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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

on the IMPACT Programme (EC plan of action for setting up
an information services market) : Report on main
events and developments on the electronic information
services markets in 1989 and 1990

1. **This Communication concerns the IMPACT Programme (EC plan of action for setting up an information services market) adopted by Council Decision 88/524/EEC of 26 July 1988.**
2. **In conformity with Article 5 of Council Decision 88/524/EEC, a report has been prepared on the most important events and developments which occurred in the information market in 1989 and 1990 and is attached to this Communication. A similar report, covering the state of the market as at the end of 1988, was forwarded to the European Parliament and to the Council as Annex III of doc. SEC(90) 1788 final, dated 24 September 1990.**
3. **This second report, based on data collected in 1990, reviews the most important trends identified over the period 1989-1990 within the following sectors:**

**online ASCII database services,
videotex services,
fax-based and audiotex services,
CD-ROM publishing.**
4. **The report confirms the findings of the previous report to some extent:**
 - **The gap between the size of the Community information services market and that of the US market is narrowing only slowly.**
 - **The Community produces only half as many databases as the US.**
 - **Professional and consumer expenditures on electronic information services and products (including videotex and audiotex services and CD-ROM titles) in the EEC are only half of those in the US.**
 - **The European information services market is still very fragmented chiefly as a result of technical, legal and linguistic barriers.**
 - **Notwithstanding positive signs of growth, productivity and exports, the sector is actually profitable for only half of its operators.**
 - **There remains a significant disparity between Member States in the use and supply of electronic information services.**
 - **Most information providers operate only on a national basis.**
5. **The report underlines two major trends which were already identified last year:**
 - **Videotex, audiotex and fax-based information services are paving the way towards mass-market applications and services: the 143 million telephone lines, more than 6 million videotex terminals and 2.5 million fax machines are creating new opportunities for a Community-wide information services market.**
 - **The prospect of the Single Market is stimulating a new demand for Community-wide information, particularly in the areas of market data, mailing lists, credit ratings and company information.**

- 10.05 -

REPORT ON MAIN EVENTS AND DEVELOPMENTS ON THE ELECTRONIC INFORMATION SERVICES MARKETS IN 1989-1990

Summary

1. When on July 26th 1988, the Council adopted a plan of action for setting up an information services market (IMPACT programme), it asked the Commission to establish a European Information Market Observatory and to present an annual report on the most relevant events and developments.
2. The first report, forwarded to the Council and the European Parliament (annex III to SEC (90) 1778 final) in September 1990, presented the state of the market for professional database services at the end of 1988, i.e. just at the very beginning of the IMPACT programme.
3. This second report, based on data collected in 1990, reviews the most important trends identified over the period 1989-1990 within the following sectors
 - online ASCII database services,
 - videotex services,
 - fax-based and audiotex services,
 - CD-ROM publishing.
4. These four sectors can be analysed as channels providing access to a large range of information services and products. This report points out the large diversity of markets which are served by each of these channels: financial services, companies, research institutes, consumers. The EEC-installed base of 143 million telephone lines, more than 6 million videotex terminals and 2.5 million fax machines pave the way for mass-market applications. Both consumer electronics manufacturers and publishers are showing increasing interest in optical publishing on Compact Disc (CD-ROM and CD-Interactive) and in multimedia applications, particularly in the area of education.
5. Within the EEC, expenditure on accessing information through electronic means amounted to around 3,000 million ECU in 1989, less than twice that in the USA (around 6,700 million ECU). ASCII online services (around 1,800 million ECU) services are still predominant in the Community electronic information market. But growth was faster in CD-ROM publishing, audiotex and videotex.

While the overall sector benefited during 1989/1990 from 12.5% turnover growth and 5% employment growth coupled with an increase of 8% of turnover per employee and a 30% export ratio, the sector is actually profitable for only half of its operators and profit ratios vary considerably. The competitiveness of the sector is greatly influenced by the high fragmentation of the European marketplace.

6. Among the operators of electronic information services, traditional publishers are becoming more active.

The first generation of electronic information services, ASCII online database services, was pioneered and developed by operators not from the publishing industry, but rather

from computer services, space and aeronautics industry, public institutions and agencies, research organisations.

At that time, publishers were cautious about investing in the field of electronic information services, especially in Europe. As mentioned in the first annual report, several European publishers and media companies preferred to acquire American firms or to operate on the American market rather than to develop such activities within fragmented national markets or on a European basis.

The development of "channels", like videotex and audiotex, and of fax-based information services opens the way to national mass-market applications and creates opportunities for newspaper and magazine publishers. Book publishers can enhance their information assets, especially dictionaries, encyclopedia, education and reference books via optical publishing.

Traditional publishers increased their involvement in electronic information services through commercial agreements and acquisitions. This concentration trend, outlined in the previous report, continued throughout 1990 but to a lesser extent than in 1988 and 1989.

7. The financial sector accounted for 69% of the total European companies' online information expenditure. As analysed in the previous Information Market Observatory report, the European consumption of the remaining 31% for the other information sectors represents a much lower usage than in the USA. However this does not necessarily mean that European companies are less informed than American ones. The shift from printed sources and from traditional providers towards electronic information services did not progress at the same rate in the EEC as in the USA.

In order to benefit from the Single Market, EEC companies must be able to easily access information on EEC national markets such as market research data, mailing lists, consumer and company credit ratings. In these areas, information firms depend on basic data produced at national level by government and public organisations. The creation of Europe-wide common databases (whether they will be distributed offline, online or published on CD-ROM) is hindered by the lack of harmonisation between government primary data in each Member State and by the diversity of national data protection laws.

8. The convergence of ASCII online services, videotex and audiotex raises new policy issues, such as transborder access and pan-European billing facilities (European kiosk). Fax is emerging as a key component of the European telematic infrastructure. "Mobile services" will affect the development of electronic information services. Multimedia platforms and ISDN converge through common standards. "Kiosk" and "premium rate" concepts helped videotex and audiotex to take off and should be taken into account for ISDN services. The "one stop shopping" concept (OSS) has been adopted for the Europe-wide development of videotex. The "Open Network Provision" (ONP) Directive defines the legal framework for telecommunications services. All these concepts, Kiosk, OSS and ONP, pave the way towards a Community telematic infrastructure.
9. Videotex, audiotex and fax-based information services, combined with an emerging demand for Community-wide information, are creating new opportunities for a pan-European information services market.

To take advantage of these opportunities, several European information providers and publishers are setting up new forms of partnerships.

Such transnational partnerships would be stimulated by:

- the elimination of legal barriers,
- the convergence of national telematic infrastructures, particularly videotex and audiotex networks,
- the harmonisation of government-owned collections of primary data.

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Penetration Rate by total population

Number of CD-ROM drive units

Foreword

This second report focusses on four means of delivering electronic information services: ASCII database services, videotex, audiotex and CD-ROM.

The distinction between these four sectors is based on technology. It reflects also the chronology of developments which occurred within the information market.

- *Online database services (ASCII) appeared at the end of the 60's and grew with the development of data-transmission networks in the 70's.*
- *Videotex was invented in the 70's but significant pilot trials in Europe only began in the 80's.*
- *The first audiotex applications appeared in the 70's; the development of interactive audiotex required touch-tone telephones, which only took-off in the 80's. Its full expansion will depend on the digitisation of telephone networks and will take advantage of technological advances in voice recognition and voice synthesis.*
- *Videodisc technology was used in the beginning of the 80's as a storage medium. With optical media (e.g. CD-ROM and CD-Interactive), developed in the frame of compact disc audio, data is stored in digital form. Optical storage opens the way to interactive applications and to multimedia products, combining text, images and sound.*

The distinction between these four sectors is also useful for the analysis of the supply of electronic information services, even if a number of information companies use simultaneously these different channels to distribute the same information. These four sectors structure the supply as alternate and complementary channels for the dissemination of information services.

However, the segmentation of the market per medium does not reflect the current segmentation of the demand, the latter being a matter of usage, information content and applications.

1. Europe's position in online database services

- *The USA still appears to produce twice as many databases as the EEC*
- *Whilst stable in the USA, the number of hosts grew 8% in EEC*
- *A slow down occurred in gateways*
- *43% of European hosts' revenue comes from non-EEC countries*

Introduction

At the end of 1989, there were over 4,300 different ASCII databases produced throughout the world for online commercial access, a 16 % growth as compared to 1988.

Unlike videotex services, to which transborder access is hindered by the diversity of standards, professional ASCII database services are potentially accessible online from any part of the world. The ASCII database services market is therefore considered usually as an international market, although in effect only a limited number of database services are actually international in view of the nature of the information they convey (real-time financial information services, scientific and technical information services).

The position of the Community in this market has not dramatically changed in comparison with 1988, and most of the trends identified in the first report are confirmed. Yet, following the stock exchange "crash" of 1988, real-time financial information services are now experiencing a slow-down in the growth of their turnover.

1.1 The USA still appears to produce twice as many databases as the EEC

The growth in the production of online databases in 1989 has been of the magnitude of 7 % in the United States and 11 % within the EEC, that is to say 151 and 101 new databases respectively have been created. Part of this growth is due to the restructuring of existing databases which have been broken down into independent information products. In the USA, the growth originates mainly from "for profit" operators who are increasingly making available online the full-text of newspapers, journals and specialised newsletters.

Within the EEC, the growth recorded originates mainly from "non profit" operators, with the exception of Italy and the United Kingdom. Most of the new databases produced in Europe (56%) are "reference" databases (directories and bibliographic files); whereas in the United States, 75% of the new databases produced for online access are "source" databases which provide direct access to facts and primary information.

Within the EEC, the production shares of the various Member States have not changed significantly. The UK still leads in the production of ASCII databases (34 %), followed by Germany (20%), France (12%) and Italy (12 %). The production of Italian databases has increased significantly (+29%) as compared to 1988. The relatively small share of France in ASCII database production can be explained by the fact that in this country, since 1985, most of the professional database services have been designed for videotex access through the Teletel kiosk.

At the end of 1989 there were 1048 different databases produced within the EEC and 2214 different databases produced in the USA that were available online in ASCII. Very few databases are multilingual. The European Information Market Observatory identified only 6 multilingual databases produced in the USA versus 146 produced within the EEC in 1989, using mainly English as a second language.

The pattern of production within the USA is increasingly orientated towards the development of full-text database services since most of the existing machine-readable bibliographic files have already been made commercially available online. This is not the general case within the EEC, because public administrations and non profit organisations still have bibliographic files which are not yet publicly available online. The production of "reference" databases predominates in all EEC Member States, except in the UK where the pattern of supply is similar to that in the United States.

1.2 The number of hosts grew 8% in the EEC

In 1989, the Information Market Observatory identified 227 hosts within the EEC and 300 hosts in the USA. The number of hosts continues to grow within the EEC (+ 8% in 1989); about half of the new hosts are managed by non-profit operators, e.g. universities or public administrations.

Worldwide, a limited number of hosts cater for most of the distribution of online databases. The 15 largest USA hosts distribute 70 % of the databases hosted in the USA, whereas the 15 largest EEC hosts only cover 50 % of the databases hosted within the EEC.

There have not been major changes in the pattern of distribution of ASCII database services as compared to 1988. The accumulated number of databases available online on EEC hosts has grown from 1,110 to 1,256 (+ 13 %). This accumulated number may count several times the same database duplicated on different hosts. In the USA, the growth is slower (9%) but in view of the larger installed base of databases available on hosts (3,078 in 1988), it represents, in absolute terms, a larger increase in the accumulated number of databases hosted (+ 270). Some 73 % of the databases distributed within the EEC in 1989 originated from the host country, 9 % from another Member States and 18% from the rest of the world. The proportion of domestic databases remains the same as compared to 1988. The proportion of databases imported from third countries has increased slightly (from 17% to 18 %) to the detriment of intra-EEC trade in databases.

1.3 A slow-down in the creation of gateways

Gatewaying has been a growing phenomenon in database distribution. It consists simply in routing a user connected to a host service to a third party host with no need for him to disconnect and reconnect. This facility allows the user to have access to data bases spread over several hosts by subscribing only to a single host service. For the host, gatewaying is an alternative to direct loading of additional databases on its own computer. The development of gateways between hosts located in different countries therefore affects the level of imports of databases.

The first commercial gateway between hosts appeared in 1985. The number of gateway entry points (hosts or pure gateways providing access to third party hosts) has steadily increased worldwide from 35 in 1985 to 44 in 1986, 56 in 1987, 84 in 1988 and 89 in 1989. In 1989, there was a slow-down in the number of links provided by gateway entry points. The total number of links set up by gateways was of the order of 265 in 1989, a

small increase (+ 1 %) as compared to 1988. In 1989, there were 63 gateway links originating from the EEC and 125 originating from the USA.

Most gateway links originating in the USA are targeted to USA hosts (89 %). EEC hosts were the target of half the number of links set up by USA gateways with foreign hosts. In 1989, 43% of gateway links originating from EEC Member States were targeted to hosts located in the same country as the gateway, 24 % to hosts located in another Member State of the EEC, 24 % to hosts located in the United States.

Various kinds of gateway services exist, ranging from bilateral links between hosts to intelligent networks providing a central access point to a number of hosts. Few gateways (13) provide access to more than 4 hosts. Among these, 8 are located in the USA, 2 within the EEC and 3 in other parts of the world. Regarding the most "targeted" hosts (those available through more than 4 gateways), 8 are located in the USA, 3 in the EEC and 1 in Japan.

1.4 Exports of EEC hosts to non-EEC-countries amounted to 43% of their revenue.

In 1989, the Information Market Observatory sponsored the European hosts survey. Although such host surveys have already been made at national level, this was the first survey which covered all EEC Member States and involved 140 participating hosts. This survey focussed on hosts providing professional database services (consumer services were out of the scope of this survey). It was carried out by national professional associations and coordinated by the European Information Industry Association (EIIA).

According to this survey, the revenue of EEC hosts worldwide totalled 2,492 million ECU in 1988. Sales to non-EEC-countries represented 1,084 million ECU, i.e. 43% of total sales. Their revenue was well balanced between retrospective database services (43%) and real-time information services (57%). 85% came from ASCII databases services, 15% from videotex services. Two operators, Reuters and Dun & Bradstreet's EEC-based hosting activities, together account for more than 50% of the revenue of all EEC hosts.

The EEC hosts employed more than 18,000 people in 1988.

2. Videotex information services and networks in Europe

- *Since 1989, several national telecommunication operators have launched programmes for the wide dissemination of low-cost terminals*
- *European telecommunication operators are developing kiosk facilities*
- *Interconnection of national networks progresses very slowly, owing to bilateral agreements*
- *The boundary between ASCII and videotex is fading away*

Introduction

More significant changes have occurred in the videotex sector than in the ASCII database services sector. Since 1988, the installed base of videotex terminals within the EEC is growing by one million units per year.

By the end of 1990, the 5.6 million Minitels in France accounted for more than 90% of the European installed base of videotex-dedicated terminals. According to a survey carried out on behalf of the Commission, Germany (128,000), UK (100,000), Italy (145,000), Spain (60,000) and the Netherlands (25,000) have a significant installed base of terminals. By taking account into videotex-dedicated terminals as well as videotex-emulated PCs, the videotex-installed base amounted to 256,000 in Germany, 150,000 in Spain and 100,000 in the Netherlands.

The development of videotex services in Europe has been stimulated directly by network operators, whereas in the USA, Regional Bell Operating Companies (RBOCs) have been prevented from providing information services (e.g. yellow pages) by a US District Court in 1982 ("Modified Final Judgement"). Even if five RBOCs tested regional videotex gateways, all of them have been waiting for the "lines of business" restrictions to be removed before committing themselves to the huge investments needed to create a videotex infrastructure. Besides RBOCs, some other videotex ventures have been started up, the most successful being Prodigy, heavily sponsored by IBM and Sears. Each of the two leading general interest online services (Prodigy and CompuServe) achieved more than 700,000 users at the end of 1990.

In Canada, Bell Canada runs a videotex gateway, the Alex service, through NAPLPS, (North American Presentation Level Protocol Syntax), which allows higher definition graphics. Alex Service has the largest installed base of videotex-dedicated terminals in North America (25,000), but has not reached the critical mass that would motivate information providers to pursue their efforts for the design of new services or to invest in promotional campaigns.

2.1 In the EEC, since 1989, several national telecommunication operators have launched programmes for the wide dissemination of low-cost terminals and for the stimulation of videotex services supply.

A low-cost terminal distribution policy based on the development of the electronic telephone directory played a key role in France. By the end of 1990, 18% only of 5.6 million Minitels were bought or rented (i.e. 82% free of charge). 19% of households

and 80% of companies are equipped with at least one minitel. 30% of the French population over the age of 15, and 40% of the working population, have access to a minitel. The number of services has reached 15,000 and the number of calls 1,500 million (40% for the electronic telephone directory).

In other Member States, where a videotex network infrastructure has been developed, the national telecommunication operators are now faced with increased demand for videotex, as a result of mass dissemination of low-cost terminals and encouragement of videotex services supply.

Videotex promotion requires significant investment at a time when telecommunications operators have to invest heavily in cable TV, ISDN, cellular telephone and mobile services. In addition, with the trend towards liberalisation, telecommunication operators are faced with profitability constraints. The return on investment in videotex programmes took longer than planned and caused controversy in France as well as in Germany. For the reasons of limited investment capacity and profitability constraints, telecommunications operators created subsidiaries or joint ventures and tried to share the costs of videotex programmes with banks, local authorities and manufacturers.

Such consortia have been created in several countries: Videotex Nederland in the Netherlands, Tercom in Belgium, and Videotel Eireann in Ireland. In the Netherlands, Videotex Nederland plans to distribute 100,000 videotex terminals, whereas Ireland is planning for 10,000 and Spain for 100,000. However, in Italy, the telecommunication operator SIP has reduced its distribution plan from an objective of 500,000 videotex terminals to 375,000 in 1993.

2.2 European telecommunication operators are developing kiosk facilities

The second major trend is the development of access and billing facilities through premium-rate "access points" managed by telecommunication operators. These "kiosk facilities" stimulate the use of information and transactional services, both by SMEs and by consumers. The diversity of tariffs in these "kiosks" and their ability to charge high prices for value-added services (20 to 70 ECU an hour) have a direct effect on the diversity of services, and especially on the supply of professional information services.

Such kiosk facilities, available in France since 1986, are operational or planned for 1991 in Italy, Luxembourg, Portugal, Belgium and Ireland.

2.3 Interconnection of national networks progresses very slowly, owing to bilateral agreements

The integration of videotex services made some progress during 1989 and 1990. This integration has resulted in the:

- Development of multi-standard and multi-protocol facilities in national networks
- Interconnection between national videotex networks.

Through multi-standard and multi-protocol facilities, it has become possible to have access to videotex services hosted within a country with different kinds of terminals (CEPT 1, CEPT 2, CEPT 3 terminals), including ASCII terminals. If the French,

British and German videotex networks are still based on national standards, most of the other videotex networks are now partly or fully multi-standard.

The interconnection of national videotex networks allows users from one country to access services in another country. These interconnections do not provide access to the whole range of services available in other countries because of the diversity of billing practices. However, progress is being made through bilateral agreements between telecommunication operators.

The representatives of network operators in 17 European countries met in March 1990, at the initiative of the CEPT (Conférence Européenne des Postes et Télécommunications), and adopted a "declaration of support for trans-European access to videotex services". They agreed on technical solutions and on marketing principles, e.g. unrestricted transborder access to the free services of networks, for which no prior subscription is required. This unrestricted access should be extended to all services as far as the structure of different videotex network allows. Operators will have to adopt the one-stop-shopping concept (OSS) to facilitate access to services requiring users to be registered. Subscriptions to foreign networks would thus be taken out at one single centre in the user's country.

At the end of 1989, there were 12 bilateral interconnections of national networks:

- two-way gateways: France/Italy, France/Belgium, Germany/France, France/Luxembourg, Luxembourg/Germany, Germany/Netherlands,
- one-way gateway: the Irish network provides access to the German, British and French networks, the Belgian one to the German and the British, and the Danish one to the German.

Through these "videotex gateways", transborder traffic grew steadily in 1990. Teletel, for example, recorded 10,000 connect hours in 1988, 30,000 in 1989 and 143,000 in 1990, through the Minitelnet gateway of INTELMATIQUE (France Telecom's subsidiary in charge of Teletel international promotion).

Yet, it is unlikely that such bilateral agreements are the best approach to build up a transparent Community-wide access to videotex services. 66 bilateral agreements would be required to achieve such an aim. A Community agreement for the creation of a European "kiosk" would be more effective.

2.4 The boundary between ASCII and videotex is fading away

As an information presentation format (set of characters, graphics), videotex was an alternative to ASCII; terminals were either "ASCII" or "videotex". Since specific structures, e.g. "pages" and "screens", were specifically created for videotex, the latter became incompatible with the ASCII environment.

The boundary between ASCII and Videotex is diminishing, and this trend can be seen at the level of terminals. For example, companies do not want to equip their employees with two different terminals and prefer a unique terminal to offer access both to internal or external resources, whether they are videotex or ASCII. The development of multi-standard and multi-protocol videotex terminals in various European countries reinforces this trend.

In order to encourage PC-users to use videotex networks and services, network operators or information providers promote "chips" and software that "emulate" the PC as well as a videotex terminal.

In addition, hosts who distribute ASCII databases try to poach videotex users by developing "interfaces" which make their databases available from a videotex terminal through simplified command language adapted to the videotex-specific function keys. Videotex network operators increasingly provide access not only to videotex-like terminals (including videotex-emulated PCs) but also to ASCII-like terminals (PCs or teletypes).

3. Audiotex services

- *In Europe, with the exception of British Telecom, the interest of telecommunication operators in audiotex is quite recent*
- *In North America as in Europe, audiotex growth meets complex legal and regulatory issues*
- *Technical barriers hamper access to audiotex services from foreign countries*

Introduction

With an installed base of 143 million telephone lines, audiotex in Europe is opening up a mass market to European information providers. The first report pointed out the ambiguity of the audiotex concept which encompasses "services ranging from the simplest, such as spoken information recorded on a tape player, to the most sophisticated, such as voice interaction with a database service".

Audiotex services may be passive (the user dials a telephone number and listens to a pre-recorded message), or interactive (the user selects the information he wants to access). The interaction can be limited to simple choices (e.g. menu) or more sophisticated ones, allowing retrieval in a vocal database. The user may interact through the telephone keys (tone recognition) or by speaking (voice recognition). Audiotex services may be either free or paid for; this includes free telephone services, linklines (local call charge only), premium rate services (PRS) and subscription services.

Information is delivered over the telephone (pre-recorded message, voice synthesis). Audio-fax and audio-videotex allow the user to search by telephone and to receive the "output" (documents, columns of text and graphics, images) on a videotex screen or by fax. Audiotex can also be combined with traditional enquiry services: the user is welcomed by the vocal host and can be switched to a human operator.

The development of audiotex is highly dependent on national telephone operators' strategies: basic telephone equipment policy (DTMF telephones allow more interactivity), digitisation of network, commercial initiatives (development of "Premium rate services", tariffing and billing policies).

Audiotex services have raised legal issues. "Live conversation" ("chat-lines" one-to-one) and "adult services" were the subject of controversy, especially when telephone operators were indirectly involved in the provision of such services, e.g. through billing and collection. The legal framework (special legal conditions to set up a service, codes of practice, regulatory bodies) varies from one country to another.

There is a large potential for pan-European-scale audiotex services, not only for business services (corporate information, share prices, foreign exchange rates). However there are technical, legal and market barriers which hinder their development.

To address this issue, the Commission held a workshop on 17-18 December 1990 in Luxembourg to discuss the barriers to growth in the audiotex sector.

This workshop brought together interested parties: telephone operators, equipment suppliers, service providers, regulatory bodies. Given the fragmented nature of the audiotex industry in the EEC, there was a surprising degree of consensus on certain issues such as:

- *the viability of a pan European premium rate service,*
- *the requirement for clear regulations at a European level,*
- *the requirement of improved pay back on high value services (i.e. tariff issues),*
- *the need for an increased awareness of audiotex as a "user-friendly" delivery medium by all participants in the information industry,*
- *the merit of clearly differentiating business and "adult" /entertainment premium rate services in the view of the market,*
- *the need for the industry to be represented in discussions about standards in technical areas (e.g. DTMF) and ONP (Open Network Provision)."*

3.1 "Premium rate services" are offered in five Member States

"Premium rate services" (PRS) or "kiosk services" are communications facilities which are charged by telephone operators at a higher rate than for an ordinary telephone call. Telephone operators collect the revenue from the users, keep a part to cover the telephone cost and redistribute the remaining part to the service provider. Specific prefixes are reserved for PRS (e.g. 0698, 0639 and 0636 in the UK, 36 65 in France, 0300 in Ireland, 06 in the Netherlands, 077 in Belgium).

The UK remains the most developed market with the largest variety of services. PRS services are offered by three network operators. British Telecom has been promoting audiotex actively since 1986 and has a 83% share of the market, competing with Rascal (15%) and Mercury Communications (2%).

The network operators in other EEC Member States adopted a more cautious attitude, considering the investments required, the moral and legal issues they would have to face or the priority given to videotex. However, in 1990, besides UK, four Member States offer PRS: France (since 1985), the Netherlands (since 1985), Ireland (since 1988) and Belgium (since 1990). In six other EEC countries, telephone operators are planning to launch PRS in 1991: Denmark, Germany, Italy, Portugal, Luxembourg and Spain.

Telecom operators' billing and tariffing practices have a direct impact on the kinds and variety of services available. Low-tariff bands are appropriate for consumer services (e.g. weather report), higher call charges are required for professional information (company information). The method of charging is an important issue for users and providers; the caller can be charged in relation to the length of the call or in relation to the fact that a single call has been made to a particular service ("single drop charging"). In France, for instance, the premium rate service (prefix 36 65) is limited to 140 seconds and the caller pays 0,22 ECU whether he listens to the whole message or not.

Low-rate "single drop charging" can be useful for sales promotion and voting purposes as a means of encouraging the use of the telephone rather than the post where high-rate "single drop charging" is appropriate for charging value-added services (e.g. the caller spends a short amount of time but receives by fax a great deal of data). For

advertising and telemarketing purposes, there is a demand for toll-free audiotex services; free of charge for the caller, but paid by the advertiser.

In the UK, there are already two tariffs, according to the audiotex operators (0.53 and 0.62 ECU per minute). In other European countries there is only one single tariff, ranging from 0,62 ECU in Ireland, 0,36 ECU in Belgium, to 0,22 ECU in France and in the Netherlands.

3.1.1 In the EEC as in North America, audiotex growth meets complex legal and regulatory issues

The involvement of telephone operators in billing the services and in collecting from the users has raised the issue of their responsibility for the content. This issue is not specific to audiotex. Videotex "pink messaging services" ("messageries roses") raised similar controversies.

In the UK and in France, two specific bodies are concerned with the regulation of audiotex development, the Independent Committee for the Supervision of Standards of Telephone Information Services (ICSTIS) and the Commission de la Télématique (which also deals with videotex).

Network operators or regulators in the UK, France, Ireland and Belgium have set up contractual clauses and Codes of Conduct in order to prevent the misuse of PRS services. However, differences between existing contractual provisions and Codes of Conduct and their absence in certain countries create a barrier to the provision of transborder audiotex facilities.

One of the issues on which these regulatory bodies must adjudicate is how far the audiotex services fit into existing legal provisions. This is particularly important in specific areas such as lotteries (there is existing lottery and games legislation), sales promotion (existing advertising rules may apply if promotions are really advertising), teenage advisory services (safeguards need to be incorporated in both live and passive services), legal and financial advice (cross-over with existing financial services legislation).

In the UK, chat line services were the subject of controversy, when, over two years ago, they were removed from operation. They were allowed back in service after one year, with the provision that they conformed to a code of practice.

These regulatory and legal issues are not specific to Europe. In the USA, the situation is rather complex, considering the overlap of regulatory bodies already concerned; the Federal Communications Commission (FCC), the Federal Trade Commission (FTC), the Public Utilities Commissions (PUCs) at State level, the US District Judge Harold Greene, the US Courts of Appeals, the Supreme Court and the Congress. Current FCC regulation aims to restrict minors' access to "adult" services. FCC requires callers to pre-subscribe both with information provider and with the telephone company for such services. This constraint has been questioned by the information providers organisations and is being reviewed by a US Court of Appeals. Several telephone companies refuse to provide billing and collection facilities for such services, arguing that the content might damage their image. Judge Greene upheld that position but the Supreme Court refused to authorize telephone companies to ban "indecent" services, considering that such restrictions should apply only to "obscene" services. The line between these two categories, "indecent" and "obscene", remains to be drawn. The US Congress is expected to come up with new legislation for audiotex "900" services in 1991, enlarging the scope to "privacy issues". Congress is concerned by "caller identification" capabilities that would permit telemarketers to recognize automatically

the caller's number. Congress could also make telephone companies offer "free blocking", which allows a telephone subscriber to select telephone numbers that cannot be accessed from his telephone. Another piece of proposed legislation would require telephone companies to show separate listings of "PRS" charges on telephone bills (like the "kiosk" does in France for videotex services).

In 1989, Bell Canada had planned to stop billing and collection for "premium rate service" (976 services), arguing numerous complaints from families and associations and constraints jeopardising profitability. The Federal regulatory authority, Canadian Radio-Television and Telecommunications Commission (CRTC), did not allow Bell Canada to stop offering such services, because the complaints have been considered as marginal and the business of the information providers would have been damaged.

3.1.2 Technical barriers hamper access to audiotex services from foreign countries

Transborder PRS services are not available today. Telecommunications operators are faced with technical and administrative difficulties to make audiotex services accessible from foreign countries. The limited level of digitisation of telephone networks slows down the diversification of price bands; present call rates are unadapted to the international traffic.

These difficulties are not specific to audiotex. International toll-free numbers (like 800 or "green numbers") are also concerned. Some barriers can be overcome today. A private company already provides toll-free calls to the UK from 46 countries.

Despite these barriers, opportunities exist for the development of an international audiotex market. In addition, bilateral free-phone interconnection agreements between national telephone operators are progressing. Even for PRS, an international access possibility has been demonstrated by the "World Info" service of OTC (Australian telecommunication operator), which gives service providers access to callers in 190 countries. The callers are charged the standard rate for an international call to Australia.

International audiotex could be appropriate for finance, travel, transport, sports and telemarketing services.

4. CD-ROM publishing

Initially oriented towards professional applications, CD-ROM shows steady growth on the consumer market, particularly in Japan.

- *Commercial titles in print increased 130% worldwide in 1989*
- *Data collections and databases which were not available online become accessible through CD-ROM*
- *European CD-ROM publishers focus on law and business while American CD-ROM publishers focus on geography, medicine and software.*
- *The worldwide installed base of drives has more than doubled in 1989, reaching 550,000 drives.*

Introduction

CD-ROM and other optical media, derived from Compact Disc Audio, were developed and promoted by electronic manufacturers, drives and "disc" suppliers. Aiming to encourage publishers to make use of this new delivery medium, electronics manufacturers and software companies paid attention very soon to standards issues. Simultaneously, progress in sound and image compression techniques occurred, raising the need for standards. The gap between technologies (image compression, hypertext software) and applications had to be filled by publishers and information firms. Their knowledge of vertical professional markets helped them to identify the potential markets and targets; their experience in users' needs and practices helped them to design innovative applications and user-friendly interfaces.

In the USA as in Japan, the strong involvement of the electronics manufacturers, relayed by several PC manufacturers, and the support of famous software companies convinced many publishers, information firms and readers to invest in CD-ROM. The feedback from the market was progressive in the USA, quite spectacular in Japan in 1990. In the EBC, the situation is more contained, with a significant effort from the publishers in terms of titles produced, but limited response from the market in terms of sales.

4.1 Commercial titles in print increased 130% worldwide in 1989

According to InfoTech, worldwide commercial titles in print increased from 52 in 1986 to 753 in 1989. They grew by 160 % in 1987, 143% in 1988 and 130% in 1989. In 1990, more than 1430 commercial titles were published .

In 1989, with 440 titles, the USA CD-ROM publishers were still predominant in the worldwide production of commercial CD-ROM titles, followed by Japan, (161 titles) and the EBC (117). The USA share of worldwide production of commercial titles dropped from 76% in 1988 to 58% in 1989, the EBC share from 18% to 15%, as a consequence of the Japanese breakthrough (21% in 1989).

The EBC share in the world-wide commercial CD-ROM titles (15%) is weaker than in the production of ASCII databases for online access (24%). Whereas, the USA share in the CD-ROM commercial titles (98%) is greater than in the production of ASCII databases (only 51%).

With respect to commercial titles : the EBC produced twice as many titles in 1989 (117) than in 1988 (58). In 1988, Italy led the EBC Member States with 18 titles, followed by the UK with 12, Germany and France with 10 each. In 1989, the UK and Italy each had 28 commercial titles in print, Germany had 21, France 17, and the Netherlands 9.

In 1990, Germany was in first place with 93 discs, followed by the UK (90), France (81), and Italy (72).

4.2 Data collections and databases which were not available online became accessible through CD-ROM

Only 4% of the databases produced worldwide for online access were also available on CD-ROM. Among the databases which are available both online and on CD-ROM, 66% were produced in the USA and 19% in the EBC.

Less than 30% of commercial CD-ROM were subsets or compilations of databases available online. Although CD-ROM publishing may compete with online for providing access to certain categories of databases, it has mainly been used up till now as a

medium to deliver in electronic form information which was not currently available online.

4.3 European CD-ROM publishers focus on law and business while American CD-ROM publishers focus on geography, medicine and software

In 1989, according to InfoTech, 19% of titles published in the EEC related to law, 16% to business, 12% to directories and product catalogues, 11% to library automation. The EEC share of total worldwide commercial titles was 15% in 1989. It exceeded 15% in the following subject areas: Library Automation (34%), Law (31%), Business (28%), Education (28%), Directories (21%) and Science (17%); whereas it was below 15% in the following subjects: Medicine (11%), General Reference (10%), Geography (7%), Software (7%) and Entertainment (3%).

20 % of titles published in the USA related to Geography, 15% to General Reference, 12% to Software, 11% to Medicine, 9% to Directories and Product Catalogues, 8% to Law, 8% to Business. American publishers are predominant in the areas of Geography (77% of titles published worldwide), Medicine (77%), Software (70%) and General Reference (67%).

Japanese CD-ROM publishers focussed on Entertainment. Among the 161 Japanese CD-ROM titles, 52% dealt with Entertainment. They published 21% of total worldwide commercial titles, reaching 85% for Entertainment titles, 32% for Education and 21% for Software.

4.4 The worldwide installed base of drives has more than doubled in 1989, reaching 550,000 drives

The installed base of drives (including both drives associated with the use of commercial titles and those associated with inhouse titles) increased worldwide by 261% in 1987, 417% in 1988 and 224% in 1989, reaching 550,000 drives. In view of current growth rates, the installed base should have passed the 1 million mark by the end of 1990.

This indicator is of particular importance to the publishers who have been waiting for CD-ROM to be well established as a medium before considering entering the market.

At the end of 1989, 43,400 drives were installed in the EEC, compared to 296,700 in the USA and 192,500 in Japan. The growth of the installed base in Japan seems to have been driven by consumer applications (games). In 1988, Japan was believed to account for 1% of the worldwide-installed base of drives. It accounted for 35% in 1989.

The installed base of drives increased more quickly in the USA (+118%) than in the EEC (+70%). In fact, the distribution of the installed base of drives within the EEC countries did not change dramatically in 1989. With 21,400, Italy was still leading the way, followed by the UK (6,500), Germany (5,000) and France (4,800). Market experts anticipated a 1990 installed base of 100,000-150,000 drives in the EEC.

5. Use of electronic information services and products

- *In 1989, European organisations spent about 1,800 million ECU on ASCII database on line services*
- *European videotex revenue amounted to 700-800 million ECU; business usage is growing in France while consumer usage should grow in other Member States, with lack facilities and larger dissemination of terminals*
- *In 1989, audiotex services generated about 300 million ECU revenue in Europe*
- *CD-ROM commercial titles revenue amounted to around 50 million ECU in Europe, mainly through library and business applications, while in Japan, 200 million ECU were originated by consumer applications.*
- *Global EEC expenditure on electronic information services amounted to about 3,000 million ECU*

Introduction

Electronic information services, initially science and business oriented, can no longer be described as a unique market. ASCII online services, videotex, audiotex and CD-ROM provide information to a large range of "communities" or market segments; research institutes and R&D departments, companies, financial institutions, legal professions and services, libraries and consumers.

The Information Market Observatory progressed in 1990 by setting up its own surveys, aiming to measure both the providers' revenues (including sales outside the EEC, i.e. "exports") and the users' expenditures (including purchases from non-EEC distributors, i.e. "imports").

For the videotex sector, network operators' revenues are not published in most European countries. Such economic indicators are lacking for users' expenditures (collected from users by network operators), as well as for information providers' revenues (redistributed to information providers by network operators).

For the audiotex sector, the estimates of audiotex revenues (according to the sources and the various definitions), show even greater discrepancies than the videotex ones. These estimates vary, according to whether or not they include passive audiotex services, or whether or not they include consumer services.

For the CD-ROM sector, the Observatory takes into account commercial titles revenue (revenue generated by the sales of discs) and excludes drives sales as well as in-house applications revenue (titles and applications which were designed for internal use by an organisation and which are not available on the market).

5.1 In 1989, European organisations spent about 1,800 million ECU on ASCII databases services

In the EEC, ASCII online database services were essentially orientated towards professional use; online consumer services are more and more provided through videotex and audiotex. In the USA, where videotex was not promoted by telecommunication operators, online ASCII hosts provide also entertainment, general and transactional services to approximately one million consumers.

The installed base of modems amounted to 10 million in the USA and 3 million within the EEC (270,000 modems in Germany, 228,000 in Spain, 590,000 in France, 300,000 in Italy, 1,147,000 in UK). Modems turn the PC into a terminal and enable PC-users to communicate online via the telecommunications networks.

According to a survey carried out by Scicon on behalf of the Commission, and based on 1,500 interviews all over the EEC, more than 700,000 companies, i.e. 6% of all European companies, used online database services in 1989. 54% of the 700,000 European companies using online database services were located in France, 16% in the UK, 16% in Germany, 10% in Italy.

In 1989, the proportion of companies using online services reached 26% in France, 7% in UK, 5% in Germany, and about 3% in Denmark. The deep penetration of videotex and the "kiosk effect" in France explain the high proportion of companies using online services.

If French companies represented 54% of European companies using online databases, they spent only 33% of the total European online expenditure, while British companies contributed 28%, German companies 11% and Italian companies 11%. Average online database expenditure per company was three times higher in the UK than in France and Germany. This can be explained by the importance of financial institutions in the UK.

According to the survey, European online expenditures amounted to 1,275 million ECU. Considering that this survey excludes residential use and underestimates legal and accounting professions, government and local authorities, universities, public research organisations and library expenditure, total ASCII database services expenditure can reasonably be estimated at 1,800 million ECU.

5.2 In 1989, videotex revenue amounted to 700-800 million ECU in the EEC

Videotex was initially geared towards households and designed to simplify consumer access to information and transactional services. Initial development plans were based on the linking of the TV set with the telephone. The free dissemination of low-cost terminals allowed France Telecom to create a mass market. Experiences of consumer services helped to design user-friendly professional services in a second stage. Teletex traffic is dominated by consumers and by general interest services, but lately professional use is growing faster than consumer use. The growth rate of high-level "kiosk" services traffic was 180% from 1989 to 1990. From September 1989 to September 1990, the number of calls per month to high-level kiosk services ("36 28" and "36 29" access codes) has grown from 92,963 to 395,220 and connect hours per month from 12,361 to 34,622. These are professional services used by companies.

In other Member States, business usage is predominant. In Belgium, 85-90% of videotex terminals are located in companies, 75% in the Netherlands, 60% in Portugal and Germany, and 55% in the UK. British success in travel and stock exchange services indicate that videotex can be used efficiently for business applications. Through wider dissemination of terminals and development of "kiosk" facilities, several European telecommunication operators plan to promote videotex towards both consumer and business markets.

In the EEC, videotex expenditure (excluding terminal sales or rentals, but including telecommunication costs) amounted to 700-800 million ECU in 1989. These expenditures include pure transactional services, information services (information retrieval) and combined services (both transactional and information).

Teletel concentrated 90% of the European-installed base of videotex terminals, 84% of total European videotex connection hours, but only 65-75% of total European videotex expenditures. (In 1989, France Telecom collected 520 million ECU from users, excluding terminal rentals.) Indeed, considering the predominance of business usage, the average number of calls and expenditure per terminal is higher in most Member States than in France.

5.3 In 1989, audiotex services generated about 300 million ECU revenue in the EEC

As with videotex, audiotex is very simple to use. It does not even require the acquisition of a specific terminal. These characteristics enable a wide range of mass market applications, directed not only to the consumer but also to the business community.

Audiotex did not develop in the same way in the US as in the EEC. In the US, audiotex has been used since the beginning of the 80's for vocal messaging applications (voice mail) and is now growing at 25% per year; vocal hosts giving access to information appeared in 1985 and grew 40% in 1989. Vocal messaging appeared only recently in Europe. Significant growth of vocal messaging will come when public operators launch commercial low-cost voice mail services designed for business and home usage. These services could be substituted for answering machines.

The previous report focussed on the professional audiotex services. The survey carried out by EPS on behalf of the Commission was based on a restrictive definition of the audiotex market: *"Services where the information is provided through interactive online access to a database using voice or tone recognition"*. According to this definition, the EEC professional market (excluding entertainment services and voice messaging, but including equipment suppliers sales) amounted to 300 million ECU in the EEC in 1989.

The Audiotex Workshop underlined the difficulties of measuring the audiotex market. Revenues generated by premium rate services (PRS) are currently as follows.

In 1990, premium rate services (PRS) amounted to 499 million ECU. 48% of European PRS revenue were generated in UK, 32% in France, 20% in the Netherlands. In most countries, 50% of revenue collected from users are redistributed by the telephone operator to the information provider. Equivalent PRS services amounted to 540 million ECU in the USA. PRS applications are dominated in each country by entertainment, adult services and general public information (weather, traffic, sport, horse racing, health, etc.). However, the so-called "serious services", e.g. financial information and banking services, account information, transaction orders, are growing rapidly in the UK, where they benefit from higher rates. In the UK, adult services represent 34% of PRS revenue in 1989, but only 22% in 1990. "Chat line" and "family" services remained stable (14% and 24%). Serious services jumped from 24% in 1989 to 41% in 1990.

Significant developments during 1990 included the introduction of audio-fax and the development of subscription services where charges are made outside the network operator's billing system, using credit card for example.

5.4 CD-ROM commercial titles revenue amounted to 58 million ECU in the EEC, mainly through library and business applications, while in Japan, 289 million ECU were originated by consumer applications

CD-ROM was originally designed as a professional tool whereas Compact Disc Interactive (CD-I) was designed as a consumer "medium". In fact today, CD-I is more

and more considered for technical documentation and CD-ROM for computer games and education applications.

The emergence of a consumer market began in 1989, especially through educational titles. This shift began in the USA, and at a lower level in France and the U.K., with sales of educational titles through mass market distribution channels, like microcomputer and electronics stores and mail order catalogues. Dramatic evidence of this shift occurred in Japan.

Worldwide commercial titles revenue doubled in 1987, from 18 million ECU to 44 million ECU, multiplied by 5 in 1988, and more than doubled in 1989 from 207 to 440 million ECU .

In 1989, commercial title revenue in the EEC amounted to 58 million ECU, compared to 90 million ECU in Japan and 289 million ECU in the USA.

Concurrent with the Italian dominance in the EEC CD-ROM industry, revenue for commercial titles in 1989 amounted to 41 million ECU in Italy, compared to 7 million ECU in the UK, 3.5 million ECU in Germany and 3 million ECU in France. In 1988, commercial title revenue was 29.7 million ECU in Italy, 3.4 million ECU in the UK, 2.4 million ECU in Germany, and 0.85 million ECU in France.

An interesting aspect of the mass market development in Japan is the use of multimedia - text with pictures, animation, video and sound - to create information products.

5.5 Global EEC expenditure on electronic information services amounted to about 3,000 million ECU

In 1989 by totaling Europe-wide ASCII database services expenditures, videotex and audiotex revenues and CD-ROM commercial titles sales, European electronic information services and products expenditures (including imports e.g. purchases from non-EEC distributors) amounted to around 3,000 million ECU. Equivalent expenditure had amounted to 2,200 million ECU in 1988; fastest growth rates were recorded in CD-ROM, audiotex and videotex.

European electronic information providers' revenue (including "exports", e.g. sales to non-EEC users) amounted to 3,500 million ECU.

The US Department of Commerce estimated American electronic information providers' revenues at 6,800 million ECU (7,440 million \$). 25% of American providers' revenues originated outside the US, mainly in Europe.

6. Concentration in the information industry

- *A slow-down occurred in the trend towards global restructuring*
- *However, concentrations and joint ventures continued at a reduced rate in all information areas*

Introduction

Over the last three years, a number of mergers and acquisitions restructured the electronic information industry. The most significant acquisitions were initiated by large specialised information firms (Reuters, Dun & Bradstreet), and by gigantic and diversified media companies (McGraw Hill, Dow Jones, Knight Ridder, Maxwell, Pearson, Elsevier, Reed, Wolters Kluwer).

6.1 The trend towards global restructuring slows down

In 1990, there was not such strong movement towards concentration. The giants had to "digest" the companies they had acquired and to rationalise their activities, products and services.

In some cases, these worldwide information firms were obliged to offer for sale their recent acquisitions to absorb their debts. For example, *Dun & Bradstreet* (US) offered for sale two companies *Datastream* (UK, acquired in 1984) and *Interactive Data-IDC* (US, acquired in 1988); they also sold *Petroleum Information* (US) to *Geoquest International Inc* (US), *Focus Research* (US) to *Ziff Davis* (US) and *Donnelley Marketing Division* (US) to *Diamandis* (US).

Maxwell Communication Corporation (UK) sold the publishing firm *Caxton* (UK) and the scientific publisher *Pergamon Press*.

The *Groupe Expansion* (France), which had acquired several financial and economic newspapers in Europe, disposed of 66% of *Dafsa* (France) to *BIS* (France), already a majority shareholder in *SCRL* (France), the credit rating provider.

6.2 Concentrations and joint ventures continued at a reduced rate in all information areas

In the field of financial information, *Reuters* (UK) acquired *Uplink* to strengthen its broadcast dissemination capacity. *Agence France Presse* and *Extel Financial* (UK) created a company, *AFP-EXTEL News Ltd.*, to compete with *Reuters*, *Lipper Analytical Performance* (US) took a share in the *Europformance* (France). *Standards and Poors* (McGraw Hill group, US) acquired the *Agence d'Evaluation Financiers* (France). *VNU* (Netherlands) reinforced the market position of its American branch *Disclosure* by acquiring *Bechtel Information Services* (US), distributor of American public companies accounts. *Disclosure* also purchased the *International Report Collection* from the *Center for International Financial Analysis and Research*, covering 40,000 companies in 47 countries. The economic press publishers *Dow Jones* (US) and *Handelsblatt* (Germany) created a 50/50 joint venture to provide financial information services.

In the field of business and company information, *Maxwell Communication Corporation* (UK) acquired *Ecodata* (Germany) which collects data about 700,000 German firms. *Computer Intelligence*, shareholder of *Atooll* (France), has acquired *ITN Marketing*. Both companies collect data on computer sites within 150,000 European companies. *Hoppenstedt* (Germany) and *Bonnier* (Sweden) created a 50/50 joint venture to provide business information services.

In the field of legal information and databases, the legal publisher *Butterworths* (UK) and *Wolter Kluwers* (Netherlands) acquired respectively the *Library Association Publishing Ltd* (UK) and *Legislation Vigente* (Spain).

In the field of scientific and technical information, *Maxwell Communication Corporation* (UK) created with *VINITI*, the Soviet bibliographic agency, a joint venture called *Sci-Tech Information*. The *Royal Society of Chemistry* (UK) and *Dechema*, the chemical industry association (Germany), set up a joint venture to offer the world's largest database on chemical and process engineering and industrial biotechnology.

In the videotex sector, growth of terminals in Europe and achievements of Teletel European interconnections encouraged several French hosts to open branches or agencies in other Member States, especially in Italy and Spain (*Segin*, *SDV*, *Nouvel Observateur*). In France, the concentration which started in 1989 is continuing, e.g. through the acquisition of *Dictel* by *Courtoisie*, of *Media Innovation* by *Imagine Interactivity*, of *Allo Marché* by *La Voix Express*, of *Canal 4* by *Le Nouvel Observateur*, of *MC2* by *SG2* and of *AZ Telematique* by *CI-Cor*. Hosts are trying to meet the growing investments necessary to develop new services, especially for business applications. The merger of *Segin*, *Sodinfo* and *FITB* promoted *Axime* to third place in French computer services and software companies in France, and to first place in the videotex sector.

In the area of CD-ROM and multimedia publishing, *Questel* and *GMF* (the insurance company, shareholder of *FNAC* stores) created a joint venture, *Imeris*. *Her Majesty's Stationery Office* (HMSO), the British Government publisher, created a joint venture with *Context* (UK) to publish on CD-ROM. *Philips* sold part of its activities within the *PDO* joint venture (*Philips-DuPont de Nemours*).

It is also necessary to take into account the agreement between *Amadeus* (Air France, Lufthansa, Iberia) and *Sabre* (American Airlines) to achieve the world extension of their reservation systems. This agreement follows the one that was made between *Covia* (United Airlines) and *Galileo* (British Airways, Swissair, Alitalia).

7. **Growing involvement of traditional publishers in the electronic information market**
- *EEC press publishers do not seem to be as interested in making available online full-text database supply as their American counterparts*
 - *However, EEC press publishers explore opportunities in videotex and audiotex*
 - *Most of the European communication groups are now involved in the production or distribution of electronic information products and services*

Introduction

A striking feature of the electronic information market is the low involvement of EEC traditional publishers in the development of electronic information services.

In the first generation of electronic information services, ASCII online database services, American publishers were not among the pioneers. The host operators originated from a large range of activities such as electronics, aeronautics and space industry (*Dialog*, a branch of *Lockheed*, *TRW*), computer services (*Orbit*, a branch of *SDC*), research agencies (*National Library of Medicine*), paper and printing industry (*Mead Data Corporation*, a branch of *Mead*), business services (*Dun & Bradstreet*).

In the past, both the USA and Europe were cautious about investing in this area. In order to assess the present participation of American and European publishers in the area of electronic information services, three different stages may be referenced:

- realising the value of existing "information assets" by transferring internal databases to a commercial host for online distribution
- development of business and consumer services in the context of mass-market delivery channels, e.g. via videotex, audiotex, fax-based information services
- strategic involvement by taking over existing operators with the aim of playing a leading role.

For European as for American traditional publishers, strategic involvement in electronic information services is not obvious, considering the other strategic development opportunities, namely:

- diversification from publishing towards television (e.g. investment in TV stations, satellite and cable)
- diversification from publishing towards advertising (e.g. creation of "free" publications)
- consolidation and internationalisation of publishing activities (e.g. creation or acquisition of printing plants and of publishing firms abroad).

It has yet to be demonstrated that the profitability of a "strategic involvement" in electronic information services will be superior to that of other strategic development opportunities.

As a final analysis, the choice between these different strategies will very much depend on the "vision" traditional publishers have of their future business development. Accordingly, companies such as McGraw Hill and Knight Ridder withdrew from the audiovisual industry in order to concentrate on electronic information services. McGraw Hill acquired DRI in 1980 and invested 500 million ECU between 1986 and 1989 in costly acquisitions in order to diversify towards electronic information services. This group has since achieved 26% of its before-tax profits in information services as opposed to 41% in the press. Knight Ridder, with substantial previous experience with VU-Text, consolidated its position by acquiring the leading American host Dialog.

Even gigantic media companies, such as Bertelsmann, Maxwell, Pearson, CEP, Hachette, Reed, Mondadori and Ringier, that initially tried to develop simultaneously all these strategies, are now forced to reconsider their future direction

7.1 European press publishers are less involved in full-text database supply than their American counterparts

Moving to electronic techniques allowed newspapers to compile full-text databases from magnetic typesetting tapes. Parallel to this development was the more and more commonplace usage of word processors in the editing process and the appearance of "electronic editorial systems", allowing journalists to have access to both internal full-text databases and press agency features.

In the USA, several hundred publications are available today in full-text on hosts; there are only a handful in Europe. At the end of the 70's, *Mead Data Central* (US) had agreed to invest 15 million ECU in order to become the first host to provide online full-text of laws and caselaw. Following Mead Data Central's lead, most of the largest American hosts developed or acquired full-text management software. A few, like *Newsnet* (US), began to specialise in the distribution of online full-text newsletters. During that time, most European hosts were still focussing on the distribution of bibliographic databases or applied their full-text software only to the distribution of legal databases. Since European markets were nationally and linguistically fragmented, it was difficult for them to obtain a return on the high investments involved in loading these voluminous press databases. One should mention, however, the initiatives of *Datasolve-Profile* in the UK, *Questel* and *G-Cam* in France.

7.2 European press publishers explore opportunities in videotex and audiotex

In the EEC, the press publishers were encouraged by the network operators to take part in videotex trials. Hence, press groups started publishing the daily news "on screen", taking into account the technical constraints of videotex. The concept of "electronic newspaper" was born, but it has found little response from the public until now.

The only noticeable exception came from France where dailies and specialised magazines were able to benefit from the dynamics of Teletel. After the failure of "electronic newspapers", the press turned towards games, general information and "chat line" services.

On the other hand, since this form of "télématique" had very little to do with their "knowledge" or their "mission", reference newspapers (like *Le Monde*) and economic and financial newspapers started implementing high-quality information services. Thus, they offered the public access to data and functionalities formerly reserved for professionals, e.g. multi-criteria access, expert systems, portfolio management for stock exchange information.

In the USA, where videotex is only just emerging, press publishers are strong opponents of the removal of restrictions imposed on RBOCs. They argue that the de facto monopoly of regional telecommunications (so-called "bottleneck") could distort competition.

The involvement of press publishers in fax-based information services is limited in Europe to newsletter delivery. In the USA, trade and general business publications, ranging from *Communications Week* to *Business Week*, and newspapers (*Chicago Tribune*, *Los Angeles Times*, *New York Times*, *USA Today*), publish a daily summary in a fax version.

7.3 Most of the European Communication groups are now involved in the production or distribution of electronic information products and services

Among the 24 leading publishing and media companies in Europe (*Bertelsmann, Hachette, Havas, The Thomson Corporation, Reed International, Pearson, Maxwell Communication, Reuters, Mondadori, Axel Springer Verlag, United Newpaper, News International, VNU, RCS International, Heinrich Bauer Verlag, Daily Mail & General Trust, Elsevier, SEAT, Groupe de la Cité, Wolters Kluwer, CEP Communication, Generale Occidentale, Burda, Office d'Annonces*) 17 are involved directly or indirectly (through subsidiaries) in the provision of electronic information services.

However, their involvement remains low. Among these 24 leading European publishing and media companies, only 10 have developed or acquired significant host activities, 13 among them each produce at least one database available through a host, 14 produce each at least one CD-ROM title and 8 are involved in CD-ROM publishing as "service bureau".

Marwell, Reed International, United Newspapers (Euxel), Pearson (Profilo) and Reuters in the UK, Holtzbrink- Handelsebt and Bertelsmann in Germany, VNU, Elsevier and Wolters Kluwer in the Netherlands, SEAT in Italy, Office d'Annonces (Kompas) in France have invested heavily and are the most active, often after take-overs.

8. Electronic information services and the Internal Market

8.1 Manufacturing companies use electronic information services less intensively than companies in the service sectors

The first report pointed out the unbalanced structure of European companies expenditures on online database services. 80% were devoted in 1988 towards real-time financial information (currency and stock exchange rates), when only 10-15% were devoted to business information (economic, credit, legal data) and 5%-10% to scientific and technical information (STI, mainly bibliographic).

According to the Scicon survey, the financial sector concentrated 69% of the total European companies online database expenditures, retail and distribution 9%, tourism 9%, and manufacturing sector only 4%. In financial, tourist and travel activities, the level of electronic information expenditure by European companies seems to be in line with their American counterparts. It is dramatically lower in other activities, particularly in manufacturing:

As analysed in the previous Information Market Observatory report, this does not necessarily mean that European companies are less informed than American ones. The shift from printed sources (press, newsletters, directories, reports) and from traditional providers (credit rating services by mail or by telephone, information brokers, market research firms, banks, public organisations) towards electronic information services did not progress at the same rate in the EEC as in the USA.

8.2. Harmonisation of national nomenclatures and of government databases could stimulate the creation of European-wide databases for market data, mailing lists, credit ratings and company information

In order to benefit from the Single Market, EEC companies must be able to access easily information on EEC national markets such as market research data, mailing lists, consumer and company credit ratings.

In these areas, information firms depend on basic data produced at national level by government and public organisations.

Market research firms, for instance, collect data on both consumer and corporate behaviour and consumption through polls, surveys and observations. They often match these data collections with data obtained from government sources (e.g. statistical offices). These market research data collections often remain the property of those clients who initiated the studies but many market-research firms retain property rights on the data they have collected in order to publish reports and to provide database services.

Mailing list brokers and direct marketing agencies obtain basic listings from public bodies (e.g. statistical offices, telephone operators, ministries) and add value to these lists by matching them with qualitative data (e.g. consumption behaviour).

Credit ratings and solvency information contribute to the reliability of commercial transactions. These activities are highly dependent on national public sources (registers, courts, government official publishers) and on national regulations (e.g. company accounts). Credit ratings activities are highly computerised and are available online in many Member States.

Very few market research firms, mailing lists brokers and credit ratings agencies operate at European level. The networking of such firms, through acquisitions as well as through commercial agreements, has made progress in the last two years. This networking should enable partners (or subsidiaries) to provide coordinated surveys, to create Europe-wide consumer and company panels, to compile Europe-wide consumer and company mailing lists or to set up gateways between their credit ratings databases. This integration of data collections created by national partners (or subsidiaries) towards a single database requires common methods and significant investments.

The creation of such Europe-wide common databases (whether they will be distributed offline, online or published on CD-ROM) are hindered by the lack of harmonisation between government primary data in each Member State.

The Commission published "guidelines for improving the synergy between public and private sector". These guidelines aim to stimulate the distribution of public sector databases by private information providers.

The issues relating to basic data harmonisation between national public bodies are more complex.

The process of harmonisation of nomenclatures, classifications and of collections of primary data produced by national public bodies has been initiated for statistics and for company accounts. Progress is quite slow but the legal frame exists. In some areas, the harmonisation process has not even been initiated.

The emergence of such Europe-wide information services is also hampered by the diversity of national data protection laws. The legal framework for these information services varies from one Member State to another, especially for consumer credit

ratings and for direct marketing. The two Data Protection Directives proposed by the Commission aim to harmonise national data protection laws, and as such will take into account the problems raised by transborder flows of such information services.

8.3 EEC lags behind the USA in the provision of full-text news databases

The Information Market Observatory has underlined the gap between the EEC and the USA in the supply of economic full-text databases. Such databases make available collections of articles which were published in daily newspapers, economic magazines, newsletters, as well as to the full-text of surveys and reports. They enable a manager to gather quickly basic facts about a company, a market, a decision-maker, a country. They also allow companies to keep informed about initiatives from their competitors, or events affecting the markets.

As mentioned above, several European press publishers, press agencies and hosts are already active in providing such services, but discrepancies within the Community are increasing in this area. However, the continuing trend of concentration and cooperation in the economic press creates the conditions for producing, harmonising and gathering business news at the European level.

Current news databases should be considered in the perspective of fax-based monitoring services (e.g. selective dissemination of information). The subscriber defines a list of key-words (e.g. company, region, market, technology, industry) and receives by fax every feature published in different newspapers relating to his selection.

9. Towards a Community telematic infrastructure

- *The convergence of ASCII online services, videotex and audiotex raises new policy issues: the European Kiosk, the pan-European telematic infrastructure*
- *Fax is emerging as a key component of the telematic infrastructure.*
- *"Mobile services" will affect the development of electronic information services*
- *Multimedia platforms and ISDN converge through common standards*

9.1 The convergence of ASCII online services, videotex and audiotex raises new policy issues: the European Kiosk, pan-European Telematic Infrastructure.

The boundary between ASCII and videotex is fading away. Audiotex, videotex and fax can be combined into hybrid applications, viz. audio-fax, audio-videotex, video-fax. This complex of complementary and inter-related channels is usually defined as "Telematics".

The convergence between these formats and channels is not only technical. The variety of audiotex and videotex services depends on the existence of "premium rate services" and on the diversity of price bands. For value-added services (e.g. audio-fax), where price is not based on time (length of the call) but on the value or the volume of the information selected by telephone and delivered by fax, flexibility of tariffs will be crucial.

It was pointed out that interconnexion of national videotex networks and the establishing of a pan-European "premium rate service" are progressing slowly through bilateral agreements.

The concept of an European kiosk has been suggested for videotex and for audiotex.

9.2 Fax is emerging as a key component of the telematic infrastructure

The worldwide fax-installed base increased from 2 million in 1985 to 10 million in 1990. The EEC-installed base grew from 150,000 in 1985 to 3,200,000 in 1990; 513,000 in Germany, 234,000 in Spain, 773,000 in Italy, 944,000 in UK, 432,000 in France.

Most of the fax terminals are located in companies. In the UK, in 1988, 65% of personnel had used a fax, against 13% in 1986. Originally in the hands of the mail and telex department, fax machines are now spreading to all offices. In the USA, the fax is even penetrating homes (1% of American households in 1990).

Through the Docdel programme launched in 1984 and several pilot projects, the Commission had anticipated the use of fax for document delivery. A few information providers began to experiment in 1986 with the use of fax to deliver newsletters, press clippings and primary documents. Later on, hosts designed applications combining interactive search of databases and fax-delivery of the records as well as selective dissemination of information (SDI) by fax. Several EEC hosts were involved in such trials in 1989 and 1990: Genios (FRG), Profile (UK), Questel (France), ESA-IRS (Italy) and ECHO.

The association of fax with audiotex ("audio-fax") is particularly attractive. It combines two terminals massively disseminated and easy to use. The association of fax with audiotex (or with videotex) allows a user to select rapidly a document which will be delivered by fax.

Two trends in the equipment of companies are likely to establish the fax as a privileged channel for information dissemination:

- the development of "fax boards" which turn a PC into a fax machine; users can manipulate the data and are able to dispatch it to a list of correspondents;
- the development of "fax hosts" linked to local area networks (LANs); information received on such a host can be dispatched within the organisation.

9.3 "Mobile services" will affect the development of electronic information services

The Commission and the Conférence européenne des Postes et Télécommunications (CEPT) are creating a framework for developing mobile telephone services (e.g. cellular telephone, radiotelephone). The framework is known as GSM ("Global System for Mobile Communications").

The provision of mobile services could stimulate audiotex services. PRS high tariff rates, which are not currently available through land-based networks, could be made available through GSM. The Audiotex Workshop pointed out that *"GSM opportunity is currently not well understood and it may be necessary to establish audiotex regulations prior to the opening of GSM services. Full details of the potential services that may be available on GSM are not yet known and the details of revenue splits between the network operators and service providers have not been announced."*

GSM could also stimulate fax-based information services (e.g. delivery of information to a motorist).

9.4 Multimedia platforms and ISDN converge through common standards

For the CD-ROM industry, multimedia relate to information products which combine textual or numeric data with graphics, still pictures, motion pictures (animation or video) and sound.

For the telecommunications industry, multimedia relate to wide-band networks, integrating data, sound and image services.

For the publishing industry, multimedia relate to the alternate and complementary channels ("media") they can use to deliver their information resources.

CD-ROM publishers began to explore in 1989 and 1990 multimedia applications, considering the existing and forthcoming formats, platforms and systems; CD-ROM for the PC, Apple and Commodore systems, CD-ROM XA, CD-ROM Multimedia Windows, CD-ROM DVI, and CD-Interactive. Manufacturers and software firms compete to impose their technology. Multimedia publishing is not likely to be standardized by any official body.

Interestingly, multimedia standards are being developed for telecommunications and for broadcasting applications in CCITT (CCITT Group 3 and 4 facsimile page image compression standards) and in ISO (ISO JPEG and MPEG colour still and motion picture compression standards).

"Kiosk" and "premium rate" concepts helped videotex and audiotex to take off and should be taken into account for ISDN services.

The "one stop shopping" concept (OSS) has been adopted for the Europe-wide development of videotex.

The "Open Network Provision" Directive (ONP) defines the legal framework for telecommunications services.

Wide-band networks and multimedia platforms converge through common standards when mobile services transform the landscape of telecommunications.

All these concepts, Kiosk, OSS and ONP pave the way towards a Community telematic infrastructure.

10. Competitiveness of the European Electronic Information Services Industry

- *Profitability analysis based on published accounts suffer from incomplete, un-focused and incomparable data.*
- *Only half of the operators surveyed claim profitable activities over 1989/1990.*
- *Turnover and employment growth results in increased turnover per employee.*
- *The EC and USA have comparable export ratios.*
- *Competitiveness is influenced by high market fragmentation, large share of non-profit activities and slow enlargement of the customer base.*

Introduction

Any analyses of the competitiveness of the electronic information services industry suffer from a lack of reliable official statistics. Private market research studies, using diverging definitions, classifications and methodologies show very different results.

This report has given above some indications of the economic performance of the sector as a result of the IMO work carried out over the years 1989 and 1990.

Analyses of profitability based on published accounts all suffer from the problem that:

- most of the companies/organizations active in the information services market are SMEs and as such are not legally obliged to publish their annual results. Consequently financial data is not publicly available;
- in large companies, which are obliged to publish their results, the electronic information services account in most cases for only a small proportion of the companies' overall activities. The published aggregated figures often do not allow a specific analysis of the profitability of the electronic information services;
- in addition the differences in accounting conventions allow for only limited comparability of the figures in different countries.

Nevertheless some indications of the financial situation of the enterprises active in the market can also be given on the basis of the IMO's own and external surveys.

In the following analysis some quantitative and qualitative indicators of the competitiveness of the EEC industry will be shown.

10.1. Quantitative Indicators

According to the findings of the EEC Coordinated Host and Database Producer Survey, 51% of the respondents considered their activities as profitable in 1989/1990. Nearly half of those respondents who stated their activity as not profitable expect that their business will become profitable in the coming years, and 26% indicated that their activities will never be profitable or that it was unknown when profitability will be reached. These figures seem in line with those that indicate that for the EEC a ratio exists of around 1 to 1 in respect of the number of databases produced by profit and non-profit organisations. By contrast, in the USA, more than 80% of the databases are produced by the private sector.

The Jordans Financial Survey of the UK Information Industry provides 1990 financial figures for some 349 companies in the UK information industry.

The UK industry, which represents 84% (1990) of the total turnover of the EC electronic information services industry (taking into account the fact that the biggest international operating companies are found in the UK), is the most advanced in Europe. Therefore, although the findings of the survey are not representative for the total European industry, they nevertheless indicate some interesting findings.

- The financial situation of the industry can be interpreted differently by bankers or venture capitalists; taking into account or not the intellectual component (staff, software, databases) as assets. Newcomer or specialist companies often have limited real assets and face difficulties for getting loans secured against "intellectual" assets. Based on the banking definition of assets, the Jordan Survey identifies two main groups. The first group is composed of some 80 larger and established companies who have over £1 million assets. These include the major holding companies and the multi-national publishing companies. They also include the major organisations providing business information who have an underlying strength and investment in property. The second group is composed of 55 companies all of which are characterised by negative assets. They frequently have high liabilities as a result of funds being employed for systems development. Those with the worst position, who are still trading, are totally dependent on the funding from a larger parent organisation.
- The highest pre-tax profit to turnover ratios are recorded in business statistics (31%), credit reporting (16%), medium to large book and online publishers (17%), bibliographic agencies (12%) and large book and online publishers (11%).
- Single digit pre-tax profit to turnover ratios are recorded in company and stock market services excluding Reuters (9%), medium sized publishers (7%), hosts and gateways (7%) and news (5%).
- Non-profit non-loss sectors are comprised of smaller database producers, library automation, market research and specialist CD-ROM houses.

The Jordans survey concludes that looking at the overall performance of the many organisations, there is some way to go before the information industry can be said to offer a secure investment. A growing number of companies, especially in areas of business information, are however profitable and achieving growth.

On the basis of the Coordinated Host and Database Producer Survey, the growth in 1990 in terms of turnover was estimated at 12,5%, and at 5% in terms of employment, as compared to 1989. A productivity increase per capita from 1989 to 1990 can be deduced from the relation of turnover and employment in both years: the mean annual turnover per employee rose by 8% from 106 KECU in 1989 to 114 KECU in 1990.

As regards export ratios, 30% of the 1990 EC electronic information sector turnover originated outside the EC, marking a slight decline from the 1989 32% export ratio. For online ASCII databases the export ratios are higher - amounting to 36% in 1990 and 39% in 1989. For the USA, it was reported by the US Department of Commerce's "US Industrial Outlook" that the US Electronic Information services industry derives an estimated 30% of its 1990 revenues from foreign sources.

In complement to turnover indicators on exports, the analysis of the geographic origin of the databases hosted on EC hosts shows that the share in terms of number of domestic databases remains stable in 1989 as compared to 1988.

10.2. Qualitative Indicators

Analysis of strengths, weaknesses, opportunities and threats provides complementary insight into the quantitative indicators developed above.

The *strengths* of the European information industry are indicated by : the presence of leading world-wide companies such as Reuters and Maxwell, the relative high concentration of databases on European hosts, the strong tradition and international presence of the publishing sector, the availability of a rich cultural heritage, the involvement of the public sector to support and foster emergent ventures and long-term investments, as well as the large installed and still growing base of consumer information terminals which stimulate awareness of electronically disseminated data.

These strengths are however counter-balanced by several fundamental *weaknesses* due to market fragmentation, the large share of non-profit activities and the slow enlargement of the customer base to end-users.

Europe faces greater internal barriers to sector development than either the USA or Japan. US and Japanese companies benefit from some distinct advantages in that they are operating in a homogenous and relatively large marketplace. In contrast, European companies operate within a highly fragmented marketplace. There is , in effect - with the exception of the financial information sector - , no pan-European industry which can operate as a competitive counterweight to the US industry. The high market fragmentation results from the combination of several factors specific to the EC space such as: multilingualism, diverging legal frameworks for privacy protection and database protection, the variety of regional economic development patterns and telecommunication infrastructures, the unharmonised public-sector-held primary data collections, and the preponderance of the non-profit and public sector organisations more inclined than private operators to work on a country-by-country basis. Those structural fragmentation factors have a multiplier effect on an information market which is by nature already highly segmented by subject of interest and delivery media.

The effects of market fragmentation are : lower levels of database production aimed principally at national markets, preponderance of monolingual databases, preferential use of more favoured languages for international marketing, limited intracommunity database exports/imports whether by direct connexion, hosting or by gatewaying, lower database to host concentration ratios, lower R&D investments and slower introduction of new technologies.

The role of the European public sector has had a major influence on the style and pace of development of the computerised information services sector in each Member State. While in the USA as in the EC, the first databanks were set up by public operators or at the initiative of public authorities, in the USA the public initiative was very quickly taken up by the private sector. Private operators were much slower to become involved in Europe as illustrated by the fact that in 1989 83% of North American databases were produced by the private sector, as against only 48% in Europe. The European public sector intervention, whilst having provided initial stability, contributed to the development of the market on a country-by-country basis.

The European market is still geared very much towards information experts by its supply pattern showing comparable activity with the USA in STI database production, but lower levels of activity in full-text, statistical, factual, legislative, financial and news databases. The shift from information expert use to final users is slow, as indicated by the recent executive panel results, showing that two thirds of executives do not use on-line sources.

A principal difference between the business information markets in the USA and Europe is that businesses in the USA are more accustomed to paying for information and are much greater users of it. The business culture is therefore much more attuned to the need for

computerised information services. In addition, staff have more experience and training in the use of technology from school days onwards and so there is less resistance to its use.

The European industry is faced with major *opportunities* deriving from technology and market changes. New technologies such as machine translation, language engineering, satellite transmission, mobile services and multimedia offer potential for overcoming market fragmentation. Market growth is affected by expansion within European market sectors (e.g.. credit information, new business needs resulting from the Single Market, value added services and Eastern Europe) and by US and Japanese markets requiring increased European information as moving to more globalised market patterns. New service opportunities are brought about by telecommunications liberalisation, by trans-European access to videotex and audiotex services, by flexible premium rate services, by new delivery vehicles and by European Community standardisation and harmonisation initiatives.

However the European industry must be aware of major *threats* from the technology and acquisition led competitive attack from Japan, the ambitions of US telecommunications companies and the strong competitive positioning of US information industry companies. At the same time, it has to be noted that European publishers, facing alternative strategic development opportunities, are somewhat reluctant to diversify in electronic information, thereby leaving opportunities open to new actors from the electronic industry, who often are not of European origin.

11. Conclusion

This second report of the Information Market Observatory (IMO) confirms to some extent the findings of the previous report :

- The gap between the size of the Community information services market and that of the US market is narrowing but only slowly.
- The Community produces only half as many databases as the US.
- Professional and consumer expenditures on electronic information services and products (including videotex and audiotex services and CD-ROM titles) in the EEC is only half of those in the US.
- The European information services market is still very fragmented chiefly as a result of technical, legal and linguistic barriers.
- Notwithstanding positive signs of growth, productivity and exports, the sector is actually profitable for only half of its operators.
- There remains a significant disparity between Member States in the use and supply of electronic information services.
- Most information providers operate only on a national basis.

This second report underlines two major trends which were already identified last year :

- Videotex , audiotex and fax-based information services are paving the way towards mass-market applications and services : the 143 million telephone lines, more than 6 million videotex terminals and 2.5 million fax machines (see tables attached) are creating new opportunities for a Community-wide information services market.

- The prospect of the Single Market is stimulating a new demand for Community-wide information, particularly in the areas of market data, mailing lists, credit ratings and company information.

To take advantage of these opportunities, some European information providers and publishers are setting up new forms of partnerships : joint ventures, gateways, Community-wide database services and CD-ROM titles.

Such transnational partnerships are rare but would be stimulated by :

a) Elimination of legal and administrative barriers:

The Commission published "Guidelines for improving the synergy between the public and private sectors in the information market" in order to stimulate the distribution of public sector databases by private information providers. The Commission has proposed a Data Protection Directive which aims to harmonise national data protection laws : it takes into account the problems raised by transborder flows of such information services.

The legal framework of videotex and audiotex services varies from one Member State to another and hampers the emergence of transnational services.

b) Convergence of national telematic infrastructures, particularly videotex and audiotex networks.

This convergence is only being achieved partially through some bilateral agreements between national telecommunications operators and could therefore also be boosted by multilateral access and billing facilities. The concept of a European kiosk could create a framework for such initiatives.

c) Harmonisation of government-owned collections of primary data :

The public sector often plays a leading role in the creation of basic data : information providers depend on the availability and the quality of the basic data produced by government and public organisations. Information providers who want to provide Community-wide database services or CD-ROM titles have to invest considerable effort in matching primary data collections which have been created at national level through different methods, nomenclatures and classifications.

The convergence of nomenclatures of public data collections would stimulate information providers to design Community-wide, value-added electronic information services and products.

Main references

1. Europe's position in online database services:

Information Market Observatory, Commission of the European Communities, DG XIII, L-2920 Luxembourg

- * IMO report 90/1: "Production and availability of online databases in 1988"
- * IMO report 90/2: "Databases in Japan"
- * IMO report 90/5: "Production and availability of online databases in 1989"

2. Videotex information services and networks in Europe

European Information Industry Association (EIIA), BP 262, L-2012 Luxembourg

- * Coordinated survey of European hosts organisations engaged in the provision of electronic information services for professional users, Final report, December 1990

Information Market Observatory, Commission of the European Communities, DG XIII, L-2920 Luxembourg

- * IMO report 89/6: "Gateways: The Growing Trend in Database Distribution"
- * IMO report 89/7: "The Impact of Videotex on the Online Market"
- * IMO report 90/3: "Overview of the videotex market in 1989"

Nouveaux médias informatiques - F.L.A. Consultants - B.T.T.

- * "Un support Videotex Européen pour le serveur Echo", July 1989

France Télécom (La Lettre de Télétel), BP No.3, 75721 Paris Cedex 15, France

- * La Lettre de Télétel, published by France Télécom, Direction commerciale.

Quadrature, 11, rue du Marché Saint-Honoré, 75001 Paris

- * Les services vidéotex professionnels en Europe. Impact sur le marché des bases de données.

3. Audiotex services

Information Market Observatory, Commission of the European Communities, DG XIII, L - 2920 Luxembourg

- * IMO report 91/1: Overview of the audiotex market in 1989 and 1990

Electronic Publishing Services Ltd., 104 St. John Street, London EC1M 4EH, UK

- * Report on the Audiotex Workshop 17/18th December 1990, Luxembourg

Electronic Publishing Services Ltd., London UK, December 1989 and November 1990

- * The Audiotex Information Services Market in Europe

4. CD-ROM publishing

Information Market Observatory, Commission of the European Communities DG XIII, L-2920 LUXEMBOURG

- * IMO report 89/4: "Production of Databases on CD-ROM in 1988"
- * IMO report 89/5: "The CD-ROM Market Revisited"
- * IMO report 91/2: "Overview of the CD-ROM Market"

Infotech and Optical Publishing Association (OPA), 1880 Mackenzie Drive, Suite 111, Columbus, Ohio, 43220 USA

- * Optical Publishing Industry Assessment, 1990

5. Usage of electronic information services and products

Information Market Observatory, Commission of the European Communities, DG XIII, L-2920 Luxembourg

- * IMO report 90/4: Size and trends of the electronic information services market

Database Promotion Center, 7th floor, World Trade Center Building, 2-4-1, Hamamatsu-Cho, Minato-ku, Tokyo, 105, Japan

- * Database in Japan 1990

Observatoire mondial des systèmes de communication (OMSYC), 20, avenue Rapp, 75007 Paris

- * **Communication Systems Statistics 1989**

US Department of Commerce, Washington, USA

- * **1990 US Industrial Outlook**

Office for Official Publications of European Communities L-2985 Luxembourg

- * **Panorama of the EC Industry 1990**

6. Concentration in the information industry

European Economic Research and Advisory Consortium (ERECO)

- * **Mergers and acquisitions in the world information market ;
Report to the Commission of the European Communities, March 1991**

7. Growing involvement of traditional publishers in the electronic information market

Price Waterhouse, London, UK

- * **Study on the Information services market
Report to the Commission of the European Communities, July 1990**

Le nouvel économiste, Hors série, novembre 1990, 65, avenue des Champs Elysées, 75008 Paris

- * **Classement des 7123 sociétés européennes et mondiales**

8. Electronic information services and the Internal Market

SCICON, London, UK

- * **The market for value-added services in Europe, December 1989**

9. Towards a Community telematic infrastructure

Electronic Publishing Services Ltd., 104 St. John Street, London EC1M 4EH

- * Fax based information services, October 1990

10. Competitiveness of the European Electronic Information Services Industry

Jordan & Sons Ltd, 21 St. Thomas Street, Bristol BS1 6JS

- * The UK Information Industry - A Financial Survey 1991/2

Specialized press

A.Jour - Transtex International - Quadrature - 11, rue du Marché Saint Honoré, 75001 Paris

- * Industrie de l'Information
- * Videotex International
- * Infotecture Europe
- * CD-ROM International
- * Videotex et RNIS magazine

Electronic Publishing Services (Publications), 104 St. John Street, London EC1M 4EH

- * EP Journal (published in association with the International Electronic Publishing Research Centre)

Learned Information (Europe) Ltd., Woodside, Hinksey Hill, Oxford OX1 5AU

- * Online Review
- * Monitor
- * Information World Review
- * Electronic and Optical Publishing Review

List of abbreviations

ASCII :	American Standard Code for Information Interchange
CD-ROM :	Compact Disc Read Only Memory
CD-I :	Compact Disc Interactive
CDXA :	Compact Disc Extended Architecture
CCITT :	Comité Consultatif International Télégraphique et Téléphonique
CEPT :	Conférence Européenne des Postes et Télécommunications
CRTC :	Canadian Radio-Television and Telecommunications Commission
DTMF :	Dual Tone Multi-Frequency
DVI :	Digital Video Interactive
EIIA :	European Information Industry Association
FCC :	Federal Communications Commission (in the US)
FTC :	Federal Trade Commission (in the US)
GSM :	Global System for Mobile Communications
ICSTIS :	Independent Committee for the Supervision of Standards of Telephone Information Services
ISDN :	Integrated Services Digital Network
JPEG :	Joint Photographic Experts Group (still picture compression standard)
LAN :	Local Area Network
MPEG :	Moving Picture Experts Group (moving picture compression standard)
NAPLPS :	North American Presentation Level Protocol Syntax
OSS :	One Stop Shopping
ONP :	Open Network Provision
PRS :	Premium Rates Services
PUCs :	Public Utilities Commissions (in the US)
RBOCs :	Regional Bell Operating Companies (in the US)
SDI :	Selective Dissemination of Information
ISO :	International Standards Organisation

Communication equipments in the EC

1990	Total Population	Telephone lines	Television sets	Video cassettes recorders	Videotex terminals **	Mobiles telephones	Fax machines	Telex
Source	Eurostat	OECD	OECD	OECD	Quadrature	OECD	Logica	Logica
BELGIUM	9 962 200	3 559 000	3 258 000	780 000	7 700	26 874	70 000	20 900
DANEMARK	5 139 000	2 909 000	2 215 000	720 000	6 000	116 342	53 500	11 300
EIRE	3 503 000	879 000	826 000	456 000	3 000	8 500	22 500	4 220
FRANCE	56 421 400	27 000 000	18 459 000	7 878 000	5 817 000	147 389	402 000	144 000
GERMANY*	62 700 000	29 837 000	29 577 000	11 614 000	256 000	138 511	550 000	152 000
GREECE	10 123 000	3 788 000	1 750 000	666 000	1 000	5 560	27 000	
ITALY	57 657 800	25 566 000	14 687 000	2 470 000	145 000	66 000	353 000	67 700
LUX.	397 500	176 000	140 000	40 000	1 000	406	2 960	2 630
NETHER.	14 951 100	6 691 000	6 850 000	3 042 000	100 000	49 500	200 000	28 000
PORTUGAL	10 365 000	2 612 000	1 626 000	639 000	3 500	2 782	11 100	27 600
SPAIN	38 995 900	14 476 000	14 314 000	3 860 000	150 000	23 779	262 000	40 700
UK.	57 395 000	25 363 000	24 650 000	12 558 000	160 000	699 000	536 000	114 000
EEC	327 065 000	142 856 000	118 352 000	44 723 000	6 650 200	1 279 083	2 468 620	640 050

* Germany's figures do not include the Ex-GDR

** Videotex terminals include videotex-emulated PC

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**Penetration Rate
by total population**

1990	Telephone lines	Television sets	Video cassettes recorders	Videotex terminals
BELGIUM	35.7%	32.7%	7.8%	0.1%
DANEMARK	56.6%	43.1%	14.0%	0.1%
EIRE	25.1%	23.6%	13.0%	0.1%
FRANCE	47.9%	32.7%	14.0%	10.3%
GERMANY	47.6%	47.2%	18.5%	0.4%
GREECE	37.4%	17.3%	6.6%	0.0%
ITALY	44.3%	25.5%	4.3%	0.3%
LUX.	44.3%	35.2%	10.1%	0.3%
NETHER.	44.8%	45.8%	20.3%	0.7%
PORTUGAL	25.2%	15.7%	6.2%	0.0%
SPAIN	37.1%	36.7%	9.8%	0.4%
UK	44.2%	42.9%	21.9%	0.3%
EBC	43.7%	36.2%	13.7%	2.2%

Number of CD-ROM drive units

	1989	1988	GROWTH
FRANCE	4755	1952	144%
GERMANY	5025	2946	71%
ITALY	21416	15968	34%
EEC OTHER	750	0	
U. KINGDOM	6463	3435	88%
IRE/BEL/GRE	1017	347	193%
NETHERLAND	3150	703	348%
SPAIN	800	125	540%
EEC	43376	25476	70%