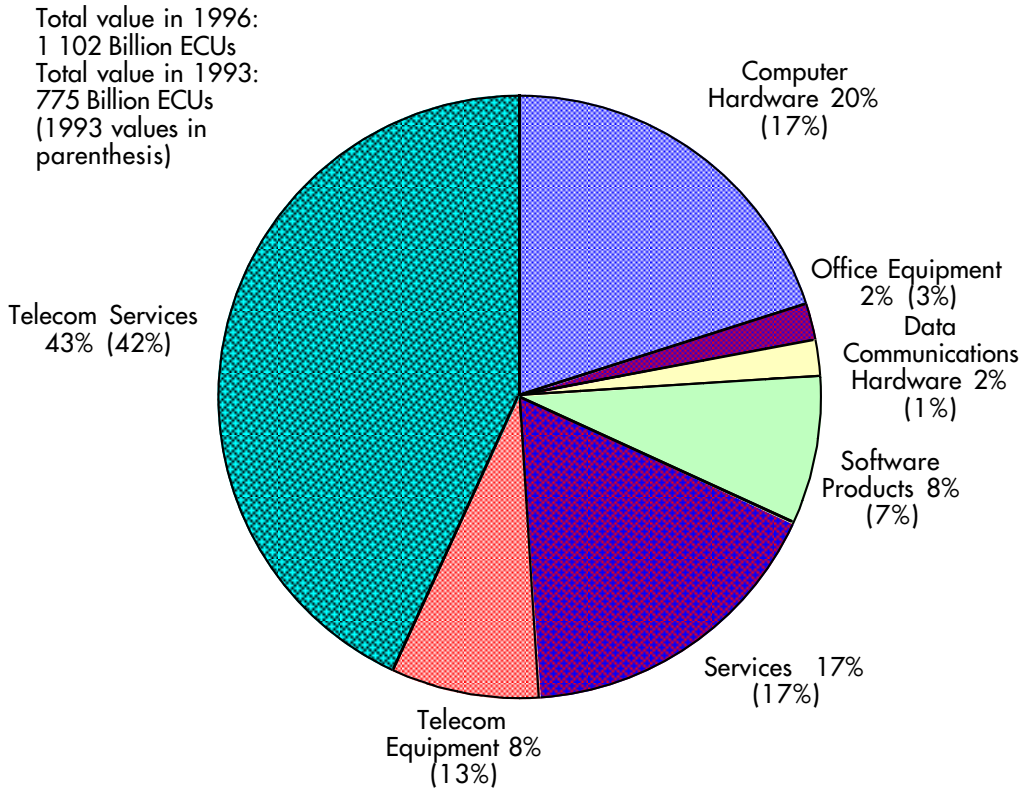
## The Global Information and Communication Technology Market by Region in 1993 and 1996



(Diagram 1:A:1) The dominant regions were the US, the EU, and Japan, making up 82%, or 635.5 billion ECUs, of the global value, 775 billion ECUs, of the information and communication technology market. In 1993, Sweden did not belong to the EU, and thus is included in the EFTA region. The exchange rate used for this diagram is from December 1992. 1 ECU = US\$ 1.29; ¥ 163.87; SEK 7.56. In 1992, IDC appreciated the global value of IT to 351 billion ECUs, however without providing a definition of IT. In 1996, the dominant regions were still the US, Europe, and Japan, responsible for 80% of the total market, as compared to 82% in 1993. By now, Europe is made up of the EU members and the non-EU members Norway and Switzerland. The rest of the world, including the growing economies of China and India, the Pacific Rim, and Australia, is the region marking the largest change from 1993 to 1996. The market shares of the US as well as of Japan are decreasing.

Sources: IDC/EITO:European Information Technology Observatory 94/European TechnologyThe Global Information and Communication

## Technology Market in 1996 compared to 1993 in Percent per Industry Sector



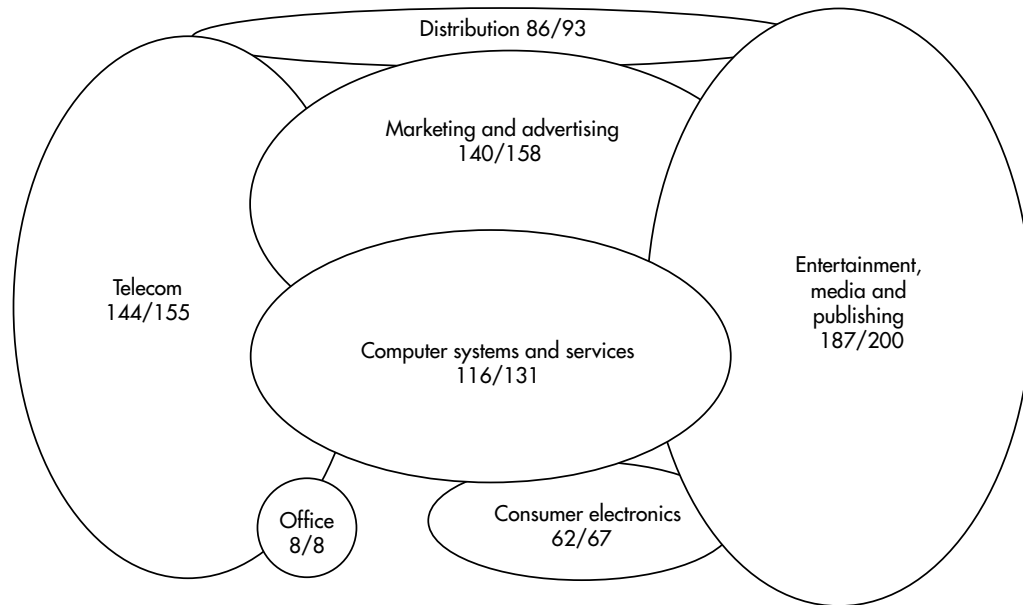
*Fig. Feb. I, (kap 2): In 1996, the global market for information and communications technologies as defined by EITO had a total value of 1 102 billion ECUs, which should be compared to 775 billion ECUs in 1993. This represents a compound growth of more than 42% over a period of three years. The percentual relationships between the industry sectors do not differ significantly, although the telecommunications sectors answered for 55% of the total value in 1993, compared to 51% in 1996. Within telecommunications, the majority of the revenue is generated by voice network services.*

*Sources: IDC/EITO: European Information Technology Observatory 94/ European Information Technology Observatory 97*

## The European Information Industry 1994 and 1995 Relative Size

Total value 1994: 743 billion ECUs

Total value 1995: 812 billion ECUs (1995 values after /)



(Diagram 1:A:9): In 1994, the total value of the European information industry was 743 billion ECUs as compared to 812 billion ECUs for 1995. The value of the US information industry at the same time was US\$ 635 billion, which is equivalent to approximately 819 billion ECUs (in the exchange rate of 1992, 1 ECU = US\$ 1.29, OECD). The global information technology market had a total value of 1.7 trillion ECUs. The two fastest growing areas are telecommunications and entertainment.

Source: EITO: European Information Technology Observatory 1995

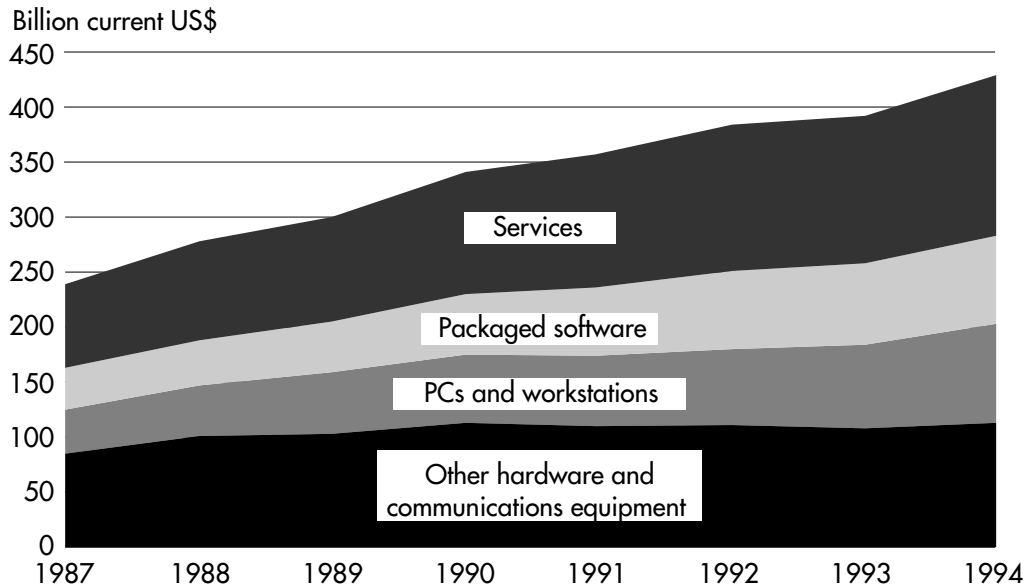
**The Western European Telecommunications Market  
by Country 1991 — 1995 in Million ECUs**

Country	1991	1992	1993	1994	1995	CAGR 91—93 %	CAGR 93—95 %
Austria	2 753	3 023	3 288	3 543	3 809	9.3	7.6
Belgium & Luxemburg	2 952	3 200	3 449	3 691	3 941	8.1	6.9
Denmark	2 166	2 345	2 552	2 764	2 974	8.5	8.0
Finland	1 228	1 325	1 404	1 477	1 536	6.9	4.6
France	19 317	20 545	21 856	23 339	24 728	6.4	6.4
Germany	29 802	33 639	36 335	39 275	42 621	10.4	8.3
Greece	1 113	1 153	1 188	1 219	1 248	3.3	2.5
Ireland	1 093	1 127	1 148	1 157	1 163	2.5	0.7
Italy	15 380	16 556	17 715	18 950	20 230	7.3	6.9
Netherlands	5 385	5 696	6 047	6 421	6 827	6.0	6.2
Norway	1 951	2 151	2 322	2 516	2 667	9.1	7.2
Portugal	830	933	1 029	1 113	1 172	11.4	6.7
Spain	9 268	9 415	9 825	10 411	11 006	3.0	5.8
<b>Sweden</b>	<b>5 374</b>	<b>5 648</b>	<b>5 867</b>	<b>6 095</b>	<b>6 388</b>	<b>4.5</b>	<b>4.3</b>
Switzerland	5 495	5 767	6 052	6 348	6 638	4.9	4.7
UK	19 910	20 311	20 932	21 631	22 299	2.5	3.2

*Fig. 18 Feb. 1: The table shows the telecommunications market per country in Western Europe in million of ECUs for 1991 to 1995, and the CAGRs for 91—93 and 93—95 per country in percent. More detailed information is available in "Communications Outlook 1997", vol 1, by the OECD, and in "The European Information Technology Observatory 97" by EITO. According to the latter, the total Western European telecommunications market had a value of 166.7 billion ECUs by 1996, is estimated to 178.9 billion ECUs for 1997, and to 191.3 billion ECUs in 1998. The total Western European ICT market as defined by EITO will be worth 337.6 billion ECUs in 1997, and 361.3 billion ECUs in 1998.*

*Source: EITO: European Information Technology Observatory 1995*

## The Worldwide IT Market by Segment 1987 — 1994



(Diagram 1:A:4): The OECD defines IT as hardware, software, and services related to computer processing. Since 1987, there has been a gradual shift in spending in the world IT markets, from hardware to software and services. These equalled the hardware spending in 1991, and by 1994, spending for software and services represented 52.2% of the total spending, or US\$ 224.6 billion.

Sources: Information Technology Outlook 1995/OECD Secretariat and IDC, © OECD, Reproduced with the permission of the OECD

\* In October 1996, the **international telecom traffic market** was estimated to an annual value of 10 billion US dollars. Some 800 million persons worldwide subscribed to telephone lines and telecom services.

Source: Ovum and IMF

## The Western European Telecommunications and Information Technology Market by Product Group in 1993 (EU & EFTA) and in 1996 for Europe



(Diagram 1:A:3) In 1993 the Western European (EU & EFTA) Information and Communications Technology market had a total value of 262 billion ECUs. 141 billion ECUs represented telecommunications equipment and services, while 121 billion ECUs worth came from traditional information technology categories such as office equipment, computer hardware and software, hardware maintenance and support, and services. The total 1996 values was 315 billion ECUs. The percental relations changed only marginally over the three year period.

Sources: EITO: European Information Technology Observatory 94/European Information Technology Observatory 97

- \* According to world population statistics, **more than half of the world's population lives more than two hours' travel time from the nearest telephone.** Vast regions are completely without telephone services. India, for instance, has 860 million people and about seven million telephone lines, all of them in the largest cities. At present, the cost for bringing modern communication facilities to poor and remote areas is so high that many of the world's citizens cannot participate in the global electronic community. However, the technology is there — satellites and "fixed wireless" can provide the technical solutions. It is now a matter of political decision making. So far, little is known about the developments of telecommunications – and its impact – in China.

Source: IMF

- \* Well functioning telecommunications are one of the prerequisites for global development and expansion, according to a study, carried out by Gallup on behalf of BT and MCI during the first half of 1996. According to this report, the global telecom market will have a turnover of more than 650 billion US dollars by the year 2000, and make up almost 2.5% of the global GNP;

Source: "Nätvärlden" # 6, 1996

### Communications Penetration by Country in Western Europe in 1993

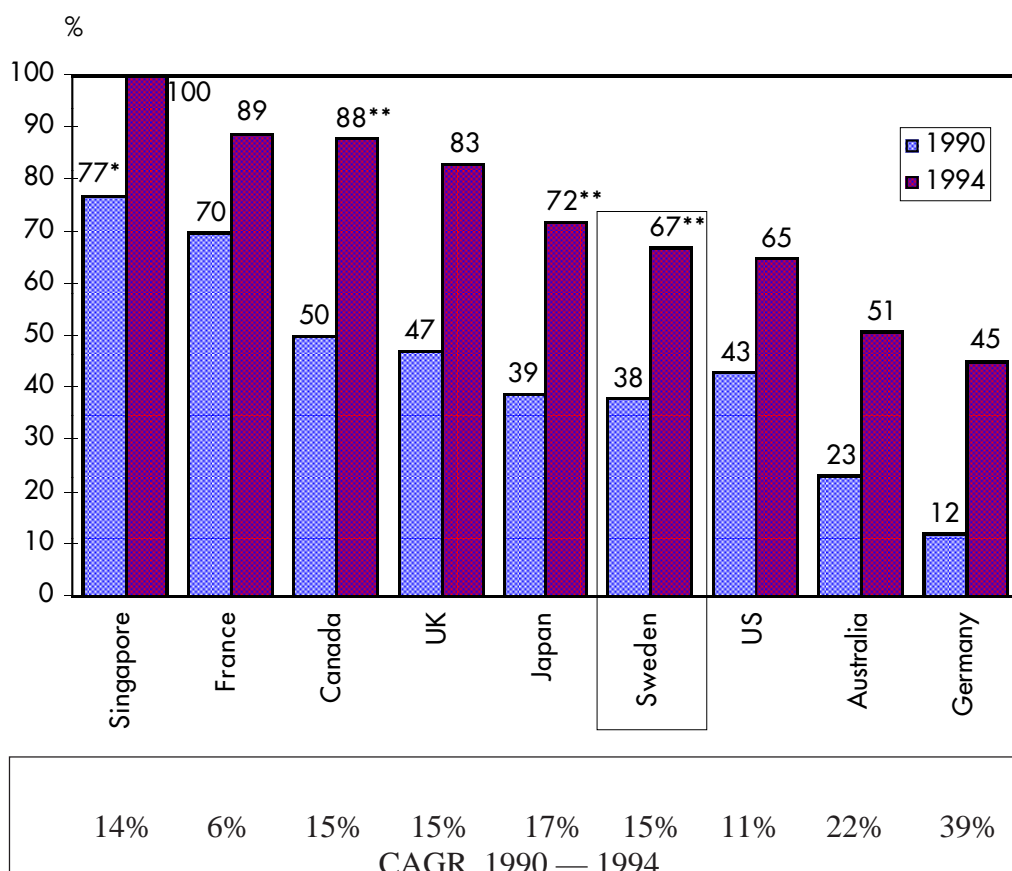
	Communications Investment/GDP %	PSTN lines per 100 inhabitants	Mobile Connections per 1,000 inhabitants	% Digitali- sation	Leased lines per 100 screen
Europe	0.7	45	12	58	7
Germany	0.8	41	7	85	4
France	0.4	51	7	80	7
UK	0.4	45	21	48	12
Italy	0.7	46	10	41	9
Spain	1.1	34	3	34	5
Austria	0.9	43	15	30	5
Belgium/Luxemburg	0.4	41	5	40	13
Denmark	0.3	58	31	34	7
Finland	0.6	54	63	90	10
Greece	0.8	41	1	6	2
Ireland	0.3	29	9	69	4
Netherlands	0.5	48	8	79	5
Norway	0.4	51	55	45	4
Portugal	1.0	27	1	25	4
<b>Sweden</b>	<b>0.5</b>	<b>69</b>	<b>66</b>	<b>47</b>	<b>7</b>
Switzerland	0.9	60	26	40	8

*Table 1:A:6: According to this comparison among Western European countries, based on input from 1993, Sweden has most telephone lines per capita, and the highest mobile telephone penetration. When it came to digitalisation, Finland was leading, and Belgium/Luxemburg were leading the "leased lines per 100 screens", i.e. cable television. The latter is considered important, because it will give access to advanced network services. In 1995, Sweden still had the most mainlines per 100 inhabitants, 68.1, and were among the leaders in mobile telephone penetration, with 2 008 000 mobile telephone subscribers to a population of 8.5 million.*

Sources: EITO: European Information Technology Observatory 94/OECD: Communications Outlook 97 © OECD – reproduced with the permission of the OECD

## Digitalisation of National Telecommunications Infrastructures, 1990 & 1994

In countries studied by DTI, in percent of total infrastructure



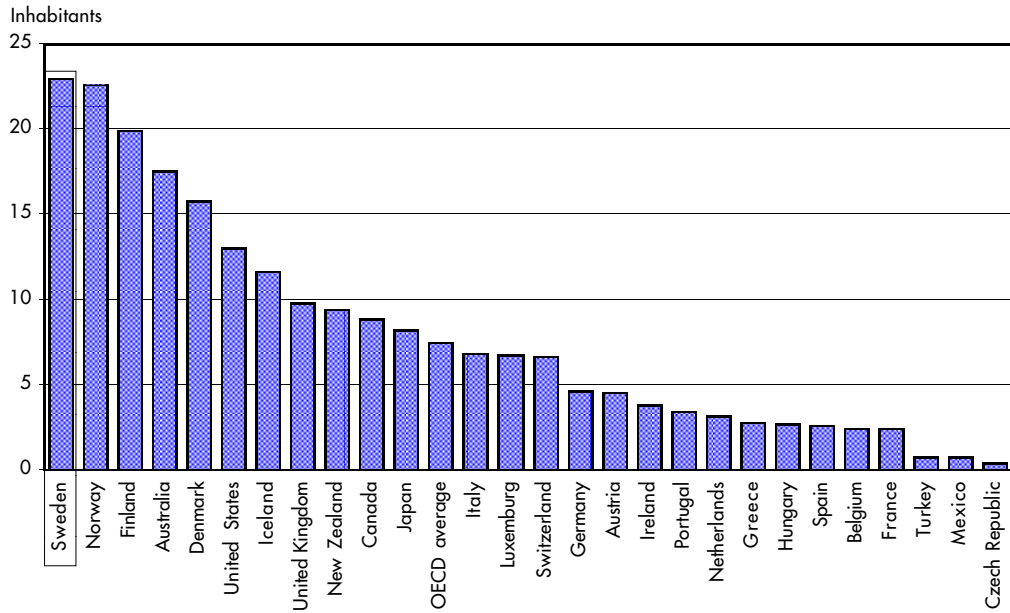
\* = 1992 data and growth rate

\*\* = 1994 estimates

*Fig 12 mars 8: According to the DTI researchers, network digitalisation is a significant indicator of the advancement towards the Information Society. The diagram shows the digitalisation in percent of total of the telecommunications infrastructure in the countries, studied by DTI, for 1990 and 1994. By 2000, all these countries plan to be 100% digital. In 1995, the OECD average digitalisation index was 82.84%.*

*Sources: © OECD 1995 Communications Outlook/ITU/ Spectrum analysis/Department of Trade and Industry & Spectrum: Development of the Information Society, 1996*

## Cellular Mobile Subscribers per 100 Inhabitants by 1995 in the OECD Countries



*Fig. 3/22 april: The diagram shows the number of cellular mobile subscribers per 100 inhabitants by the end of 1995 in the OECD countries. The market is growing very rapidly, by more than 50% in some countries.*

*Source: Communications Outlook 1997, vol.1, © OECD, reproduced by permission of the OECD*

### \* Global Mobile Telephones

From 1990 to 1994, the number of mobile telephone subscriptions has increased globally from 11.2 million to 54.8 million. According to Dataquest, there were 85 million subscribers to mobile telephones globally by the end of 1995. The growth rate in some regions is approximately 50%. The fastest growth is taking place in Asia. By 2000, some 350 million persons will be subscribers to mobile phone connections.

*Source: SCB: Data om informationstekniken i Sverige 1996/Dataquest/Computer Sweden, April 30, 1996*

**\* Mobile vs. Fixed Telecom Growth in the World**

In 1995, the global number of mobile telephone subscribers increased by more than 30 million to totally 85 million. By the end of the year, there were 88 331 970 subscribers to mobile telephones in the world. 83.9% of these lived in the OECD area. In Asia, the number of subscribers more than doubled, to 22 million subscribers. In Europe, the number of subscribers increased by 9 million to 23 million.

The largest market for mobile telephony is the U.S., having more than 40% of all subscribers in the world. During 1995, the number of mobile telephone users increased by 9 million to totally 33 million subscribers.

Norway and Sweden are competing about having the highest penetration rate, i.e. the largest percentage of mobile telephones related to the number of inhabitants. Early April 1996 some 23% of all Norwegians and Swedes were subscribers to mobile telephones. The per capita penetration rate in the U.S. was 13%, in the U.K. 10% and in Germany 5%.

*Source: OECD*

**GSM Available in 94 Countries to 4.34 Billion Persons**



*Fig. 1.1. The GSM standard for mobile telephony is the most widely distributed one in the world. 4.34 billion persons in 94 countries subscribed to the GSM services in early 1995. Mexico and Central America, the majority of Latin America, large parts of Africa, and central Asia are the (only) areas, where the standard had no coverage by early 1995.*

*Sources: Telia: Tele # 3/1995, Telia, Ericsson, and Motorola*

### \* GSM for Mobile Data Communications

According to the Swedish magazine "Ny teknik" # 1996:41, some of the GSM operators, among these Ericsson and Nokia, along with some computer manufacturers, such as Intel, Microsoft, and Compaq have started a collaborative effort to connect the system for mobile telephony to modems and portable computers. The objective is to make GSM more available to mobile data communication. Some telecom operators, like Telia, Mannesmann and Vodata, have joined the group.

*Source: Ny teknik-Teknisk tidskrift, # 1996:41*

### AMPS Available in 73 Countries to 3.01 Billion Persons



*Fig. 1.2. The American AMPS standard for mobile telephony was available to 3.01 billion persons in 73 countries worldwide early 1995. Europe, parts of Africa, the Middle East, India, and central Asia, is not covered by AMPS. The interesting question to the user is, of course, to what extent the two networks do collaborate.*

*Sources: Telia: Tele # 3/1995, Telia, Ericsson, and Motorola*

**\* European Mobile Growth Slows Down**

According to "Mobile Communications", the number of mobile telephone subscribers in Western Europe increased by 904 703 during September 1996. The total number of western European subscribers were 30.89 million. The net increase was 3.02% compared to 3.19% during August 1996, and 4.30% during July 1996.

Source: Svenska Dagbladet, Oct. 22, 1996

**The Cellular Market in Europe, Forecast Subscribers 1991 — 1997**

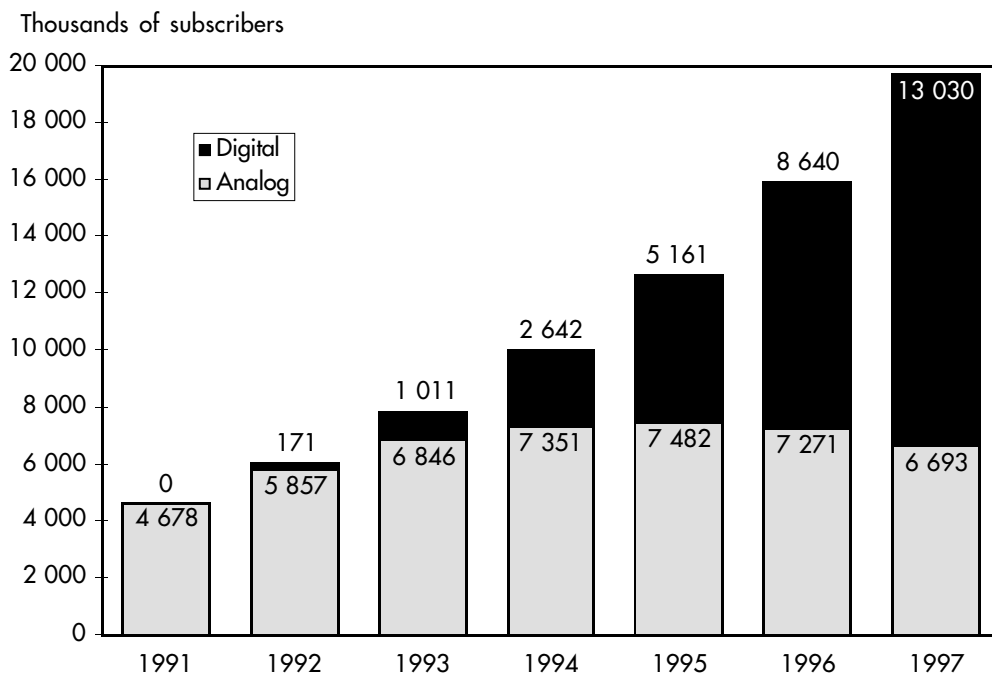


Fig. Feb. H (kap 2): The Western European cellular market as seen in 1994 by EITO. The number of subscribers are forecast for analog and digital systems users. By the end of 1995, 5.16% of Europe's 447 525 000 inhabitants were mobile subscribers, i.e. 23 092 290 Europeans.

Source: EITO: European Information Technology Observatory 94

\* **Global Computer Density**

In 1994, there was one computer per 350 inhabitants in all the world. This should be compared to the situation in 1965 — then there was one computer per 10 000 inhabitants.

Source: SCB: *Data om informationstekniken i Sverige 1996*

**Computer Penetration by Country in 1992**  
In percentage of GDP, and in ECUs

	IT/GDP %	IT per Capita ECUs	White collar per screen
Europe	1.93	313	1.8
EU	1.88	295	1.8
EFTA	2.35	501	1.8
Germany	1.94	361	1.6
France	2.00	362	1.8
UK	2.41	340	1.9
Italy	1.35	227	2.1
Spain	1.25	143	2.1
Austria	1.61	293	1.7
Belgium/Luxemburg	2.20	353	1.7
Denmark	2.60	554	1.4
Finland	2.02	352	1.6
Greece	0.73	43	2.5
Ireland	1.71	181	1.7
Netherlands	2.36	387	1.8
Norway	2.71	547	1.5
Portugal	1.20	79	2.5
<b>Sweden</b>	<b>2.59</b>	<b>574</b>	<b>1.8</b>
Switzerland	2.65	730	2.3
USA	2.83	501	1.2
Japan	2.04	229	4.3

*Fig. Feb. A.: The table shows the computer penetration in Europe, the EU, the EFTA, the Western European countries, the US and Japan. The penetration is given in percentage of GDP, in ECUs spent per capita on data processing equipment, and in number of white collar employees per computer screen in offices. Between 1982 and 1992, the Scandinavian countries led the European IT adaptation. In 1992, IT penetration suffered a general setback in all of Europe. The figures also show that the European IT market consists of several segments in different stages of development, depending on the national economic growth.*

Source: EITO: *European Information Technology Observatory 94*

## Global Notebook and PDA Market 1991 — 1997

Year	1991	1992	1993	1994	1995	1996	1997
<b>Notebook &amp; Subnotebook</b>							
Shipments (1000)	607.0	1 145.0	1 742.4	2 380.4	3 251.7	4 098.3	5 110.5
Revenues (Million ECUs)	2 171.9	3 971.6	4 809.5	5 666.1	6 484.3	6 950.3	7 679.0
<b>PDA</b>							
Shipments (1000)	0.0	0.0	9.0	30.0	65.0	125.0	195.0
Revenues (Million ECUs)	0.0	0.0	7.3	20.3	35.1	64.1	79.0

*Fig. Feb. G (kap 2) Mobile computing and mobile communications are moving closer and the two markets are merging. However, the majority of existing notebook computers have little communication ability away from the office. The diagram shows the total estimated notebook and PDA market from 1991 to 1997.*

*Source: EITO: European Information Technology Observatory 94*

- \* The major barriers to the progress of the full **merger of communications and computing technologies** are many. Miniaturisation of the electronic and mechanical components is one, maybe the one most easily overcome. Others are:
- + lack of international standards
  - + questions related to frequency allocations
  - + infrastructure — who is responsible?
  - + cost versus performance
  - + user acceptance.

Mobile communications, which are the heart of the products of the future, have to have global standards for

- + computer hardware
- + operating system software
- + communications hardware
- + communications infrastructure.

Also compare diagrams 1.1 and 1.2 of GSM and AMPS global availability.

*Sources: EITO, Telia, Ericsson*

## European Potential Market Development Versus Rest of the World

Technology	Europe	Japan	USA
Analog Cellular	—	+ —	+ —
Digital Cellular	+	+ —	—
Telepoint	+ —	+ —	—
International Paging	—	+	+
Packet Radio	+ —	—	+ —
Wireless LANs	+ —	—	+
Personal Computing	+ —	+ —	+ —

— = below average position

+ — = average position

+ = above average position

*Fig. Feb. J (kap 2): In 1994, EITO made the above comparison between Europe's market potential in some of the fastest growing information and communication technology areas, and that of Japan and the United States. Each region has one single area, in which its potential is superior to that of the others — for Europe, in digital cellular technology, for Japan, in international paging, and for the US, in wireless LANs.*

*Source: EITO: European Information Technology Observatory 94*

### \* New Customer Challenges and Demands

International telecom customers are challenging their international telecom operators by constantly increasing their demands for services, according to Ovum.

Any company with global operations are at least expecting

- that all telecom services are available globally
- that all services are the same and function in the same way anywhere in the world
- that IVPN services are available everywhere, i.e. a company wants to be able to connect their local switches to one corporate "internal" network
- 100% compatibility and seamless transgressions between all members in an alliance
- favourable pricing for operator loyalty
- flexible invoicing
- one single contact and service person.

*Source: Ovum*

## 2.2. The Industry Structures

The Ovum Telecoms Industry Alliances Map 1996

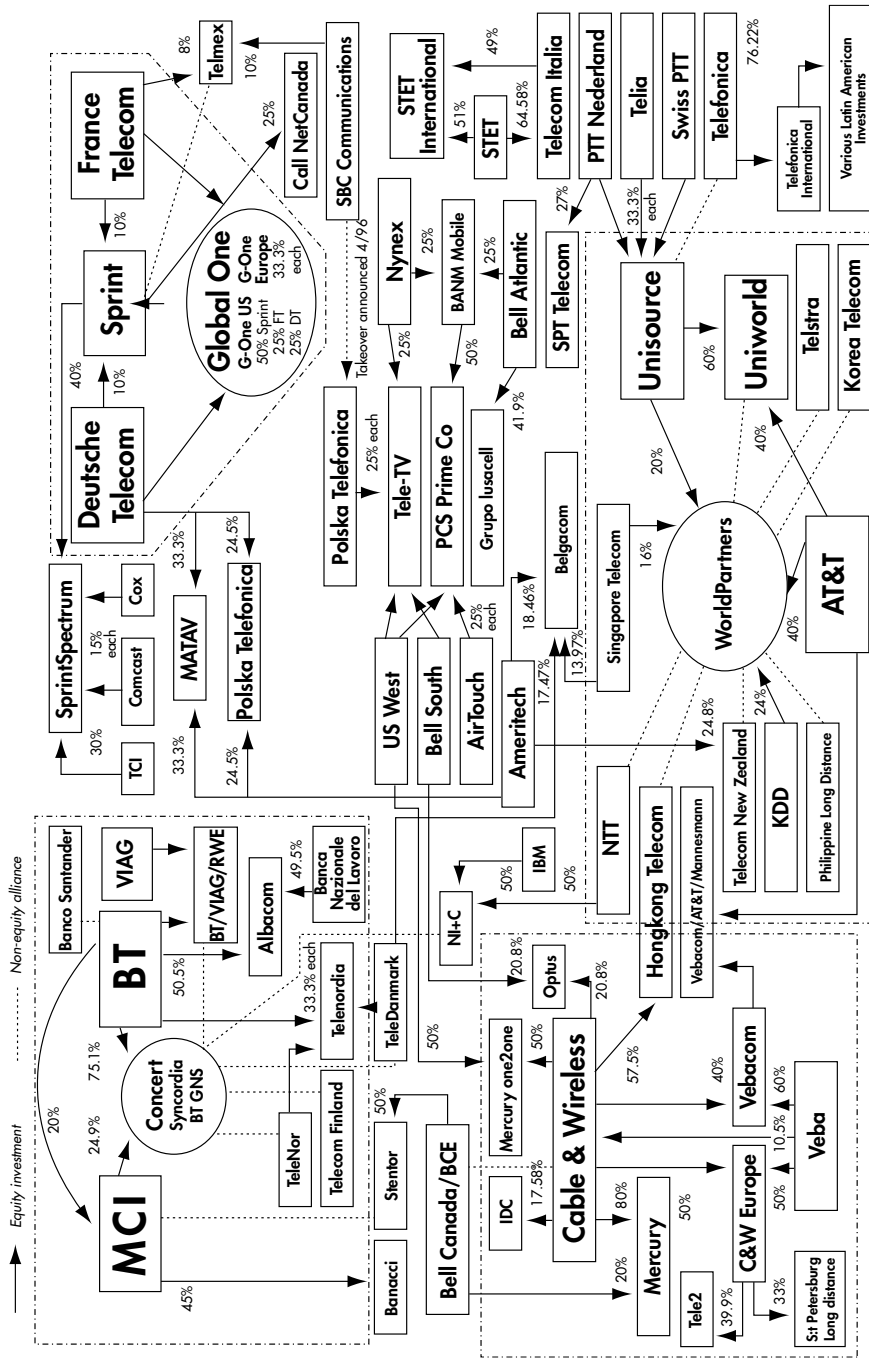


Fig. 1 The British telecom intelligence company Ovum has mapped the major telecom operators of the world and their strategic alliances. The most interesting fact is that not one single telecom operator is large enough to cope with global telecommunications on its own.

Source: Ovum

\* **You Have to be BIG, Real BIG, to Take on the WORLD...**

Today, not one single telecommunications operator, or any other organisation involved in ICT, is large enough to act as a single, global player, and actually being able to provide services worldwide.

*Sources: Several*

\* **Globalisation — Alliances**

So far, international telecommunications have been based on collaboration between national and international operators. Only few operators, AT&T, BT, and Cable & Wireless, have built their own global networks for telephony. Specialists in data transmission, like Infonet, MFS, and GEIS, having their own international networks, are expected to enter the competition for the telecom users as soon as deregulation is permitting;

*Source: Ovum*

\* **Globalisation — Three Leading Telecom Groups**

Three groups, formed through strategic alliances, are presently competing for global telecom dominance. The groups are: Concert, Global One, and World-partners.

**Concert** was formed in 1994 and is owned by BT (75.1%) and MCI (24.9%). BT also owns 20% of MCI.

Concert has formed strategic alliances and signed agreements for collaboration with local operators, making it possible for the group to cover Canada, USA, Mexico, UK, Norway, Denmark, Sweden, Finland, Spain, Italy, Germany, South Africa, Indonesia, Taiwan, Japan, and Australia.

In April 1997, it was announced that Spanish Telefónica leaves Unisource in order to join the BT and MCI alliance Concert.

**Global One** is owned by France Télécom, Deutsche Telekom, and Sprint. Sales are expected to exceed 800 million US dollars annually, and the overall growth is predicted to some 15 — 20%. The group has to have a permission to operate from the EU Commission, and the American FCC, due to the deregulation of the French and German local markets. Are they not deregulated by January 1, 1998, the group will lose their permission to operate.

**Worldpartners** was created in 1993 by AT&T, KDD, and Singapore Telecom. Later on, Unisource joined the group. The ownership is distributed as follows: AT&T — 40%, KDD — 24%, Unisource — 20%, Singapore Telecom — 16%. Worldpartners, a partnership based on non-exclusive agreements, has so far attracted a number of local operators, for instance Telstra in Australia, Telecom New Zealand International, Hongkong Telecom, Korea Telecom, Unitel in Canada, The Philippine Long Distance Telephone Company, Bezeq Israel Telecom, International Telecommunications Authority of Taiwan, Telkom South Africa, and NTT, Japan.

*Sources: Ovum and "Nätvärlden" # 6, 1996*

\* **KPN of the Netherlands + Swiss Telecom + Telia from Sweden = Unisource**

Unisource was founded in 1992 by Dutch KPN, Swiss Telecom, and Swedish Telia, and describes itself as "the first truly pan-European telecom company, providing telecommunication services to European corporations and individuals at work, on the move, or at home". The company has its headquarters in the Netherlands. **Spanish Telefónica belonged to Unisource from early 1996, when it got an OK from the European Commission to become a full member of the group, but in late April 1997, it announced that it is leaving in order to join the Concert group.**

In 1995, Unisource reported revenues of NGL 1.3 billion, had made investments of NGL 326 million, and had 2 229 employees. Unisource has a close collaboration agreement with AT&T, manifested by the formation of the company AT&T-Unisource Communication Services, having 450 employees, also based in the Netherlands. The group is one of the partners in the global alliance WorldPartners, jointly owned by American AT&T, Japanese KDD, Singapore Telecom, and Unisource. For more detailed information, see chapter 10.

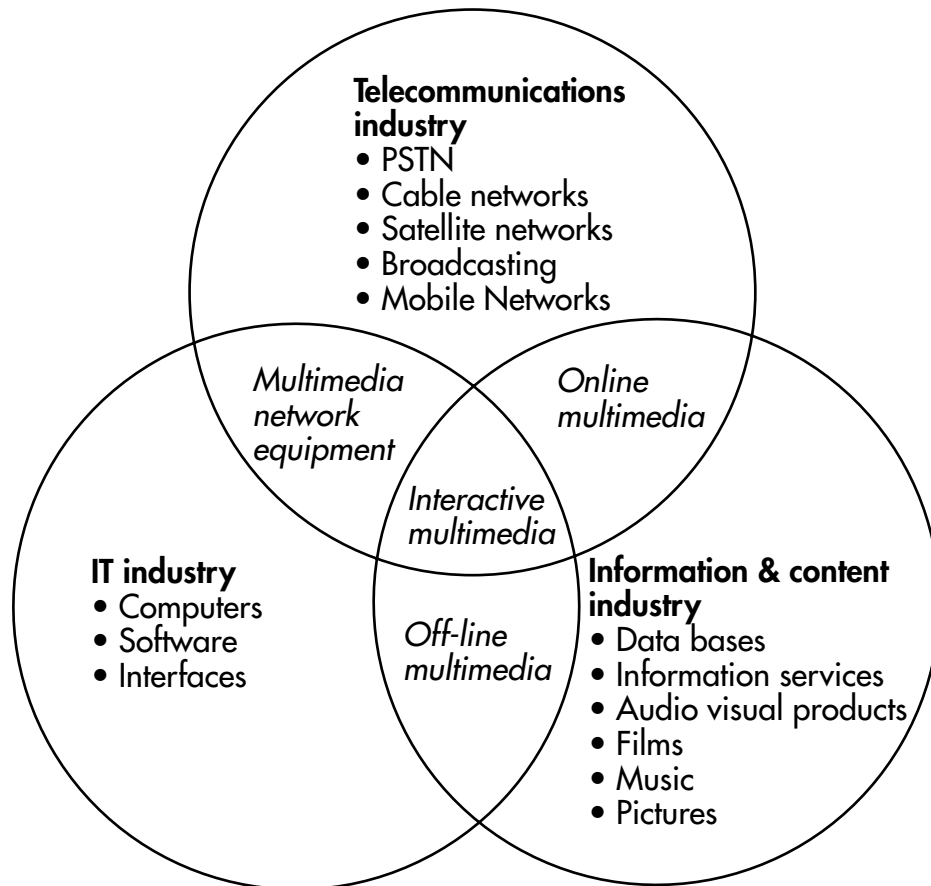
\* **Unisource + AT&T = Uniworld**

Unisource and AT&T, in turn, have agreed to form a global company, Uniworld, owned to 60% by Unisource and to 40% by AT&T. The objective of Uniworld is to create a European operator for business customers. Uniworld is planning to invest about 1 billion Swedish Crowns over the next five years. Uniworld will offer their customers the present business networks services, satellite and voice services of Unisource and the AT&T Business Communications Services Europe plus AT&T Easy Link Service.

*Source: "Nätvärlden" # 6, 1996*

## 2.3. The Market Structures

### The Information Society — A Result of Converging Technologies?

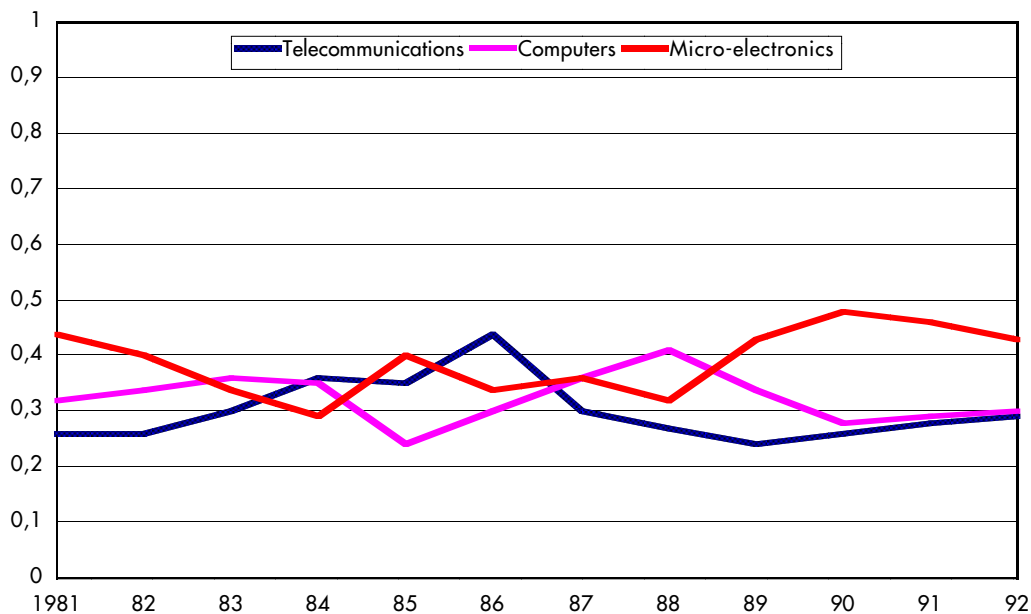


*(Diagram 1:A:7): This is a current model of how the convergence of the telecommunications and information technologies will result in the information society and in one single Information Society Technology market, IST.*

*Sources: DTI: Development of the Information Society, An International Analysis/OECD: 1996 Information Infrastructure Convergence and Pricing/Devotech: "Developpement d'un environnement multimedia en Europe"*

## Proportion of Strategic Alliances of Computer Companies with Partners From Telecommunications and Microelectronics 1981–1992

As proportion, 1 = 100% of alliances



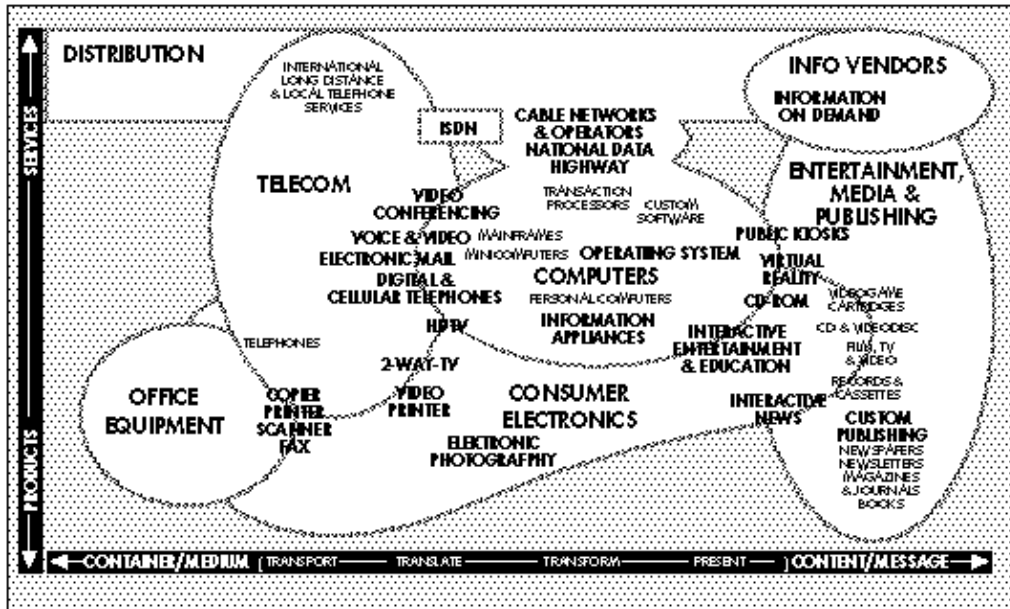
Three year moving averages. The data is based on a sample of leading IT manufacturers in computers, semiconductors, and telecommunications sectors.

*Fig. 25 Feb 17: Over the past 15 years, strategic alliances between companies in the information society technologies have become even more important to survival and success. There are several factors pushing this development, a few of them being related to the merger of technologies like microelectronics, computer science, media development, and telecommunications, and others being related to the development of new markets as a result of the merging technologies. The demand for new products and services in the media area is likely to see an even faster tendency to alliances in the years to come.*

*Mergers are considered especially important to industries under pressure to get new products and services to market swiftly. The diagram shows the development of strategic alliances for telecommunications, computers, and microelectronics during the period 1981 — 1992. The reader is advised to use the diagram as an indication of relations only, the data going back some time.*

*Sources: Duysters, 1995/OECD: Information Technology Outlook 1995 © OECD, reproduced with the permission of the OECD*

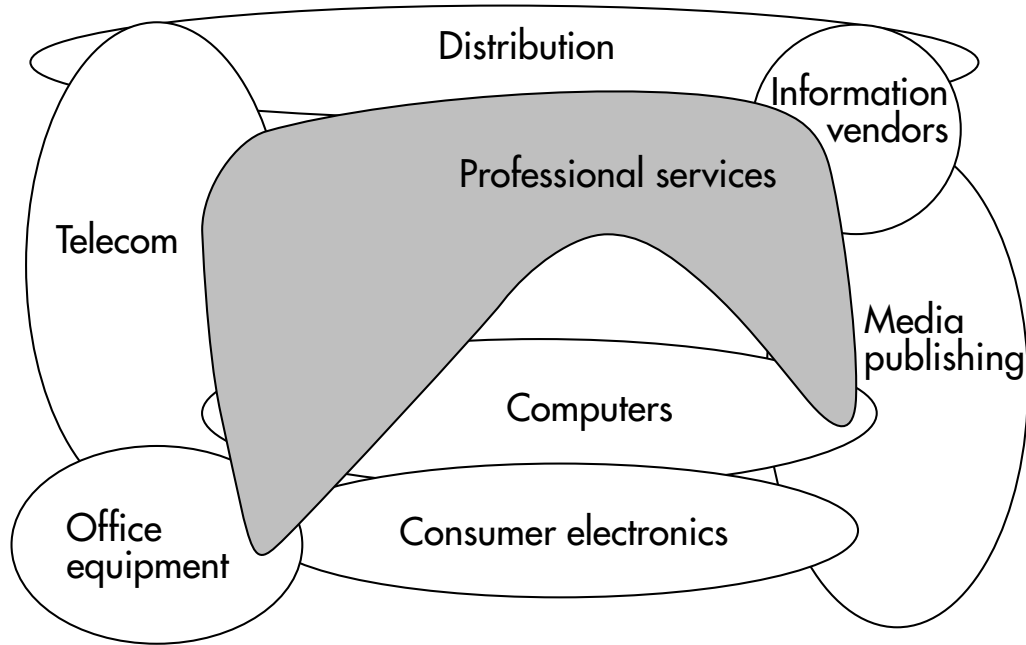
## The IT Industry in 2001



*Fig. 146: The telecommunications and IT industries are constantly creating new visions about the future. Thus, Apple Computers imagines that the users want products that can fulfill the demands according to this scheme by 2001. The number of technological opportunities for new products and services demonstrate an overwhelming growth, among others due to the fact that there are no longer borders among today's different technologies and industries. One cannot help wondering what a similar mapping of the Bill Gates Brave New World and his Teledesic project would look like!*

Sources: Apple/The Economist, February 27, 1993

## The Information Business Area



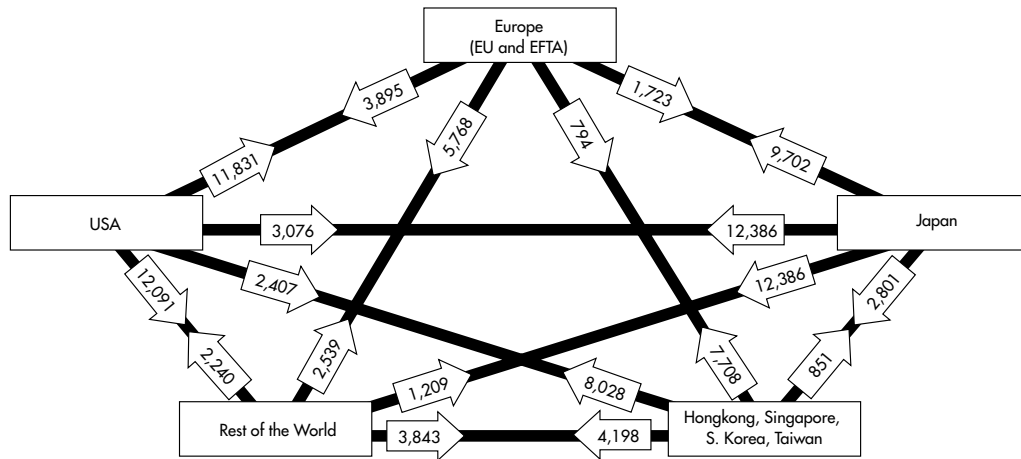
*(Diagram 1:A:10): These are the current information business areas, as seen by specialists at the Harvard University. The area of professional services is integrating into all of the other areas. Implicit is the rapid development in the microelectronics field, chips manufactured in VLSI design containing more than three million transistors and integration of many different technologies continuing. Also see chapter 9.2. The New Technologies. Moreover, this figure provides some of the backgrounds to the strategic alliances and the consortia, formed by the various players in the IST industries.*

*Sources: EITO/Harvard University*

## 2.4. The IST Business

### The Global Trade Flow of Information and Communication Technology Equipment in 1992

In million of ECUs



*Fig. Feb. C: In 1992, the trade balance between Europe and USA for information and communication technology equipment differed by a factor three — the US exported goods to Europe for a total value of 11 831 million ECUs, while the Europeans exported goods valued at 3 895 million ECUs. For the same period, exports between Japan and USA differed by a factor four — Japan exported for 12 386 million ECUs to the US, which in turn had an export equivalent to 3 076 million ECUs. The difference in exports between Japan and Europe is at a factor 5.6 — the Japanese exported goods at a value of 9 702 million ECUs to the Europeans, who in turn sold goods at a value of 1 723 million ECUs to the Japanese. The trade deficit for Europe between imports from and exports to non-European countries was 23 billion ECUs in 1992. The intra-European trade is dominating both imports and exports — 54% for imports, and 72% for exports. Specifically interesting is to note, that Europeans seem to prefer to trade with their neighbours rather than with the US, Japan, and the rest of the world.*

*Sources: Eurostat/EITO: European Information Technology Observatory 94*

- \* In 1995, the European Union member countries spent £5.1 billion on public sector procurement of hardware, and £10.5 billion on software and services.

*Sources: European Information Technology Office/Financial Times 7/2/96/DTI*

- \* The driving forces for changes in the information and communication technology markets are basically socio-economical. Europe is going through a period of economic instability, which, in combination with technology and competition and liberalisation developments, and evolving and ever more sophisticated user needs, are shaping and changing the future markets. Looking at the imports and exports of equipment for 1992, the diagram above points to several interesting facts. Two of these are:
  - intra-European exports dominate the European trade;
  - Europe had a total trade deficit of 23 billion ECUs.

Not shown in the diagram are the following facts:

- in the computer and office machinery segment, Europe had a trade deficit of some 19 billion ECUs;
- in the telecom equipment segment the trade balance was positive, by 252 million ECUs.

Source: EITO: European Information Technology Observatory 94

### Government Expenditure on Goods and Services as % of GDP in 1992 In countries studied by DTI

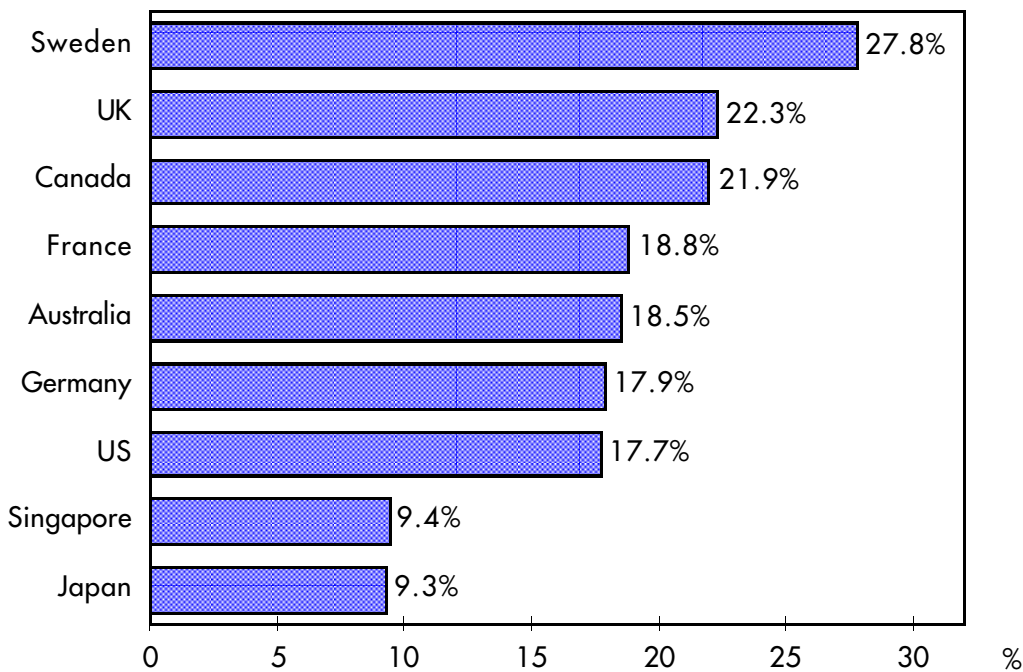


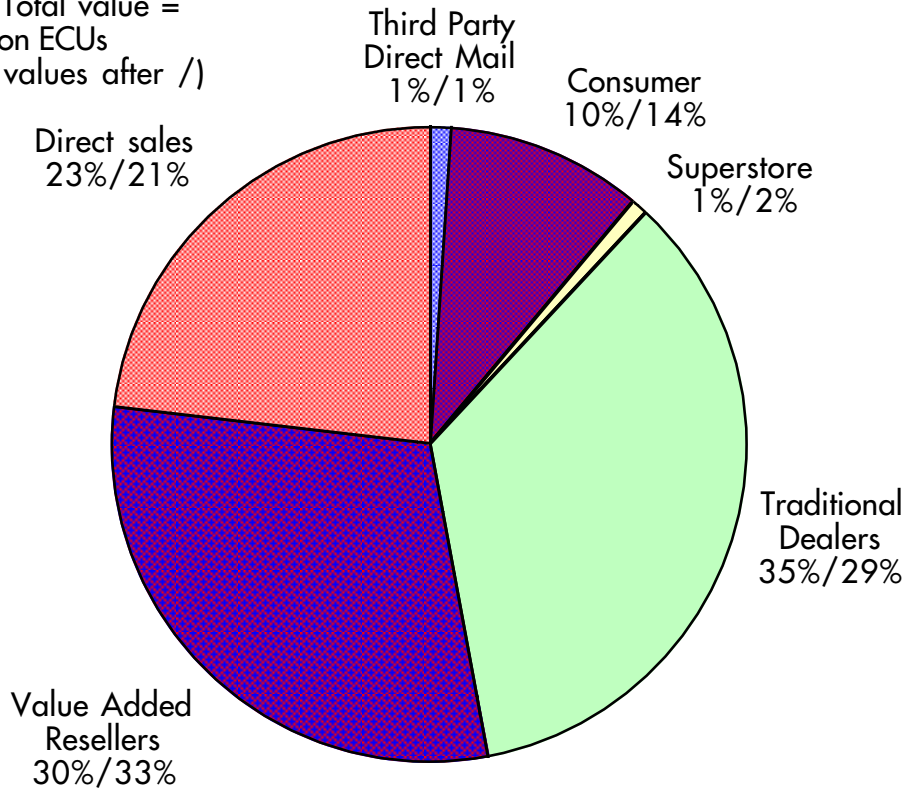
Fig. 12 mars 17: According to the researchers of the DTI, government represents a major element in the ICT economy. The government has double roles — as a user of ICT as well as a promoter. The Swedish government was the largest buyer of goods and services among the countries studied by the DTI.

Source: Department of Trade and Industry & Spectrum: Development of the Information Society. An International Analysis, 1996

- \* New distribution channels are regarded as essential to market share. The reasons are many. One is that the whole telecommunications and information technology market is moving from a so called professional market to a mass market. The suppliers follow these trends. Thus, it is possible to buy a telephone subscription along with your telephone in a specialised shop. In Sweden, anyone can buy a mobile telephone subscription along with a mobile pocket phone in numerous shops all over the country. And when you buy a modem for your PC in a PC shop, you can buy an Internet connection and a yearlong subscription along with it. But so far, the distribution channels seem to change rather slowly. In 1993, PC shipment in Western Europe at a total value of 18.4 billion ECUs, was distributed to 88% by what can be called traditional distribution channels — see diagram Feb. D below. The hype about Internet marketing has not quite lived up to expectations as yet, although software, CD-ROM-based music, and books have shown some signs of taking off. For Europeans, there are several problems to cope with for tranborder electronic shopping. One is to quickly translate the price you will have to pay from one currency to another. A second one is related to local VAT and customs — in reality, trade is nowhere as free as in theory. And, of course, there is the ever present security problem — I cannot be certain that my business card numbers are not misused. For more information about Internet shopping, see chapter 7.

## PC Shipment per Distribution Channel in Western Europe in 1993

1993: In percentage of total value = 18.4 billion ECUs  
 1995: Total value = 18 billion ECUs  
 (1995 values after /)



*Fig. Feb. D: In 1993, PC distribution in Western Europe still followed the traditional pattern. The diagram shows the value per channel in percent of the total value, which amounted to 18.4 billion ECUs. The picture of 1995 has not changed much. The total value of PCs distributed had decreased to 18 billion ECUs; the traditional dealers lost out to value added resellers, and direct sales. Sources: EITO: European Information Technology Observatory 94/European Information Technology Observatory 97*

### \* "Fixed Wireless" Networks

"Fixed wireless" networks geared for access rather than mobility are solving telecommunication problems all over the world, and fast. So, for instance as one example of bringing communications to many, Argentina announced in February 1994, that it was awarding licenses for the entire country to CTI, a GTE-led consortium. By May an 800-cell fixed wireless network that AT&T built for CTI was up and running, serving 160 000 subscribers.

*Source: Scientific American, September 1995*

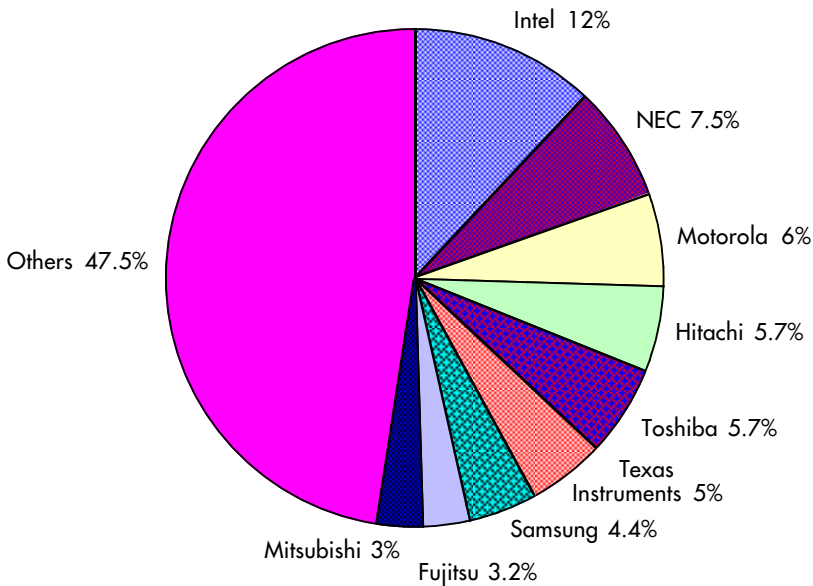
**\* Semiconductors — The New Global Basic Industry?**

The global microelectronics industry grew by 40% during 1995. About 30 new semiconductor factories are planned worldwide, each year. This is the direct result of the development of the ICT society, the semiconductor being its very heart. Or rather, brain. By the year 2000, the semiconductor industry will have an annual turnover of some 400 billion US dollars. Industry analysts with SGS-Thomson are projecting a doubling to 800 billion US dollars by 2010.

The distribution of semiconductors per application area were as follows by the end of 1995:

- computers 54%
- communication 17%
- consumer goods 18%
- industry 9%
- automobiles 4%
- military equipment < 1%

**The Leaders in Semiconductors in 1996**



*Fig. 28 april 1: According to the research firm Dataquest, the leading semiconductor manufacturers in 1996 were Intel, having 12% of the market; NEC 7.5%; Motorola 6%; Hitachi 5.7%; Toshiba 5.7%; Texas Instruments 5%; Samsung 4.4%; Fujitsu 3.2%, and Mitsubishi 3%. 47.5% of the market were provided by other companies, of which some are European. The world market for DRAMs is down, causing the whole semiconductor segment to decrease by 7% over 1995. The total turnover for 1996 was 945 billion SEK. Sources: Dataquest/Computer Sweden, 28 February 1997*

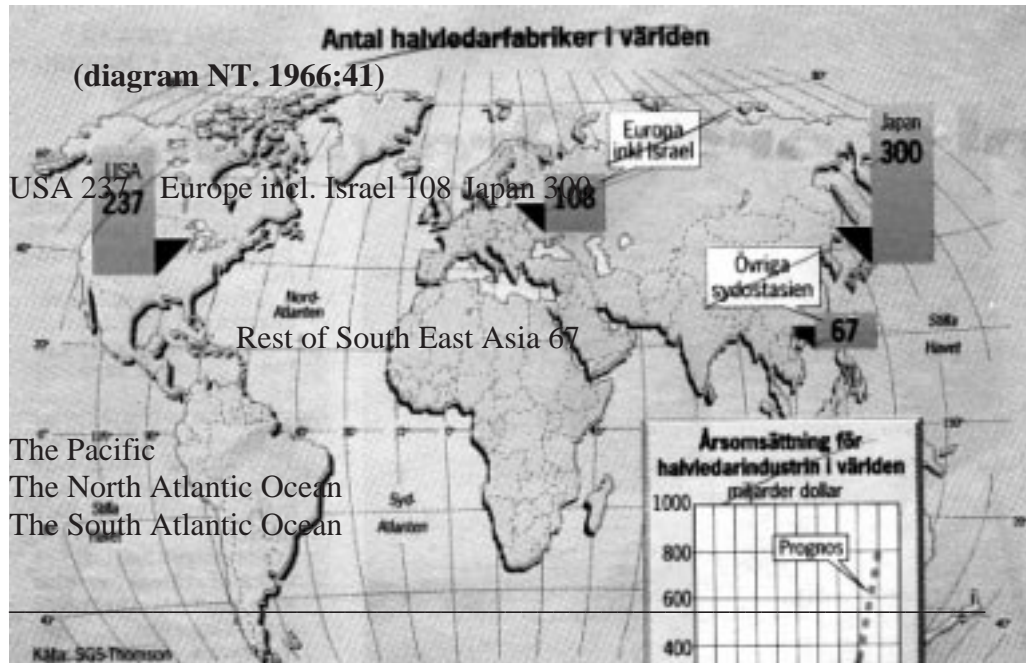
**Top 20 Semiconductor Companies in 1994**  
**Ranked after 1994 turnover in million US\$**

1. Intel	10 099
2. NEC	7 961
3. Toshiba	7 556
4. Motorola	7 238
5. Hitachi	6 644
6. Texas Instruments	5 552
7. Samsung	4 832
8. Fujitsu	3 869
9. Mitsubishi	3 772
10. IBM	3 035
11. Philips	2 920
12. Matsushita	2 896
13. SGS-Thomson	2 640
14. Sanyo	2 321
15. Sharp	2 188
16. AMD	2 134
17. Siemens	2 090
18. National Semiconductor	2 023
19. Sony	1 876
20. Goldstar	1 697
Other companies	27 237
<b>Total turnover</b>	<b>110 580</b>

*Fig. 25 Feb 16: This IT industry segment has not changed significantly over the past few years. There are, however, two interesting facts, that should be noted in this simple table. The one is that IBM is included, after having decided to supply semiconductors to the outside market, leaving AT&T's Lucent Technologies to cater still, to a single and captive market. The second fact is the advent of the Korean manufacturers in Samsung and Goldstar.*

*Sources: Dataquest/OECD: Information Technology Outlook 1995 ©OECD, reproduced with permission of the OECD*

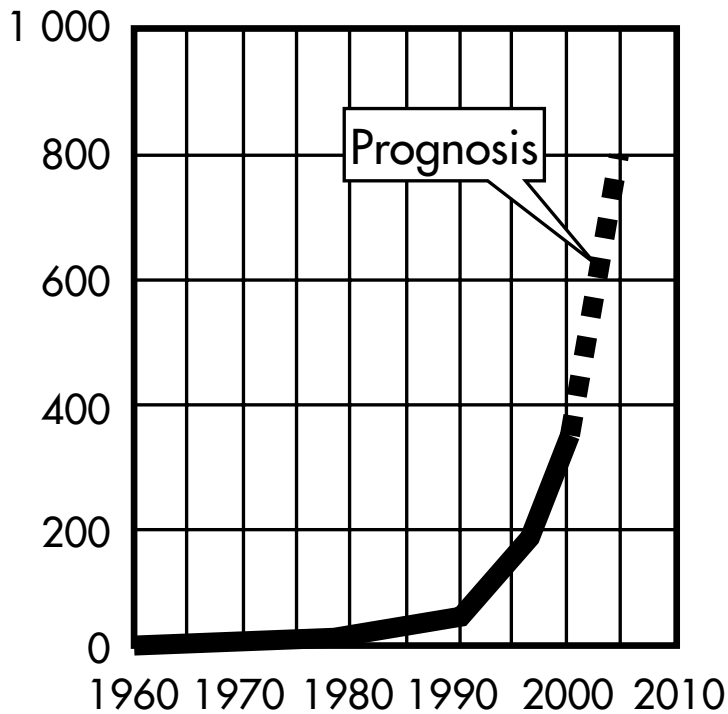
## Semiconductor Factories in the World 1995



*Fig NT:1996:41) Semiconductors are likely to be the new global basic industry. Today, 54% of all semiconductors are used by the computer industry, but the distribution of intelligence into all kinds of equipment, from home electronics to cars, along with increasing intelligence built into telecommunications networks and equipment will increase demand for semiconductors. The Japanese have seen this development early on, and the Americans have learnt from them, while the Europeans are the laggards, when it comes to investing in and building semiconductor factories. Sweden has three semiconductor factories .*

*Sources: Ny teknik 1996:41/SGS-Thomson*

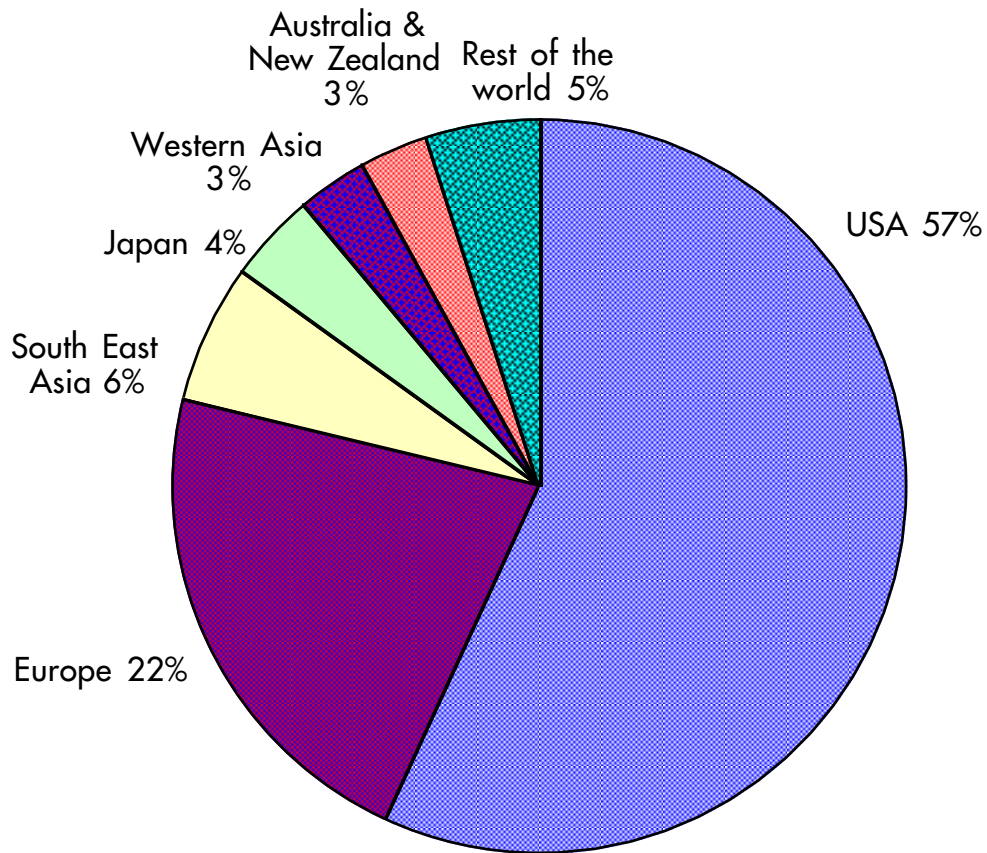
## Annual Turnover for the Global Semiconductor Industry 1960 — 2010



*Fig NT:1996:41:1 In the year 2005, the annual turnover for the global semiconductor industry is projected to some 800 billion US dollars. For 2000, the projection is 325 billion US dollars. In 1995, the global turnover was 144 billion US dollars. The microelectronics industry is rapidly becoming the new basic industry of this world, thanks to the development of the IST – the Global Information Society and its technologies.*

*Sources: Ny teknik 1996:41/SGS-Thomson*

## India — The Software Manufacturer of the Future?



*(Diagram 1:A:5) India is rapidly becoming the most important supplier of software to the large US and European software manufacturers. In 1985, India had less than 7 000 software specialists turning over the equivalent of 70 million SEK. In 1996, 140 000 persons were working in the software industry, exporting software code to a value equivalent to 8 billion SEK.*

*Sources: Ny teknik, 1996:46/Nasscom*

## 2.5. Current Standardisation Issues

*"The standardisation process in the information and communications technology area has become increasingly visible in recent policy discussions, as witnessed by the conclusions of the G-/ Ministerial Conference on the Information Society, held in Brussels on February 1995..."*

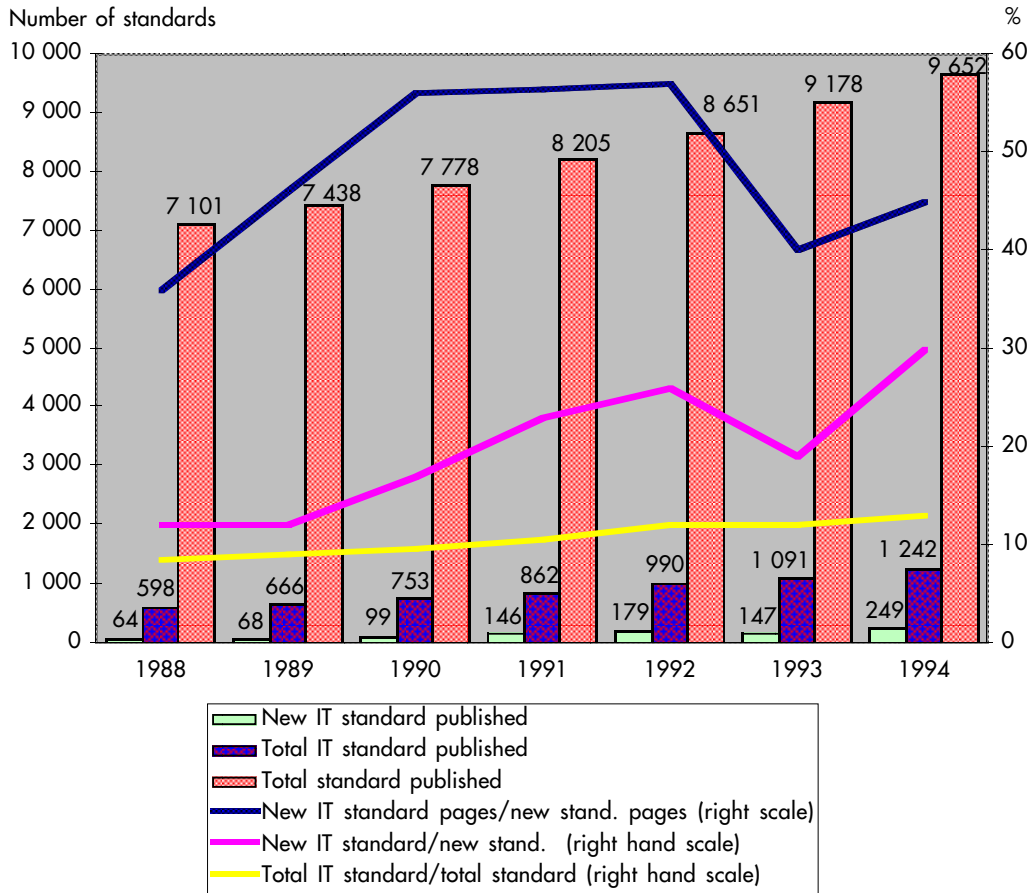
*Source: OECD: Information Technology Outlook 1995*

Within the European Union, standards are also debated, particularly in the wake of the "Bangemann Report" on the Information Society. At the OECD, a special group, the Ad Hoc Group of High-Level Industrial Experts on IT Standardisation, has brought forward a number of conclusions and recommendations, presented in "**ICT Standardisation in the Global Context**", published by OECD in 1996. OECD has dedicated itself to gaining a better understanding of the economic dimensions and processes of IT standardisation.

A number of joint efforts to tackle new and ever more complex standardisation questions are made by several international and national bodies. One example is the attention to new multimedia requirements given by the **Joint Technical Committee, JTC1**, of the **International Organisation for Standardisation, ISO**, and the **International Electrotechnical Commission, IEC**. They are looking at questions as diverse as coding of audio, picture, multimedia and hypermedia information, security questions at all levels, open electronic data interchange, image processing, interconnection of information technology equipment, just to mention a few.

In several OECD member countries informal standard fora have been established. In USA, the **Information Infrastructure Standards Panel**, is working under the aegis of the **American National Standards Institute, ANSI**, to facilitate consensus among all partners involved.

## Compound Evolution in Number of the International Standards Published in 1988 — 1994



*Fig. 25 Feb. 1: The number of international standards published from 1988 to 1994, and the number of pages of technical text, is given in this diagram. This data reflect a quantitative slowdown in the development of standardisation activities in some IT areas. This may reflect the impact of economic difficulties in many firms. The total number of standards is growing, however, because IT applications have become increasingly essential to all industry sectors.*

*Sources: International Organisation for Standardisation/OECD: Information Technology Outlook 1995, © OECD, Reproduced with the permission of the OECD*

## 2.6. Do You Know This About Telecommunications and ICT Standards?

- \* Nine of the largest electronics companies in the world have agreed upon a common technical standard for the new CD-ROM video disc, the **Digital Video Disc, DVD**. The companies will launch the new standardised discs as the "ideal digital storage medium for the multimedia era". The agreement will cover development and production of DVD players for video, and DVD-ROM readers for personal computers. DVD players will also play regular audio CD-ROMs. A standard for music is under development. DVD stores information on both sides and can contain 4.7 gigabyte per side, i.e. 133 minutes of pictures and sound. A conventional CD-ROM can store 650 megabyte. Toshiba, Sony, and Philips are three of the partners.

*Source: Svenska Dagbladet, 9 december, 1995*

- \* The American standard for digital mobile telephony will be introduced as the **Japanese standard** during 1998. The number of subscribers is increasing so rapidly that broadband transmission is needed for the network to function without friction. According to the MITI, there will be some 45 million subscribers in Japan by 2000.

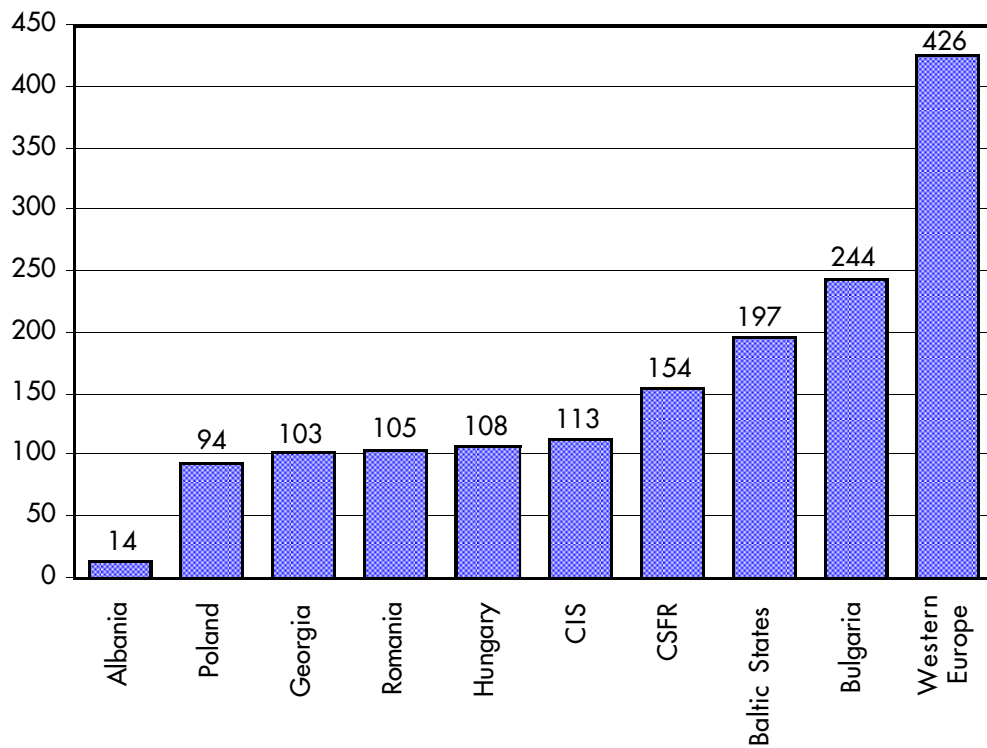
*Source: Ny teknik, 1997:9*

## 2.8. Do You Know This About Information and Communications Technology in the World?

### Some Facts About Telecommunications and ICT in the Former Eastern Block

The majority of the former east block countries launched telecommunications modernisation programs during the years immediately after the fall of the Berlin wall, i.e. in 1991 to 1993. The PTTs have concentrated on quick solutions to some of the most urgent problems, directing investment towards overlay networks, cellular communications, and international gateways for majors business centres. The following diagrams describe the telecommunications situation per country.

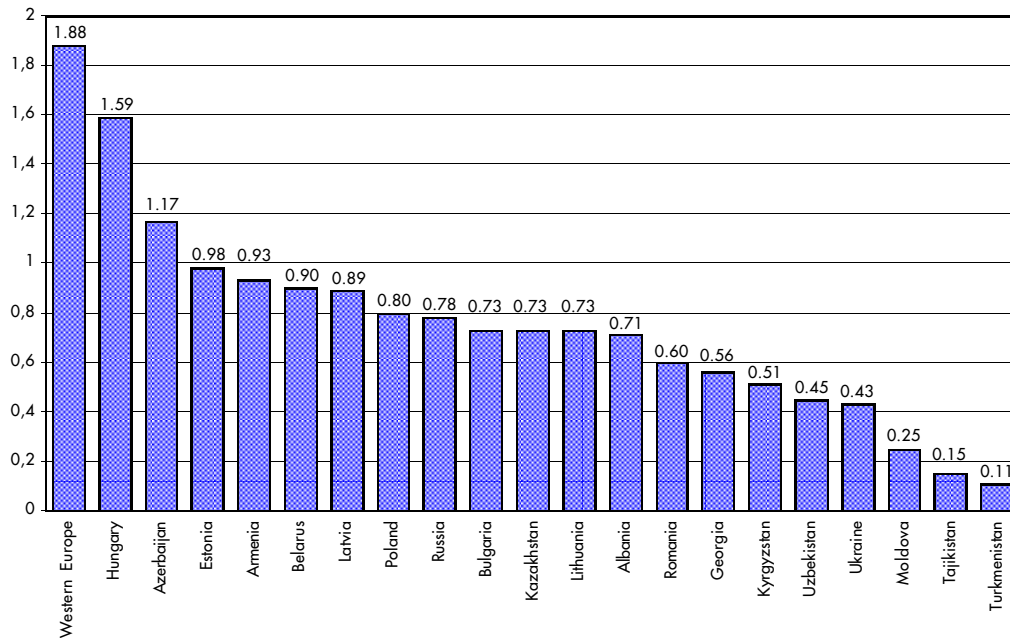
### Telephone Lines Per 1 000 Inhabitants in 1991



*Fig. 18 Feb. 3: The diagram shows the number of telecommunications lines per 1 000 inhabitants in the former eastern block countries in comparison to western Europe. The modernisation of the telecommunications infrastructure is a must for economic reform. Approximately 200 billion ECUs of infrastructural investment will be needed for the eastern countries to reach the same penetration level as western Europe.*

*Sources: ITU, OECD, EITO*

## Telecommunications Revenue in Percentage of GDP in Former Eastern Block Countries for 1991



*Fig. 18 Feb. 5: The compounded average western European telecommunications revenues in percentage of GDP amounts to 1.88%, which is compared to the percentage of GDP per country in the former eastern block in this diagram.*

*Sources: ITU, OECD, EITO*

## Telecommunications Network Development Plans for Eastern Europe in 1993

Country	Gateway	Cellular	Overlay
Armenia	E	N	P
Azerbaijan	P	N	P
Belarus	E	N	N
Georgia	P	N	N
Kazakhstan	E	N	P
Kyrgyzstan	P	N	N
Moldova	P	P	N
Russia	E	E	P
Tajikistan	P	N	N
Turkmenistan	P	N	N
Ukraine	E	P	E
Uzbekistan	P	N	N
Estonia	E	E	P
Latvia	E	E	E
Lithuania	E	E	P
Czech Republic	E	E	E
Slovak Republic	P	E	E
Hungary	E	E	P
Poland	E	E	E

*Fig. 18 Feb.7: The keys to this table are as follows: E = established; P = planned; N = none. The availability of financing and investment are the major keys to the modernisation of the telecommunications networks of the eastern countries.*

*Sources: Business Central Europe, 1993/EITO*

- \* The **German telecom market** will be deregulated by January 1, 1998. Before that, Deutsche Telekom will be privatised. A number of pilot projects are being carried out by various new consortia and alliances in order to find out what services users are willing to pay for. The diagram below show the top ten fastest growing services and their estimated growth rates in Germany.

**Top 10 Growth Areas for Deutsche Telekom  
Change in turnover in percent compared to previous year**

ISDN	+ 79%
Networks	+ 43%
Text TV	+ 24%
Information & brookerage services	+ 23%
Picture communication	+ 22%
Fixed lines	+ 21%
Cable connections	+ 17%
Telephony, business switches	+ 10%
Audiovision	+ 8%
Analog telephony services	+ 4%

*Fig. 25 Feb 11: ISDN is the top growth area for Deutsche Telekom. The reason for this is that the majority of the Germans see multimedia services as a great opportunity for development. See following diagram.*

*Source: Computer Sweden, 21 February 1997*

**Multimedia** is one of the techniques that are looked at and seemingly received with a positive interest by the Germans. About half of the German working population is employed in areas dependent on information technology. In 2000, two thirds of all working Germans will be involved in IT. Thus training and learning are big future markets, and in these multimedia will serve well. This is according to the report "IT- och multimedietjänster" (IT and Multimedia Services) compiled by STATT, The Swedish Office of Science and Technology.

## Multimedia the Future for Deregulated Germany?

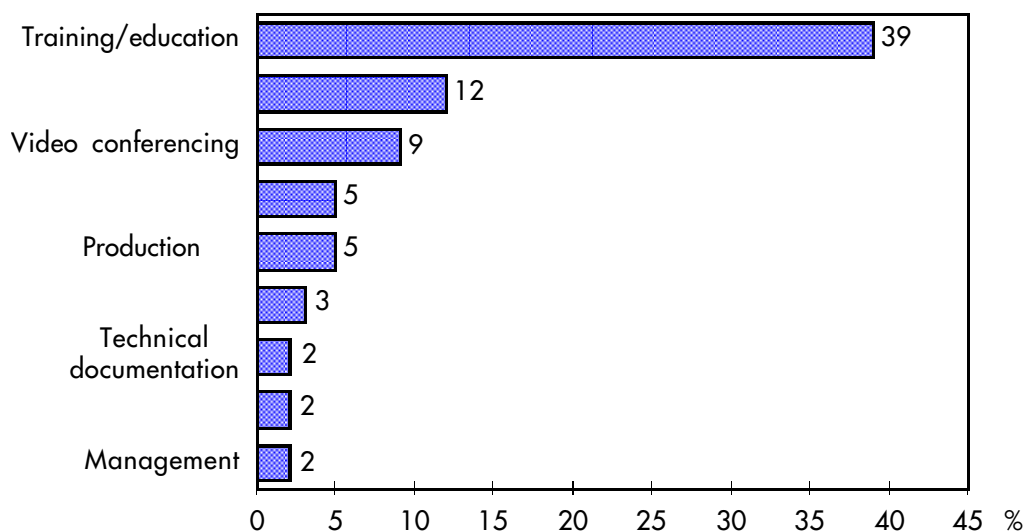


Fig. Feb. 18 9: (kap 3): Predicted distribution of multimedia services in Germany after deregulation in January 1998. The diagram is based on the responses of interviewed Germans in 1996.

Sources: STATT: <http://www.swetech.se/Dagens IT>, February 18, 1997

- \* One of the many myths created by politicians and related to telecom is that this industry should create a number of new jobs. Facts from real life do not support this particular myth, to the contrary: The number of employees of telecom operators has decreased by 30% from 1990 to 1993.

Source: SCB: *Data om informationstekniken i Sverige 1996*

- \* The Internet will be the death of print publishing. So far, however, the major effect has been to inspire the release of hundreds of books for the computer shelves. A myth as effective as the one about the paper less office?

Sources: *Several*

- \* "'Most' old computers cannot cope with dates after 1999, so they will 'crash' as the clock chimes midnight for the year 2000."

- \* **A Personal Computer Is a MUST for Americans**

The personal computer, the PC, is being regarded as an absolute must by 90% of all Americans, according to a study made by the Yankelovich Partners for Intel. Nine out of ten Americans said that the PC is a must at work as well as at home. This means that IT is number three on the American list of absolute "musts" for an acceptable life, medical care, and agriculture being number one and two. And IT is regarded as more important than a strong defence and transportation systems.

Sources: *Yankelovich Partners/Computer Sweden 28 February 1997*

\* **GSM 1800 to One Million Chinese Subscribers**

Ericsson has been appointed to deliver a GSM 1800 system for mobile telecommunications to one million subscribers in the North Eastern part of China.

*Source: Computer Sweden 22 April, 1997*

One source of this urban myth, which has gathered momentum over the past four years, is the English Member of Parliament, Mr David Atkinson, MP for Bournemouth East, who has written to the British Prime Minister to ask if he is aware of the problems which now face the British industry. When asked to name any make or model that will crash, Mr Atkinson responds:

"I am no IT expert, but I have been advised that the vast majority will crash".

The Prime Minister has referred the question to a government committee, which will report and give 'guidance'.

*Source: New Scientist, 13 January 1996*