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COMMUNICATION FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT

IMPACT Programme (EC plan of action for setting up an information services market) - Evaluation Report of Programme and Report on the most important events and developments which occur in the information services market, submitted in accordance with Council Decision 88/524/EEC

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, an evaluation of the results achieved within the Programme has been carried out.
3. A report has been drawn up by a panel of independent experts and is attached to this Communication as Annex I. The evaluation of the programme is, in general terms, positive, and the report makes a number of recommendations, with particular regard to the continuation of activities in this area at Community level. A descriptive list of pilot/demonstration projects selected for support under the IMPACT Programme is attached for information as Annex II.
4. In conformity with Article 6 of Council Decision 88/524/EEC, the Evaluation Report was submitted to the Senior Officials Advisory Committee for the Information Services Market (SOAC) for consultation at its meeting of 29 March 1990.
5. Also in conformity with Article 5 of Council Decision 88/524/EEC, a report has been prepared on the most important events and developments which occur in the information market and is attached to this Communication as Annex III.

ANNEX III

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**Report on main events and developments on the
information services market**Summary

1. When on 26 July 1988 the Council adopted a plan of action for setting up an information services market, it asked the Commission to establish a European information market observatory and to submit to it and the European Parliament an annual report on the most important events and developments occurring on the market.

This first report concerns the state of the market for professional database services at the end of 1988.

2. The gap between the size of the Community information services market and that of the US market is closing only gradually. The Community produces only half as many databanks as the United States of America and consumes half the volume of electronic information services. The Community market is more highly developed than that of Japan, but the latter has been making strenuous efforts in recent years to catch up.
3. The European information services market is still very fragmented, chiefly as a result of linguistic, legal and technical barriers. Its main developments are taking place on a national basis. The diversity of national telecommunications policies, particularly on the development of videotex networks, combined with the economic disparities within the Community exacerbates the discrepancies between Member States.
4. Up to now, the main operators on the European information services market have favoured national or transatlantic agreements. The coordinated advance of integrated services networks, the emergence of the CD-ROM market and audiotex technologies and the provision of gateways between hosts, coupled with the new demand for information generated by the prospect of the single market, are creating new opportunities for developing a Community-wide information services market.
5. To take advantage of these opportunities, European operators must set up new forms of partnership, particularly if they are to overcome language barriers. This will happen only if the public authorities make a sustained effort to:
 - eliminate the remaining technical and legal obstacles, so as to reduce market uncertainties;
 - minimize the disparities between Member States in information services infrastructure, so as to promote the dissemination of electronic information products and services throughout the Community;
 - foster cooperation between European partners in order to overcome language barriers and develop products and services covering the whole of Europe and meeting the end user's needs more effectively.

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Foreword

"Whereas fuller statistics on the Community information market are vitally needed to match those for more traditional sectors", the Council, in its Decision of 26 July 1988 concerning the establishment of the plan of action for setting up an information services market, approved "the establishment of a European information market observatory to stimulate the provision of fuller statistics and, in order to keep the Commission informed in drawing up its policy, to identify the European Community's competitive strengths and weaknesses in the sector".

The Observatory relies on a network of correspondents in all Member States, who keep it informed of data sources on the market.

It has also acquired a number of tools:

- a system for monitoring the development of the world supply of online or CD-ROM databanks: the Supplystat database;
- a representative sample of 500 databank users scattered throughout the twelve Member States and consulted three times a year;
- a data stock containing the main events and data on the market identified in specialist publications or research reports.

The Observatory's primary objective in 1989 was to make the world supply of database services better known.

To determine the impact of technological innovation on the distribution of database services, the Observatory launched two specialized surveys, one on the development of audiotex services (vocal response databases, accessible via a standard telephone), and the other on the distribution of database services via broadcasting facilities.

To gain a better impression of the size of the online information market, the Observatory set up a survey of European hosts in collaboration with the professional associations in the sector.

It also instigated a comparative study of the economic and financial performances of the main European, US and Japanese actors, to determine the strengths and weaknesses of the European information services industry compared with those of its main rivals.

Finally, the Observatory initiated methodological work in cooperation with Eurostat, with the aim of improving the quality and comparability of the surveys of the information market and ultimately compiling official statistics on the sector.

This first report summarizes the information collected by the Observatory during 1989, which is incomplete: several studies are still under way and their results are not yet available. They will be called upon for the second annual report.

1. Europe's position as a world supplier of databanks

Production

- * The United States produces twice as many databanks as the Community
- * Japan has been making strenuous efforts to catch up
- * European production is largely dominated by the United Kingdom
- * The United Kingdom is responsible for three-quarters of Community "exports"
- * English is still the principal production language.

Distribution

- * One in four hosts is based in the Community
- * Ten US hosts account for one-third of the world distribution.

1.1 Databank production

Introduction

The terms "database services" and "electronic information services" cover a multitude of offerings today: documentary databases, electronic directories, financial information and stock exchange quotations disseminated in real time, full-text databanks containing newspaper articles and press releases, information services on the solvency of firms and individuals, economic forecasting services, address files and electronic transport and tourist booking systems.

Electronic information services cover a wide range in terms of the type of data distributed (bibliographical, numerical, textual, graphic), the fields covered (economics, law, finance, science, technology), and the services rendered (access to archive data, real-time information dissemination), but have one thing in common: the use of EDP technology, not only for storing and structuring the information in databanks but also for distributing it to users.

The Observatory's statistics on the amounts of information produced by databanks relate exclusively to professional database services accessible in ASCII mode. They do not include videotex services. These statistics are global, lumping together banks of very disparate sizes, qualities, target audiences and ages. This problem is not exclusive to databases; it applies equally to statistics on traditional publications. However, despite their limitations, such statistics are useful for identifying certain trends.

1.1.1 The Community produces only half as many databanks as the United States.

The Information Market Observatory registered a worldwide total of 3.780 databanks available commercially online in 1988, not counting those distributed only by videotex. The survey is not exhaustive, particularly in the case of Japan, but covers all database services publicized in the national and international trade directories.

With 2.063 databanks, the United States continues to dominate the world market, but its share is gradually diminishing, with the rise in strength of the Community and Japan and the appearance of new producer countries. The Community produces 947 databanks available online, i.e. half as many as the United States.

1.1.2 Japan has been making strenuous efforts to catch up

Before Japan became involved in producing databanks, it concentrated its efforts during the 1970s on access to foreign databanks, particularly in the scientific and technical categories. Major publishers such as Maruzen and Kinokuniya made the North American and European hosts available commercially in Japan. Rather than consulting foreign databanks from a distance, the public agencies (JICST, Japan Patent Information Organization) and the universities preferred to acquire the banks in order to use them, develop and make them available on their own hosts.

Japan began disseminating its own stocks of information online a few years after the United States and the Community.

In 1981, the Industrial Structure Council submitted to the Japanese government an initial report on the information industry. In 1983 it stressed the development of databank services. The MITI published the first Japanese databank directory in the same year, and in 1984 the Database Promotion Center was founded. In 1987, a Promotion Reserve Fund was set up to encourage databank producers; this was initially limited to two years, but was extended to 1989. Also in 1987, the conditions of access by the private sector to data stocks of public origin were laid down. The Federation for the Promotion of Information Industry provided the necessary channels.

This sustained effort bore fruit: in 1988, the MITI registered 528 databanks of Japanese origin. This figure covers both databanks available online and those which are marketed in machine-readable form for local access. It cannot therefore be compared directly with statistics on the production of online databases in the United States and Europe. Between 1983 and 1986, the average rate of emergence of new databanks was 23% per year. 1987 saw an acceleration to a 44% growth rate, or 128 new databanks. In 1988, 103 new databanks had been created.

1.1.3 The production of European databanks is largely dominated by the United Kingdom

The UK alone produces one-third of all online databanks in the Community, i.e. 325 out of 947. The reasons for this are a strong library tradition, lively British learned societies firms and a powerful publishing sector, stimulated by the potential American market for products in English.

The predominance of the UK is also reflected in the number of hosts (in the Community, one in three is British) and on the market (more than 50% of European market turnover).

1.1.4 The United Kingdom is responsible for three-quarters of the exports of databanks produced in the Community

192 European databanks are "exported", i.e. exploited by non-Community hosts, three-quarters of which are in the USA. The number of European databanks exploited by the United States - 141 - is, however, very small, representing only 6% of the 2 259 banks distributed on the other side of the Atlantic.

Three-quarters of these Community "exports" are made by the United Kingdom.

The UK, and to a lesser extent the Federal Republic of Germany, contrasts clearly with the Community in general: the British databanks have a more international coverage and more than one-third of them are exploited by foreign hosts in the USA, in other English-speaking countries and also in the other Member States. Some of them are used only by hosts based outside the United Kingdom.

1.1.5 English is still the principal production language for databanks

The USA and the United Kingdom alone account for nearly two-thirds of world databank production. It is not surprising, therefore, that English is the dominant language used by producers, with 80% of databanks accessible in English compared with only 8% in French and 6% in German.

1.2 Databank distribution

Introduction

The databank industry grew up during the 1970s around online hosts. The provision of database services called for the use of powerful computers and sophisticated software. In addition to technical and financial barriers - investments in hardware and software and the high cost of operating large databanks - there was the heavy commercial investment involved in opening up the market. This first generation of hosts concentrated its efforts on documentalists: the heavy investment and this homogeneous target favoured multidisciplinary hosts known as "supermarkets".

During the 1980s, the generalized development of data transmission networks, the emergence of videotex, the appearance of new software and the development of computer architectures made the essentially technical role of host more commonplace.

The simultaneous appearance of professional databanks more geared to the final user gave the initiative back to the producers, who were closer to the users and thus better placed than general hosts to distribute their own banks.

1.2.1 One in four hosts is based in the Community

In 1988, the Observatory registered 211 hosts in the Community and 302 in the United States, not counting those which provide videotex only. The Community and the USA account together for two-thirds of active hosts worldwide.

This proliferation of hosts, which is likely to increase further with the emergence of micro-hosts, belies a heavily concentrated distribution structure: half of the hosts listed by the Observatory distribute only a single databank; in contrast, some twenty hosts operate more than half of the databanks distributed worldwide.

1.2.2 The North American general hosts, particularly those dating from the 1970s, have continued to grow, becoming mega-hosts

The North American hosts, supported by a powerful domestic market, were the first to reach the critical size enabling them to disseminate their services on the European and Japanese markets. The general hosts set up in Europe in the late 1970s had better commercial foundations in their own countries and used national databanks, so that they succeeded in defending the national markets from the North American hosts but failed to gain a significant foothold in the transatlantic market.

Conversely, whereas the North American general hosts continued to increase their capacity and international connections, their European equivalents remained moderate in size. The nineteen largest hosts - those exploiting more than 50 databanks - account for more than 50% of world distribution by themselves. Among them, there are only four European hosts, among them, including one Swiss, compared with thirteen US and two Canadian hosts.

2. Very different rates of consumption according to market segments

- * Europe makes only half as much use of electronic information services as the USA
- * Financial operators in Europe make more use of electronic information services than their US counterparts
- * European R & D staff and laboratories use the services as much as their US counterparts
- * Consumption by firms and consultancies is four times greater in the USA than in Europe
- * Information experts are relying increasingly on European hosts.

Introduction

The proliferation of contradictory figures on the world databank market means that care must be taken with any analysis and that certain explanations are necessary:

- The overall figures for the consumption of electronic information services are not very meaningful, since the market actually consists of a large number of segments of very different sizes and levels of activity. The consumption of telematic hotel reservation services can hardly be lumped together with that of scientific and technical databanks, or financial information services with materials databanks, and still give valid results.

- The consumption of electronic information services does not reflect the overall consumption of information. The fact that the Community makes only half as much use of database services as the USA does not mean that it uses only half the information. Rather, the difference stems from the fact that electronic services have been slower to replace traditional information services - the press, surveys, individual consultancy services, telephone enquiries, document reproduction. The databank market figures have to be seen in the light of those on the consumption of offline services.

- The consumption of electronic information services is not measured as accurately as press readership, conference attendance or audio-visual media audiences. The results of surveys of suppliers, conducted today by a few private research organizations, cannot be cross-checked: the various segments of the market can be assessed from the type of information disseminated (financial, scientific and technical, legal, on patents or firms, etc.), the intended user (scientific researchers, finance institutions, engineers, lawyers, etc.) or the form the information takes (documentary references, textual data, numerical data or statistical series). Within the various segments, the typologies used to distinguish between different services or categories of user vary from one study to the next.

One of the Observatory's aims is to help improve the quantitative evaluation of the various segments of the market by encouraging the organizations surveying the market to use consistent methodologies and hence produce more comparable results, but also by conducting its own surveys when reliable and comparable data are required. The data collected in 1989 relate to three large information markets: finance, science and technology, and business. In each of these three segments, different factors combine to foster the replacement of traditional information services and products by electronic ones.

2.1 The United States spends twice as much as Europe on consulting databanks

According to available sources, Western Europe's consumption of electronic information services is two to three times less than that of the USA. In 1988, according to Link Resources, the US market was around 6 000 million ECU, compared with less than 2 000 million for Western Europe. Since the levels of consumption of scientific databanks and financial information services in the USA and Europe are comparable - some 1 000 million ECU for financial and 150 million for scientific and technical information - the difference between the two global figures is explained by a higher consumption in North America of database services in other fields: databanks on legislation, companies and current affairs, chiefly of interest to managers and members of other professions.

The exact size of the Japanese market is difficult to assess. The Japan Database Promotion Center puts it at 155 000 million yen (approximately one thousand million ECU). This figure reflects only part of the actual consumption in Japan: the powerful commercial companies (sogo shoshas), the large industrial groups and government organizations (MITI and JETRO above all) use large information systems. These databanks are usually consulted "outside the market", according to non-commercial procedures: privileged access for clients, contractors, suppliers and partners in commercial companies and industrial groups, and access to public databanks via government and regional agencies.

2.2 Financial operators consume more electronic information services in Europe than in the United States

In the field of finance, sudden rises and falls in the rate of inflation, rapid variations in interest rates, fluctuations in exchange rates which are unpredictable in the short term and, lastly, a series of computer innovations in the processing and circulation of financial flows - mean that financial information has a crucial role in risk management and in investment decision-taking. European financial market-places and operators adapted quickly to electronic information and real-time services.

The North American and European financial information markets are thus comparable: the European market is valued at 1 000 million ECU, two-thirds concentrated in the United Kingdom, and the North American market at 800 million ECU.

2.3 European R & D scientists and laboratories consult scientific and technical databanks almost as often as their US counterparts

In the field of science and technology, access to the results of published or patent-protected research work, monitoring of research by rival laboratories and teams and the detection of technological breakthroughs have become essential components of research and development strategies.

It was in this field that databank consultation first appeared in the 1970s. European research organizations have caught up with the USA in both the production - the SPRU, based on the Cuadra directory, estimates the number of databanks produced by the Community in this segment at 295 as against 335 in the USA - and consultation of databanks, where some 150 million ECU are spent in Western Europe compared with 180 million in the USA.

2.4 Consultancy firms and individual consultants in the United States make four times as much use of electronic information services as their European counterparts

For firms, rapid access to accurate information or to reliable analyses and forecasts has become an essential competitive factor: to make themselves known and to get to know their markets and rivals, to detect business opportunities and adjust their strategies, and to target their marketing campaigns, firms are turning increasingly to electronic information services. The need to mobilize technical and commercial information is apparent in virtually all sectors of activity, including traditional ones such as agriculture.

It is here that Europe lags a long way behind the USA in both production and consumption: 200 million ECU in Western Europe compared with some 800 million in the USA. There are several explanations for this delay:

- consumption habits are still centred on traditional (offline) information products and services which are only gradually being replaced by their electronic counterparts;
- only part of the basic information is in digital form (directories, information which must be published by law);
- non-videtex services are still designed for information experts and are complicated for the inexperienced user;
- it should also be stressed that the statistics of most research organizations omit the consumption of videtex services, which may be considerable in France, United Kingdom and Germany.

There is nevertheless a rapidly-growing trend towards supplying information to the end user.

2.5 Information experts are relying increasingly on European hosts

The first generation of databank users cut its teeth in the 1970s on the US hosts. Database host services were set up in the wake of Euronet explicitly in order to channel the flow of enquiries towards the national hosts. Their commercial aim, i.e. to win back this well-financed, highly-motivated and well-trained clientele, was evident from the type of databank they chose to distribute - often North American in origin. The governments which promoted or subsidized the founding of national hosts had the same aim, albeit for different reasons.

The proliferation of national hosts undermined the achievement of these commercial and political objectives: the European hosts, calling on a more restricted databank catalogue than their US rivals but competing with each other by often distributing the same banks, did not seem in a position to win back users who were already familiar with other retrieval languages and wished to access most of the databanks they needed via the same host. These general European hosts nevertheless had a better commercial footing in their own countries and called on national databanks, so that they were able to compete successfully with the US hosts for the national markets.

According to the panel of information experts set up by the Observatory, three-quarters of research today is carried out via European hosts and nearly half via national hosts. A list of the most popular hosts confirms this phenomenon: of the US hosts traditionally operating in Europe, only Dialog, the leader, has maintained a strong position. Next, but a long way behind, is Dastatar of Switzerland, followed by eight European Community hosts.

3. The weaknesses of the Community on the electronic information services market

- * A fragmented European market
- * A market still geared too much towards information experts
- * A private sector only slowly taking over from public producers

3.1 A fragmented European market

3.1.1 Data bank producers aim first for national markets: nine out of ten European databanks are monolingual

Most databanks produced in Europe are concerned with a country's documentation, firms, economy and legislation. Since their primary aim is to meet the information needs of domestic users, it follows that more than nine European databanks in every ten are accessible in only one language, i.e. that of the producer country.

Producers in some countries are making a special effort to promote multilingual access to the data they compile. With the exception of Belgium and Community institutions, which are multilingual by nature; attempts at multilingualism are made for export purposes or at least for expansion outside the producer country and language zone.

In Europe, the biggest drive towards multilingualism is in the Federal Republic of Germany, where 30% of databanks are accessible in English and 6% in French. The indexing of scientific and technical banks reflects the will to penetrate the North American and world markets, one manifestation being the agreement between FIZ-Inka and Chemical Abstracts Services (CAS) and the Japan Information Center for Science and Technology (JICST).

In the ten Member States of the Community in which English is not the official language, some databanks are produced directly in English and account for 52% of European banks accessible in the language, while the two anglophone Member States, the United Kingdom and Ireland, produce only 35% of European databanks.

3.1.2 European hosts import few databanks from other Member States

The tendency of European databanks to cater for the national market, plus the exclusive use of the national language, explains why most databanks produced in Europe are distributed by hosts based in the country of production.

Of the 1 110 banks distributed by Community-based hosts, 73% are of national origin, 17% from third countries (half of which are from the USA), and only 10% from other Member States: the British hosts plus that of the European Space Agency, are the biggest contributors to intra-Community databank flow.

3.1.3 Despite their advantages, there are still few gateways between hosts based in several countries

The gateways being set up between hosts are a major trend in electronic information dissemination, but are having little impact on the development of an intra-Community information market.

Through its HOSTINTER project, the Commission of the European Communities had attempted to make European hosts aware of the advantages of gateways. It seems today that spontaneously-developed gateways tend chiefly to reroute North American users to European hosts, or the users of one host to another in the same country; in other words, they are more often transatlantic or national than intra-European: when a European host offers gateways to its subscribers, one-third of them on average re-route within the same country, one-third to the USA and one-third to another Member State.

3.2 A market still geared too much towards information experts

3.2.1 Community databank activity still focusses on scientific and technical information.

In 1988 the Community produced:

- almost as many scientific and technical databanks as the USA;
- but only one-third the number of legislative databanks;
- only one-quarter the number of financial databanks, despite several lively stock markets;
- only one-tenth the number of news and current affairs databanks, despite a dynamic economic and specialist press.

3.2.2 Community effort is still aimed at documentation specialists

The first generation of bibliographical databanks catered for documentation experts in research institutions and large public and private organizations, who mastered the relatively complex documentary software and acted as intermediaries between the databanks and the users of the information.

It was only with the second generation of databanks that these activities became a growth industry in the USA: information service companies, consultants, professional publishers and financial information agencies took advantage of the penetration of micro-computer technology into firms and the widespread access to telematics networks in order to offer information services targeted at the end user: these full-text, numerical or factual databanks do not require a documentation specialist as intermediary and are directly accessible by financial directors, lawyers, engineers, marketing executives and members of the liberal professions.

If the Community has caught up in terms of bibliographical databanks - it produces 287 to the USA's 275 - the gap is widening where banks aimed at the end user are concerned, with the Community producing:

- half as many factual databanks as the USA;
- one-fifth the number of full-text banks;
- one-sixth the number of statistical banks.

3.2.3 Information experts still account for a large part of the databank market

Data banks have been used in Europe for many years. Automated documentation techniques penetrated the documentation and patents departments of the major European chemical, oil and pharmaceuticals companies virtually at the same time as in the United States: as soon as the first scientific and technical databanks, chiefly US and British, became accessible, documentation experts in Europe were determined to take advantage of them.

With the development of legal, economic and financial information services targeted at businessmen and the professions, documentation specialists in the USA were replaced by managers, engineers and other professionals. This process took longer in Europe.

Information experts today account for an estimated 25-40% of the European electronic information services market, according to the country. The United Kingdom has the largest proportion, at 40%. These figures are declining by an average 5% per year in favour of management executives - 20% in France in view of the development of professional videotex.

3.3 The private sector is only slowly taking over from public producers

In the USA as in Europe, the first databanks were set up by public operators or at the initiative of the public authorities, particularly in the scientific and technical information sector. While the public initiative was very quickly taken up by the private sector in the USA, private operators were slower to become involved in Europe.

In 1988, 83% of North American databases were produced by the private sector, as against only 48% in Europe.

The rapid growth of the European market (estimated at more than 20% per year of turnover) is now fuelled by private operators, particularly in the fields of business, economic and legislative information: the production of these operators is growing at twice the rate of the equivalent in the public or quasi-public sectors (non-profit organizations). The same is true of the US market: the growth in the number of databanks is due essentially to the private producers.

4. Trends

- * The gaps between Member States are growing larger
- * The large market is stimulating a new demand for information
- * The concept of the "professional kiosk" could give a decisive boost to the electronic information services market via videotex networks
- * The diversification of the distribution networks is opening up new but uncertain markets to European producers
- * European publishers are experimenting with CD-ROM publishing
- * Transaction services in the USA are developing rapidly
- * The information industry is becoming increasingly concentrated

4.1 The gaps between Member States are expanding

The diversity of legislative policies in the telecommunications field is combining with the economic disparities in the Community to widen the gaps between Member States:

- 90% of European videotex terminals are based in France, 75% of data broadcasting receivers are based in the United Kingdom, and 62% of CD-ROM drives are based in Italy;
- one-third of hosts are based in the UK, which also dominates production with one-third of Community databanks;
- expenditure by users in the UK represents half the European consumption of electronic information services, two-thirds of financial information and half of business information.

The liberalisation of telecommunications services, encouraging the emergence of value-added networks, is likely to increase the disparities between Member States still further: decisions on investments, siting, contracting out and the choice of industrial partner are determined by the effectiveness of communications infrastructures - by the quality of the "information environment", i.e. ease of access to basic information: solvency of firms, address files, regulations, patents and standards.

These disparities are particularly worrying in view of the special position of the less-favoured peripheral regions of the Community: being remote and not always possessing the telecommunications infrastructure, equipment and know-how needed for making use of database services, these regions are often the casualties of progress in documentation technology and information networks.

4.2 The large market is stimulating a new demand for information

The growth in intra-Community trade is already showing itself in a demand for information services covering the whole of the Community: European firms have to keep track of their rivals and identify potential suppliers, customers and partners in other Member States. They also have to be informed about the legislation and standards in force in the other Member States if they are to operate on the single market. To meet this demand, information suppliers are having to make supreme efforts to integrate and harmonize the presentation of data and to overcome the language barriers.

4.3 The concept of the "professional kiosk" could give a decisive boost to the electronic information services market via videotex networks

The various videotex systems established by the Member States in the late 1970s developed very differently. Each Member State took its own approach to technical standards, transmission network development, terminal distribution policies, support policies for providers of services, user tariffs and invoicing methods.

The twelve Member States have failed to agree on a common standard, arriving instead at three:

- CEPT 1, derived from the German BTX specifications;
- CEPT 2, derived from the French Télétel specifications;
- CEPT 3, derived from the UK Prestel specifications.

The videotex information services market, aimed at the end user without documentation experience, is also split up into language zones.

Gateways between national videotex networks are developing in Europe, but without generating yet a significant international trade. France, for example, has begun to offer foreign suppliers of information the use of these professional "kiosks". Several Member States are also considering setting up their own kiosks. This invoicing system removes the need for users to subscribe to several data services by including their cost in the telephone bill. Following its successful application to French professional databanks, it should likewise encourage new users, particularly SMEs, to interrogate foreign databanks. The arrival of kiosks providing this simplified billing method in other Member States may become a decisive factor in the development of the information market in Europe, given the partnerships needed to overcome language barriers.

The development of national videotex networks in the Member States and their interlinking may help develop the electronic information services market. It should be stressed, though, that videotex terminals are usually unsuitable for consulting professional databanks: small screens, slow response time, no memory to capture data for local processing. 92% of the information experts on the Observatory's panel consider these terminals better suited to popular use, as against only 41% who regard them as suitable for specialized information. Such terminals are, however, suitable for distributing simple and volatile data such as commercial catalogues, stock market prices, trade mark and freight exchange data, etc., as the French example shows.

Three factors have helped to make videotex a powerful stimulant to the French professional databank market:

- The ubiquitous terminal: thanks to France Telecom's free distribution policy, three out of four SMEs now have Minitel terminals. France Telecom estimates the total number of minitel terminals held by firms at one million.
- Simplified invoicing for information services: to encourage the use of videotex for professional work, France Telecom has reserved several telephone numbers for offices: the "professional kiosks" on 3616, 3617, 3628 and 3629, in contrast to 3615, the "general public kiosk". These numbers give users access to a wide range of hosts without having to take out several subscriptions. The cost of the information services is included in their telephone bills.
- Simplified access to information: producers wishing to make their databanks available via the professional kiosks have to adapt the retrieval language and, more generally, the user-friendliness of their services to inexperienced users. Several French databanks which have made the effort and are accessible via the kiosks - files on companies or trade marks - have seen a threefold or fourfold increase in consumption:
 - * Euridile, a databank on companies, records 20 000 connect hours per month;
 - * Medline, Inpi-Marques and AFP (the French press agency) total 5 000 hours per month;
 - * Bottin (a companies directory) clocks up 3 000 hours per month.

According to the study by UFB-Locabail, a company credit organization, one French SME in four uses a videotex terminal as a link with professional databanks.

4.4 The diversification of distribution networks is opening up new markets to European producers

Introduction

The information industry is fuelled by a continuous flow of technological innovations. During the 1960s, advances in computerized documentation technology and the creation of the first data transmission networks had made remote access to the first databanks possible. This in turn gave birth to online consultation, with clearly separate roles for databank producers, hosts and transmitters.

This standard online distribution model around which the information services industry has grown is now giving way to a wide variety of technical and commercial configurations.

An information service may be disseminated by cable links or by radio relay channels via either ground-based infrastructures or satellites.

Data base hosts may be linked to videotex networks, in which case they can reach a wider range of customers without experience of documentation as distinct from the narrower clientele of information experts. These networks also offer them new technical and commercial facilities: simplified invoicing, possible rerouting to other hosts, and mail services or value-added networks with captive subscriber customers.

Hosts may also disseminate their data vocally with the emergence of audiotex technologies, or take advantage of the wide availability of telefax machines by becoming "document servers".

Lastly, the coordinated establishment of the ISDN in Europe for the early 1990s heralds the age of multimedia information dissemination on workstations designed for all categories of user.

The progress made in these new data transmission techniques and the Community-wide establishment of a legal and technical environment favouring open network provision should enable the Community to catch up on the supply of information services to the end user - managers, members of the professions, researchers, students and teachers. The proliferation of such electronic communications infrastructures heralds a new growth in the information industry and should encourage private investment, as happened with videotex.

4.4.1 More gateways between hosts

Three factors are helping to change the world pattern of databank distribution:

- The development of gateways between hosts. Instead of overloading their databank computers, hosts today prefer to reach commercial agreements with one or more other hosts offering additional catalogues. Subscribers wishing to consult a databank offered by one of these catalogues are re-routed to the relevant host without noticing it. This practice is very widespread amongst the large hosts who wish to add more specialized data services to their general catalogues: about half of the 30 largest hosts use this type of gateway. Conversely, hosts using a reduced catalogue of specialized databanks wish to provide access to a large general host to spare their client the trouble of subscribing to two or three different hosts. Two-thirds of the 30 biggest hosts are accessible through gateways.

- The development of access points to a large number of hosts via a single number. The Observatory registered a dozen of these worldwide in 1988, excluding videotex - half of them in the USA and two in the Community. These access points are only moderately successful, since users are often baffled by the enormous choice they provide. Furthermore, they only partially solve the problems of the complexity and variety of retrieval languages. One-third of the information experts on the Observatory's panel recommend more "intelligent" access points able, among other things, to provide a suitable common language.
- The development of gateways between electronic mail or vertical telematic (freight exchanges, reservation systems, etc.) services and databank hosts. Operators of professional electronic mail or telematic services are putting in gateways to databank hosts as a supplement to their basic services to an educated and outgoing clientele receptive to the potential of online information services.

4.4.2 Radio transmission of data is encountering obstacles in Europe

Data transmission by radio relay channel, i.e. ground-based TV networks, satellite or FM radio (subcarrier), is an alternative method of supplying electronic information. Broadcasting is particularly suited to data services aimed at large numbers of users simultaneously: real-time stock market prices, race results, updated price lists transmitted to a distribution network. These three segments are the core of the provision to date. This medium has the following characteristics:

- no interaction: either the the service is simply transmitted page by page (Reuter), or the user may select pages to be re-transmitted in cycles by calling them up on a number (Antiope or Ceefax);
- real time: this medium is particularly well-suited to passive (continuous, without user involvement), multiple and simultaneous dissemination of data in real time.

Five factors are delaying the development of this medium:

- competition from cable telecommunications networks offering an interactive service: few data services today are content with one-way transmission;
- the legal background, which is both vague and undergoing rapid change, discouraging potential investors;
- the high initial outlay: the annual technical cost of a broadcasting service is around two million ECU. Of the 33 services in operation today, only ten are used by information providers, the rest being used by firms for internal purposes (9) or directly by broadcasters (14);
- poorer reliability and protection than with cable transmission;
- a shortage of radio frequencies, which the PTT prefer to allocate to the new radio telephone services.

In order to assess the progress of broadcasting and its potential application to the marketing of electronic information services, the Observatory commissioned Knowledge Research and the Centre for Communication and Information Studies to conduct a survey. This counted only 43 broadcasting services in Europe, ten of which were still at the planning stage, compared with the 915 databases available online in 1988 and over 20 000 videotex services.

Once again the United Kingdom dominates the European market, with 50% of the operational services and three-quarters of the 21 188 receiving terminals. It is followed at a distance by France, with 20% of the services and 15% of the terminals installed, the rest being divided between the Federal Republic of Germany, the Netherlands and Italy.

4.4.3 Audiotex offers European information providers 120 million potential users

The term audiotex is ambiguous, since it is applied to services ranging from the simplest, such as spoken information recorded on disc, to the most sophisticated, such as voice interaction with a database service. Certain conversational services inspired by the French "Minitel rose" are also sometimes classed as audiotex, but this report deals only with the application of audiotex technologies to interactive database services.

Audiotex is a technology which gives users interactive access to information and telephone communications services: one's bank account, sports results, stock market prices or financial information on firms. The user is routed into the service by making a selection from successive menus, as with videotex tree-searching, using the twelve keys on his or her telephone. The information is supplied either by a synthesized voice reciting the data collected at the end of the search, or transmitted automatically by telefax. Voice recognition systems enabling the user to ask questions are beginning to appear, with 1 500 - 2 000-word vocabularies. A pilot multilingual audiotex service with voice recognition is currently being tested by the ECHO host at the Commission of the European Communities.

This technology, which is just beginning to emerge in Europe, is a serious rival to videotex, since it makes use of the simplest and most widely-available terminal today: the telephone. Data services using this universal medium can thus be accessed easily and anywhere. A large number of videotex services - stock market prices, home banking services, electronic directories, etc. - could be transferred to audiotex immediately, but this is hampered by the legislative and tariff restrictions applied to the interactive telephone to keep out "audiotex rose", and by a number of technical constraints.

Electronic Publishing Services, on behalf of the Observatory, has surveyed the prospects for developing professional data services on audiotex. According to its survey, the Community audiotex information services market was 280 million ECU in 1988 (for comparison, the online databank market was 2 000 million ECU). The United Kingdom accounted for three-quarters of the market, with France, the Netherlands, Belgium, Denmark and Spain a long way behind.

The European market could develop by 300-400% in five years and reach 800 to 1 100 million ECU by 1993, if certain conditions are met:

- digital telephone networks enabling tariff and invoicing procedures to be diversified, for example;
- faster, standard Community procedures for equipment approval;
- dual-tone multifrequency (DTMF) telephones in general use: these are still scarce in the Community, their use ranging from 10% in the UK (British users have small portable numeric keypads) to 56.1% in France;
- high call rates, in keeping with the price of professional information services;
- facilities for calling up audiotex services throughout Europe, impossible at present since their numbers cannot be dialled from abroad.

4.5 European publishers are experimenting with CD-ROM publishing

4.5.1 No locomotive application

CD-ROM today covers a wide variety of applications, from diagnostic programmes computer graphics via cartography and full-text encyclopaedias. The user population is equally heterogeneous: it may include anyone from a stockbroker prepared to invest 20 000 ECU in a CD-ROM linked to his firm's local network to a Japanese youth using a 200-ECU games disk.

The size of the fields covered varies greatly from country to country. In 1988, for example, legal information products accounted for nearly one-third of the 58 titles published in the Community and for three-quarters of the twelve published in Italy. Geography accounted for 17% of the 253 US titles; none are published in this field in Europe. Similarly, the proportion of CD-ROM used for software and desktop publishing is negligible in Europe but 8% in the USA.

At present this medium has no locomotive application to "pull" the disk reader market, as the electronic phone directory did for videotex or spreadsheets for the PC. Half of the 328 titles available on the market in 1988 are CD-ROM versions of online databanks and are intended for target customers approached by direct marketing. Nevertheless, the trend in the supply sector is towards full-text databanks and multimedia products aimed at a wider clientele. Such products, better able to exploit the potential of the CD-ROM and less suited to online distribution, are now beginning to appear on the market.

4.5.2 The USA dominates with 77% of the supply and 80% of the market; Europe is two years behind

The CD-ROM supply sector can be divided into two roughly equal segments:

- commercial CD-ROM, sold directly or via specialist distribution networks such as computer shops: 328 titles in 1988;
- company CD-ROM (internal documentation). This category is far more widespread in the USA, where 50% of CD-ROM readers are dedicated to internal applications compared with only 13% in the Community. These disks are used for archiving applications and, more generally, all storage of very large quantities of data: 300 titles in 1988.

The total number of titles published was thus 628; it doubles each year.

The USA dominates the supply of commercial CD-ROM and publishes three-quarters of them. The Community accounts for 18% of the supply in this segment, with 58 titles divided between Italy (18), the United Kingdom (12), France (10), the Federal Republic of Germany (10) and the remainder (8).

Although Europe began developing databanks and setting up hosts several years later than the USA, one would not have expected a similar gap to open up in the "virgin" CD-ROM field, particularly since US, Japanese and European publishers and databank producers discovered the potential of this technology, perfected by European and Japanese companies such as Philips, Sony and Hitachi, at more or less the same time.

As it happened, some North American publishers had become involved in videodisk data publishing before 1983, and service companies already experienced in data transfer on videodisk converted to publishing on CD-ROM. Moreover, Philips, Sony and Hitachi concentrated their promotion drive on the North American publishers, judging the success of CD-ROM to depend on a monolingual market well-equipped with microcomputers and used to online data consumption over the past 20 years.

The world CD-ROM market, about 50% accounted for by sales of disk readers, was valued at 350 million ECU in 1988, 80% concentrated in the United States. The Community totalled 65 million ECU, 70% in Italy, mainly for legal, and above all fiscal, information. This market doubles each year and may reach 1 600 million ECU by 1990.

4.6 Rapid development of transactional services in the USA

One of the most marked trends in electronic information is in the development of transactional services: data services offering the means of consulting an electronic catalogue to identify a product, price, timetable or price of a share and then to make an immediate order, reservation or transaction.

Providers of services, whether these are aimed at individuals (distribution, tourism and travel, rail and air transport, real estate), at firms (personnel management) or at vertical sectors (road transport, concessionnaires, garage services, pharmacies, hospitals), thus have to publish their services in electronic catalogue form in order to automate all or part of their transactions.

The use of transactional catalogues is becoming automated to the point of being an activity in itself. Such services are usually developed via the installation of value-added networks and constitute a natural field of application for EDI (electronic data interchange) techniques.

The trend has been most spectacular in the air transport sector, where the success of American Airlines' Sabre system which gave access to all airline timetables while favouring its own, had a profound effect. The other airlines followed suit with similar systems: Apollo-Covia (United Airlines), PARS (TWA), DATAS II (Delta Airlines) and System One (Texas Air) in the USA and the rival systems Amadeus and Galileo in Europe. These services generated a thousand-million-dollar turnover in the USA in 1988.

4.7 The information industry is becoming increasingly concentrated

4.7.1 The Observatory records 148 joint ventures of companies and 195 takeovers in three years

The electronic information services sector has undergone radical changes in the past three years: 148 joint ventures and 195 takeovers have been noted by the Observatory.

For example, the No 2 on the US econometric information market, Wharton Economics Forecasting, bought out No 3, Chase Econometrics. The No 1 US public telematics network, Compuserve, took over No 3, The Source. Two of the largest US hosts, BRS and SDC-Orbit, were taken over bit by bit by the Maxwell group; the largest of them, Dialog, was bought by the US publisher Knight-Ridder.

Most takeovers were made by a handful of operators such as Dun & Bradstreet, McGraw-Hill, Reuters, Thomson Corporation, Knight-Ridder and Maxwell, the only groups prepared to make the heavy investments needed to consolidate their position or diversify. Citicorp, for example, spent 590 million ECU on Quotron, Dun & Bradstreet 1 220 and 1 540 million ECU on IDC and DMS, Maxwell 650 million ECU on the Official Airline Guide, Knight-Ridder 300 million ECU for Dialog and Dow Jones 400 million ECU for a 40% share in Telerate.

4.7.2 Some European operators are deploying world strategies

At the beginning of the 1980s, a few Dutch and British groups felt that the guarantee of an adequate return on their investments was insufficient in Europe and decided to take over US firms. These general communications groups such as Maxwell, Reuters, Reed, Pearson and VNU still take over US firms, but they now use world strategies. Maxwell, for example, has bought two US hosts, BRS and SDC-Orbit, two companies specializing in chemical information, Orac and Molecular Design, and two CD-ROM publishers, Nimbus and AMDS. Reuters consolidated its position in the financial information segment by acquiring Finsbury, IP-Sharp, Network Utilities, Reveal Software and Instinet.

4.7.3 The increasing power of network operators

Telecommunications network operators used to refuse to concern themselves with the contents of the messages passing through their networks, let alone provide information services. With the development of value-added networks, the dividing line between transport and services has become blurred: with the opening-up of telecommunications, attempts are being made to restrict the scope of national (in the USA, regional) telecommunications network operators to basic services and to fix the conditions under which they are allowed to run value-added, particularly information, services.

The current debate in the United States is therefore about whether the seven regional companies which emerged from the dissolution of AT&T should be authorized to run videotex services, electronic yellow pages and audiotex services. The US authorities fear that these companies may abuse their dominant position and their financial (risk of overlapping subsidies), technical (control of networks) and commercial (direct contacts with users, control of invoicing) capacities in order to compete with other providers of information services. These restrictions explain the delay in developing videotex infrastructures in the USA. Five of the seven regional companies have just begun to experiment with videotex; schemes launched by the banks and distribution chains have not yet caught on with the public.

In Europe, particularly in the UK, Italy and France, the dominant telecommunications operators are becoming more and more involved in providing information services, often via subsidiaries: hosts, videotex kiosks, telematic gateways, electronic mail services, directories and yellow pages.

5. The information industry is beginning to restructure in Europe

- * North American firms are dominant only in certain segments of the information market
- * Extra-Community operators in Europe are concentrated in a few segments
- * Partnerships and takeovers are beginning on a European basis

5.1 North American firms are dominant only in certain segments of the information market

Some segments of the information market, such as scientific and technical documentation, macro-economic forecasting and financial information, can be grasped only on a world basis. Although most large scientific and technical databases are North American, several European operators have made their presence felt in or have conquered parts of the market: Derwent in patents and Inspec in electronics, for example.

In the field of professional information, on the other hand, in segments such as legal information, data on the solvency of firms and individuals and information on markets and companies, the services on offer are still dominated by national operators. The main data resources are structured according to the country or even the language. The public sector often produces the "basic data": public organizations may exert a controlling influence by disseminating their own data or commissioning private operators to do this, exclusively or otherwise.

Competition is still open in these segments: US operators beginning to diversify internationally are competing with dozens of medium-sized European firms operating primarily on national markets. To give their services international cover, operators have to invest heavily in data collection, form partnerships or buy up companies.

5.2 Extra-Community operators in Europe are concentrated in a few segments

In the fields of scientific information, macro-economic forecasting and financial information, the US hosts operate mainly at a distance, at most opening commercial representative branches.

Where professional information is concerned, however, the basic data is structured nationally: dissemination is dominated by national operators, often derived from traditional services. To date, only a few US operators (Dun & Bradstreet, Dow Jones, ITT World Directories) have invested heavily in getting a foothold on the national markets in Europe, chiefly via takeovers.

5.3 Partnerships and takeovers are beginning on a European basis

The economic and professional press has restructured radically with the cooperation between the Pearson and Elsevier groups, the purchase of the Les Echos group by Pearson, the establishment of the Eurexpansion network around L'Expansion, the expansion into Europe of the Dutch group VNU (Exa Publications in France, Gruppo Editoriale Jackson in Italy) and the British groups Reed, United Newspapers and Haymarket, the boom in the Spanish economic press and the purchase of the Cote Desfossés in France.

The same has happened in the direct marketing segment, with the creation of Europe-oriented centres such as Sysmark after the takeover of DPV and Bottin.

The credit information segment, subjected to pressure from Dun & Bradstreet, had to reorganize around three large rival European networks with partners in every Member State.

Lastly, the market research segment is reorganizing: takeovers of AGB by the Maxwell group, Mil Research Group by MAI and Addison by Motivaction.

6. Conclusion

Electronic information services in Europe are still lightweight compared with the communications or computer services industries: software, timeshare and value-added networks.

However, the electronic information services already account for:

- 55% of expenditure in Europe on market research;
- 15% of expenditure on consultancy services;
- 34% of expenditure on auditing services;
- 36% of expenditure on management consultancy.

The new demand from members of the professions and businessmen for information, generated by the coming of the single market, together with the development of new techniques for disseminating and marketing electronic information services, is opening up new prospects for market development.

Despite the beginnings of restructuring in the European information services industry, there are no clear signs that European operators are seizing this opportunity.

European providers of information services are usually modest in size. Because of the high cost of international cooperation, the language barriers and the fragmentation of the European market, they prefer to operate on the national market or look for economies of scale on the North American market.

Faced with the challenge of the single market, they most often adopt a defensive strategy involving national agreements or transatlantic cooperation.

The large market needs an internal information services market. To achieve this, a sustained effort will have to be made to:

- eliminate the remaining technical and legal obstacles, so as to reduce market uncertainties;
- minimize the disparities between Member States in information services infrastructure, so as to promote the dissemination of electronic information products and services throughout the Community;
- foster cooperation between European partners in order to overcome language barriers and develop products and services covering the whole of Europe and meeting the end user's needs more effectively.

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