

**WESTERN EUROPEAN
ELECTRONIC INFORMATION SERVICES**

1989 - 1994

INPUT

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INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

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Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

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Market Analysis Programme—Europe

Western European Electronic Information Services, 1989-1994

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Abstract

Electronic information services has emerged as an area of increasing focus and interest for many organisations. This report is a new evaluation of this important and complex market opportunity in Western Europe.

The report provides an assessment of the current size of this market and a forecast of its growth through 1994. The market is analysed by country market size and by cross-industry sector. Also included are commentaries on the competitive environment, including identification of the leading vendors in the market and the major development forces that are driving market growth. The complex user environment is discussed in detail, and strategy considerations are offered to provide insight and direction in how to take advantage of the opportunities afforded by this dynamic market.

The report contains 150 pages and 58 exhibits.



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Table of Contents

I

Introduction	1
A. Scope and Objectives	1
B. Methodology	2
C. Report Structure	2

II

Executive Overview	5
A. Electronic Information Services Market	5
B. Electronic Information Services Market Components	6
C. Electronic Information Services Participants	7
D. Market Factors	8
E. Electronic Information Services Market, 1989-1994	9
F. Strategic Perspectives	11

III

Electronic Information Services	15
A. Market Definitions	15
B. Market Sector Definitions	17
C. Market Dynamics	19
1. Cost Factors	20
2. Applications	23
a. Market Analysis	23
b. Industry Analysis	23
c. Company Financial Information and Profiles	23
d. Customer Analysis	24
e. Share Prices and Other Investor Services	24
f. Professional	24

Table of Contents (Continued)

IV	Market Analysis and Forecasts	25
A.	Market Definition	25
B.	Forecast Definition	26
C.	Western European Market	27
D.	Competition	33
1.	Market Sectors	33
a.	Financial Services	35
b.	Textual Information Services	43
c.	Information Brokers	45
2.	Market Developments	47
a.	European Economic Community	47
b.	France	48
c.	U.K.	53
d.	West Germany	55
e.	Italy	57
f.	Benelux	59
g.	Scandinavia	60
h.	Spain	61
i.	The Rest of Europe	63
V	Market Environment	65
A.	The Importance of Electronic Information Services	65
1.	The Communications Environment	68
2.	Regulation	71
B.	Technological Drivers	76
1.	Standards	77
2.	Videotex Services	78
3.	Electronic Bulletin Boards	79
4.	Network Services	80
5.	Artificial Intelligence	81
6.	Optical Media	82
7.	Image-based Databases	84
8.	Datacasting	84
C.	Market Issues	86
1.	Economic	86
2.	Use	87
3.	Delivery Mechanisms	90
4.	Strategic Perspectives	91
a.	Joint Ventures	95
b.	Western European Cross-Flow	96

Table of Contents (Continued)

VI	The User Environment	99
	A. Implementation Issues	99
	1. Reasons for Not Implementing	99
	2. Method of Access	100
	3. Growth	100
	4. Market Sector Usage	102
	B. User Ratings of Electronic Information Services	103
	1. Overall Service	103
	2. Service Considerations	106
	a. Service Features	106
	b. Pricing	109
	c. Market Opportunities	110
	i. Electronic Publishing	111
	ii. On-line Selection and Ordering	112
	iii. Consumer and Home-based Services	112
VII	Conclusions and Recommendations	115
	A. Publishing Issues	115
	B. Distribution Issues	117
	C. User Issues	118
	D. Strategic Issues and Recommendations	119
	1. Information Providers	122
	2. Systems Vendors	122
	3. Infrastructure Companies	123
	4. Service Sponsors/Brokers	123
	5. Financial Information Services	124
A	Appendix: List of Database Hosts and Producers	125
B	Appendix: Analysis of Research Sample	131
C	Appendix: Electronic Information Services— Vendor Questionnaire	133

Table of Contents (Continued)

D	Appendix: Electronic Information Services— User Questionnaire	137
E	Appendix: Detailed Forecast Data	143
F	Appendix: Reconciliation of 1988 and 1989 Forecasts	145
G	Appendix: Definition of Terms	147

Exhibits

II

-1	Electronic Information Services Industry, 1989 (Western Europe)	6
-2	Electronic Information Services Market—Components	7
-3	Electronic Information Services Participants	7
-4	Market Factors	8
-5	Western European Electronic Information Services Market by Country, 1989	10
-6	Western European Electronic Information Services Market by Sector, 1989	10
-7	Strategic Perspectives	13

III

-1	The EIS Market by Information Quality	17
-2	Electronic Information Services: From Source to User	19
-3	Evaluating the Service	20

IV

-1	Software and Services Industry Structure, 1989	26
-2	U.S. Dollar Conversion and Inflation Rates	27
-3	Western European EIS Sector Market Analysis, 1989-1994	28
-4	Western European EIS Country Markets, 1989-1994	29
-5	Western European EIS Market Sectors, 1989-1994	30
-6	Western European EIS Country Markets, 1989-1994	30
-7	Western European EIS Markets by Country, 1989	31
-8	Western European EIS Markets by Sector, 1989	32
-9	Western European EIS Markets by Country, 1994	32
-10	Western European EIS Market by Sector, 1994	33
-11	French EIS Market Analysis, 1989-1994	49
-12	Breakdown of Teletel Traffic by Type, 1988	52
-13	U.K. EIS Market Analysis, 1989-1994	54
-14	West German EIS Market Analysis, 1989-1994	56
-15	Italian EIS Market Analysis, 1989-1994	58
-16	Benelux EIS Market Analysis, 1989-1994	59
-17	Scandinavian EIS Market Analysis, 1989-1994	60
-18	Spanish EIS Market Analysis, 1989-1994	62
-19	The Rest of Europe EIS Market Analysis, 1989-1994	63

Exhibits (Continued)

V

-1	The Importance of EIS Worldwide	66
-2	EIS Industry Segments	67
-3	Reasons for Call Failure	69
-4	Factors Influencing European Telecommunications Reform	72
-5	Technological Drivers	76
-6	Electronic Bulletin Board Attributes	80
-7	Network Services' EIS Offering	80
-8	CD ROM: Installed Base in Western Europe	83
-9	User Resistance/EIS Demands	88
-10	EIS Niches	92
-11	Information Brokers in Western Europe	94

VI

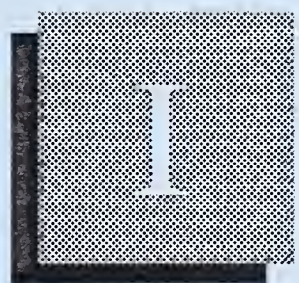
-1	Reasons for Not Using Electronic Information Services (Non-Users)	100
-2	Public Data vs. Leased Line Usage—Western Europe	101
-3	Anticipated Average Annual Growth	101
-4	EIS Usage by Market Sector	102
-5	Most Frequently Mentioned EIS (At Least Five)	104
-6	User Ratings of Electronic Information Services (Total Western Europe)	105
-7	User Ratings of Best Features of Electronic Information Services (Total Western Europe)	106
-8	User Ratings of Most Serious Deficiencies of Electronic Information Services (Total Western Europe)	107
-9	Vendor Rating of Important Features of Electronic Information Services (Total Western Europe)	108
-10	Vendor Attitudes Towards EIS Pricing	109
-11	Vendor Assessment of Opportunity Areas	111

VII

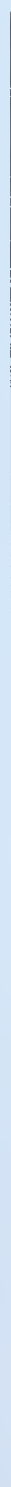
-1	Information Provider Issues	117
-2	Revenue Building Strategies	120
-3	Information Providers—Strategic Approaches	121
-4	Systems Vendors—Strategic Approaches	122
-5	Recommendations for Vendors of Financial Information Services	123

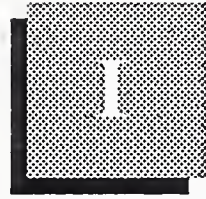
Exhibits (Continued)

B	-1 Analysis of Research Sample	131
<hr/>		
E	-1 Detailed Forecast Data	143



Introduction





Introduction

A

Scope and Objectives

This report, part of INPUT's Market Analysis Programme for the computer software and services industry, examines the Western European market for electronic information services from 1989 to 1994.

The electronic information services market is a key growth area in Western Europe, as the need for faster, more accurate information is required by companies seeking to compete in the evolving single European market.

The electronic information services industry has been constantly growing over the past five years, with many sectors of the industry experiencing growth rates in excess of 20% per year. In addition to this, new technologies such as optical media, artificial intelligence, and broadcast and satellite technologies will impact the electronic information services market dramatically over the forecast period.

Intensification of competitive forces within the industry is causing vendors to reassess their strategies with regard to pricing, distribution and promotion of their products, and to develop joint ventures and alliances. The primary objectives of this report are to:

- Provide a quantitative assessment of present and future electronic information services markets through estimates and forecasts of end-user revenues
- Provide a qualitative assessment of the underlying forces shaping these markets and the surrounding competitive environment
- Identify the technological and strategic issues that will impact the electronic information services market

The scope of this report covers the electronic information services markets in the U.K., France, West Germany, Italy, Benelux, Scandinavia and Spain. INPUT's forecasts include purchases in Western Europe of data from international on-line vendors. Revenue to domestic vendors from sales abroad of electronic information services is excluded. Forecasts are derived from corporate end-user expenditures on electronic information services.

B

Methodology

This report has been compiled through a series of interviews with selected Western European vendors, industry experts and users, as well as reviews of vendor-produced literature.

Thirty interviews were conducted either in person or by telephone with leading vendors active in the electronic information services market. Leading EIS vendors appear in Appendix A.

Two hundred telephone interviews were conducted with senior managers responsible for information services within user organisations.

Revenue forecasts are based on end-user expenditures by industrial companies and financial institutions on electronic information services. These services consist of:

- Leasing and royalty payments to electronic information service providers
- Expenditures on electronic information services access and related services paid to electronic information services vendors

An analysis of the research sample (vendor and user) is provided in Appendix B.

C

Report Structure

This report examines the electronic information services industry in the following sections:

Chapter 2 is an Executive Overview that provides a summary of the essential points of the entire report.

Chapter 3 sets out INPUT's definitions, and general background material on the industry.

Chapter 4 provides INPUT's estimates and forecasts of user expenditures on electronic information services, broken down by country market and by cross-industry sector, examining the industry structure and reviewing key market developments in Western Europe.

Chapter 5 examines the key technological, economic and market-related issues affecting the market and considers the communications and regulatory environments.

Chapter 6 presents INPUT's user survey results and the consequent product and marketing issues.

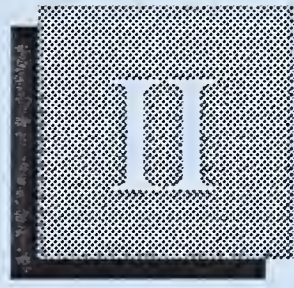
Chapter 7 presents the report's conclusions and major strategy recommendations.

Appendix A includes West European database hosts and producer listings.

Appendix B provides an analysis of the research sample.

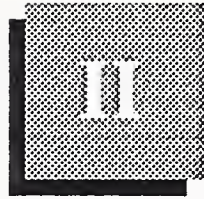
Appendix C contains the vendor questionnaire.

Appendix D contains the user questionnaire.



Executive Overview





Executive Overview

A

Electronic Information Services Market

The electronic information services (EIS) market is highly specialised, with computer and communications technology becoming less critical as the information and associated added-value services become more dominant through specialisation, joint ventures and new media.

There are almost one million users of electronic information services in Western Europe, with a wide cross-section of user types and activities. The financial, economic, industry-specific and news information sectors are the most widely used. EIS users typically access the vendor of choice via ordinary telephone lines through a modem attached to a microcomputer or computer terminal.

The number of electronic information services has grown over 20% in the past five years; there are now approximately 700 databases in Western Europe alone. This number continues to increase, although, given the small number of subscribers to particular services, the newer services tend to be industry-specific and tend towards narrow market segments. New electronic information services are still viable business opportunities, since they can be offered at premium prices. There are over 200 on-line vendors reselling the data of over 1,000 publishers.

The leading electronic information services publishers—Dialog, Dow Jones, Reuters, and Mead's Nexis—still share a small market in proportion to the number of personal computer users in Western Europe—there are close to 30 million personal computers in use. The Western European electronic information services market is worth just over \$2 billion, considerably short of the \$5 billion market anticipated ten years ago.

In addition, the advent of CD ROM disks, attached directly to PCs and holding thousands of pages of text and data, is likely to erode the current base and attract new subscribers in the non-real-time sector of the market.

Exhibit II-1 summarises the key statistics of the electronic information services market.

EXHIBIT II-1**Electronic Information Services Industry, 1989
(Western Europe)**

- Almost 1 million users
- 200 on-line vendors
- 1,000 publishers
- 20%+ growth
- \$2+ billion market

B**Electronic
Information Services
Market Components**

Electronic information services is the term INPUT uses to describe the full range of user-accessible computer-based information services. These are listed in Exhibit II-2.

As electronic information is highly fluid, it is not restricted to single distribution systems, and may be transmitted across any number of networks in electronic form. Single sources of distribution consequently offer little economic advantage over multiple sources to the electronic publisher.

This will change as the development of CD ROM and the consequent end to "pay per view" pricing, along with the advent of new technologies such as satellite, dramatically alters the nature of the electronic information services market. Furthermore, high-volume users are demanding increasingly sophisticated services and are prepared to pay premium prices.

EXHIBIT II-2

**Electronic Information Services
Market—Components**

- On-line databases
- Optical media
- Bulletin boards
- Network services
- Videotex

C**Electronic
Information Services
Participants**

There are four major types of EIS market participants. These participants are illustrated in Exhibit II-3. Each has different strategic objectives:

EXHIBIT II-3

**Electronic Information Services
Participants**

- Information providers
- Systems vendors
- Infrastructure companies
- Service sponsors and information brokers

- Information providers, such as Dun & Bradstreet and Reuters, have a potential problem in that electronic information services will affect print revenues. With the decline in distribution costs, publishers are obtaining more independence from systems vendors. In order to combat this threat, these companies are developing their own extensive networks.

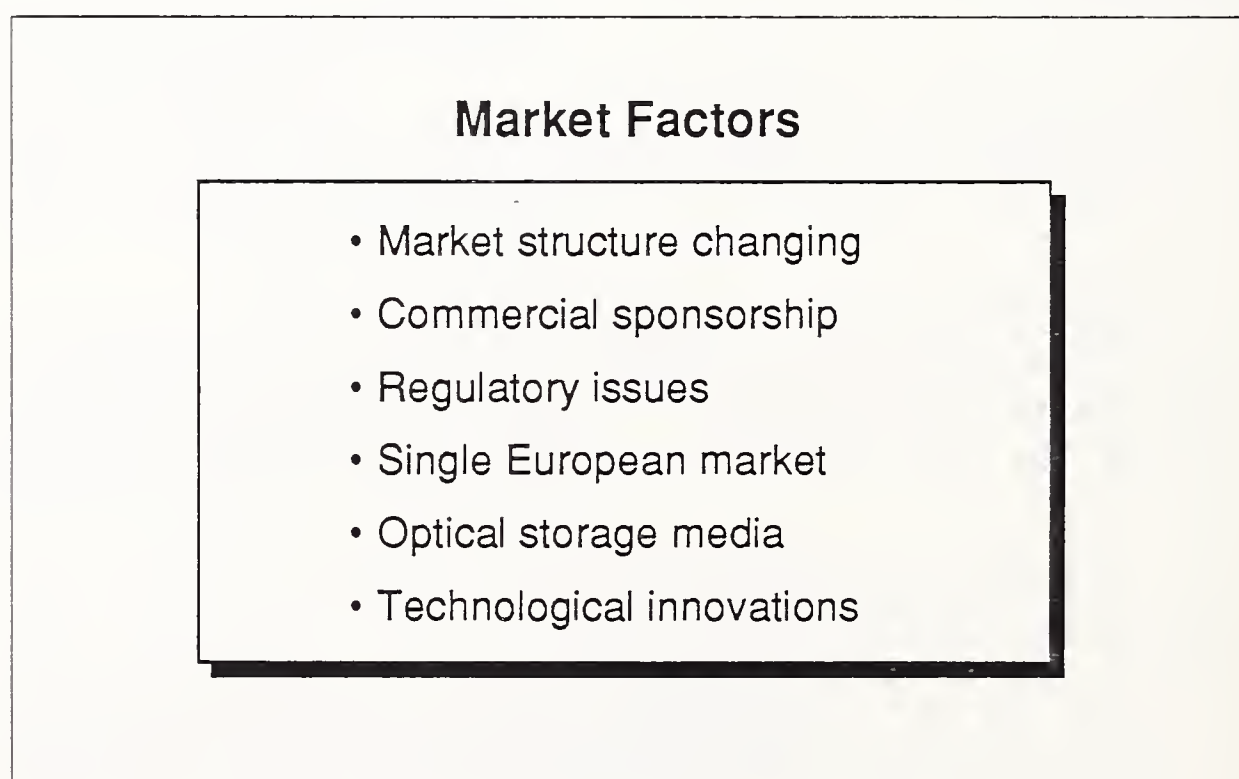
- Systems vendors, such as Dialog, Data-Star and BRS, are finding their revenues being squeezed from three directions: firstly, by the publishers who are able to bypass vendors and sell directly to users; by competing vendors with similar products; and by infrastructure companies and service sponsors who are entering the electronic information services market.
- Infrastructure companies, such as the PTTs, are looking for new ways to stimulate demand for their core services. These companies face competition from other infrastructure companies, and problems with the hitherto uncertain regulatory environment in Western Europe.
- Service sponsors and information brokers seek to use electronic information services to add value to vertical market businesses. Some service sponsors in effect constitute a "second tier" of information providers with more freedom to innovate than traditional publishers.

D

Market Factors

The EIS market in Western Europe is a buyer's market, in that supply exceeds demand. As a consequence, vendors are keen to expand their market beyond the small core of heavy users. Vendors are attempting to attract more customers with features that make access and use more attractive. These include gateways, thematic bundling of databases, differing price structures and training courses. These factors are illustrated in Exhibit II-4.

EXHIBIT II-4



How far there is still to go before the “global village” envisaged by Marshall McLuhon comes into view, is a point of contention. Undoubtedly the success of Minitel in France, and videotex in certain niche areas throughout Western Europe, is an indication that electronic information services have latent mass appeal and that the market structure is changing.

The real-time financial sector, whilst still a lucrative and expanding market, has experienced price erosion and lower profitability due to intense competition in niche markets. Survival in these markets will belong to the lowest-cost producers, and advertiser or commercial sponsorship is inevitable.

The movement towards a single European market and the proposed deregulation of telecommunications prior to 1992 will open the European market to information services providers via the European Commission initiatives. The successful development of the electronic information services market rests with the EEC, national governments and the PTTs, focusing on issues such as regulation, monopoly, charges and—ultimately—national security.

The advent of optical storage media, such as CD ROM, will alter the user's economic relationship with databases, enabling users to avoid the “pay per view” pricing associated with remote on-line databases. In addition, there are other technologies that hold promise for the on-line industry. For example:

- Massive front-end processing combined with AI templates as an alternative to keyword searching
- The eventual emergence of image-based databases
- The introduction of “hypermedia” like nonsequential text-organising abilities
- Satellite technology

E

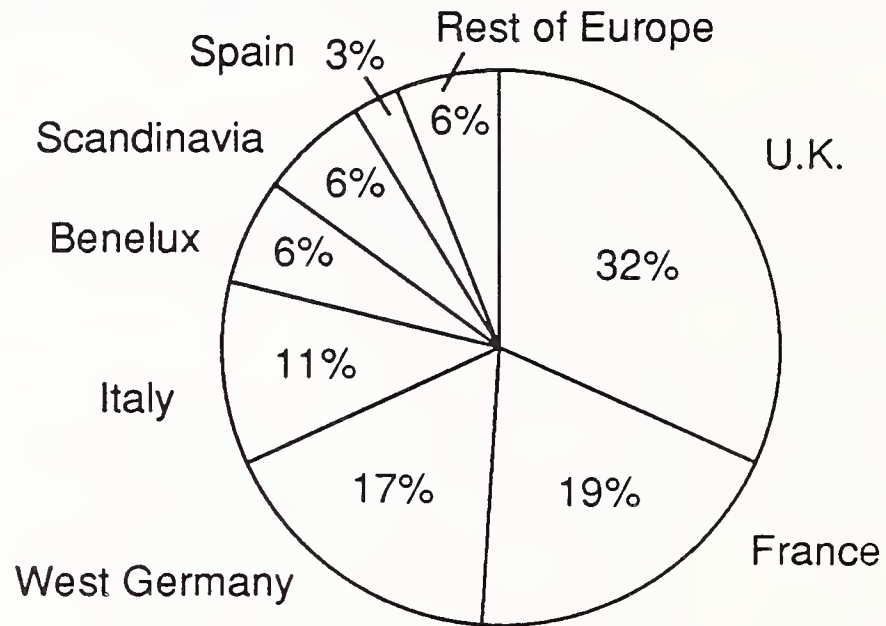
Electronic Information Services Market, 1989-1994

The electronic information services industry is facing a period of rapid change, due primarily to mergers and acquisitions, new entrants and the challenge from the network service providers. Exhibits II-5 and II-6 show INPUT's five-year forecasts by country market and by sector.

The U.K. is the largest single country market, primarily due to the influence of London as a world financial centre. France and West Germany will experience high rates of growth along with Italy, which is currently the largest market for CD ROM.

EXHIBIT II-5

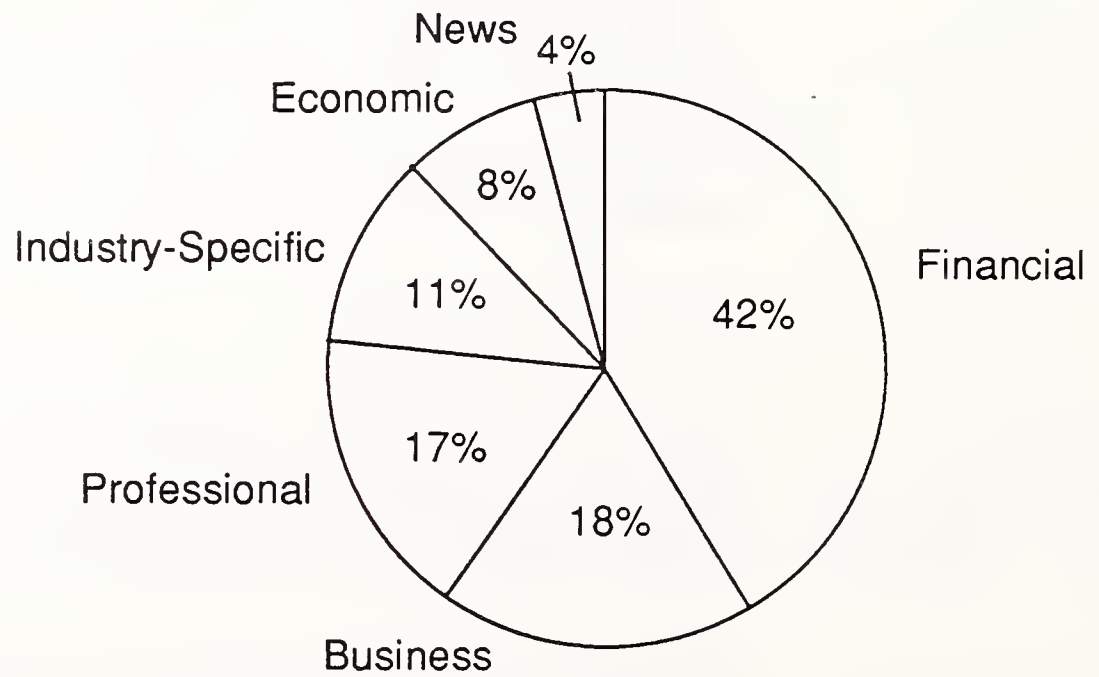
Western European Electronic Information Services Market by Country, 1989



Total 1989 Market: \$2.2 Billion

EXHIBIT II-6

Western European Electronic Information Services Market by Sector, 1989



Total 1989 Market: \$2.2 Billion

Whilst the financial sector remains the most dominant, there will be rapid growth in industry-specific sectors, as applications such as EDI are applied as information drivers. However, it will be new applications and new media which will be prime generators of this growth, as will the availability of on-line consumer and commercial data through services such as Teletel in France.

The Western European electronic information services market is expected to grow at a compound annual growth rate of 21% over the next five years. The real-time financial sector remains dominant, whilst in the textual information field, the established vendors are being challenged by CD ROM providers of digests and historical information.

F

Strategic Perspectives

The central strategic issue for information providers is to prevent erosion of their print media by electronic information services. This can be achieved by adopting the following strategies:

- Avoid exclusive deals with systems vendors
- Develop new distribution channels either independently or through alliances
- Publish on a variety of electronic media
- Sell electronic services directly to corporate networks

For systems vendors, the issues are differentiation of service and maintaining market share. There are several approaches which would be relevant to systems vendors to differing degrees, depending on their targeted markets. Such strategies would include:

- Eliminating services with low market penetration
- Bundling services to vertical market sectors
- Improving and simplifying billing procedures
- Adding value to products, (analysis, interactive databases)
- Entering into alliances with information publishers and infrastructure companies

The key issue for infrastructure companies is simple: stimulate demand for core services. This can be achieved in several ways:

- Encourage the growth of private networks
- Make acquisitions in order to extend market reach

For service sponsors and information brokers, the key issue is to maintain presence in niche markets and to add value to vertical market businesses. INPUT believes this can be achieved by the following:

- Underwrite new electronic information services
- Develop alliances
- Provide specialised services

The financial information services market is such a specialised market that there are strategic issues unique to this market. As a highly profitable, specialised niche market, it has become highly competitive. INPUT makes the following recommendations to vendors of financial information services:

- Exploit opportunities for new adaptive technologies
- Dominate selected niches via comprehensive service and strategic alliances
- Develop relationships with software companies
- Develop customised services
- Differentiate via service and customer support

These strategies are listed in Exhibit II-7.

EXHIBIT II-7

Strategic PerspectivesInformation Providers

- Avoid exclusive deals with systems vendors
- Develop new distribution channels
- Publish on a variety of electronic media
- Sell electronic services directly to corporate networks

Systems Vendors

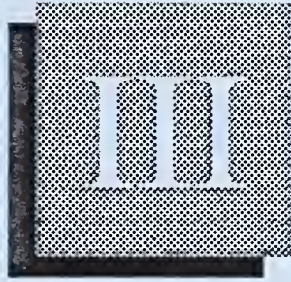
- Eliminate services with low market penetration
- Bundle services to vertical market sectors
- Improve and simplify billing procedures
- Add value to products
- Develop alliances

Infrastructure Companies

- Stimulate demand for core services
- Encourage private vendors
- Make acquisitions

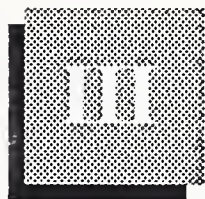
Service Sponsors/Brokers

- Develop niches
- Underwrite new electronic information services
- Develop alliances
- Provide specialised services



Electronic Information Services





Electronic Information Services

A

Market Definitions

The term electronic information services (EIS) is INPUT's label to describe variations on the basic theme of user-accessible computer-based information services that now proliferate in Western Europe. Examples of EIS that go beyond the more traditional on-line database services include network services, videotex services and computer bulletin boards.

As a consequence, the terminology describing participants in the on-line database industry is in a state of flux. Databases that are on-line generally contain machine-readable records available for retrieval via interactive (two-way) telecommunication channels, special software and a computer terminal.

With the evolution of information-processing technologies, personal computers and workstations are replacing dumb terminals on database users' desktops, whilst large databases can now be delivered to users' desktops—without the “pay-per-view” on-line charges—via optical storage media such as CD ROMs.

Distinctions between remote databases that are available on-line in the traditional way, and local databases that are available on media that run directly on the user's machinery, are likely to blur over the forecast period as vendors exploit the obvious synergy between frequently updated remote databases and less-frequently updated local database media. Service will become a key differentiator, facilitated by Europe-wide telecommunications deregulation.

On-line retrieval of information is the process of accessing a remote computer through a telephone line from a terminal. Hosts are organisations which mount databases on a computer and offer them to users on

behalf of the database producer. Producers receive a royalty or licence fee, and users are charged a combined host and royalty fee per connect hour, plus print charges. The same database is often offered by a number of different hosts. Dialog is currently the largest host.

The single European market will offer companies the opportunity to reach wider markets. It will also bring all the difficulties attached to trading in foreign territories (e.g., basic unfamiliarity, both commercial and cultural). The most successful businesses will be those who start off well-informed. Electronic information services will have a key role to play in this development process.

There is no shortage of available information; in fact the burgeoning number of electronic information services leads to confusion. On-line databases can be split into two categories:

- Specialist/Professional (e.g. Dialog, BRS, Mead)
- General purpose (e.g. Minitel, Telecom Gold)

A further segmentation of the specialist market takes place on the basis of user need:

- Specialist/Professional:
 - Information crucial to decision-making, i.e., real-time financial information systems such as Reuters, Telerate, and Topic.
 - Information valuable to decision making, i.e., industry- or profession-specific databases such as legal, medical, wine, and advertising.
- General Purpose:
 - Information useful but peripheral to decision-making, i.e., full text, bibliographic, unfocused textual databases.

This structure is illustrated in Exhibit III-1.

Not surprisingly, the most profitable and expanding services within the electronic information services market are those that address the first two areas of need. In terms of subjects, commercial information seems to be more important than scientific and technical information. In terms of customers, it is end users, for example, stockbrokers, and not information intermediaries such as librarians who have most need for commercial information. Information about money is almost as valuable as money itself.

EXHIBIT III-1

The EIS Market by Information Quality

Information Quality	Specialist	Professional	General Purpose
Crucial	Real-time financial information		
Valuable		Legal, medical, industry-specific	
Useful			Full-text, bibliographic

B**Market Sector Definitions**

Electronic information services can be distinguished in several ways. In terms of data, EIS can be split into three categories:

- Word-based (e.g. bibliographic, full-text files)
- Number-based (e.g. statistics, econometric data)
- Picture-based (e.g. components, maps)

Furthermore, the information itself can be seen in terms of its level of refinement which can be categorised as follows:

- Raw
- Reduced
- Verified
- Quality-assured
- Quality-controlled
- Evaluated
- Certified

Separated by subject matter or by the function of the information, there are further categories:

- Single subject (e.g. legal)
- Multidisciplinary (e.g. chemical and biological data)
- Problem-orientated (e.g. medical research)
- Transaction-orientated (e.g. financial trading)

When classified in terms of delivery modes, there are the following:

- Pay per view on-line databases (e.g. Dialog, Dun & Bradstreet)
- CD-ROM (e.g. European Kompass, CIFAR)
- Information brokers (e.g. Financial Times Business Information Service)
- Viewdata (e.g. Topic)
- Videotex (e.g. Teletel)
- Teletext (e.g. Ceefax)

The basic markets sectors can be defined in terms of their components:

- Corporate
- Government
- Academic
- Consumer

INPUT's forecasts of electronic information services revenues are classified into the following sectors. These are:

- Financial (i.e., real-time financial information and historical data concerning money markets)
- Economic (i.e., econometric databases, stocks, bonds, commodities and future databases)
- Business (i.e., business abstracts, demographic, credit checking, market research)
- Professional (i.e., scientific, technical, medical, legal, patents, etc.)
- Industry-specific (i.e., chemicals, pharmaceuticals, petrochemicals, manufacturing)
- News (i.e., abstracts or full texts of newspapers, news services, etc.)

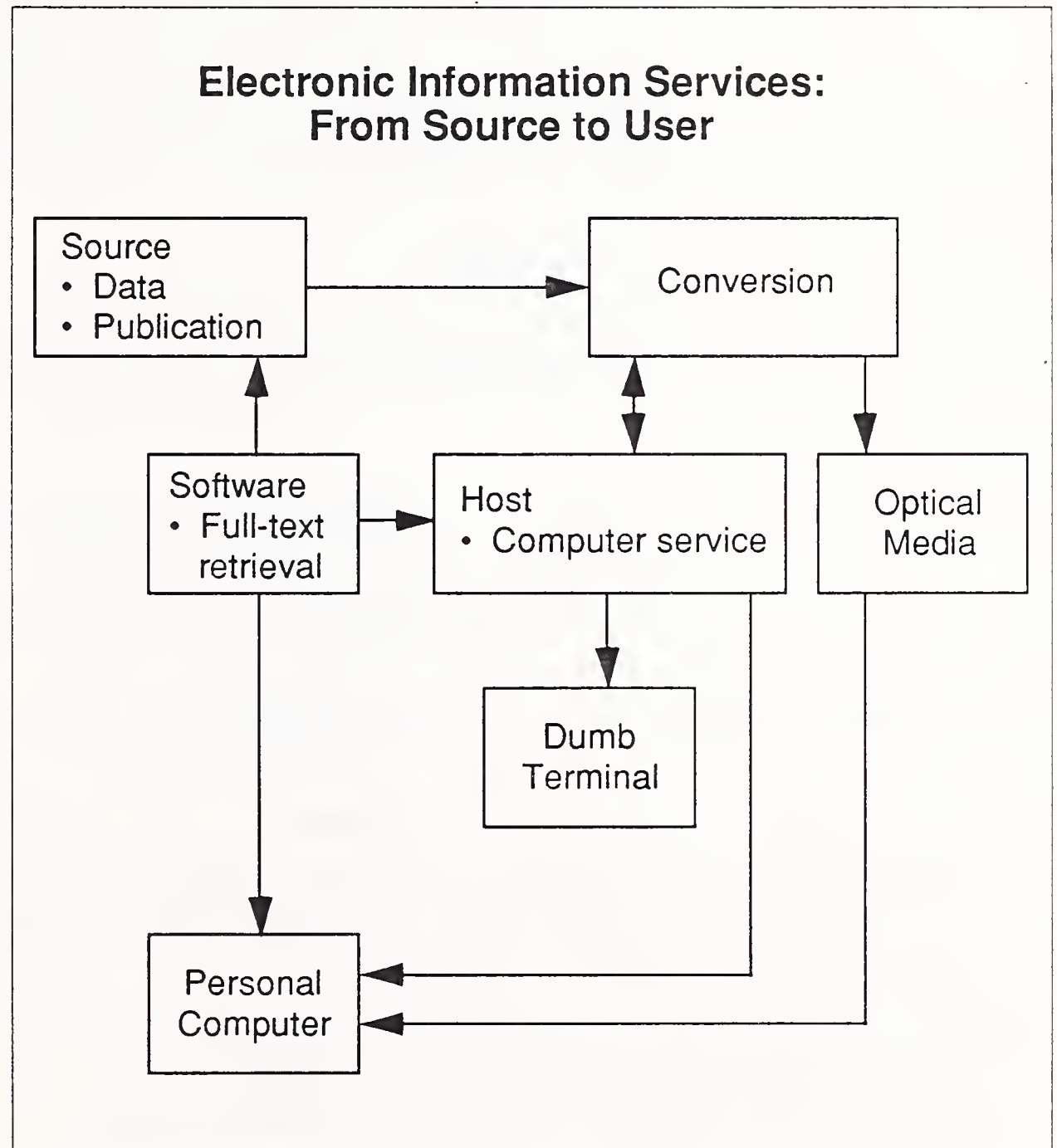
INPUT's forecasts refer to these six key industry sectors throughout the report.

C

Market Dynamics

Exhibit III-2 illustrates relationships within the EIS market, and the path from source to user. For the user, however there are several factors to take into account before making a decision to use an electronic information service.

EXHIBIT III-2



For example, whilst host organisations offer demonstrations, with some of the larger ones offering free on-line time to test the service before signing up, many users will need to do extensive research before host selection: This would include:

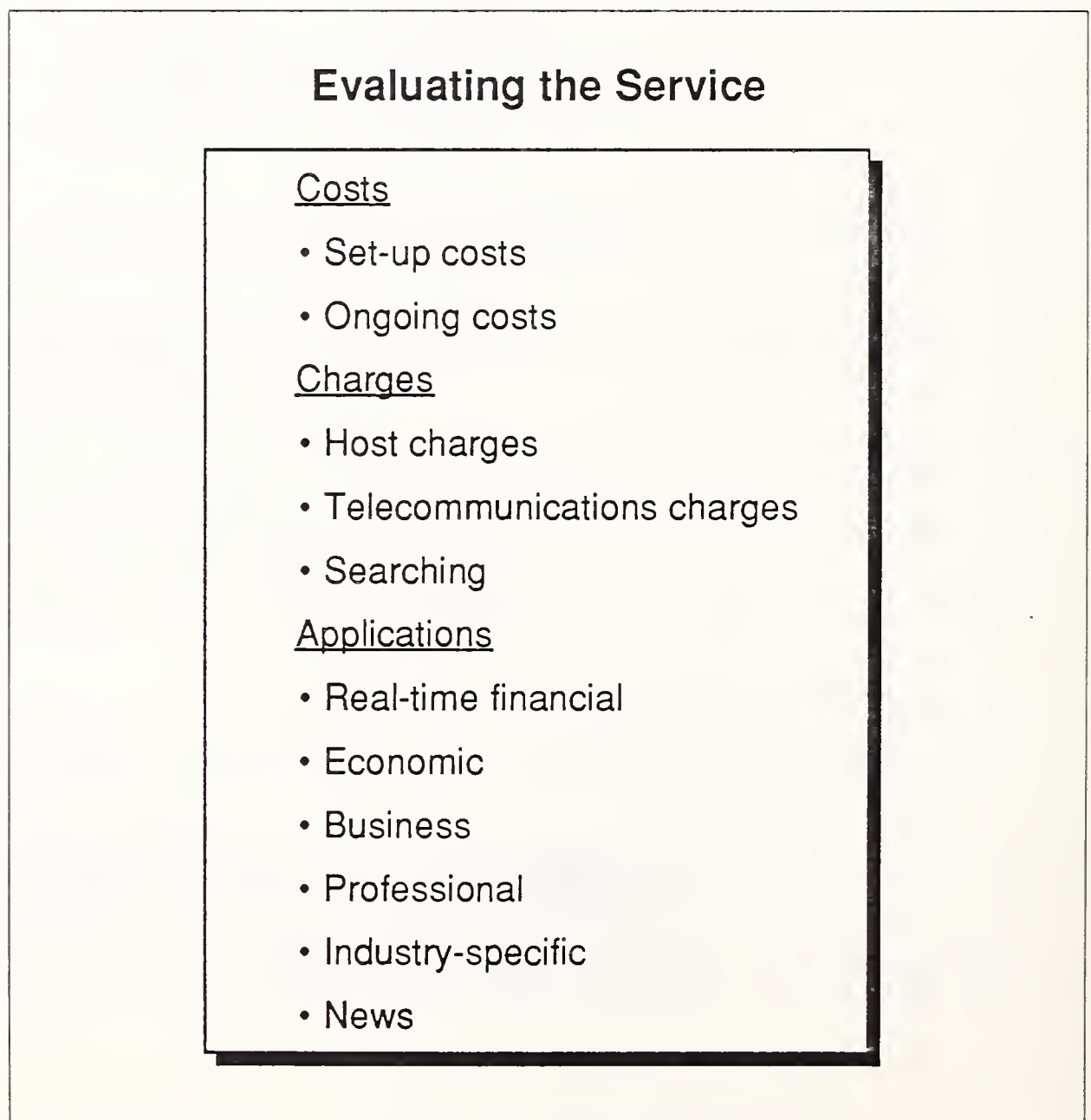
- Information service evaluation
- Cost comparisons
- Training, helplines, support services
- Ease of searching
- Ease of accessing results

Whilst services such as Datastream and Textline offer the facility of a dedicated terminal which can be leased or rented, most users invest in the basic equipment, which consists of terminal, telephone line, modem, printer and communications software. Once signed up, users are issued with a password to access the service (to "log on"), and an NUI (Network User Identity) giving access to the national telecommunications network.

1. Cost Factors

INPUT has broken down the factors to be taken into consideration when evaluating the service. These are listed in Exhibit III-3.

EXHIBIT III-3



- Set-up costs—This will include personnel time, cost of manuals, NUI, connection charge, terminal and communication equipment (software, modem).
- Ongoing costs—Connect time charges and/or subscriptions, printing and administrative charges, telecommunications charges, operator costs (including cost of training), administrative overheads and equipment rental (if applicable).
- Host charges—Average on-line connection cost per hour is approximately \$100. Some hosts such as Data-Star and Dimdi charge a separate royalty/licence fee, whereas others, such as Dialog and ESA-IRS, include these in the per-hour rate. The majority of hosts charge on a per-use rather than a subscription basis. Dun & Bradstreet charges a subscription fee which is calculated on a volume-related sliding scale. Off-line prints are cheaper than on-line prints. This involves a request to the host computer to send a printout of the search results. It is useful to have regular updates sent through an SDI service (selective disseminated information).
- Telecommunications charges—There are a number of different ways of accessing hosts' computers. In the U.K., for example, this might include using the Datel service, where data is transmitted over the public voice telephone network (PSTN), or using a dedicated data communications network such as the Public Data Network (PDN). The International Packet Switching Service (IPSS) allows customers of the PDN to access hosts located overseas. It is currently connected to over 100 networks in more than 70 countries.

IPSS call charges contain two elements—duration and volume. An IPSS call to the U.S. or Canada costs 3.75p per 30 seconds (£4.50 per hour) and 2.25p per 5 data segments transferred (£34.50 per kilosegment). One segment can contain between 1 and 64 characters, although the average number of characters per segment when using on-line database access is 45. The charges for IPSS calls to Europe are 1.5p per 30 seconds (£1.80 per hour) and 0.9p per 5 segments (£1.80 per kilosegment). Call charges for all other countries outside Europe and North America are 4.5p per 30 seconds (£5.40 per hour) and 2.7p per 5 segments (£5.40 per kilosegment).

IPSS is a cost-effective service for information retrieval. As a guide, assuming that ten A4 pages (containing 20,000 characters) were transmitted during a 15-minute call to a U.S. database, the call charges would be £3.13. For dial-up access to the Public Data Network, an NUI is required, which allows dialing into the local Packet Switching Exchange via the telephone network. The charge in the U.K. for an NUI is £40 (one-off), plus a quarterly rental charge of £10. To receive incoming

calls, it is worth having a dedicated data line connection to the local exchange. Charges for such a service are £700 (one-off) plus £350 quarterly rental. For both types of access, a terminal, modem and telephone line are required.

Some of the larger hosts offer access through their own private networks, for example Dun & Bradstreet's DunsNet, Dialog's DIALNET, ESA-IRS' ESANET and BRS' BRSNET. Telecommunications charges will need to be added to the standard search charges.

- Searching—Searching methods vary between different databases and hosts. The usual method of accessing information is by entering keywords and constructing search terms. Training and the use of cheap or free on-line training files help users carry out a search in the quickest and cheapest way possible. It is also useful to be familiar with the hardcopy version of the database, so the user can anticipate the type of electronic information that will be available.

A database host may have a number of files which could potentially meet the user's requirements when carrying out a particular search. Rather than accessing each one in turn, it is faster and cheaper to cross-search between files, if the host offers this service. The major hosts all offer this facility.

There are also a number of on-line directories of databases, such as the service offered by Cuadra Associates, and Dundis, offered by the European Community host organisation, ECHO, which help users identify new and relevant databases for a given subject area.

- Potential uses and application of databases—The main benefits can be summarised as follows:
 - Speed of access (critical in the real-time sector)
 - Wide coverage
 - Flexibility (key for economic and financial analysis)
 - Accessibility
 - Constant updating

There are obvious disadvantages with electronic information:

- Information available will never fill every information need, and supplementary hardcopy material will be required.
- Printed sources are easier to use and cheaper.

Whilst some electronic information services (Textline, Datastream, ICC's Viewdata service) are menu-driven and relatively easy to use by an inexperienced user, others like Dialog and Data-Star are best accessed by users who have had the benefit of training and experience in searching techniques.

Although industry-specific databases are strong in some areas such as technology, they still have a long way to go before they can be described as comprehensive, and this has a negative impact on the development of the EIS market.

2. Applications

a. Market Analysis

Using market research databases can be a valuable means of identifying previous research which has been conducted in specific areas. Databases such as Findex and Marketing Surveys Index list published research.

Research can be focused on specific products; in this area there are a number of patent databases, for example Inpadoc which contains over 12 million patent documents from 50 countries. Major database providers which offer focused databases include: Maid, Dialog, Mead, Data-Star, Orbit and Pergamon.

b. Industry Analysis

Industry size and forecast data can be obtained through the use of economic services offered by Datastream and other major hosts such as Euromonitor and Maid. There are also specialised industry databases which provide background information, technical information, and news on new products.

Figures can be obtained on industry norms or statistics such as average profit margins and return on capital, through ICC Keynote, Jordan's industry surveys, Datastream, and Industry Performance Monitor. It is also possible to analyse the performance of companies within particular industry sectors—either your own competitors, or all companies listed under a specific SIC code.

c. Company Financial Information and Profiles

Company information is one of the most common applications of on-line databases. A good deal of information can be obtained on a parent company, its subsidiaries and financial strength, and trends, including performance comparisons against industry standards or other companies. Major database services for financial analysis of U.K. companies are ICC

and Datastream. Dun & Bradstreet, Moody's and Standard & Poor's are major services for the analysis of U.S. companies, and Worldscope, Datastream, Predicasts and Hoppendstedt analyse Europe and the Far East. These services can be supplemented by a search in newspaper and business journal databases, such as Textline and Profile.

d. Customer Analysis

Directory databases form a basis for mail shots and promotional activities, and are a starting point for sales and market planning. Services from ICC, McCarthy, Dun & Bradstreet, Kompass and Hoppendstedt are strong in this area .

e. Share Prices and Other Investor Services

Electronic information is essential for transmission of data covering share prices, exchange rates, traded options and other securities news. This is available through viewdata services as well as on-line services. TOPIC is the largest private viewdata system in the world, with approximately 3500 terminals in use. It is operated by the London International Stock Exchange.

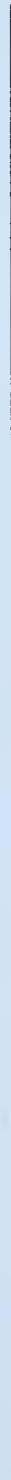
Other major service providers are Extel, Profile, Datastream and Reuters, Telerate, Citicorp, IP Sharp and Quotron.

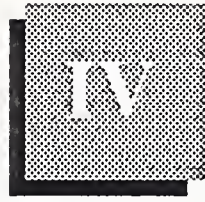
f. Professional

News of developments in technology and new products are contained in the specialist industry and scientific and technology databases.



Market Analysis and Forecasts





Market Analysis and Forecasts

A

Market Definition

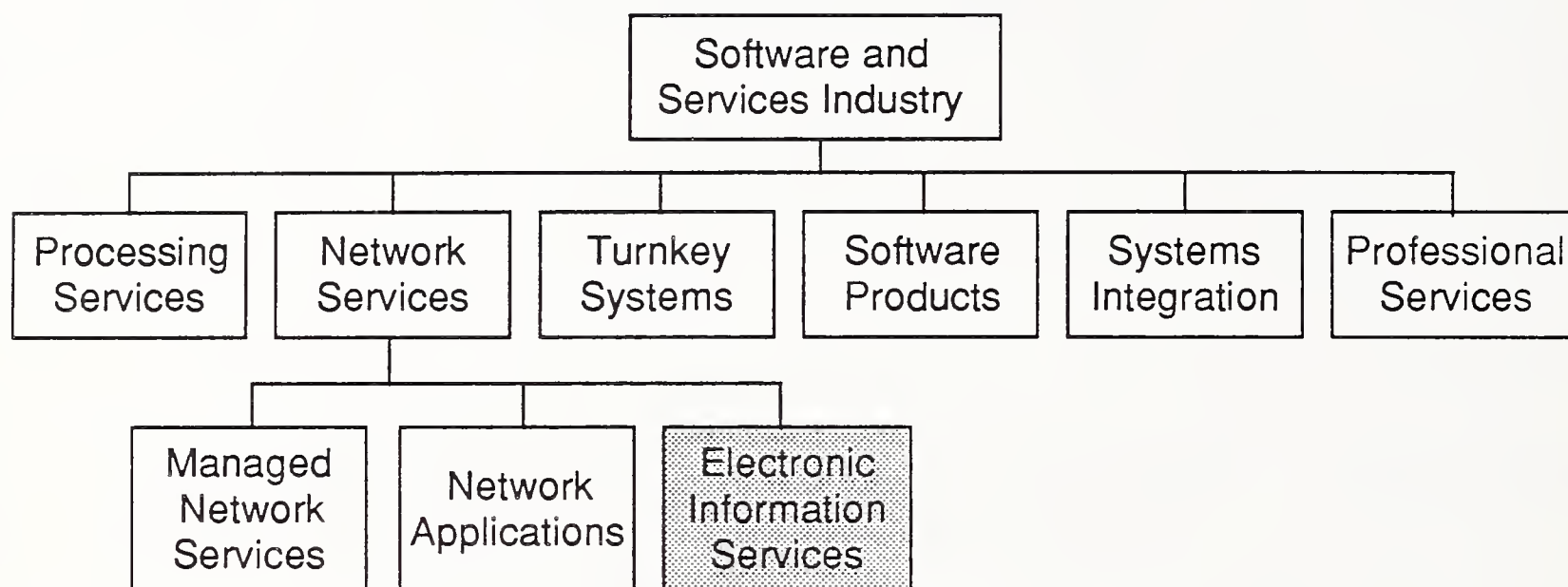
INPUT has developed forecasts for user expenditures on electronic information services (EIS) for Western Europe. These forecasts are based on end-user expenditures and consist of:

- Database lease and royalty fees paid to information providers
- Expenditures for database access and related services paid to systems vendors

INPUT defines electronic information services as part of the network services sector. Exhibit IV-1 gives the overall market structure.

EXHIBIT IV-1

Software and Services Industry Structure 1989



B

Forecast Definition

The market forecast was developed from a detailed analysis and evaluation of the current and projected activities in the country markets studied.

The market sectors defined in Chapter 3 were analysed and assessed; the forecast covers the period from 1989 to 1994. The total market is defined in this report as the sum of end-user expenditures for EIS, but excluding communications costs.

Revenues generated by videotex services were included where the service provided was a commercial, public service providing on-line access to stored data. Consumer videotex services were excluded.

Forecasts are made in local currencies for individual country markets and converted into U.S. dollars for aggregation and comparative purposes.

The U.S. dollar exchange rates are shown in Exhibit IV-2. These rates are INPUT's average exchange rates for 1989. The forecasts are expressed in current year rates and thus allowance must be made for the rate of inflation. The inflation assumptions made by INPUT are also shown in Exhibit IV-2.

EXHIBIT IV-2

U.S. Dollar Conversion and Inflation Rates

Country	Currency	Dollar Conversion Rate	1989 Inflation Assumptions
Belgium	BF	13.60	+2.8
Denmark	DK	7.53	+4.8
France	FF	6.55	+3.5
Italy	Lira	1,409.00	+6.5
Netherlands	Dfl	2.18	+1.1
Spain	Pta	121.00	+6.3
Sweden	SK	6.55	+7.0
U.K.	£	0.61	+7.7
West Germany	DM	1.93	+3.0

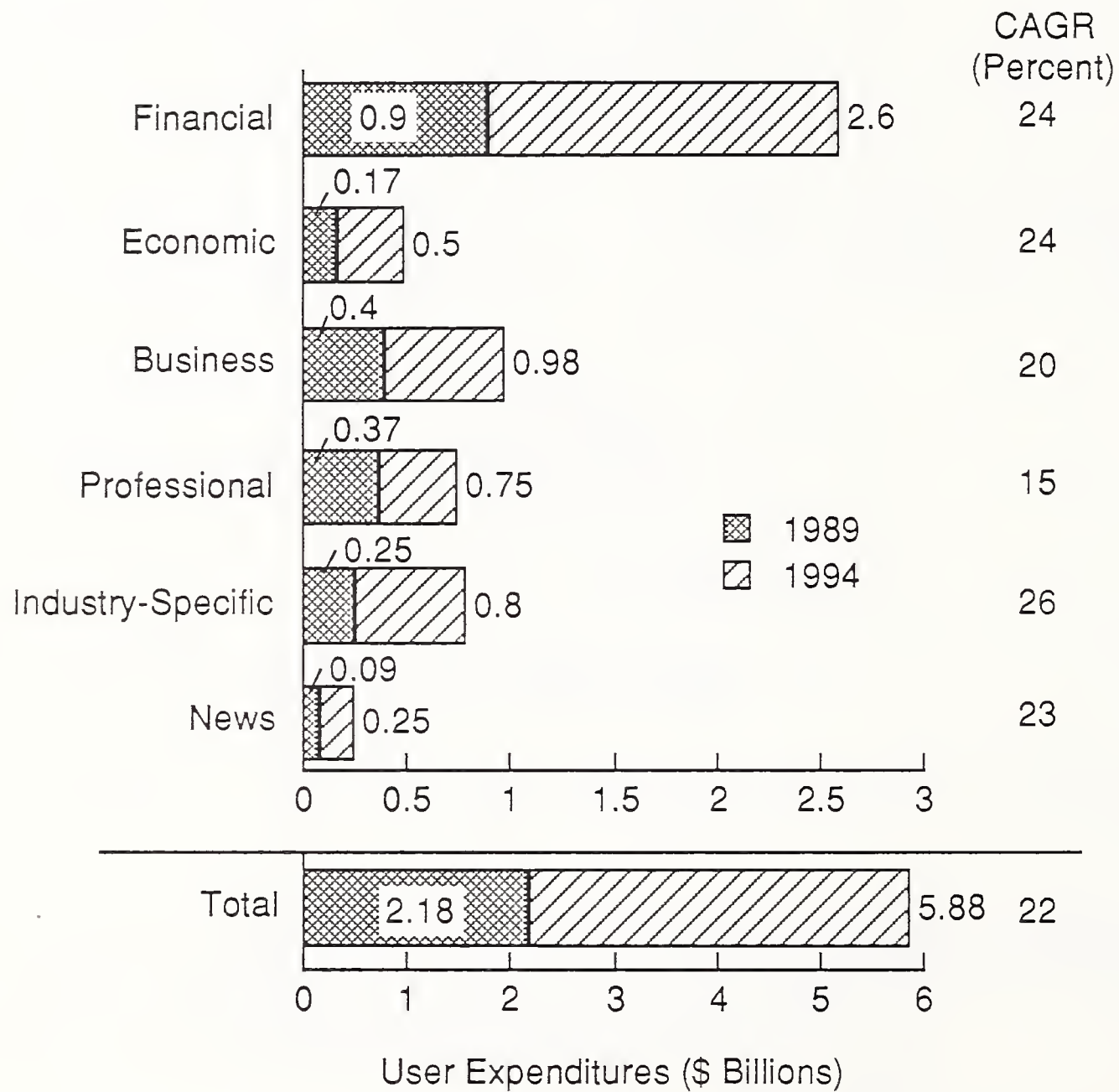
Source: Exchange Rates: IMF (average ratios for 2nd quarter 1989)
Inflation: Barclays Bank (August 1989)

C**Western European Market**

Exhibit IV-3 shows the electronic information services (EIS) market from 1989 to 1994, segmented into the six sectors defined in Chapter 3. The exhibit shows all sectors growing at a rate of approximately 20%, and how the overall market (as measured by user expenditures) is expected to change over the next five years.

EXHIBIT IV-3

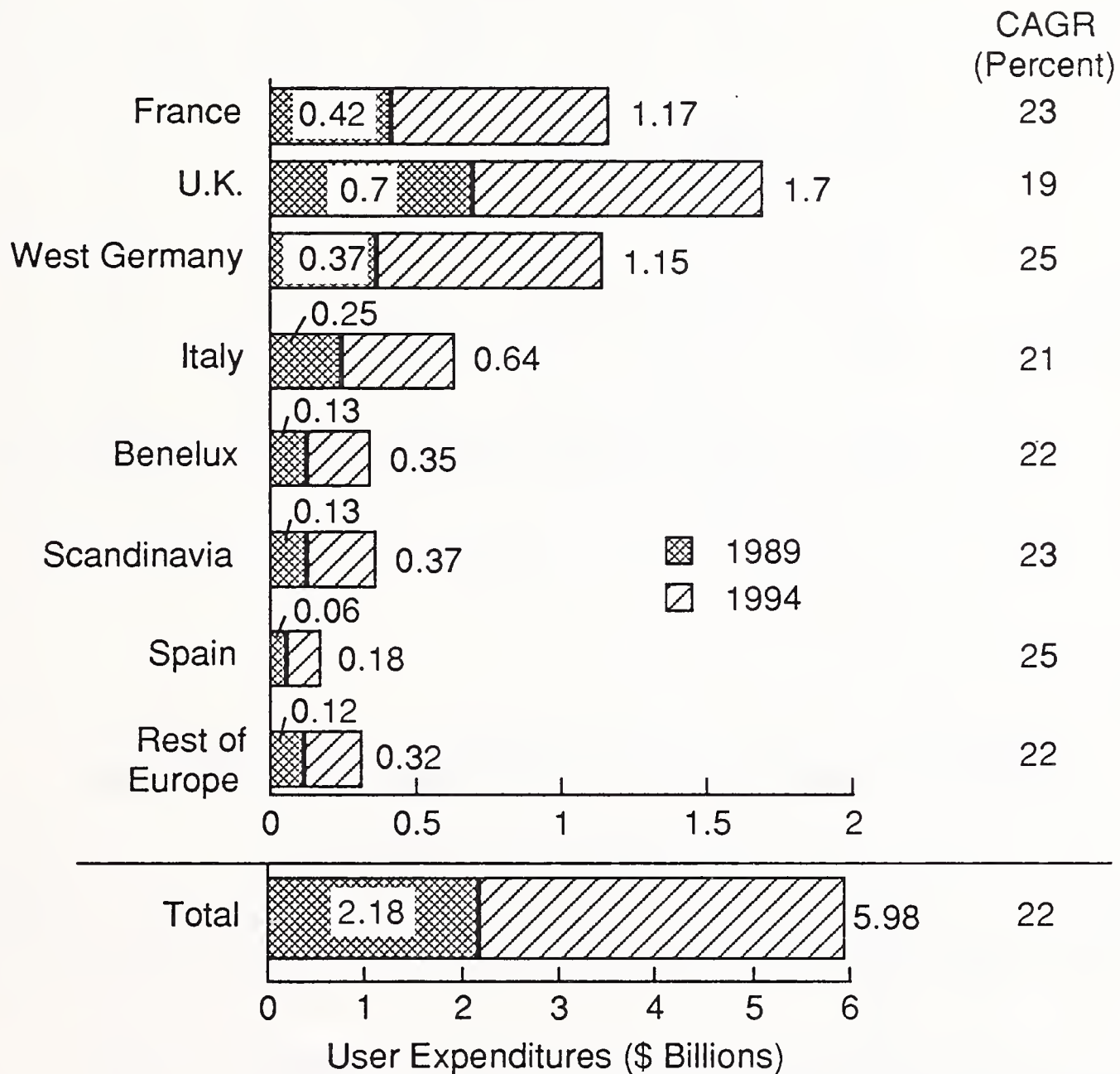
Western European EIS Sector Market Analysis, 1989-1994



Total market size in 1989 is estimated at \$2.18 billion. Forecasts for 1994 place the total market size at nearly \$6 billion, approximately equal to a 22% compound annual growth rate (CAGR) between 1989 and 1994. This can be seen in Exhibit IV-4.

EXHIBIT IV-4

Western European EIS Country Markets, 1989-1994



Exhibits IV-5 and IV-6 present user expenditures in years 1989-1994 for Western Europe, by country market and by sector. The long-term forecasts should be considered with circumspection, since the electronic information services market continues to restructure as technology drives it forward. Nonetheless, the longer-term forecast provides vendors and service providers with a valuable insight into the potential of this market.

EXHIBIT IV-5

Western European EIS Market Sectors, 1989-1994

Sector	User Expenditures (\$ Millions)						CAGR (Percent)
	1989	1990	1991	1992	1993	1994	
Financial	900	1,300	1,620	1,890	2,200	2,600	24
Economic	170	200	250	320	400	500	24
Business	400	500	600	700	800	980	20
Professional	370	420	470	530	630	750	15
Industry-specific	250	330	460	600	690	800	26
News	90	110	130	160	200	250	23
Total	2,180	2,860	3,530	4,200	4,920	5,880	22

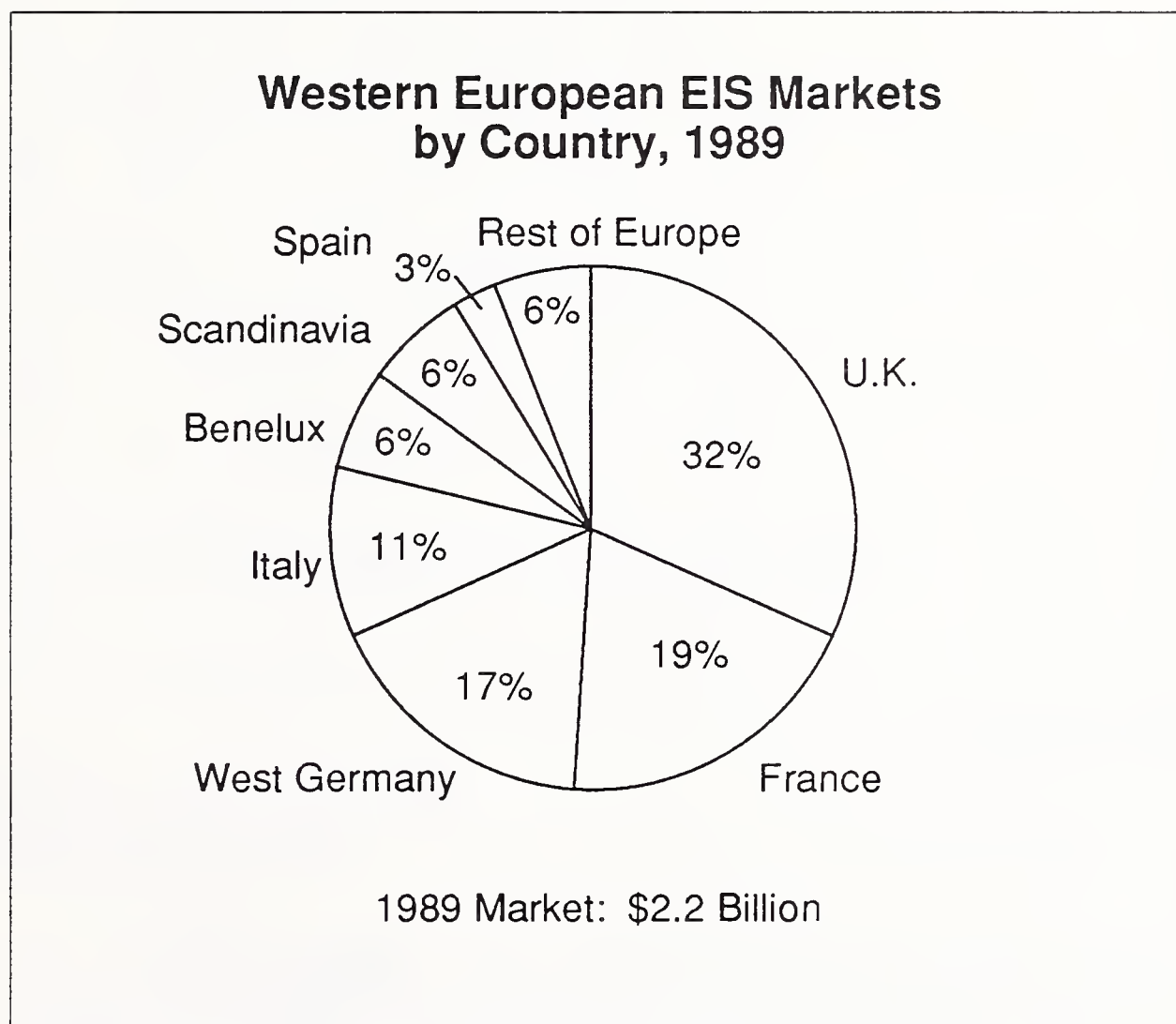
EXHIBIT IV-6

Western European EIS Country Markets, 1989-1994

Sector	User Expenditures (\$ Millions)						CAGR (Percent)
	1989	1990	1991	1992	1993	1994	
France	420	540	670	830	1,010	1,170	23
U.K.	700	920	1,100	1,260	1,400	1,700	19
West Germany	370	490	620	800	940	1,150	24
Italy	250	330	420	460	550	640	20
Benelux	130	170	210	250	300	350	22
Scandinavia	130	170	210	250	310	370	23
Spain	60	85	100	120	150	180	25
Rest of Europe	120	150	200	230	255	320	22
Total (rounded)	2,180	2,855	3,530	4,200	4,915	5,880	22

The U.K. represents the largest country market, as can be seen from Exhibit IV-7, but all country markets under consideration will continue to show rapid growth through the forecast period and beyond. As can be seen from Exhibit IV-8, the real-time financial sector remains dominant and the established vendors are being challenged by CD ROM providers of digests and historical information.

EXHIBIT IV-7



Exhibits IV-9 and IV-10 give the breakdown of the electronic information services market by country market and industry sector for 1994, showing the continued dominance of the need for financial information.

EXHIBIT IV-8

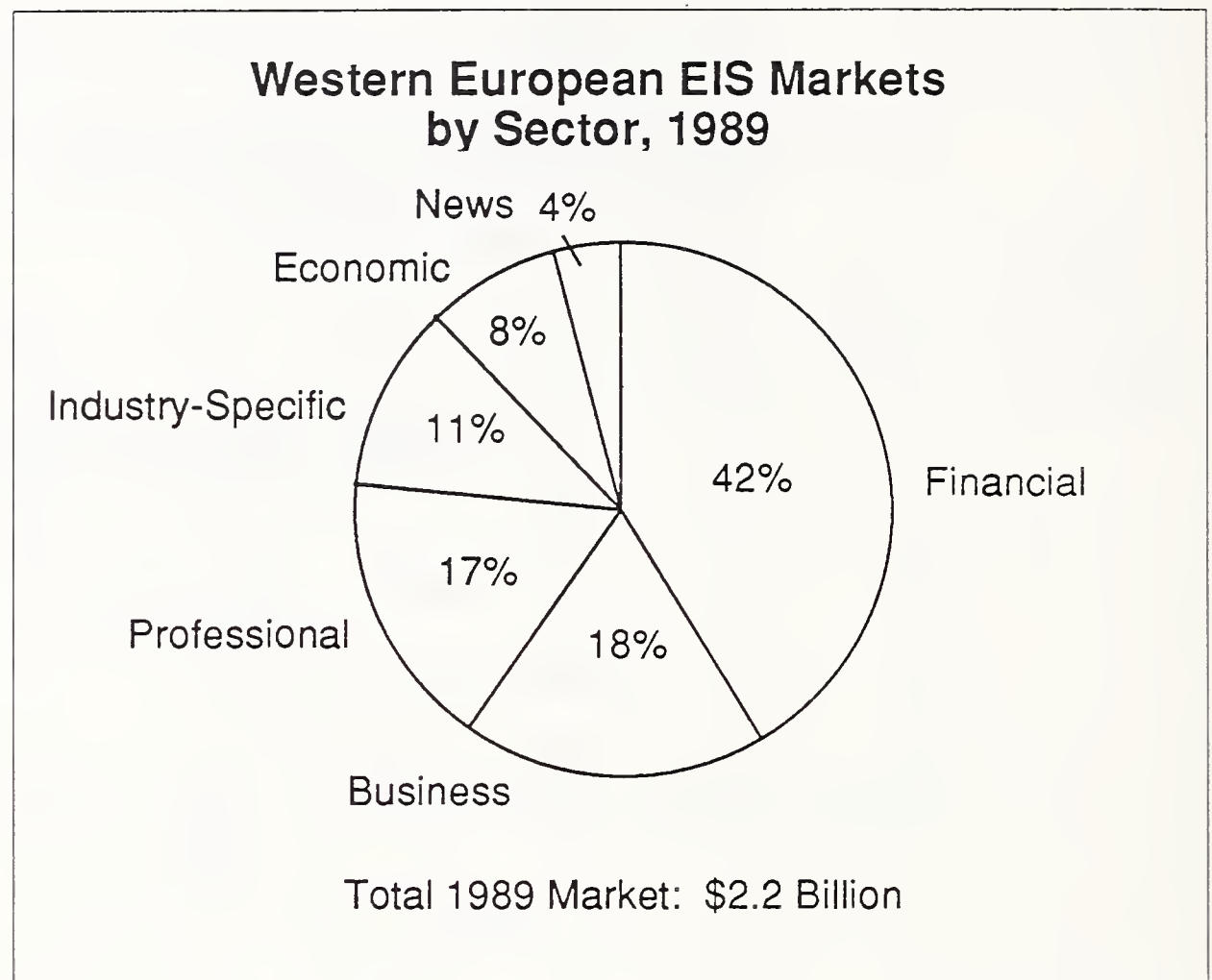


EXHIBIT IV-9

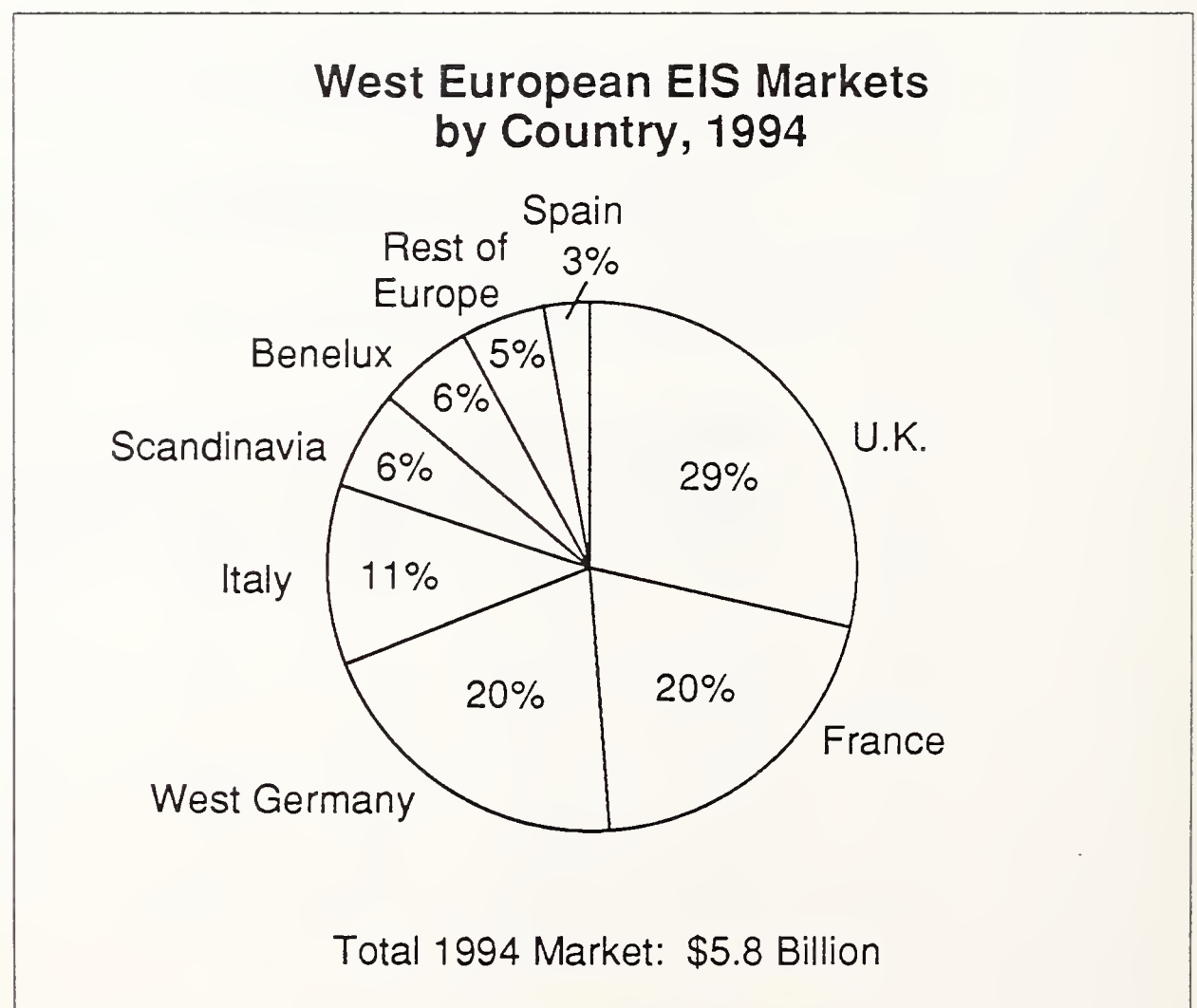
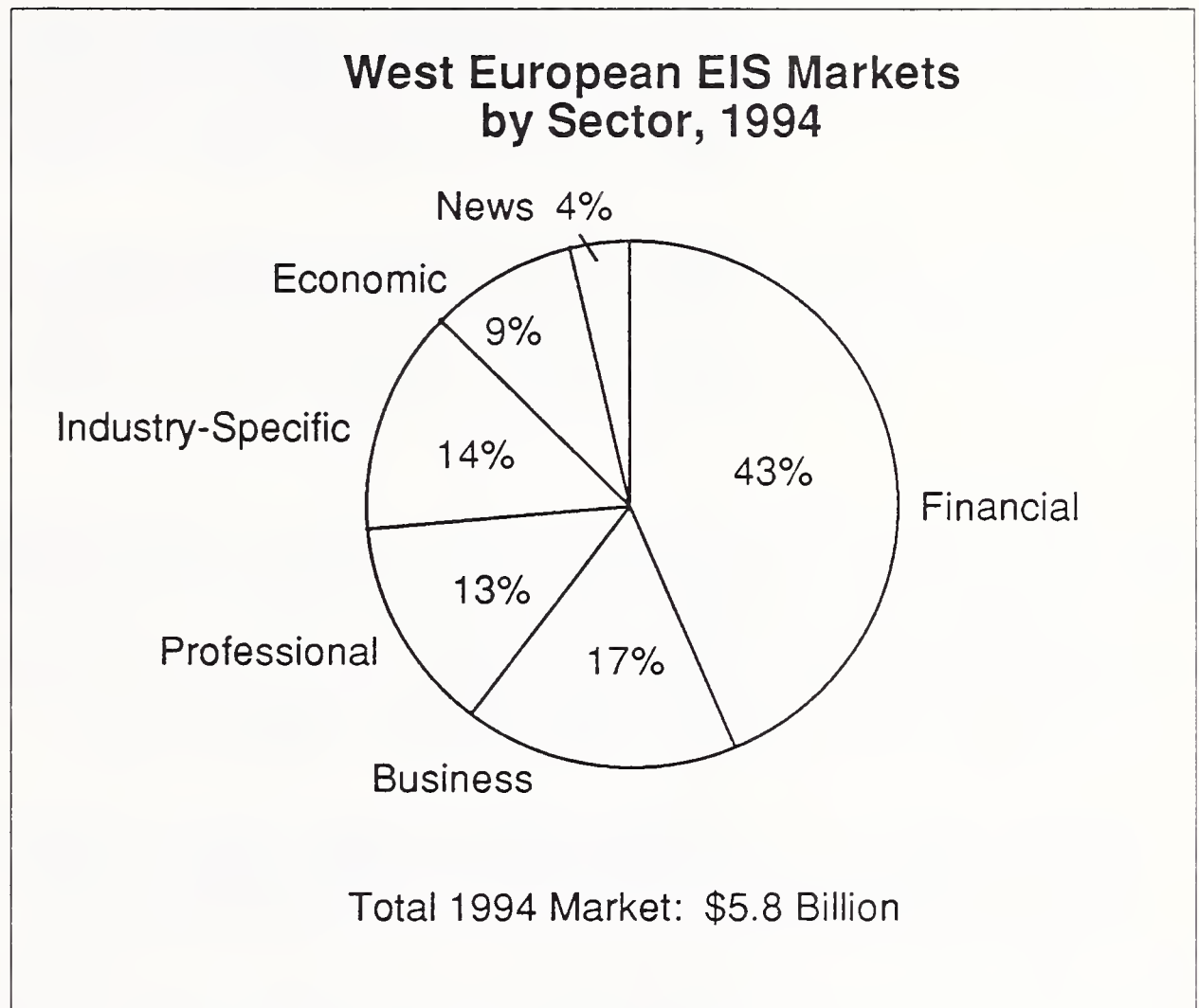


EXHIBIT IV-10

**D****Competition****1. Market Sectors**

One of the major inhibitors of the electronic information services market is that it is still at the stage of transferring much of the world's knowledge onto its host systems.

Overall, there are around 1,000 databases in Western Europe, with about 300 in the U.K., marketed through 50 hosts. Yet 50 percent of the on-line information obtained by European companies comes from the U.S., where there are 1,500 commercially marketed databases on fewer hosts than in Europe.

The most important type of business information is that involving securities data with a large transactional element and foreign exchange. This type of information accounts for over 70% of the financial data market. Reuters and Telerate are the clear market leaders.

There is a strong move in the industry to provide gateways to electronic information services through intelligent menu-driven interfaces that guide the user to the correct data. Many of these are being installed by information brokers or wholesalers, as a one-stop shopping service, where users can dial in and be directed to the appropriate hosts.

Deregulation, increasing competitiveness, and internationalism is driving significant growth in the financial services sector and, particularly, demand for numeric databases. INPUT forecasts that the market for numeric databases will increase from approximately \$1 billion in 1988 to about \$3.7 billion in 1994.

Although the cultural and technological climate for the use of electronic information services outside the financial services sector is becoming increasingly favourable, growth in other sectors will be largely for numeric information, such as corporate treasurers. Consequently INPUT forecasts relatively low levels of growth for textual information services—under 20% over the forecast period.

The large profits to be made from the provision of on-line financial information has led to intense competition among companies seeking to introduce innovative products and services.

On the other hand, the lack of profitability in such areas as textual information services has led to consolidation as vendors seek critical mass. This area is likely to need several more years of high growth before some payback can be achieved.

Of necessity, many of these markets are industry-orientated and are marketed accordingly. Nearly all services are aimed at the business sector, where there is the highest preparedness to pay for information relevant to a profit-making enterprise.

As with any on-line service, particularly for critical applications like trading, the provision of a very high level of service to the end user is of the utmost importance. Consequently, organisations like Reuters provide a high level of maintenance and service support and are continuing to study ways in which this might be improved.

There are, however, continuing opportunities for industry-specific and “boutique” services in the textual field, and much of this growth will come from links with transaction-based services such as EDI, and widened distribution via electronic mail.

Certainly in the banking and financial services, the electronic age has arrived with a vengeance. Stock market data is a major growth area, whilst the other disciplines—medical, legal, market research and management—are avid users of electronic information. Dialog estimates that 80% of new business in 1986 came from these areas.

The range and content of electronic information services is growing daily; there are 3,000 services available worldwide. As telecommunications links become cheaper, these are now available to the ordinary PC user.

The range of information on these services is growing too: apart from the normal news clipping and business database services, improvements in electronic typesetting have boosted the growth of full-text databases of all kinds, including a number of new electronic magazines.

a. Financial Services

The keys to success in the financial on-line markets are the flexibility and resources to cope with an environment of rapidly changing customers and technology. Deregulation in the U.K. extended the life cycle of electronic information services in even the most mature market segments, for example, stockbrokerage, and has created a ripple effect into different, but related markets, such as corporate treasuries.

There are ample opportunities for new services in a changing environment, especially as the move towards 24-hour global trading puts pressure on the requirement for comprehensive integrated international information sources.

The key strategic trend is to offer comprehensive services to niche markets:

- In the U.K., Telerate and Reuters dominate the credit and banking sectors
- Topic dominates the auxiliary banking sector
- Topic and Datastream dominates the investment and insurance sectors

Overall, the market is subtly differentiated and there is limited head-to-head competition.

This has led to an increase in value added to software in terms of service enhancements. Users' demands for ease of use, modelling, decision support facilities and integration of multiple information sources has led to the development of PC-based packages for interactive training, using basic artificial intelligence and analysis tools interfacing with real-time data.

A key opportunity lies in the development of software which facilitates the customisation of information for specific customers, and truncated services for infrequent dial-up users.

Brand engineering emerged as a key marketing strategy owing to increased flexibility in distribution; for example, the larger financial institutions require integrated digital data feeds which are then used to distribute own-label client services.

Pricing and discount policies need frequent and careful review as the number of terminals spreads within institutions, especially in France and West Germany. A further aspect of customer closeness is the need to compete on service and offer comprehensive implementation and support services.

There can be no doubt that the stock market crash of October 1987 forced the financial institutions to review their fixed costs, part of which comprised the price of services provided by Reuters, Telerate, Quotron and the London International Stock Exchange. All these vendors have bolstered their traditional services by supplying value-added data and, in some instances, the dealing-room delivery systems themselves.

Quotron, acquired by Citicorp for \$700 million in 1987, has lost its U.S.-equities-only image by offering products in the foreign exchange and money market areas. Their foreign exchange service—FX Quote—was launched along with Global Rate Report System, providing money market rates from 25 banks. Quotron's Q1000 processor, running UNIX, receives video feeds in real-time, enabling the user to build his own indices very quickly using spreadsheets and a range of custom-built application tools. It also monitors any applications running in the background.

Telerate has been continuing its policy of expansion through strategic alliances, acquisitions and internal developments. It has purchased a stake in Radiocor, the Italian electronic information services provider, and is developing a Global Transaction Services joint venture with AT&T, a foreign exchange dealing system that would form the basis for expansion into other markets. Telerate's plans to build a new computer site in outer London to boost its processing power indicates its commitment to Europe.

Automatic Data Processing, despite a huge presence in the U.S., has a relatively low profile in Europe. Its U.K. subsidiary, ADP Information Services, a result of the merger between ADP Financial Information and ADP Comtrend, is seeking to boost its European presence with its Comtrend, Trendsetter and Marketcpulse products. Comtrend comprises ten years of data covering commodities, options, financial futures and foreign exchange, and offers analytics and graphics as well as updates in real time. Trendsetter offers analytics on real-time data for similar market areas. Marketcpulse, digital-based, provides real-time coverage of equities, futures and options markets.

Another vendor investigating the City of London market is Knight-Ridder, whilst Quick of Japan is keen to expand its client base beyond its predominantly Japanese customers. Switzerland's Telekurs is looking into new areas, amongst which is the back office. There does not seem to be any slackening in vendors' product development; indeed the increased deference to costs is making for more carefully developed products and a wider range of services in a bid to find niches in the market.

CompuServe brought its eponymous information service to Europe, initially targeting the U.K. and Switzerland via an agreement with Swiss company Tele Columbus's Radio Schweiz division, which handles local marketing and support of the U.S. service, and is also helping to develop a Europeanised version for introduction in early 1990.

Financial communications depend upon the relationship between the network providers and the service users. In the early 1970s, Reuters created its foreign exchange price monitoring system in the wake of the collapse of the Bretton Woods agreement. This agreement had effectively fixed the relationship of world currencies against the U.S. dollar, leaving little room for a traded market in currencies. Reuters was not serving an existing market.

Indeed, Reuters effectively brought the market into being, by persuading the banks that needed to buy and sell currencies to contribute information on the prices at which deals were being done. The Reuters Monitor Dealing System handles around a third of the \$300-450 billion that is traded daily on the international foreign exchange markets.

Whilst the growth of real-time financial services has been driven by the increasing velocity of financial movements, which in turn has put a high premium on speed, other kinds of financial network can function at much slower speeds.

Until the crash of October 1987, the market for on-line financial information was growing at around 30% a year by value. In 1986 the European market was estimated to be worth £285 million; the U.K. accounted for around 44 percent. The world market is now dominated by Reuters, followed by Telerate (67% owned by the Dow Jones News Organisation) and Quotron, a unit of Citicorp, which lost \$37 million last year; second quarter results at Telerate revealed a drop in overall profitability despite an increase in turnover.

Reuters too has had some problems, such as the failure of the Georisk — an electronic risk management system—joint venture with Swift.

The market may also have to deal with AT&T. With a U.S. court lifting Judge Greene's ban on AT&T's participation in electronic publishing, the company is already co-developing a foreign exchange dealing system with Telerate.

AT&T has been discussing ventures in financial information and transaction services with potential partners, and in September 1989 bought Istel, one of Europe's leading network services providers.

The deregulation of the world's financial markets and the ability of new computers to process billions of bits of information quickly and cheaply have meant the continued boom in electronic financial information.

However, in the two biggest markets, foreign exchange and money markets, there is still a highly profitable, virtual duopoly. Reuters and Telerate are simultaneously seeking to expand into other markets such as futures, equities and commodities.

Reuters is in effect the world's foreign-currency market, supplying not only currency quotes and other financial news, but also screens and satellite communications. Roughly one-third of the world's foreign-exchange trade is done through Reuters' 10,000 dealing screens. Perhaps another third is done over the telephone after consulting a Reuters screen. Clients, which include most of the world's banks, pay rent for the screen and a fee for each service.

Once the telecommunications network is in place, profits from the sale of screens at Reuters drop straight to the bottom line. Reuters' operating margins last year were 29%. The foreign exchange and money markets accounted for 55% of its revenues and about 70% of its £179M (\$320M) pre-tax profits. Selling news to newspapers brought in only 7% of its revenues.

Telerate has grown even faster. It has an operating margin of around 40% and its annual pre-tax profits have risen 25-fold over this decade, to \$77M in 1987. Virtually the whole of that has come from the market in American Treasury bonds and bills, which it dominates, supplying four-fifths of the dealing screens (the rest come from Reuters).

Reuters and Telerate have been able to maintain their dominant position by virtue of their sheer coverage. It is costly to develop new systems. As a consequence, information providers have the opportunity to provide products and services that appeal to a large customer base. In Europe however, the market for new screens in Reuters' and Telerate's established services is effectively saturated.

Whether Reuters and Telerate can maintain this duopoly remains to be seen. There is little competitive pressure on price, since firms are more concerned with the quality of service than with finding a cheaper new-comer. Both Reuters and Telerate have built their integrated systems around the dealing room. The next stage should be to tie those systems to the back office (e.g., matching and clearing).

These functions, however, are the domain of the equipment vendors such as IBM and Digital. This may be the opportunity for these vendors to attack the Reuters and Telerate market—through the back office. Certainly attempts at head-on confrontation have not proved successful. IBM's venture with Merrill Lynch was a failure back in 1984, whilst more recently, the venture between AT&T and Quotron failed.

However, with the big computer firms investing heavily in high-speed networks which link back offices around the globe and switch information simply and quickly, it would be relatively easy to adapt such technology to the dealing room without the services of Reuters or Telerate. Digital, IBM and Fujitsu may well attack from the back office.

Electronic information services have played a significant part in the changes to the stockbroking and investment banking businesses. The idea of globalisation—competitive, technology-driven markets, dominated by a few worldwide organisations—has not become reality to the extent anticipated. The relationship between market share and profitability in markets like the City of London has changed due to the advent of electronic information services. This is because, in such a market, the best source of profit is information that others do not have.

Electronic information services have made that information more cheaply and generally available. Corporate treasurers and institutional investors can use electronic information services, such as Reuters, to form their decisions.

A significant trend in an allied sector is that brokers such as James Capel have announced severe job cuts, whilst one of the largest market-makers in equities, Smith New Court, announced financial losses earlier in the year. The era of electronic information services has highlighted over-capacity and reduced the call for specialist services. There are significant opportunities for the banks to expand in this area.

Speed and reliability of information will inevitably become the key value-added features, as technological developments allow other areas to adopt features of the current real-time financial information market. For example, one such adoption of these features might be in bringing relevant information (relating to a particular client, company or service)

instantly to the client on the line. ISDN-type applications would also be an example, integrating the telephone system with computer applications that hold data about clients, as well as with traditional external information feeds.

To highlight the opportunities in this area, the U.K. "dealerboard" market, which accounts for 50 percent of worldwide sales, is worth £35M in value, with a volume of 23,000 trading positions. British Telecom (CBP), a wholly-owned subsidiary of British Telecom, has the largest share of the market (40%) with one product alone, the City Business System, a touchscreen trading system combining advanced telephony and computing facilities, installed in over 250 locations across 26 countries. In five years, CBP has grown to be a substantial company, generating an annual turnover of £43M (\$70M) in 1987-1988.

Reuters' activities in real-time information serve as an indicator of the development towards analytical tools. These include adding new exchanges and traded instruments worldwide, adding to specialist data from third-party sources, and improving speed and presentation of market news by defining specialist presentation formats for individual markets. In addition there are services such as the Reuter Equity Graphic Service (displays on some of the world's top 2,500 companies), Reuter Chartist (a real-time datafeed to personal computers for comprehensive analysis of cash and futures markets), and Marketfeed 2000 (high speed data on world equities, futures, options and energy markets).

In the field of historical information, Reuters concentrates on two main markets:

- Products compatible with real-time financial services and delivered to the customer base
- Specialist historical information for analysts who do not use the real-time Reuter service

Reuters uses its two historical database subsidiaries, Finsbury and IP Sharp. These services include Finsbury's database of published text for financial and related markets developed throughout Western Europe and notably in Scandinavia. In 1988, the first Finsbury non-English language service, Accountline (in Italian), producing on-line full texts of U.K. companies' annual reports, was developed for launch.

At the same time, IP Sharp's worldwide packet-switched network, IPSANET, was being integrated into Reuters' communications facilities.

The following is a indication of some of the many services provided by some of the leading players in the financial and securities sector.

- **Dialog**—Dialog distributes Trade Plus as DIALOG Quotes and Trading, a gateway service delivering stock and options quotes. Up to 75 portfolios can be set up on DIALOG Quotes and Trading with the value of the portfolio's securities updated to reflect current market prices as well as the capability to track gains and losses and to project the dividend income of a portfolio.
- **Extel**—Extel produces and distributes Earnings Guide, currently the largest database of consensus forecasting estimates on U.K. equities, presenting the combined results of the analysis of over 30 leading stockbrokers, with information from Extel's financial share database (Exshare, which covers over 100,000 international equities). ESPRIT is its computer system which maintains a real-time database of prices and related information, and supplies both snapshots of the database as intraday prices and continuous feeds of pricing data. The Real-time Feeds (RTF) service provides a digital data feed of real-time information, international Stock Exchange securities, London traded options, major financial indices, London International Futures Exchange (LIFFE) and foreign exchange rates. The data can be processed by the user for use on in-house computer systems.

Extel also offers Exbond, a database of the terms and conditions of over 1,300 international and Eurobonds with over 300 items of data per bond. Exbond is reputed to be the most comprehensive and up-to-date database of its kind in the world.

- **Finstat**—Financial Electronic Publishing produces and distributes Finstat, an electronic U.K. price service offering a daily electronic feed of statistical data from the Financial Times' Share Information Service, which provides price and yield for 3,000 commonly-traded securities and gilts. The company also provides the FT Currency and Share Index Databank, which reports the dealing rates in the foreign exchange, money and gold markets as well as movements on the London Stock Exchange. Information includes the FT30 Share Index, the FTSE 100 Share Index and the FT Actuaries Share Indices with representative price indices from the major international stock exchanges.
- **IP Sharp**—IP Sharp's Commodities contains historic prices, volume and open interest for all major commodities traded on the London, Paris, New York and Tokyo futures market, as well as most U.S. and Canadian markets. Containing over 60,000 statistical time series on metals and soft commodities, updated daily, this database is one of the most extensive services offered by any vendor. The company also provides The Daily Currency Exchange Rates Database, which gives a total of 715 currency exchange rates. Information includes daily spot, buying and selling, and forward rates. Reuters, Telerate, Telekurs, Quotron and IP Sharp all offer extensive money market services.

- **Telekurs**—Telekurs has a series of services. Investdata is a real-time database inquiry system which allows the user to access the Telekurs database of over 200,000 financial instruments trades worldwide, with latest quotations for 78,000 securities, and portfolio management for over 130,000 securities. Indes is a new investment decision service providing information on securities price data as well as international and national economic news. It includes facilities for users to compile their own list of quotes and to have these automatically updated.
- **Datastream**—Datastream produces and distributes Datastream Equity Research Services, covering research on market performance (statistics and graphics), company accounts analysis and search facilities. Research data is stored on equities from all West European markets as well as many others. Datastream provides access to nearly 6,000 stock indices, interest rates, exchange rates and commodities. Updates are made in real time for the U.K., France, West Germany, Belgium and the Netherlands.

The company also provides a series of other services, including Datastream Financial Futures Service (real-time quotations); Datastream Fixed Interest Services, including 3,700 issues from the U.K., 8,500 from West Germany, 2,200 from Switzerland, 2,000 from Benelux, 300 from France and 150 from Italy, with the stocks updated daily; and a real-time service covering the International London Stock Exchange, the London International Futures Exchange (LIFFE) and the European Options Exchange (EOE).

- **ADP**—ADP Comtrend (U.K.) provides real-time price and trading data from the world's major exchanges relevant to dealers and traders. The major innovative feature provided by ADP is its ability to generate real-time charts and graphs from commodity information. There are other facilities, such as Comtrend Plus and Trendsetter II, which enable users to design their own trading models and construct a personal database using a mixture of stored real-time and research information.

Marketspulse is ADP Comtrend's real-time quotes and trading information database which puts information from all the world's major equity, commodity and financial future exchanges on one screen. Sources are Dow Jones, AP-Dow Jones and Extel Examiner News Service. ADP Data Services distributes Futures Database from Commodity Systems Inc., a futures database covering international futures contracts for 90 commodities traded on over 30 major exchanges.

- **RCI**—In France, RCI (Reseaux Commerciaux Informatiques SA) produces and distributes COTA, providing stock market information on French companies listed on all French stock exchanges, with the information available two hours after the stock markets close.

- Dafsa—Also in France, Dafsa produces and distributes Base de Données des Obligations Françaises, real-time data on 2,000 French bonds with daily market rates, enabling users to carry out portfolio analysis. Dafsa also produces and distributes Gestion des Valeurs Mobilières, a real-time portfolio management service for transferable securities and French and foreign stocks and shares. It is mainly geared to the needs of mutual societies, insurance companies and banks. Dafsa also provides Informatitres, information on over 40,000 French and foreign quoted and unquoted securities.
- Affarsdata—In Scandinavia, Affarsdata produces and distributes AktieInformation, which provides current stock prices quoted on the Stockholm Stock Exchange as well as company information on listed companies. It carries 20,000 records and is updated every two minutes.

b. Textual Information Services

The key opportunity for vendors of textual information services is to develop and package new services which appeal to specific segments of the end-user market. The electronic information services industry is changing from the “supermarket” approach, originally adopted by vendors like Dialog, of hosting large, comprehensive, complex and largely unstructured textual databases, to the “boutique” approach of the packaging industry- and user- specific information products.

A possible scenario for the future of largely unprofitable database hosts is that they become intermediary computer services companies, and the information providers will take responsibility for the administration and marketing of on-line products.

A major opportunity is to offer intelligent interface facilities for on-line services that provide transparent access to a range of services. Intelligent access has been provided on some new services, for example British Telecom’s Hotline service, but there is not a common standard across all on-line services, and this inhibits market development.

Electronic mail vendors are continuing to offer gateways to a wide range of electronic information services. However, what is required is the development of individually packaged solutions for target vertical segments. Electronic mail and electronic information services should be marketed as an integrated business expansion facility for sectors such as shipping and freight forwarding.

Some examples are Spearhead, a Department of Trade and Industry database developed in conjunction with the supplier Profile Information (part of the Financial Times Group). Access is also offered via Telecom Gold, One to One, Mercury and IRS/Dialtech. Spearhead gives details on

all changes facing businesses as 1992 approaches, including a summary of all current and prospective EC measures and other useful facts. For example, EC research and development programmes, and measures on health and safety at work and the environment are included.

BOTIS (British Overseas Trade Information System) is another DTI database which covers product and industry information, overseas contacts, export opportunities, promotional events and useful publications. This can be found at the Export Market Information Centre (EMIC), a library of information in-house publications for potential exporters, and market researchers.

EUROLOC is compiled by the European Policies Research Centre to help businesses looking for financial assistance. The database includes finance available to industry from governments and the EEC, and also has news and statistics of interest to businesses located in each country.

IES-DC is a free database of interest to the technology industry, giving details on ventures like ESPRIT and RACE which organise funding for research and development projects throughout the EEC, and listing relevant contacts. It is supplied by ECHO (European Commission Host Organisation).

Electronic information services offering multilingual capabilities include Eurodicautom, which provides modern translations for scientific and technical phrases as well as a list of abbreviations. This service is also free from ECHO.

Mercury offers a translation service in French, German, Dutch, Spanish, Italian, Portuguese, Danish, Swedish and Norwegian. The charge is \$2 per line of translated text or \$2.50 for a special priority service.

Marketing information services include Eurofile from Dialcom, which offers data on 12 consumer markets, including size and trends, and also lists main companies. Euromonitor offers details on markets in the U.K. and Europe, and provides close scrutiny of particular products. Eurofacts, also from Dialcom, offers statistical information on marketing and industry, including employment, trade, size of market and levels of production.

In the financial sector, Kompass Online offers details on 270,000 leading companies mainly in manufacturing, industry and related services. Information includes the company's sales, number of employees, directors, products and services, and whether involved in import, export, production and distribution. This service makes it possible to look for all companies in named countries with a specific turnover and product manufacturing capability.

Extel offers Examiner, an up-to-the-minute business and financial news service, offering 400 news stories available via a dynamic indexing system with data being presented on printers or monitor screens distributed through local and national networks.

Reuters, whose services in the past have been built on real-time financial data, has also moved into the historical information business. As part of the move, Reuters acquired two key companies dealing with historical information—IP Sharp and Finsbury Data. The highly regarded Textline originated at Finsbury Data, whilst IP Sharp provides financial, economic, aviation and energy information databases. Some of Reuters' services in the historical information sector include:

- **Reuterfile:** Users can now access the databases on their own PCs, whereas in the past it was necessary to have a dedicated terminal. The company has developed its own communications software (Reuters Connect), making the whole process less complicated and technical.
- **Textline:** A large database carrying news stories from all around the world; already well-known and under Reuters management, the aim is to make it easier to use and more comprehensive. With 1992 in mind, it is being extensively changed to suit companies trading within the EEC. There are two million stories on file: about 70% are in full text and the rest are abstracted. Reuters is adding foreign language news—the first will be in Italian.
- **Dataline:** For international company forecasting and company data. Gives access to accounts and financial statements for the past five years. Includes a financial modelling system for preparing forecasts based on projections of key variables.
- **Country Reports:** Updated daily, by cameramen, photographers and correspondents around the world. The main information is on political and economic changes and trends.
- **Accountline** covers U.K. company reports and accounts.

c. Information Brokers

The creation of a single European market will mean increased business and professional mobility. There is already a well-established international executive search operation called the Transearch Network, and a European division which uses the latest database technology to select top calibre individuals. The Transearch European division consists of independent partnerships in the U.K., France, Belgium, Holland, Germany, Spain, Sweden and Italy. They all subscribe to a London headquarters, where Merton Associates coordinates Transearch worldwide.

Technology plays a major role in the executive search process. Transearch subscribes to on-line services and also uses an in-house database STRIX, which has since been bought by Interpol for worldwide use. On-line services are also accessed via the Transearch computers—international databases which provide information on companies by market, product, industry and individuals. These databases have mostly replaced yearbooks, as they are cheaper and faster.

Transearch subscribes to Pergamon Infoline, Dialog and Data-Star. Pergamon Infoline is the most used service as it gives access to hundreds of databases, many of which are business-orientated. The main databases exploited by Transearch include Inter Company Comparisons, Jordans, Predicasts, Key British Enterprises, Financial Times and Textline.

Directories for the research department used to cost thousands of pounds per year, but databases are more economical, as they are only used for the required information. Computerised searching also provides a fast method of finding information, so although per-hour connection costs may seem high, they compare favourably to buying directories. In short, electronic information services enable business development.

To this end, a U.K. company, Computerscan, offers a computer match-making service with a difference—it takes detailed questionnaires from software and hardware suppliers and compares them to find the ideal system. This is an on-line service used mainly by accountants and management consultants to advise their clients on the best buys. The database is constantly updated and covers all products available from 4,500 U.K. suppliers. It also shows where systems are supported, in the U.K. and worldwide. It is possible to match the buyer's needs (applications, languages, operating systems and types of hardware). With what is available, the entire procedure can take a few minutes rather than being charged at full management consultancy rates.

Suppliers are not charged for having information on their products included, which helps Computerscan remain impartial. Subscribers can access the database for £8 a minute on their own PC via a modem, or if they intend to make more extensive use of the service, Computerscan will install the entire product and provide a full maintenance update contract. Simple enquiries such as who provides a particular product would take about two minutes. A full search to cross-match 30 requirements against 4,500 suppliers would take approximately eight minutes.

2. Market Developments

a. European Economic Community

The European Commission's Directorate General for Telecommunications, Information Industries and Innovation (DG XIII) has been playing a key role in the development of the European Information Services market. The European Commission's role in the single market for electronic information services has been to stimulate an internal information services market that strengthens Europe's information services suppliers. The Commission has allocated \$36 million for the two-year action plan called IMPACT (Information Market Policy Actions) which will run until the end of 1990.

Most of the money will go towards setting up pilot demonstration projects to demonstrate the potential of information services to professional users, although the Commission hopes the public will also reap the benefits of the enhanced information services that will be available. The IMPACT program aims to:

- Create a European Information Market Observatory (IMO). This organisation will gather and analyse market statistics and data on the information market itself to help policy makers and business managers.
- Propose ways of wiping out the legal, administrative and technical red tape that prevents the establishment of a pan-European information market.
- Bring together the public and private sectors in Europe. The private sector will be encouraged to exploit public sector information, and the public sector will be encouraged to make more information available externally.
- Set up pilot demonstration projects to develop new information services and make them accessible to users who may not be familiar with the technology. These projects will include patent information, image banks, tourist information, standards information, road transport information, interlibrary collaboration, and intelligent interfaces to electronic information sources.
- Promote the use of the new services (by providing multilingual directories) and to give objective information about the services available. The program will make increased use of ECHO (European Commission Host Organisation), the Commission's own database host, which will act as an outlet for new services when requested to do so, and which will assist in the promotion of services.

The European Commission is playing a key role in the development of a European EIS market, most significantly with Euronet DIANE, a single European network with location independence and uniform tariffs. Euronet has provided the infrastructure critical to the development of a specialised electronic information services market in Western Europe, serving as a spur to the national PTTs and a significant contributory factor to the introduction of packet-switched networks.

Other Commission initiatives that have contributed to the market's development, albeit indirectly, are the DOCDEL (electronic publishing) projects. Whilst not impacting on the infrastructure in the same way as Euronet DIANE, the DOCDEL projects have generated more in commercial spin-offs than the total original investment. Microcomputer-based composition systems for scientific and technical manuscripts (respecting industry norms), and the transition of vector graphics from a design tool to a database technique, are two examples of commercial applications.

The Commission's host service, ECHO, which was created in 1980, has been helping within the newly agreed Community programme for 1989-1990 (IMPACT—Information Market Policy Actions) to set up an information services market in the Community. ECHO's major aims are to:

- Provide objective multilingual information about Community information services
- Give guidance and training for users, with the emphasis on regions where access to electronic information is not so common
- Act as an outlet for advanced information services

b. France

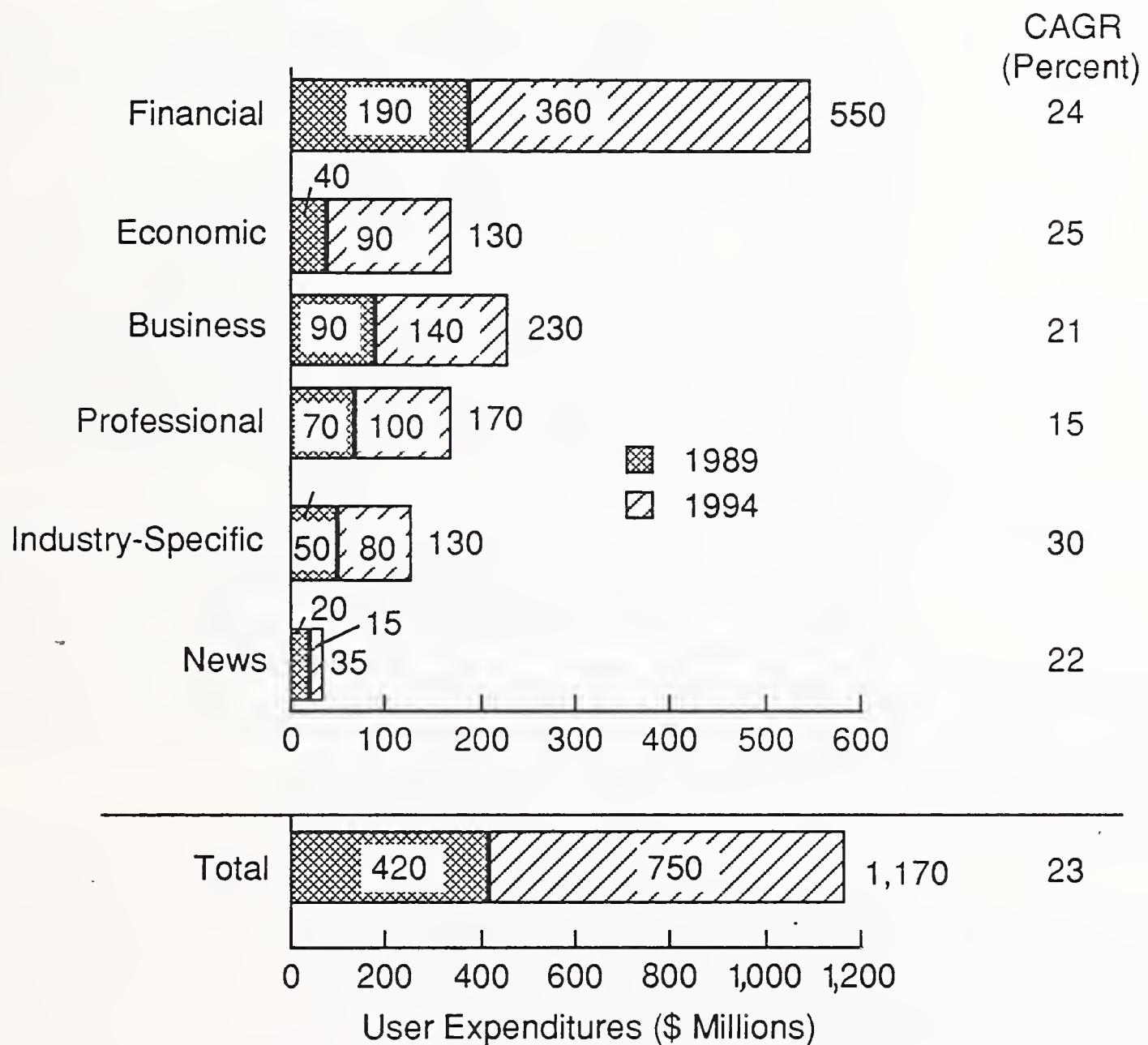
The French market is expected to grow at a compound annual growth rate of 23% during the forecast period. A breakdown of the French EIS market by industry sector is given in Exhibit IV-11. France has one of the most sophisticated telecommunications environments in Europe, and videotex is further advanced in France than anywhere else in Europe, due in part to substantial government subsidy.

Videotex systems are geared towards business and industry-specific sectors, and this explains France's lead over the rest of Western Europe with regard to on-line selection and ordering electronic information systems.

Telesystemes Questel is France's largest host. Questel's success is partly attributable to its links with Teletel, France's national videotex system, and the world's most successful public electronic information service. There are over four million Minitel terminals in France, 40 percent of

EXHIBIT IV-11

French EIS Market Analysis, 1989-1994



them in the business sector. Over 8,000 services are available on the system and between 30% and 40% of the inquiries Questel receives come from these videotex terminals seeking information stored in one of the 70 databases (all aimed at business users) that are distributed by the French company.

Questel's wholesaling approach is still not common practice in Europe. The preference of many European vendors is to rely on their won communications infrastructures rather than wholesale hosts, which makes accessing varied data expensive, time-consuming and problematic.

Companies access most databases through Questel, where the advantage lies in being able to switch from one database to another. Derwent, the patent database of World Patent International, can be accessed through Questel, it has a sophisticated inquiry system, is invariably up-to-date, is interactive and gives highly detailed descriptions.

Essor, another database marketed through Questel, provides data on 80,000 companies in France, with very detailed and up-to-date information about the financial situation and activities of individual firms.

Not surprisingly, Questel distributes Dun & Bradstreet's "Dun's France Marketing", a directory of 200,000 French companies in all sectors which have a minimum of 10 employees or a minimum annual turnover of 10 million FF. Questel also distributes Defotel, one of the most important company databases in France, providing information on all companies quoted on the Paris Stock Exchange as well as a further 500 unlisted companies, using over six years' historic data for Stock Exchange and two years historic data for accounts. The database producer is Cote Desfosses.

Competitors to Questel are G-CAM Serveur which offers the Delphes database which covers press releases on all French companies, as well as covering news items on industry sectors and products both in France and overseas. Delphes can be searched using free text, using the name of a company, product, industry sector and country. Over 1,000 French and foreign periodicals are searched on a regular basis, and the database contains over 300,000 separate items.

G-CAM also distributes "Qui Decide en France" from the DPV Group, which produces a series of annual directories, under the banner "Qui Decide", covering different industry sectors. In "Qui Decide en France", the largest and most general of the directories, there are over 80,000 companies included. The company also distributes the Chambre de Commerce's ISIS bibliographic database, providing 170 citations with abstracts on French and international economics, law, industry, insurance and computer science.

OR Telematique distribute the French National Register of Trade's INPI STE 3 database, which holds the accounts and balance sheets of 400,000 French companies, sourced from the local register of commerce. This is a classic case of a host working in conjunction with an information provider, in this case L'Institut National de la Propriete Industrielle, to provide an easily analysable database for users.

OR Telematique also produces and distributes Liens Financiers, which covers shareholders and participations of the 80,000 largest French companies, listing subsidiaries and affiliates of major French companies both in France and abroad. The company also distributes the Groupe

Galande's Tele Inform, two services which provide information on over 2.5 million companies in France. Tele Inform 1 provides financial information, historical turnover and profit figures with credit ratings and credit reports, whilst Tele Inform 2 provides current commercial information.

Adelin is one of the major French company databases, providing details of the principal shareholders of 80,000 major French companies, and traces companies' links with subsidiaries and affiliates. Similar to the directory "Liaisons Financieres" produced by Dafsa-Kompass, Adelin is, significantly, also available from Dafsa, indicating the demand for this type of information.

GSI-ECO, a subsidiary of network services provider GSI, provides CJTRES, produced by INSEE (Institut National de la Statistique et des Etudes Economiques). The focus of this database is the earnings data from over 4,000 French industrial companies, providing aggregated statistics on 90 industrial sectors. One of the company's most successful databases is Dataeco, a collection of databases on French international economics and finance. It includes a number of databases including GSIDATA, which contains French economic indicators and overall economic trends.

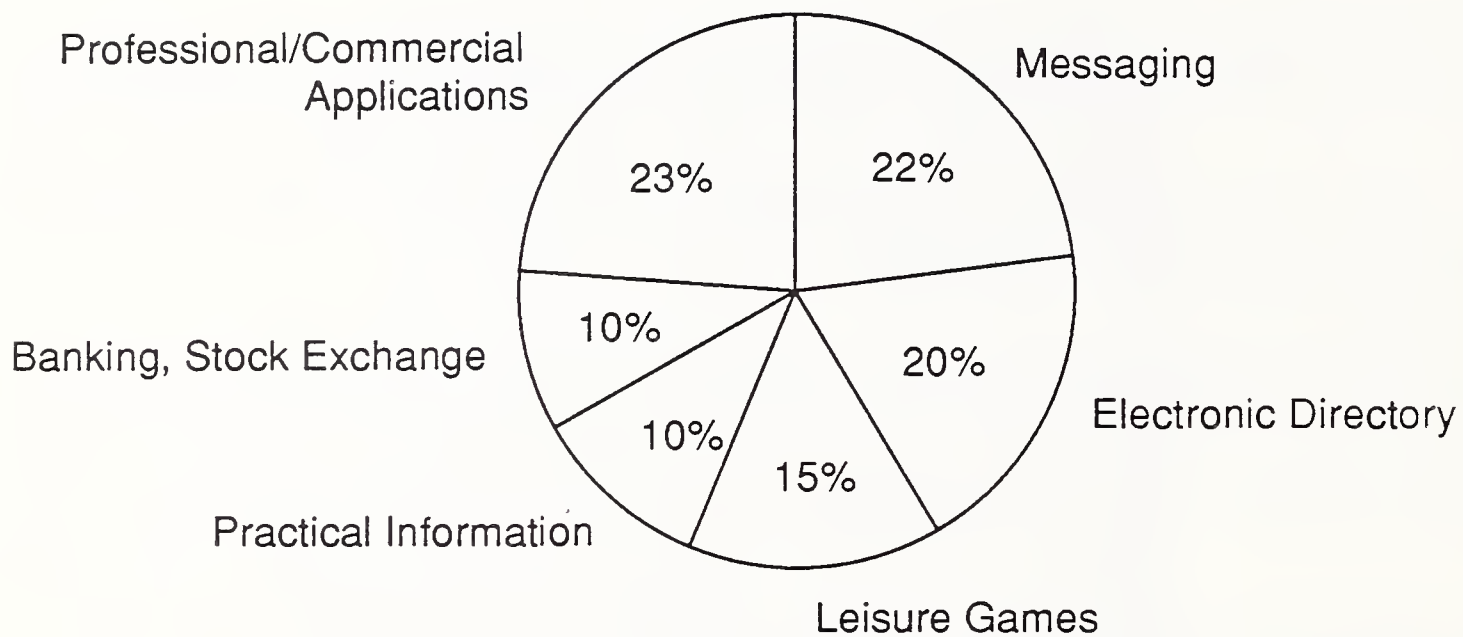
In terms of users, Minitel is the dominant service in the world's videotex market. INPUT's estimate of the Western European videotex market is \$1.6 billion, with France accounting for \$1 billion. There are 4.5 million terminals installed in France, with 850,000 being installed in 1988, a 25% increase over the previous year. A breakdown of Teletel traffic by type is included as Exhibit IV-12.

Teletel, the service on which Minitel runs, had a total of almost seven million hours of on-line time in 1988, with the commercial sector showing growth of 44%, rising to 381,000 in 1988, professional applications accounting for 23% of traffic. Fifty-three percent of Transpac's traffic is accounted for by Teletel.

Without question, Minitel's success in France proves the existence of a far wider consumer market than is currently being reached. The French ideal of universal service provision via modern, unified networks run by a national monopoly, France Telecom, results in charges on Minitel based on time, not distance, with costs kept low to encourage use.

This charging system is a key development, because it enables service providers to choose from different services with different rates. Charges are levied via the telephone billing system, with service providers being paid by France Telecom. Users pay their charges with their telephone bill. This offers two advantages:

EXHIBIT IV-12

Breakdown of Teletel Traffic by Type, 1988

Source: Teletel

- Small charges are recovered economically for the service providers.
- Users remain anonymous.

The system works by sending charging pulses to the subscriber's meter from the videotex access point at the Transpac network. The pulses flow at a faster rate than normal to cover the costs of the Transpac network and the service.

The "Kiosk" billing system removes the need for subscriptions, passwords or direct billing by service suppliers. France Telecom hands over a proportion of the sums collected by using traffic statistics. The more popular a service, the greater the return.

Videotex has flourished in France because a radically different approach was adopted. As opposed to running videotex services on powerful host computers owned and operated by the PTT, Minitel is an open system to which service providers connect their own host computers, whether micro, mini or mainframe. The electronic information services are connected to Transpac with user terminals connected to the PTN (Public Telephone Network). The interfaces between the two networks, (the gateways) are referred to as PAVs (Points d'accès videotex).

Transpac uses the international standard X25/X29 protocol for interconnecting host computers, so Minitel services can be accessed outside France.

However, Teletel lost 5.3 billion FF (\$742 million) in 1988 according to Cour des Comptes, the accounting watchdog of state-owned companies. Whilst these figures do not take into account the revenues that France Telecom draws from Transpac traffic, the figures were serious enough for the Cour des Comptes to propose a 10FF monthly charge for Minitel terminals for all users, bringing in 2.8 billion FF (\$392 million) a year.

France Telecom, with six subsidiaries and 156,000 employees, had a turnover in 1988 of 87,000 million FF, (£8,223 million). Revenues for international activities (of which 70% is European) reached 1 billion FF, (£94 million), 10% of their revenues. Transpac's turnover is 2,639 million FF, with Telesystemes' 1,044 million FF.

In the U.S., France Telecom and CSC formed Minitel Services and negotiated for access to Bell company viewdata gateways and the allegiance of information providers. They have been successful on the West Coast with Nynex, and with Bell Atlantic. Access to Bell's gateways is vital to Minitel because it will mean that subscribers U.S.-wide will be able to access its services with a local phone call, using Minitel emulation software in their MS-DOS or Apple boxes or buying a Minitel terminal for \$500. The terminal emulation software is being offered free, and Minitel says that it will provide gateways to viewdata networks in Belgium, Italy, Spain, Germany and Finland by the end of 1989.

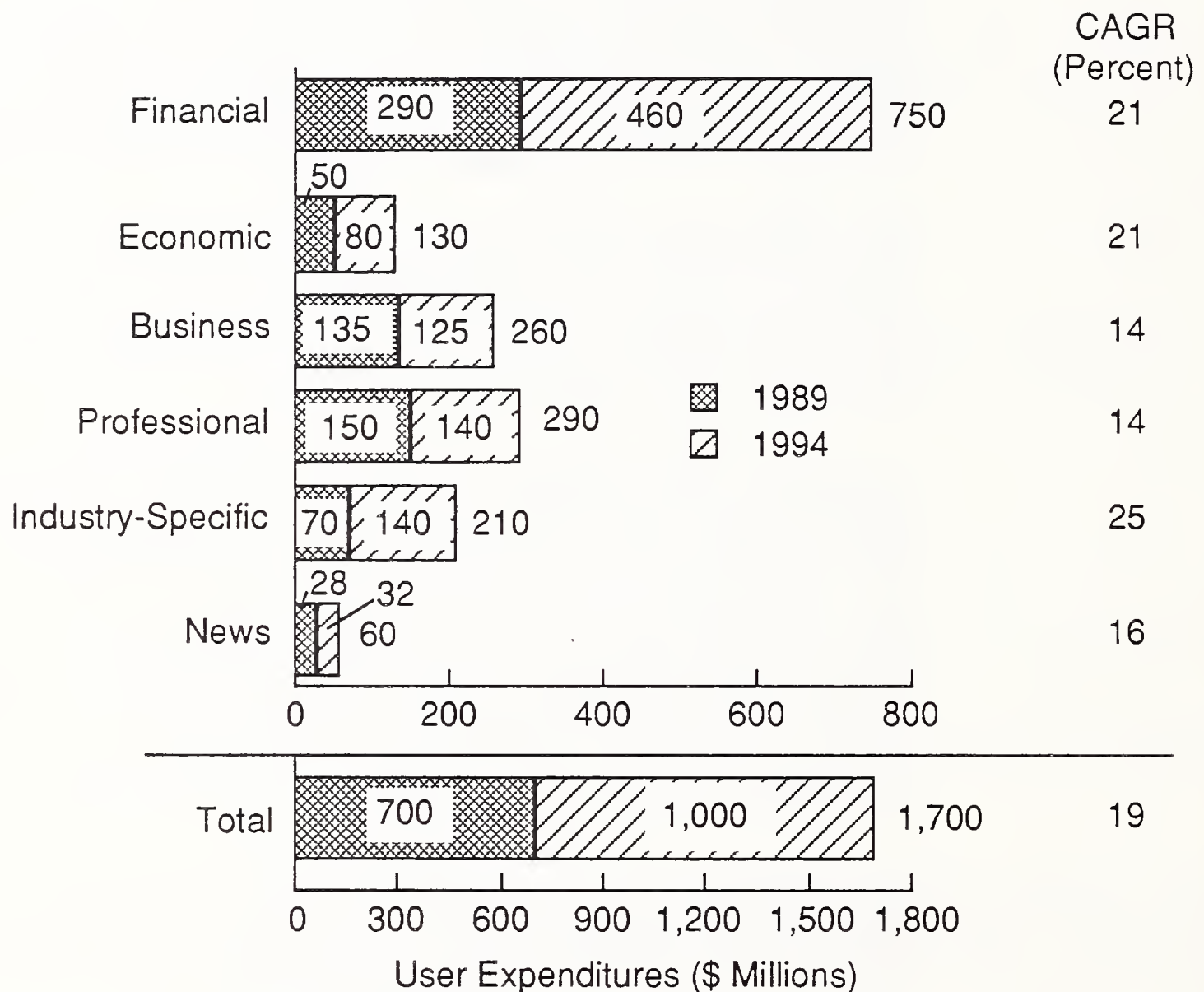
Information providers pay \$1,000 plus \$1,000 a month network access charge, and will hope to make a profit from the \$10.20 per hour that Minitel charges subscribers. Minitel, which handles all the billing, takes \$1.20 an hour for that service, plus another \$4.50 an hour for itself, leaving the information providers \$4.50 per hour plus any additional transaction charges they choose to impose. A user will have to spend 200 hours a month looking at the information before an information provider makes any money.

c. U.K.

The U.K. market for electronic information services was estimated for 1989 at \$700 million and is forecast to grow at a compound annual growth rate of 19% to reach \$1.7 billion by 1994. A breakdown of the U.K. EIS market by industry sector is given in Exhibit IV-13. It is the single largest market in Western Europe and will retain this lead to the end of the forecast period, although showing lower growth than other country markets on account of the market flourishing in the yet to be deregulated financial markets.

EXHIBIT IV-13

U.K. EIS Market Analysis, 1989-1994



The major reason for the U.K.'s position is the presence of London as a leading world financial centre, and the large market for electronic information services in this area. Furthermore, the shared language between the U.K. and the U.S. has aided the market's development, as U.S. producers are able to launch services in the U.K. that require minimal linguistic modification.

British Telecom's announcement that it will be offering on-line access to its Directory Enquiries system indicates that the company is investigating the electronic directory idea, but in a more ordered and less innovative way.

Digital's Financial Information Service (FIS) provides instant access to information from insurance companies. As well as allowing financial intermediaries to search the market and produce full quotations on screen, Digital's network enables the transaction to be completed at the terminal. Whilst FIS is only available to investment and life assurance companies in the U.K., financial liberalisation in Europe will lead to rapid development.

Extel has an electronic database—updated daily—of all public and private transactions involving U.K. companies, providing a comprehensive picture of merger and acquisition activity in the U.K. going back to 1986. The U.K. database is complementary to the system offered by Extel's U.S. sister company, IDD Information Services. The U.S. database has about 150 subscribers. The typical charge is \$660 (£370) a month for three hours' use and there are discounts for volume use.

d. West Germany

The West German market is particularly strong in the areas of business, professional and industry-specific information, as can be seen from the breakdown of the West German market by industry sector in Exhibit IV-14. However, these are traditionally the smallest sectors of the market and the German market is expected to grow from \$370 million in 1989 to \$1.1 billion in 1994, a compound annual growth rate of 24%, which is above the industry average.

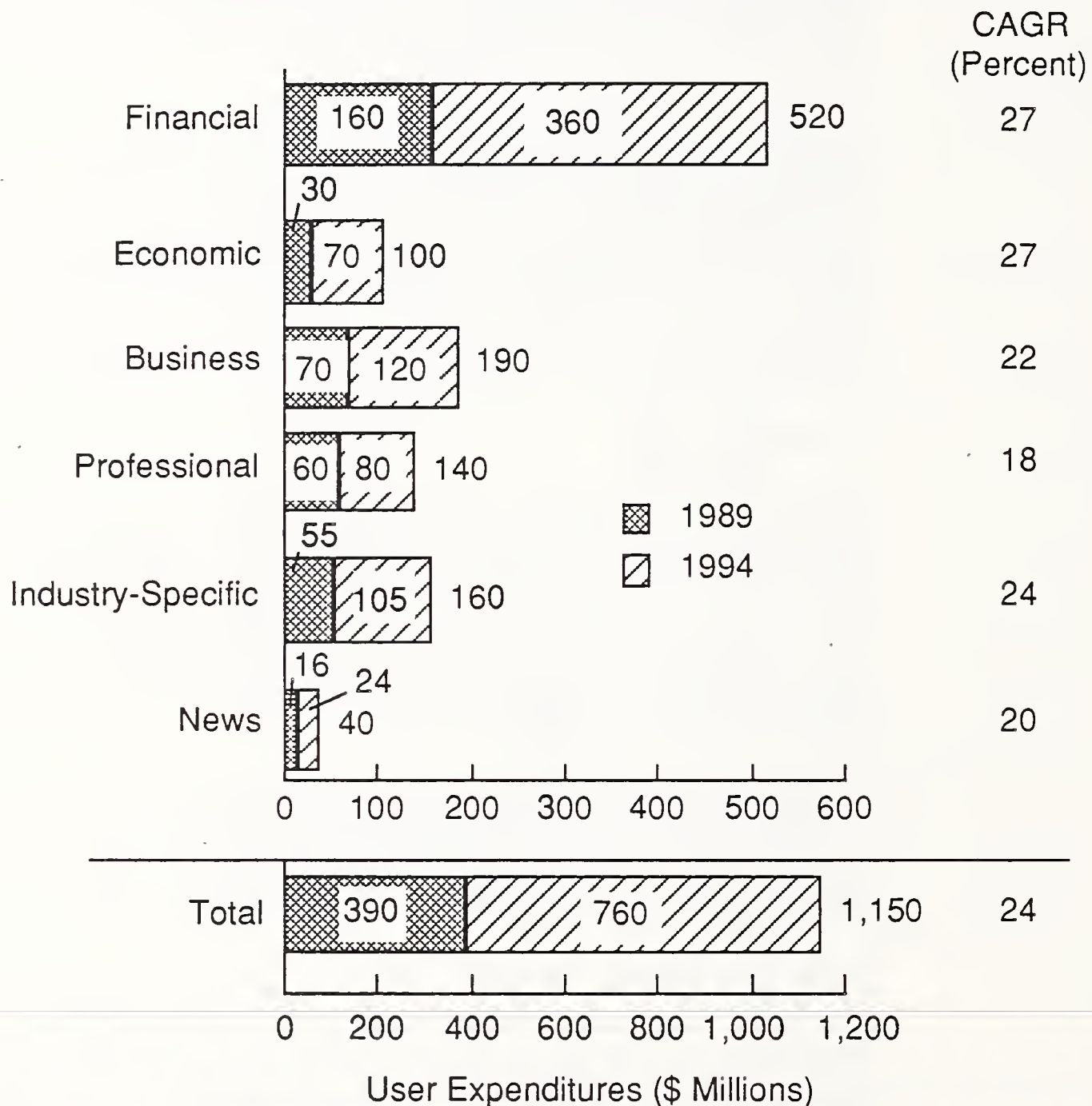
Currently, the monopoly position of the Deutsche Bundespost and high communications costs have conspired to slow market growth in West Germany. However, the rapidly expanding banking sector will be a principal driver leading to the overall growth in the market.

One of the biggest vendors, Bertlesmann, produces and provides Firmen-Info-Bank, a database providing information on about 20,000 firms in West Germany, with particular reference to about 150,000 decision makers. Both private and public companies are included, according to a criterion of a minimum annual turnover of about 20 million DM. Bertlesmann is targeting departments dealing with imports, market research, planning, marketing, management, journalists, advertising agencies, research institutes, unions and political associations.

Both Bertlesmann and Genios offer Verband der Vereine Creditreform, a quarterly series of financial and textual reports on over 300,000 German companies. Genios also offers FINF-Numeric from GBI (Gesellschaft für Betriebswirtschaftliche Information mbH), which gives annual results and commercial balance sheet figures of German industrial companies.

EXHIBIT IV-14

West German EIS Market Analysis, 1989-1994



Genios and FIZ Technik offer the GBI's BLISS database (Betriebswirtschaftliches Literatur-Suchsystem), an economic and literature search system which offers information on German and international economic literature. It is unquestionably the leading German language literature service covering most vertical sectors, using trade magazines, essays, dissertations and research reports as source material, and containing over 93,000 records.

Hoppenstedt is a large database producer in West Germany, providing electronic versions of the directory, *Handbuch der Grossunternehmen*, which gives detailed descriptions of almost 40,000 German companies. Both Dialog and Data-Star distribute this in West Germany, with a similar directory existing for Austria, but for only 3,500 companies.

e. Italy

Developments in the Italian market have been slowed by the relatively poor telecommunications environment and the problems with Itapac, the Italian public packet-switched network. Exhibit IV-15 gives INPUT's industry sector breakdown for the EIS market. Currently worth \$250 million, the market is growing at a compound annual growth rate of 20% to reach \$640 million in 1994.

A feature of the Italian electronic information services market has been the provision by professional bodies of electronic information services as part of an annual subscription for other services, e.g. Cerved, which provides business services on behalf of various Chambers of Commerce. Although such services increase potential interest, there is a problem in that users become conditioned to an unrealistically low price environment.

SANI (National Register of Firms) is the largest database on Italian companies, and is sourced from the Register of Companies which every Chamber of Commerce is required to file. Over four million items are available, and Cerved is both the producer and the provider.

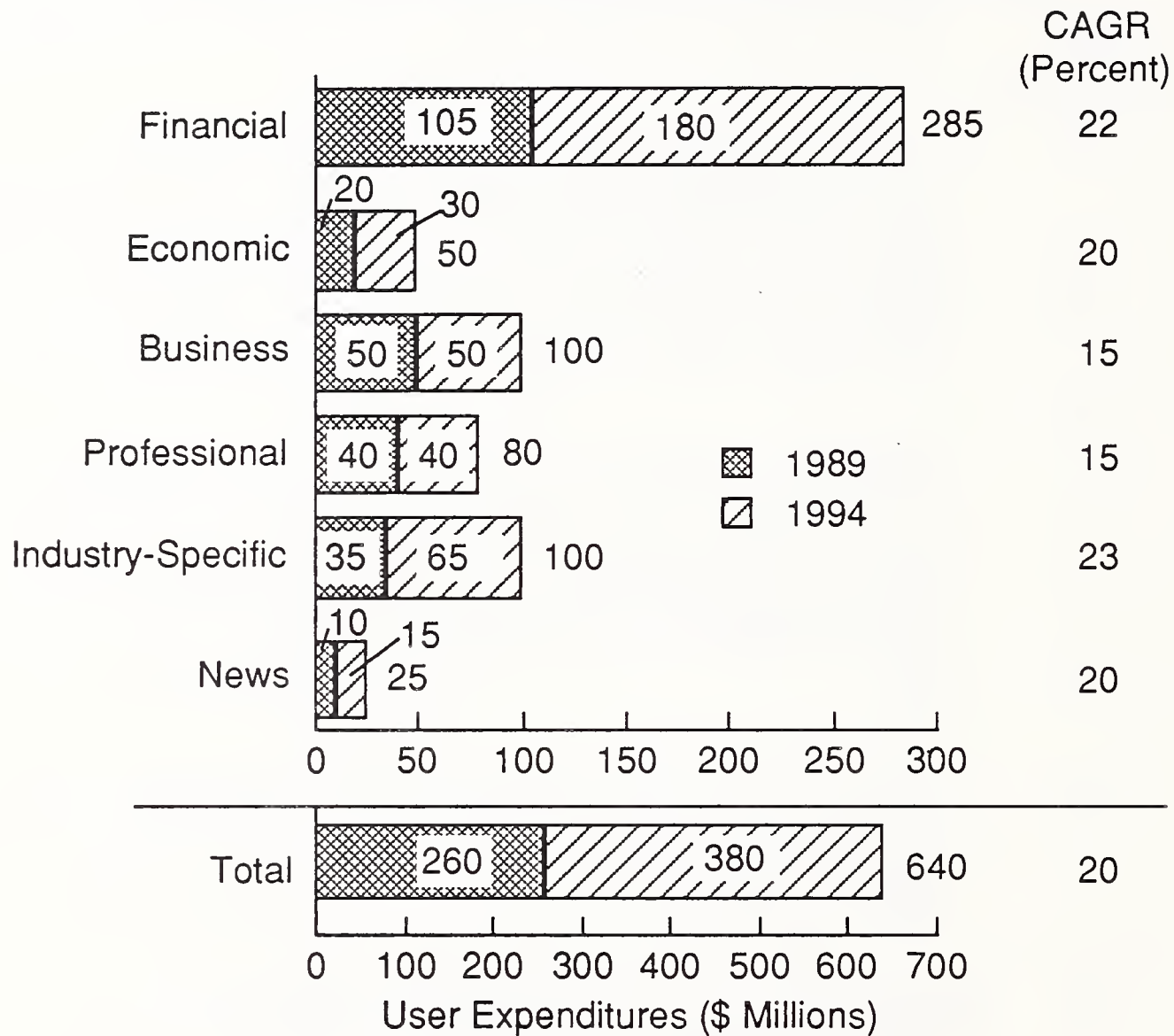
Other Cerved produced and distributed services include, SANP a national defaulters file of over 25 million items; SDOE, a database of 60,000 companies engaged in import/export; and SIBIL, consisting of two sub-files: SABB-BUSARL, containing the balance sheets of 200,000 Italian limited companies, and SABRI, containing balance sheet data for the largest 30,000 companies over the last three years.

Cerved also offers the leading Italian news agency's ANSA's DEA database, an on-line news service on company events such as purchases, disposals and press releases on annual balance sheets with full-text news and abstracts available from 1983.

The host GIANO provides the Confindustria database called *Dati Anagrafici di Imprese Italiane* which provides details on 350,000 Italian companies, using company reports and accounts. The Italian market is highly fragmented and some of the services available highlight this. The host Sirio provides the Assolombardo database, *Dati Anagrafici di Imprese Lombarde*, a database providing basic information on over 14,000 industrial companies in Milan and the Lombardy region.

EXHIBIT IV-15

Italian EIS Market Analysis, 1989-1994



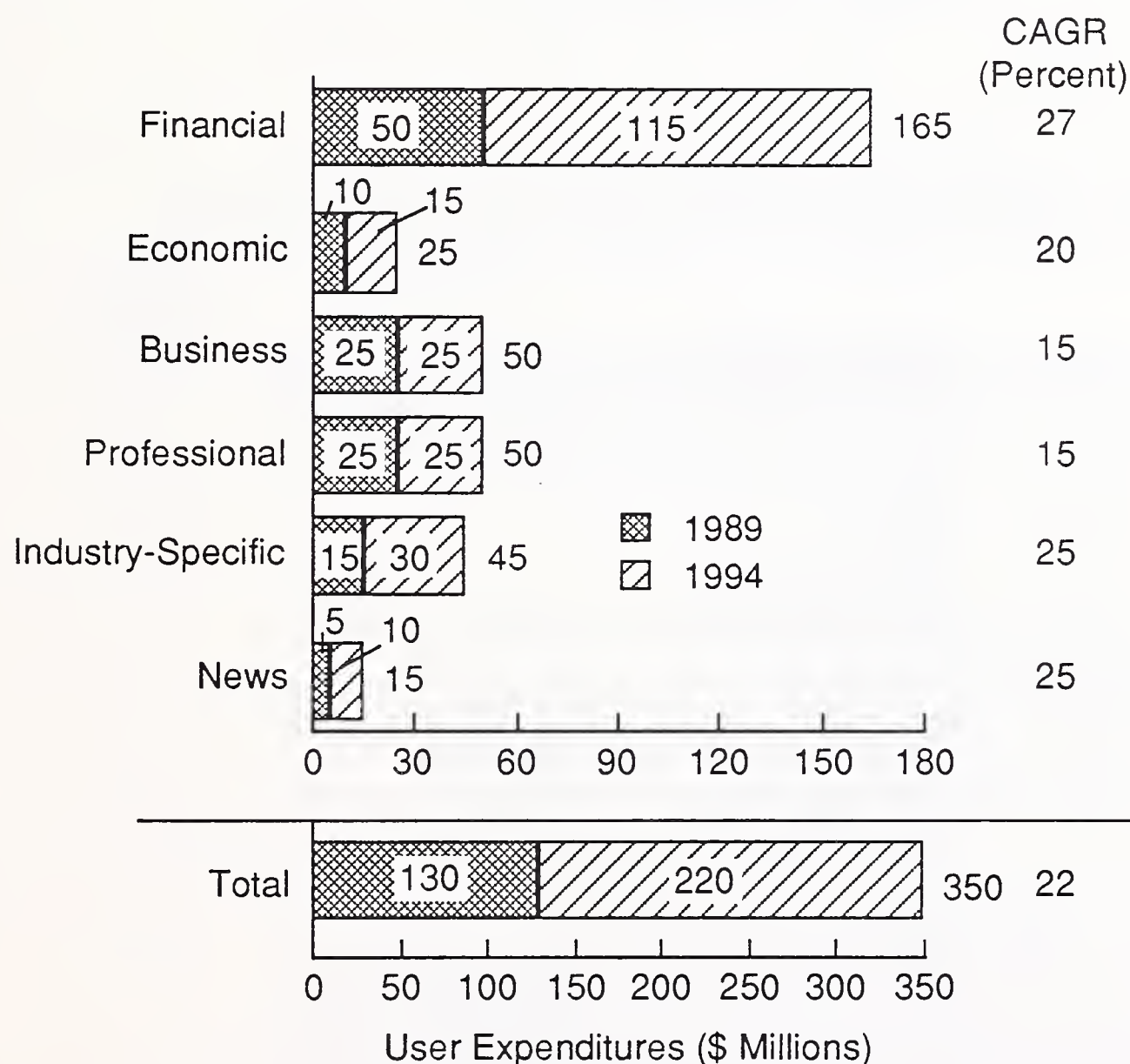
An example of commercial service sponsors is Pagine Gialle Electroniche, available from Sarin and distributed by Seat. An equivalent to the "Electronic Yellow Pages", it provides basic information for over 800,000 Italian companies with full product information for over 100,000 of these. Significantly, however, there are over 200,000 advertisements included.

f. Benelux

The Benelux market for electronic information services was estimated to be \$130 million in 1989 and to grow at a compound annual growth rate of 22%, the industry average, to reach \$350 million at the end of the forecast period. A breakdown of the Benelux market by industry sector is given in Exhibit IV-16.

EXHIBIT IV-16

Benelux EIS Market Analysis, 1989-1994



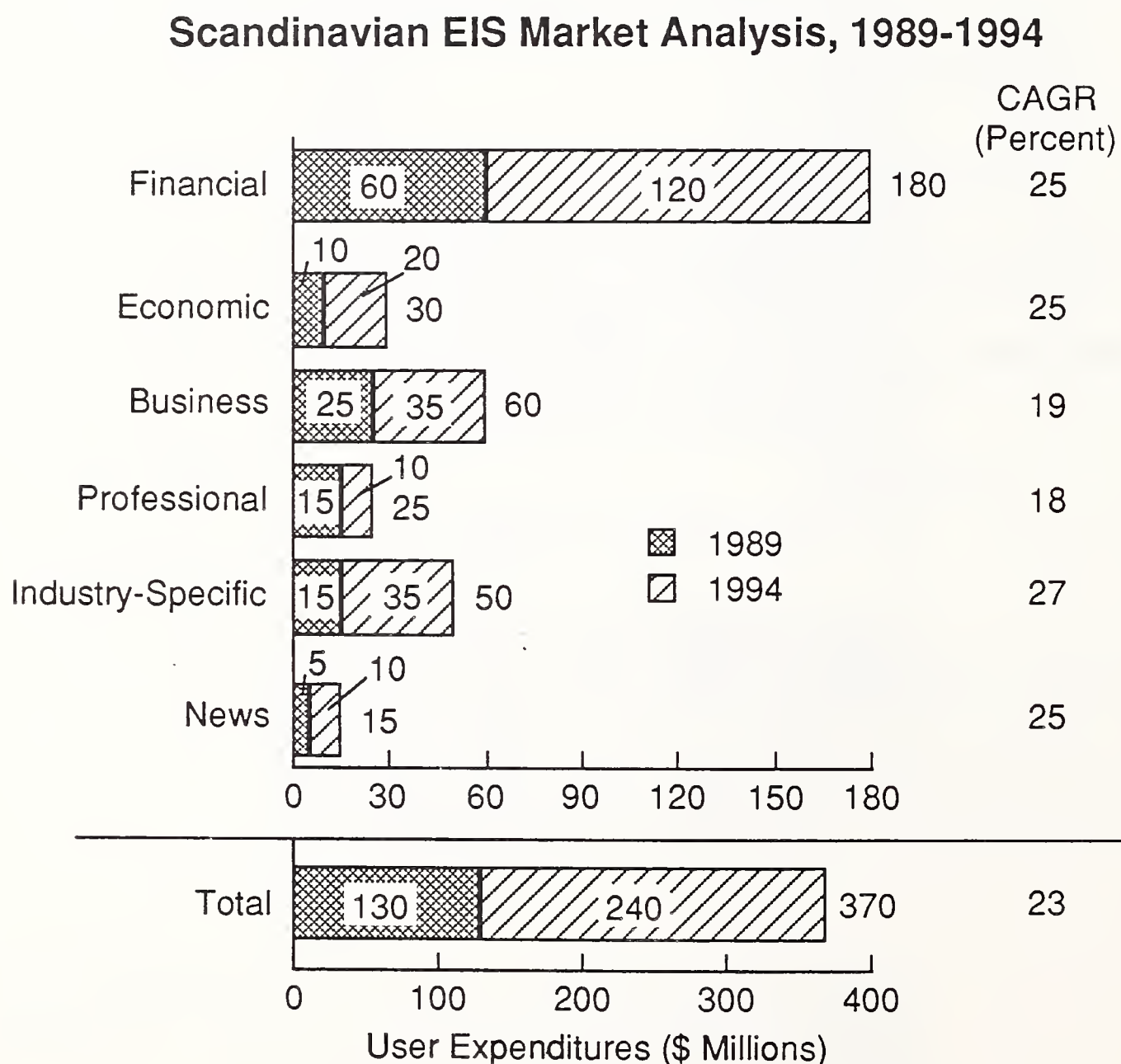
Dialog and Data-Star distribute Hoppenstedt's Netherlands database, the electronic version of Netherlands ABC Voor Handel en Industrie, providing profiles of 22,000 companies in the Netherlands. Dialog also distributes Investext, the full text database of industry reports.

Other electronic information services in the Benelux markets include: Societe Generale De Banque (SGBD—a bibliographic database covering economics and finance), available from Belindis and Data-Star, PTS Prompt, a Predicasts service, Dun & Bradstreet with its International Dun's Market identifiers, Dataline from Reuters, and European Kompas On-line.

g. Scandinavia

INPUT estimates the total Scandinavian market for electronic information services to be worth \$130 million in 1989, and expects the market to benefit from a compound annual growth over the forecast period of 23% to reach \$370 million by 1994. A breakdown of the Scandinavian EIS market is given in Exhibit IV-17.

EXHIBIT IV-17



Findata is one of the major electronic information sources for financial and economic data in Sweden. Findata is producer and provider, and has capitalised on the need of U.S. customers to access data and to overcome the difficulties in Swedish accounting rules, by offering a service whereby Findata conducts a company investigation, and supplies tailor-made software that assists in interpretation of figures.

In addition to Findata, another Scandinavian host, Affarsdata, offers the Kompass directories on-line for Sweden, Norway, Denmark and Finland, as well as for West Germany. These are available in English as well as native languages. Affarsdata also produces and distributes Stor-Tele, yellow-pages-type information for over 100,000 Swedish companies, as well as Sveriges Handelskalender, a database containing information similar to the Kompass directories but with a broader product classification, for over 15,000 Swedish companies.

In Denmark, the information bureau of trades association produces and distributes Soliditet Online Service (SOS), which is a factual reference database containing information about all joint stock companies, private companies, parent companies, and subsidiaries or other affiliated companies in Denmark.

Borsinformation Telecom produces and distributes Telecom, a full-text Danish database containing financial and political news both in Denmark and abroad, as well as holding accounting details of companies registered on the Copenhagen Stock Exchange.

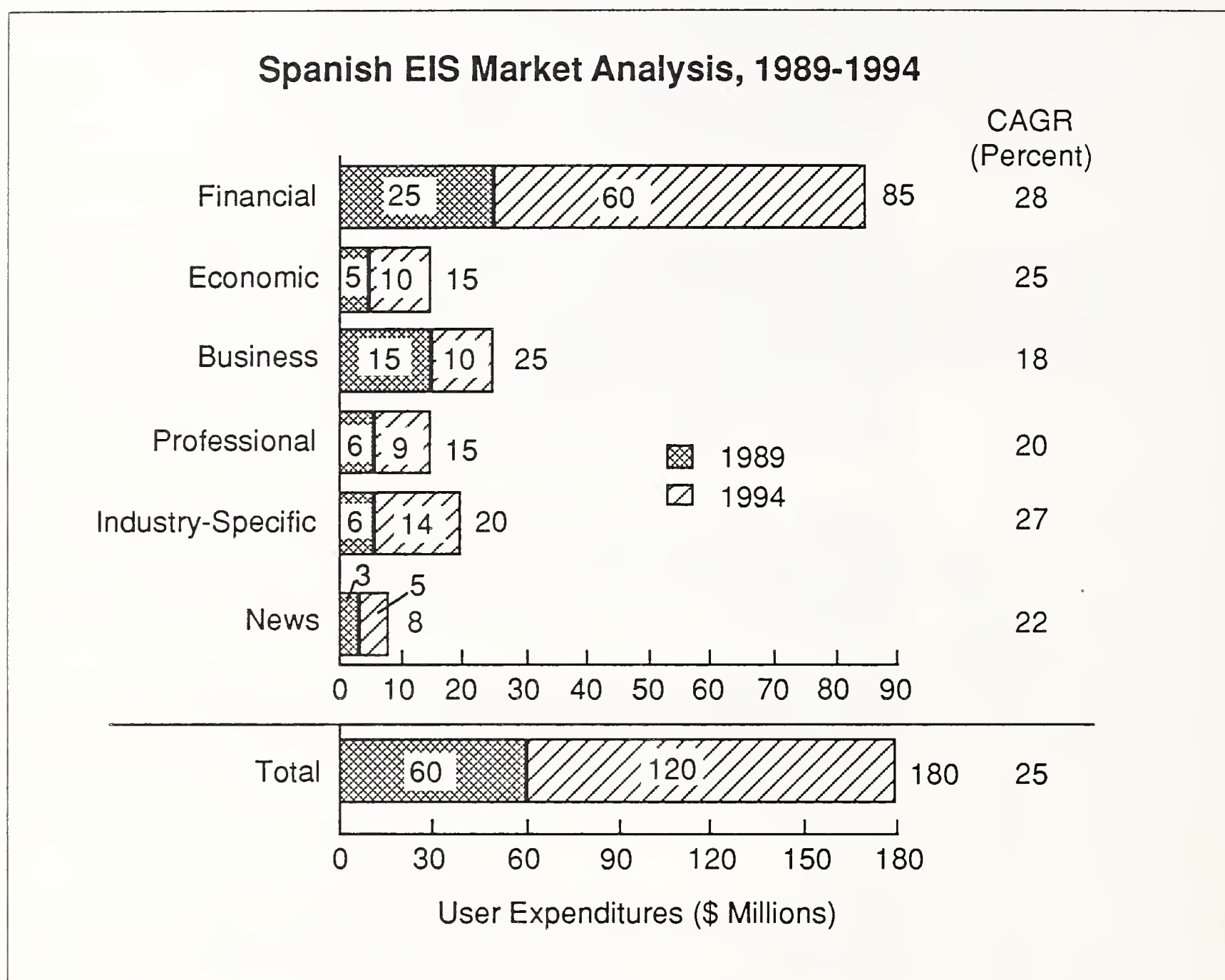
h. Spain

INPUT estimates the Spanish market for electronic information services to be worth only \$60 million in 1989 but expects the market to benefit from the highest compound annual growth over the forecast period—25%—to reach \$180 million by 1994. A breakdown of the Spanish EIS market by industry sector is given in Exhibit IV-18.

One of Spain's largest hosts—Camerdata—is optimistic about the Spanish market and is concentrating on offering electronic information about Spanish companies, using a subscription service whereby the user does not need to access the data himself. Business Information System's Empresas, a Spanish company directory available from Instituto de la Pequeña y Mediana Empresa Industrial (IMPI) concentrates on smaller companies.

Entel distributes the INE's (Instituto Nacional de Estadística) BD-INE, a Spanish economic database, providing 45,000 time series of socio-economic, demographic and business data for Spain.

EXHIBIT IV-18



The Spanish market is still in the development phase, as evidenced by the fact that the majority of databases are offered by chambers of commerce and government institutions. Thus, the Instituto Espanol de Comercio Exterior (ICEX) distributes Oferes, a database providing basic company details on over 30,000 Spanish exporting companies, produced by the Instituto nacional de Fomento de la Exportacion (INFE).

Complementing the Oferes file is SYCE, also produced by INFE and distributed by ICEX which provides data on Spanish exporting companies, including the value of exports, allowing users to rank companies and undertake further analysis of statistics provided.

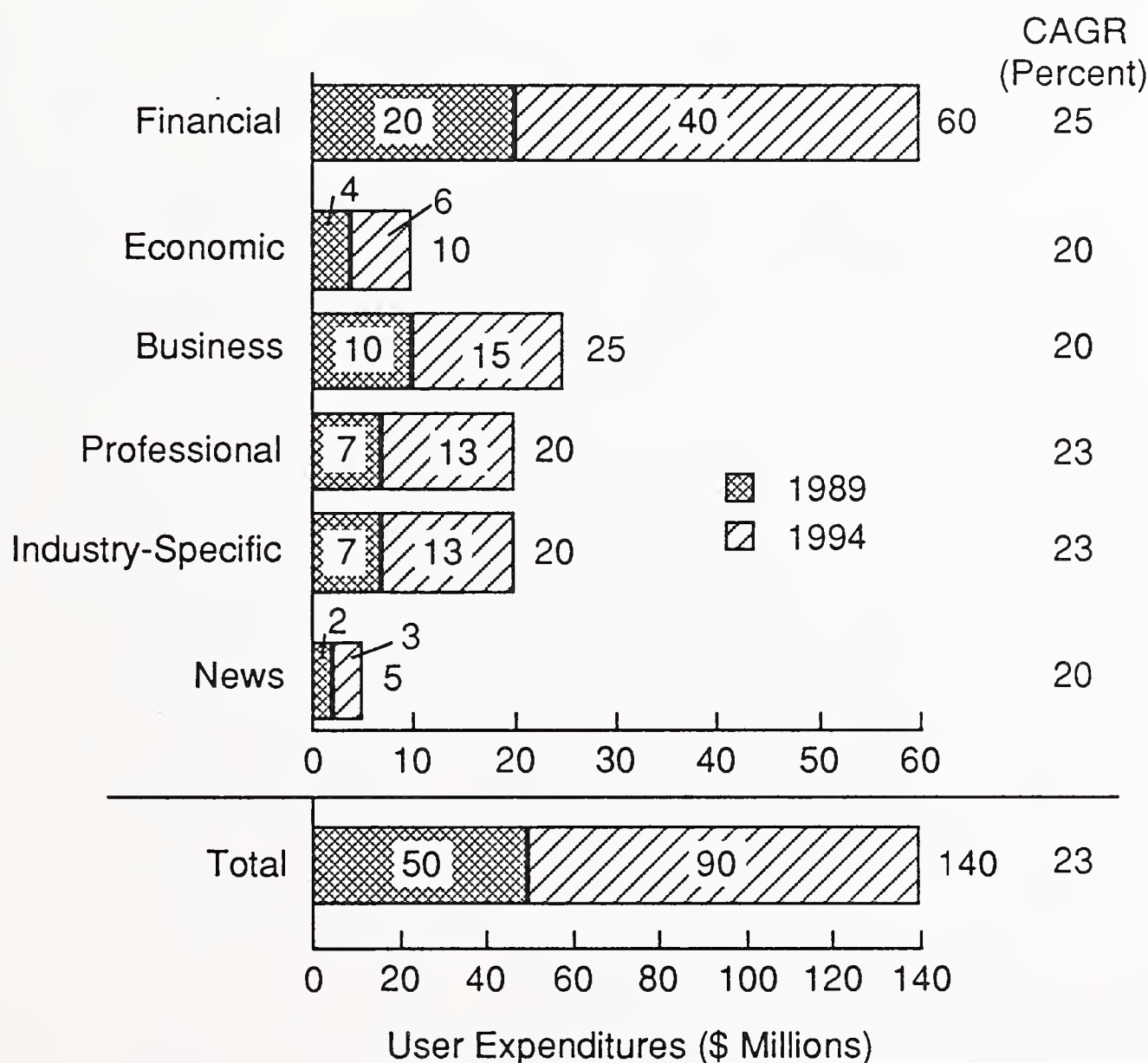
Another example is the Registro de Establecimientos Industriales, a database of Spanish industrial companies, providing basic financial and product details. This is available from IMPI (Instituto de la Pequeña y Mediana Empresa Industrial) with the producer Sistema de Informacion Empresarial. Over 90,000 documents are included.

i. The Rest of Europe

As far as the rest of Europe is concerned, the majority of the \$120 million EIS market in 1989 is provided by Switzerland's Telekurs. A breakdown of the EIS market for the rest of Europe is provided as Exhibit IV-19.

EXHIBIT IV-19

The Rest of Europe EIS Market Analysis, 1989-1994

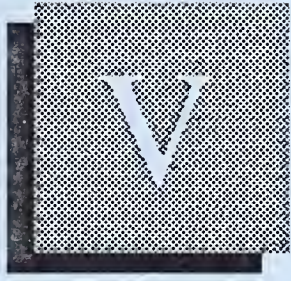


Telekurs offers an alternative to the financial offerings of Reuters, Telerate and Quotron and dominates the Swiss market with three services, accounting for much of the \$120 million the market was worth in 1989.

The Investdata system is a database inquiry system enabling users to access the Telekurs' database of over 200,000 financial instruments trades worldwide and using six different programs. These are broken down as follows:

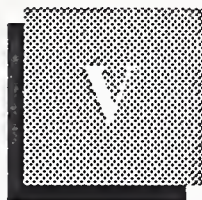
1. International price data (latest quotations)
2. An international index to securities
3. Portfolio management data
4. An economic news service supplied by the AP-Dow Jones FinWire financial news suppliers
5. Foreign exchange and precious metals
6. Instant price quotations from international stock exchanges

The Teledata service (TDS) provides real-time price data from world markets, providing latest prices/quotations from 69 worldwide exchanges and the Valordata system, a worldwide securities service. The valuation service provides users with up to date pricing information needed for valuations supplied according to the individual's own requirements.



Market Environment





Market Environment

A

The Importance of Electronic Information Services

The electronic information services market has seen considerable activity over the past two years, with the industry becoming increasingly dominated by large corporations—Reuters acquiring IP Sharp, Instinet and Finsbury Data Services, and Pergamon acquiring the U.S. host, Orbit.

The increasing convergence of banking and computer services has led to the acquisition of Quotron by Citicorp, and a joint venture between Mercantile Credit and ADP. New services have been launched by existing players, for example by Reuters with Equity 2000.

However, competitive and administrative pressures have led banks to reappraise their strategies, and they have been leaving the opportunities to be exploited to service companies such as Reuters and Telerate. The nonfinancial on-line sector has also been suffering, due to problems of profitability, with many vendors still failing to return a profit on their considerable investments.

The growth of the electronic information services industry can be indicated by the following key statistics, summarised in Exhibit V-1.

- Between 1980 and 1988 the number of databases available worldwide on-line increased sixfold, from 600 to over 3,800.
- In the same period, the number of database records worldwide grew from 200 million to over 2 billion.
- By 1988, an estimated 2.2 million customers were served worldwide by over 500 on-line services and 1,500 publishers.

EXHIBIT V-1

The Importance of EIS Worldwide

- 2 million users
- 500 electronic information services
- 2 billion records
- 1,500 publishers
- 500 on-line vendors

In contrast with the above however, Dialog worldwide has only 80,000 customers, indicating that the electronic information services industry is far from fulfilling the claims made for it.

- Revenues generated by the industry during the 1980-1988 period increased “only” threefold, to \$4 billion.
- Most new databases are used fewer than 200 hours during the first quarter that they are on-line.
- In 1988, over 100 on-line databases were withdrawn by vendors or producers, indicating increased industry retrenchment.

Electronic information services can be segmented into producers, distributors and users. However, it is the on-line database industry’s principal product—electronic information—that distinguishes it from traditional publishing as well as from most other industries. Electronic information is highly fluid and not restricted to single distribution systems. Therefore, the generator and publisher are the “push” mechanisms for distributing information, whereas the broker and users are the “pull” mechanisms representing demand.

As one descends through the chain, the value of information at each stage increases, while the ability of the preceding groups to control the information decreases. This, in combination with new production and distribution technologies, is blurring boundaries between groups in the user chain. The interaction between these groups becomes more evident when the “push” side of on-line database publishing is examined as part of the whole electronic information services industry.

Exhibit V-2 shows the division of the EIS market into four segments, lists the typical participants within each segment, and outlines their principal business objectives. The electronic information services industry is technology-dependent but not technologically driven. A need for data-bases was recognised long before high-speed, low-cost computer equipment and communications networks made them both technically and economically viable.

EXHIBIT V-2

EIS Industry Segments

Segment	Participants	Objectives
Information Providers	<ul style="list-style-type: none"> • Publishers • Database producers • New services • Market research organisations 	<ul style="list-style-type: none"> • Increase revenues • Expand markets • Defend revenue base
Systems Vendors	<ul style="list-style-type: none"> • EIS vendors • Videotex services • Processing services companies 	<ul style="list-style-type: none"> • Add value to information • Protect investment in network
Infrastructure Companies	<ul style="list-style-type: none"> • PTTs • Network services • TV companies • Software companies 	<ul style="list-style-type: none"> • Increase demand for core businesses • Extend networks
Service Sponsors/ Brokers	<ul style="list-style-type: none"> • Financial companies • Industry-specific companies 	<ul style="list-style-type: none"> • Differentiate and add value to products • Improve productivity of basic functions

However, the technological developments and resulting cost reductions are key development forces for the EIS market. The availability—throughout Western Europe—of public packet-switched networks as well as the improvements in communications standards, has led, and will continue to lead, to a wider range of services.

Furthermore, the existence of extensive network-based service providers offering new delivery modes is also a key driver of this market. Many vendors are looking to integrate EIS with other applications, such as electronic mail and electronic data interchange.

1. The Communications Environment

Much will depend on Europe's achieving a real single market for telecommunications by 1992. The telecommunications link is vital to the provision of on-line services. Accessibility, cost and service level of communications facilities are key. High-capacity networks will be an essential, dynamic element of Europe's productive capability.

In its annual survey, Eusidic, which represents on-line service providers using the public networks as delivery mechanisms, and Eurolog, the European On-line User Group whose members contributed to the survey, turned in results which suggested that almost one in four calls made on Europe's PDNs fails.

The most frequent reason given for call failure is a problem with the called party at the other end of a link (16.4%), followed by failure of a local PDN node to respond (14.9%), unrequested disconnection (14.2%), traffic congestion (12.9%), busy local node (11.5%) and local line noise (8.5%).

Although the overall failure rates were slightly lower than in 1988, the 1989 figure of 24% would not be tolerated in the telephone network. The U.K., regarded as one of Europe's most dynamic and forward-thinking data communications environments, turned in the second-poorest performance of any country with a failure rate of 24.7%. Only Spain, (30.5%), was worse. Sweden and Netherlands topped the list, with rates of 10% and 9% respectively. These results are included in Exhibit V-3.

However, there is no doubt that the development of distance-independent public packet-switched networks, such as Transpac in France, has helped the development of EIS throughout Europe. In addition to the public packet-switched networks, EIS has benefitted from the existence of large private networks, as well as the development of value-added networks throughout Europe.

EXHIBIT V-3

Reasons for Call Failure

	Percent
Problem at other end	16.4
Failure of local PDN node	14.9
Unrequested disconnection	14.2
Traffic congestion	12.9
Busy local node	11.5
Local line noise	8.5

Source: Eusidic

Electronic information services suffer from problems of definition. There are the 3,000 worldwide databases which can be accessed using a modem and communications software. However, the growth of CD ROM technology, such as Lotus's One-Source—a compilation of financial reports from publicly-held companies—is changing the dynamics of the market.

There are also the newer delivery mechanisms, such as information distributed using radio systems or satellite technology (Lotus's Signal system for example), which distributes real-time securities quotes using FM-radio technology.

The key differentiator between these technologies is that on-line dial-up services are interactive; CD ROM is also interactive, but the processing occurs locally, on the user's machine. The major difference between the two is that a CD ROM cannot be updated, only replaced.

Broadcast technologies such as radio and satellite are ideal for applications where the data has to be current, for example stock prices that are being used to manage a pension fund. However, they are not interactive. One of the most recent satellite services in the U.K. is called Satquote by the Euro American Group of London. The system covers most U.K., U.S. and Canadian equities and futures, and operates over Eutelsat 4, in geostationary orbit 22,000 miles over the mid-Atlantic. The service transmits data as it is generated by Standard and Poor's, being picked up via a dish aerial and receiver.

EAG, a U.K. company, will provide the user with bespoke software systems to carry out analyses, such as portfolio analysis, options pricing and risk analysis, of Satquote data. A key feature of the Satquote service is that it costs approximately £200 (\$328) a month, considerably less than the cost of land line services at over £1,000 (\$1640) a month.

Broadcast technology is likely to have an impact in the following areas:

- Financial/economic—Information on company performance, the capital markets, national and international economies, etc.
- News—Full text or abstracts of daily newspapers, national wire services or current magazines
- Full text—Entire articles from magazines and journals
- Abstracts—Synopses of articles, books, and dissertations
- Bibliographic—Massive indexes which cross-reference every form of printed media to a single topic—like a giant card catalogue in a library, that references not only books, but magazines and newspapers

Currently, providers furnish the facilities to run the database, such as the software and the telecommunications, and the producers rent space on the providers' machines to offer their database to a wide market. The producers keep a percentage of the hourly usage charge incurred when someone uses the database, and the providers receive the balance to defray the costs of running the system and to provide their profit margin. Producers require distribution, providers have that distribution in place via their networks.

However, data broadcasting's first applications will be in the provision of one-way links between company head offices and their branches. Banks could reduce the sums spent on private couriers for interbranch communications, whilst a key electronic information service development will be sending updates of business or telephone directories stored on databases.

However, although the European Commission has indicated that countries should allow business customers throughout Europe to use small dish terminals to accept signals from any satellite by the end of 1989, the licences issued by the U.K. stipulate that they can only broadcast to receivers in Britain. Most Western European countries are following a similar slow path towards amending their laws.

This legislative inhibitor, coupled with the perceived technical difficulties, will undoubtedly affect the crucial infrastructure phase. When compared to the ease of leasing a line, satellite technology is behind. British Satellite Broadcasting's Datavision, which has ensured that their £250 (\$410) dishes and decoding boxes will be able to receive low-speed data as well as satellite television programmes, may lead to a change in that perception.

2. Regulation

The twin forces of technology-push and market-pull are redrawing the lines of telecommunications regulation. In the International Telecommunication Union, new rules were laid out at the 1988 World Administrative Telegraph and Telephone Conference that will smooth the way for competition on international voice and data traffic. Furthermore, calls for the abolition of market access barriers have led to telecommunications services being included in the General Agreement on Tariffs and Trade (GATT) talks for the first time. In the European Commission, a group of policy initiatives is aimed at speeding the liberalisation process.

Four major factors influence European telecommunications reform, and are likely to delay the widespread liberalisation of Europe's data services as promised in the Green Paper (the European Commission's plan to open the market for telecommunications equipment and services by 1992). These factors are illustrated in Exhibit V-4.

Whilst concepts such as Open Network Provision (ONP) in Europe and Open Network Architecture in the U.S. point to policy convergence, there is still a considerable range of opinion from country to country on the means and pace of reform. Political, financial and trade worries are leading to a split between the countries that feel they will gain from reform and those that believe they have much to lose.

France, Italy, Belgium, Spain and Greece all oppose the services directive drafted by the Commission in December 1988 that calls for all services other than voice telephony and telex to be released from the monopoly control of national telecommunications administrations by January 1991. These countries are unwilling to radically liberalise their leased-line policies, and do not want to surrender their monopolies over basic data transmission. Many European telecommunications administrations want to delay competition until they are ready to compete.

EXHIBIT V-4

**Factors Influencing European
Telecommunications Reform**

- Political ideology
- Cross-subsidy of nonprofitable services
- Union opposition
- Fear of competition

However, taking the U.K. as an example, it is likely that such attempts to protect current revenue streams coming from public switched networks and value-added services will result in users looking to independent and private networks for the answer to their needs.

France is leading the deregulation opposition. Although the French telecommunications administration is well-placed technologically, there is a feeling of vulnerability, in that it has not been able to generate the volume of transatlantic traffic it will need to compete with British Telecom and the major North American carriers.

France voluntarily opened its national terminal equipment market in 1980, yet foreign suppliers still complain about regulatory barriers. It also opened the network service sector to independent providers in 1987. Despite this, users complain that neither the use of proprietary protocols nor freedom of network operation is clearly assured.

In addition, an arbitrary network size limitation has been established. Vendors are having to ensure that they adhere to OSI standards, and authorities reserve the right to levy surcharges for connections to the switched public network or for carrying third-party traffic.

France Telecom is one of several European administrations to have bought shares in Infonet, the managed data network service partly owned by CSC. It is also one of the more active administrations in forging bilateral deals. Last year, for example, France Telecom and the Deutsche Bundespost set up a joint subsidiary, Eucom, to provide network services. The company is now going into the business of setting up and managing private networks for large business users.

Despite this new awareness, highlighted by France's public debate on the future of telecom services, the strict ideological stance of the country's ruling Socialist party, entrenched unions, and a natural inclination to protect the status quo indicates that a full opening-up of the markets to competition is still a long way off. The French argue that the administration should retain special and exclusive rights for public packet-switching for political, economic and social reasons.

The French also reject the Commission's argument that data transmission must be opened up to competition in order to spur growth, arguing that users' needs are already satisfied by Transpac, the national public switched data network. Transpac's monopoly means that private service providers are restricted from offering end-to-end service, and their traffic must be routed through the Transpac network.

In addition to problems with the content of the Commission's services directive, France, Italy, and eight other administrations have raised objections to the Commission's use of Article 90 of the Treaty of Rome, which enables the Commission to bypass the normal procedure for issuing directives to implement the Green Paper. The case is pending before the European Court of Justice. The Commission's decision of June 1989 to proceed with Article 90, on its directive to open data services, is almost certain to be opposed through legal means or political tactics. France is likely to be supported by a number of other administrations, including Italy and Belgium, which cite many of the same reasons for wanting to delay the opening-up of data transmission to competition.

The argument is well-known: basic data transmission is part of a national administration's public responsibility and since revenue from that service is often used to cross-subsidise less-profitable public services, the economic health of each country's operator should be taken into consideration when setting the pace of reform.

The situation in Italy highlights many of the problems facing the Commission—the Italian government does not wish to liberalise basic data transmission because its own switched network is not yet in a good enough position to compete on an open market. However, the government is considering opening up network services to full competition. This is partly because the restrictions on value-added services have not prevented users from doing what they want; major service providers are already carrying third-party traffic on leased lines.

Whilst STET has had some success with network services offerings (via Televas SpA and its EDI offerings), Italy's telecommunications infrastructure is in need of radical streamlining and this is unlikely to happen before 1992.

Belgium faces a similar dilemma: GEIS has submitted a complaint to the European Commission about the RTT's (Regie des Telegraphes et des Telephones de Belgique) leased-line policies, yet the RTT is reluctant to change policies that users and service providers consider anticompetitive. The Belgian stance is that they are operating in a monopolistic environment, and that if reorganisation is to come, it must be introduced slowly.

INPUT believes that it will be the countries that listened to users' demands for international services that will benefit from their decisions to liberalise. Frustrations have led users and private service providers to reroute data traffic to nations offering more flexible environments, and to move their European computer centres away from countries still protecting public-switched networks. An example of this occurred in the mid-1980s when the major international banks were frustrated by rigid network constraints and some of the highest tariffs in Europe, and so moved their operations from Frankfurt to London.

In the data communications and electronic information services markets, proximity is not a major factor in terms of where the service is provided. Therefore, if the patchwork of different regulations continues, it is inevitable that the service providers will migrate to the more liberalised countries. Information services economies in those countries will flourish, because at the same time that the national market develops, they will benefit from business in surrounding countries. It is becoming a straight choice between the interests of the monopoly administrations and the individual national economies. Liberalisation of telecommunications services permits greater variety, which in turn has a positive effect on the national economy.

West Germany's recent liberalisation has highlighted the problems of late liberalisation, with the West Germans only recently gearing the basic structures to the process of change, instead of already having a firm basis from which to concentrate on the changes in the market and technical innovations. The West German reforms include permitting a second provider of mobile telephone service, open competition for all terminal equipment, lifting restrictions on third-party data traffic and abolishing volume-sensitive surcharges. Removal of surcharges makes it much easier for private companies to undercut the Bundespost to lower its fixed connection tariffs. West Germany's position is that nothing other than voice should remain under monopoly control.

The Netherlands is also trying to change the management of its telecommunications administration, by developing new market strategies and service offerings. In January 1989, the Netherlands telecommunications administration became the Royal PTT Netherlands, a limited liability company, with terminal equipment and value-added services opened up to the competition. The new company has a monopoly telecommunications infrastructure, and has the obligation to provide anyone in the Netherlands with telephony, telex and data transport services. Leased lines must be provided to every applicant. Competitors are free to provide value-added services; however, the Dutch Telecommunications Act forbids the use of leased lines to provide reserved services to third parties.

The crucial question is how the demand for telecommunications services will develop in 1992. It is likely that it will be the demand for services, and not the offer, which will be the dominant factor. Companies will have to adjust the offer to the demand. It could be argued that a change from monopoly status gives the telecommunications administrations a much clearer view of the products and services that will be in demand. In the Netherlands, this will be in shipping and other forms of transport.

In the U.K., competition is between British Telecom and Mercury in local, long-distance, mobile and value-added services. Terminal equipment, satellite communications and pay phone markets have also been liberalised. Starting in July 1989, British companies were allowed to sell spare capacity on lines leased from BT and Mercury to third parties for basic voice and data transmission. This facility, known as simple resale, is not permitted anywhere else in Europe.

These new measures open the way for private network operators to compete with BT and Mercury, giving users more freedom of choice and also increasing pressure on BT to improve its service offerings. BT is under pressure in other areas as well. A review of the current duopoly system is scheduled for 1990. BT's profits, in terms of return on capital, have generally shown an improvement each year since privatisation. The next step is acquisition, aimed at helping BT to manage a broad variety of personalised services and to branch out into the international scene. What the European telecommunications administrations share is a growing vulnerability to competition, if radical changes are not made in the way they run their businesses. The failure of the proposed pan-European MDNS (Managed Data Network Service) has exacerbated their problem.

B

Technological Drivers

The technological drivers (both vendor and user) enabling the development, production, distribution and use of EIS, are listed in Exhibit V-5. Present and near-term technological improvements at the publisher's and vendor's end include:

EXHIBIT V-5

Technological Drivers	
Vendor-Driven	User-Driven
Advances in OCR	PCs
New media	AI
Speed of access	Optical storage medium
Increased distribution channels	Cheaper communications products
Standards	Integration

- Advances in optical character recognition (OCR) and full-page scanning, automated indexing and abstracting, and speech processing that assist with data input
- Mass storage and processing speeds that make it possible to handle ever-growing reservoirs of data efficiently
- A proliferation of new media, like optical disks, that increase the variety of possible distribution channels, as well as reduced storage costs and a reduction in size constraints

Technology-based advances at the user's end of the spectrum include:

- Greater machine-embodied intelligence on the desktop, via personal computers.
- More sophisticated search assistance software, some with artificial intelligence based learning abilities
- PC-compatible mass memory devices such as disk drives for optical storage media
- Cheaper high-speed modems, some as standard equipment on PCs, that will increase in number beyond the current level of one modem for every ten computers
- Greater integration of more-capable output devices, including wide-screen monitors, laser printers and facsimile hardware

1. Standards

Without standards, technology-dependent markets can deteriorate into chaos. The lack of industry-wide search standards is often cited as a reason why more users have not plugged into on-line services. EIS standards issues go deeper than this, however. Standards begin with machine-level input and output, extend through the telecommunications networks, and finally surface at the user interface.

The proliferation of EIS standards across Western Europe, and indeed across the world, creates problems. Some of these standards are:

- The ASCII character set, which has evolved as the de facto standard for text-based data
- The multiple videotex standards across Europe (Cept3, Teletel etc.)
- The number of CD ROM standards, at least ten in Italy, the largest market for CD ROM
- The electronic mail standards (at least until X.400 and X.500)
- The ISDN voice/data integration standard, where field tests are being carried out in most Western European countries

Amongst the EIS vendors, Dialog, for example, has spent a lot of time simplifying the power of Boolean search techniques into a system comprehensible to the average searcher.

New users need a standard methodology and language to search any database, from any database publisher, from any information retrieval service, as easily as possible. ECHO's work in the area of standard methodologies and languages can be regarded as extremely important.

Vendors throughout Western Europe agreed however, that the development of X25 packet-switching techniques had greatly improved the standards situation, and many were keen to see the developments that satellite would bring to the area.

The standards issue will assume greater significance during the market-led phase of EIS. Currently, during the services phase, the applications to be developed remain a more pressing issue.

2. Videotex Services

The relative failure of videotex (with the notable exception of France) since its optimistic beginning has led to an intensification of the debate as to whether videotex is an application or a technology. In contrast to the elaborate user interfaces of most on-line services, public access videotex makes few demands on the user.

Videotex's applications are various, the key ones being as follows:

- Consumer orientated services—These are user-supported, require a PC and a modem, and provide information of general interest. Services include electronic shopping, home banking, interactive games and electronic mail.

- Private services—These may be either standalone or networked systems. They usually supply proprietary information to groups of paying customers (e.g., stockbrokers, travel agents), or in-house information for dissemination within a corporation or government agency.
- Public access services—These often take the form of advertiser-supported public kiosks that offer directory and shopping information.

There are optimistic signs for videotex, caused by the success of the Minitel service in France, which shows that consumer-orientated videotex can find a market, given government encouragement. Whilst the Minitel service is not yet profitable, the development of critical mass is regarded by the French as more important during the key development phase. The exporting of the Minitel service to the U.S. will provide an important indicator as to the long-term future of the service.

Other key developments in the videotex market can be summarised as follows:

- Computer hardware vendors are providing videotex hardware support.
- In Western Europe there are over 40 fee-based videotex systems, accessed by over 700,000 subscribers.
- There are numerous examples of successful corporate and private systems.

Videotex has become important in France, primarily via Minitel, where it has been taken up both commercially and at home. However, ultimately, with the existence of personal computers, videotex's importance has been seriously undermined. The technological development has eroded the original strategic concepts upon which videotex systems were based. It is likely that the applications and the concept will continue to influence the development of the EIS market, and videotex as a technology will remain predominantly in publicly accessible services.

3. Electronic Bulletin Boards

In terms of user accessibility, an electronic bulletin board system lies between videotex and the on-line database. Bulletin boards have grown from the increase in personal computers, and can be easily assembled with rudimentary PCs and software. They can download or upload files or software, marketing information, sales reports, research data, community news, or virtually any other kind of message. Bulletin boards have attributes unique to EIS applications, which are listed in Exhibit V-6.

EXHIBIT V-6

Electronic Bulletin Board Attributes

- Versatility
- Low initial investment
- Low operating costs
- Low usage costs
- Fast dissemination

Bulletin boards provide a fillip for the electronic information services market in that they provide invaluable firsthand experience to new users of computer networks. Their growth in Western Europe will affect the videotex market.

4. Network Services

If the definition of a value-added network is that it adds value to the transmission and switching services it purchases from the telephone company, electronic information services fit into this category. The EIS offering is listed in Exhibit V-7.

EXHIBIT V-7

Network Services' EIS Offering

- Speed and ease of access
- Volability and uniqueness of information
- Provision of decision support
- Software enhancements
- Consultancy and professional services
- Training and customer support

With raw, unprocessed data having low value, processed data and the supply of additional services to augment basic electronic information services have high value, representing the key ingredients for expanding and profitable opportunities for vendors.

As infrastructure companies, the network services providers, with electronic mail and electronic data interchange products, are in a unique position to innovate with on-line delivery services. Gateways, cross-vendor searching and support for home banking, electronic shopping and personal networking services are examples of the network service providers' influence. These companies are likely to become increasingly involved in the EIS market.

Network services providers are ideally placed to offer value-added electronic information services. They can offer the following:

- Speed and ease of access relative to extent of data
- Volability and uniqueness of information
- Level of processing to refine data into information
- Provision of decision support
- Software enhancements
- Consultancy and professional services
- Training and customer support

5. Artificial Intelligence

On-line searching would appear ideal for the application of knowledge-based expert systems. Selection of the appropriate database is another area in which users often require help. However, most of AI's success has come in areas with specific logic structures. Searching is still very much an art. Nonetheless, there are attempts being made to create AI shells for searching.

In the financial sector, software products relying on massive front-end processing of full-text electronic files using selection templates specified by the user are replacing traditional keyword searching.

These products will ultimately threaten current systems with obsolescence, and as a consequence, the major equipment vendors such as IBM and Digital are looking to develop such systems that currently can only operate cost-effectively in a highly profitable environment.

6. Optical Media

CD ROMS have taken much of the media attention in the EIS industry over the past five years. The reason for this attention focuses on their huge storage capacity—600 megabytes of data on a single disk—and their potential as software media for personal computers. Moreover, CD ROMs are relatively cheap to produce. A master disk can cost between \$3,000 and \$10,000 with reproductions only a few pounds.

CD ROMs represent an opportunity and a challenge for current EIS participants. Whilst information providers welcome CD ROMs as a more direct route to end users, with a bonus of greater editorial control, systems vendors see CD ROMs as a threat to the on-line services medium. Naturally, end users will find CD ROMs attractive because they offer unlimited searching at a single subscription price, free of open-ended access and telecommunications charges. CD ROMs will not suit those seeking up-to-the-minute information. It will be medical, legal and reference applications for which CD ROM is most suitable.

Most of the large EIS vendors, such as Dialog, Mead and BRS have entered the CD ROM business. There still are obstacles, such as the small base and the uncertain status of standards, but options already include CD-I (Compact Disk Interactive), DVI (Digital Video Interactive), WORM (Write Once, Read Many) and erasable optical disks.

Imaginative products such as Lotus' One Source will be essential if a user base of CD ROM products emerges to any great degree during the forecast period. Currently, INPUT estimates the user base to be almost 50,000 in Western Europe.

Systems vendors are responding with a barrage of pricing and product bundling alternatives, including special on-line files dedicated to CD ROM updates. Broad user acceptance of local media could persuade vendors to price their information services more like optical disks, i.e., having users pay a one-time fee for unlimited access.

If you compare the 515,000 million 1994 figure in the table in Exhibit V-8 with the estimated number of personal computers in use then, (35 million), the immediate slowness of the CD ROM market becomes apparent.

The growth of CD ROM is highlighted by the fact that there are over 400 compact disks offered to inform the public. This includes public domain software such as "Type n Talk," which allows the user to type a word or sentence and have it spoken in a natural male or female voice.

EXHIBIT V-8

CD ROM: Installed Base in Western Europe

Country	1989	1994	CAGR
France	6.0	90	72
U.K.	6.0	90	72
West Germany	7.5	100	68
Italy	18.0	95	40
Benelux	3.0	40	68
Scandinavia	2.5	40	74
Spain	2.0	30	72
Rest of Europe	2.0	30	72
Total Western Europe	47.0	515	61

(Installed base of CD ROM drives by country) (thousands)

However, the CD ROM industry, in spurning any type of common, friendly menu or command system, has created many anomalies. The first CD ROM produced by international collaboration among three equivalent national bodies will make it easier to find and compare standards.

Users find the current way of paying for information illogical: there is an up-front charge and a time-based connection charge. Time does not usually correspond to the quality of answers received. An example of a response to this is "Meter It", a software solution which gives greater flexibility to hosts. The user is provided with a software key for his computer and a code that gives him access to a given number of units. These units can be defined as anything appropriate, such as the number of pages downloaded or browsing time. The host can also provide "throw-away" keys for limited access. Once the units are expended, the user can obtain a further key over the telephone. The host does not need to buy special telecom equipment for complex charging systems, and the user is not obliged to download large sections of valueless information.

7. Image-based Databases

The advent of cheaper and more capable computer graphics software as well as optical disks, has resulted in the advent of image databases. The other restriction, that of narrow bandwidths, has been eased by data compression advances, and will eventually be overcome by the omnipresence of fibre optic networks. Whilst several numeric databases currently offer the capability to plot time-series or econometric data, and many videotex applications use graphics as a presentation medium, most image-based data is stored off-line.

It is likely that there will be an increase in activity in this area during the forecast period, especially from database publishers on optical media. Areas of opportunity are in architecture and design, business graphics, education, geography, town planning, media, military, medical and scientific, real estate and travel.

8. Datacasting

Datacasting, discussed earlier in Chapter 3, works by using a spare line of television transmission (a vertical blanking interval —VBI) with some 14.2 kilobits transmittable per second. Presently, two such VBI lines are used from each of the two BBC channels. Up to four could be used in the next five years.

Satellite television could also apply this technique. An experiment on the Direct Broadcasting payload of the European Space Agency's Olympus satellite, called BBC Eurocast, is intended to show the feasibility of replicating Datacast across Europe.

It is also possible to use FM sideband (Sub-Carrier Authorisation) and the European Broadcasting Union's Radio Data Service for the transmission of data. Encoding would ensure that there was no interference to the main radio broadcasting services. BBC Radio already uses RDS for its U.K. network, passing on station identification and automatic tuning facilities to a new range of RDS receivers.

Information services taking advantage of the already installed infrastructure of data broadcasting are beginning to expand rapidly. Rather than using terrestrial data networks, which are still largely controlled by PTT monopolies, such data broadcasting services work out efficiently and do not entail customers having to access packet-switched data nodes which may be some distance from their place of work.

In the U.K. for example, the BBC-run Datacast service offers a tariff of only 3.8p per kilobit of customer data. On the British Telecom national data network PSS might cost a fraction of this for the time and volume charges, but there would be other costs to add, such as a local telephone call to the node and registering for an NUI (network user identifier).

For volume use the price becomes very competitive. For just over £1,100 plus VAT, unlimited use of the London International Stock Exchange financial information service, Market Eye, can be supplied. The price includes all rental charges on the equipment, which consists of a box of electronics, a colour video monitor and a simple 20-button keypad. The information available includes real-time access to prices and movements of 2,800 SEAQ equities, the FT-SE 100 Index, gilt indexes, traded options, ticker tape on all trades, and other information.

Other services being offered by Datacast include:

Coral Racing—Some 800 betting shops are fed multimedia racing information of data which is received on 12 screen video displays. Remote switching between off-air television programmes, satellite racing coverage, private paged teletext magazines and Coral's comprehensive real-time betting, information and prices service are included.

Post Office Nu-Media—A moving-image information and advertising service on display boards in 1,500 post offices is provided.

ECCTIS—Datacast has been used with the U.K. Department of Education and Science on their Educational Counselling and Credit Transfer Information Service. The Training, Education and Careers database, published on CD ROM, was updated daily to provide the latest details of courses and availability. The pilot project was deemed a success and could lead to other projects which join CD ROM and data broadcasting.

Financial Times—The FT broadcasts its electronic newscaster boards at its headquarters and on the Stock Exchange floor.

Genossenschaftlicher Information Services (GIS)—An information service set up by the Association of Credit Union Banks in West Germany has purchased datacasting equipment for use with existing video cable systems. Transfer via satellite is also planned. If the trial is successful, up to 1,000 GIS banking members will be supplied with Datacast receivers.

Datacast umbrella—A significant portion of the Datacast capacity will be offered to retail, finance and travel companies through an arrangement with the information and communications systems group, Bishopsgate Systems, part of the Alphanumeric Group. The Halifax Building Society is equipping a substantial number of its 3,500 retail offices with a Datacast high-level graphics display and information service.

C

Market Issues

Information is priced by value. Despite this, the information providers who are also involved in hardcopy publishing favour value-pricing their electronic media at a premium over print. There is still little incentive for them to develop electronic services at the expense of core businesses.

1. Economic

The leverage on electronic publishing is considerable, once business exceeds a certain volume. Whilst development costs are high, marginal costs can approach zero over wide ranges of use. Those producers with early offerings in the right market sectors can gain considerable advantage. However, the high margins invite intense competition.

The attitude of systems vendors is markedly different to that of the producers, since it matters little to them what services are being accessed by end users. Their priority is to offer ease-of-use features and unambiguous pricing, which encourages users to switch between services. Because the marginal costs of delivery are so low, vendors are developing pricing strategies that optimise their returns across different levels of use.

In professional markets, vendors have traditionally structured their prices around price-insensitive heavy users. Factors which are now prompting vendors to deviate from this approach include:

- Increasing competition in the broad on-line markets
- Challenges posed by "local" media like CD ROM
- A more sophisticated population of heavy users
- A desire to extend services to populations that include more casual users

On account of this, a pricing dilemma is being created as vendors look beyond their existing markets, to build usage without jeopardising their revenue base. Some responses by major vendors in Western Europe have been significant:

- Price increases, particularly in display or printing charges
- Retrenchment and removal of databases from on-line status
- Consolidation of similar databases into larger files
- Creation of second versions of established services at lower cost but with fewer features
- Extending off-hour rates to more users

Compounding these changes is an estimated 25% per year projected rate of improvement in the price-to-performance ratio of data processing and communications technologies. Rapidly declining distribution costs give a distinct advantage to smaller producers who can afford to serve smaller niche markets.

CD ROM is affecting pricing strategies as well. There is reason to expect that a proliferation of disk-based databases will encourage on-line vendors to return to subscription fee policies. Pricing will then have moved full circle since its origins as an adjunct of subscription-based print products. The era of hourly fees and display charges is nearing its end.

2. Use

In Europe there are some 35 million personal computers, but less than one million are connected to modems for communication at speeds up to 1200 baud. The number of regular users of electronic information services is only a fraction of this. These numbers are miniscule when compared with the European population of information workers. The speed of uptake can be attributed to many factors, the most significant of which are:

- Nonspecialists are confronted with technically complex systems and difficult access to networks.
- Many managers prefer to receive information on paper—even from databases.

The key vendor challenge is to bring information to the user rather than the user having to search the services. Advanced electronic information services should offer various services for different target groups of users. These should be based on preselection and editing by the information provider, taking into account the specific information needs or profiles of the target group. Exact, concise, appropriate and timely information aids decision-making.

The European Commission has supported a number of electronic journals in its DOCDEL projects. Delivery was offered to electronic mail-boxes or in printed form. The reader not only had his news as soon as he switched on his personal computer, but was able to sort and stock the information he wanted to retain efficiently .

The database TED, Tenders Electronic Daily, on ECHO, offers a service like this for telex customers with a telefax service being introduced at the end of 1989.

A number of other databases and services offer automatic information retrieval. The electronic mail-based Finstat offers key share information, gilts, unit trusts, and currency information which can be downloaded to the customer's machine. However, electronic mail is not the only medium that can use this technique. The centralised videotex systems in the U.K. and West Germany enable users to receive and send messages to multiple clients.

The bulk of on-line users are still professional searchers supported by corporate research budgets. Barriers to the use of electronic information services are numerous: For many potential users, EIS is another data source that compares unfavorably with volumes of free, subsidised or advertiser-supported information. In addition, the technical nature of electronic information services requires that users master a series of new techniques. This results in user resistance and a need for vendors to address several issues that are listed in Exhibit V-9.

EXHIBIT V-9

User Resistance/EIS Demands

- Techno-fear
- Modems and communications software
- Boolean search techniques
- Complex billing systems
- System quirks
- Nonstandard command structures

- Overcome the techno-fear.
- Understand the rudiments of modems and communications software.
- Master basic Boolean search techniques for on-line searching.
- Tolerate steep prices and complicated billing systems.
- Accommodate systems quirks and nonstandardised command structures.

“Ease of use” is now the key issue in the EIS market, intensified by the advent of optical media which takes the ease-of-use requirement further by relieving the user of the intricacies of on-line communication. Investment in CD ROMs or diskette-based data alters the economic relationship between user and data.

Many vendors, like Dialog and Kompass, sponsor extensive user training courses in order to help users along the learning curve. Beyond training, another ease-of-use innovation is the gateway, essentially networks interconnecting multiple vendors’ electronic information services in a way that is transparent to the user. In effect, gateways dissolve the distinctions between on-line vendors. The last few years have seen agreements between services such as between Télésystèmes and GSI and Pergamon and Profile.

Cross-vendor searching is another variation on the gateway theme. Users can tap into a bundled service such as ComputerScan at an hourly rate (payable only if the search yields results) and at a standard hourly on-line charge. Ease-of-use thinking has also spawned an increasing amount of front-end search software such as that developed by Reuters and AP Dow Jones. Most packages lead the user through a series of user-friendly menus and has been termed the “Bring” principle.

Dow Jones has a service which delivers the news to its customers and allows them to converse in English, via a multimillion dollar computer interface, rather than in esoteric retrieval computer language. SDI, selective dissemination of information, using a standardised search, is a well-known technique and the latest products not only collect information according to defined rules, but inserts it into word processing or spreadsheet software automatically. The customer can ask normal language questions for supplementary information.

Dow Jones is also revolutionising its charging policy. Companies subscribing to the new service will—like ESA-IRS—no longer be charged on an inefficient time-based scale. Dow Jones will levy charges based on the number of computers on a local area network.

INPUT believes that the "Bring" principle will reinforce the breakthrough of electronic information services from the relatively small market of current users to the much larger market of users who require better information to make them more productive.

3. Delivery Mechanisms

Dow Jones' system of offering seamless retrieval to users by shipping information to them automatically has been termed "information broadcasting". This substantial shift in the electronic information delivery mechanism—not dissimilar to Reuters' vast array of software products—has identified the technology, i.e. the method of dial-up, as the key inhibitor.

Specialised services such as Lexis, the legal database, which have proved successful, will benefit from this improvement at the retrieval end. The information available will be tailor-made for insertion into corporate personal computers—for instance for reports, spreadsheets and localised databases.

Many of the users interviewed by INPUT commented that even after successful mastery of the communications software and modems needed to access an electronic information service, they have to deal with confusing methods and terminology for the information they require.

The vendors' response, precipitated by CD ROM, has been to move towards new delivery systems. As one vendor remarked, "We want to be continually present in the customer's office, rather than the customer having to come to us."

Some examples are Dow Jones' News/Retrieval system, which enables presorted information to be sent automatically to central computers at user sites, and distributed to individual personal computers where the News/Retrieval information can be integrated with work on individual computers. If the information is not there, a query can be issued to produce the relevant articles. Such an approach will remove the high on-line fees.

Dun & Bradstreet, more traditionally involved in the credit information sector, have developed a PC service called WorldView which can be programmed to link up automatically with Dun & Bradstreet databases and to update Lotus 1-2-3 spreadsheets seamlessly.

Mead, wary of protecting its legal, medical and general interest databases, is installing software called Nexis News Plus that enables the user to design searches prior to log-on, the new software allowing for simultaneous, multiple searches.

Lotus' aggressive entry into the CD ROM market should be viewed in the light of the above. It is attacking the same market of heavy users with CD ROM offerings such as its "One Source", which offers financial and corporate text and statistics updated weekly. They are undoubtedly making inroads into libraries and corporate research departments.

There is also the threat of the PTTs and their capability to act as gateways and distribution channels for electronic text and data. Within a deregulated telecommunications environment, the access of the PTTs through their telephone subscribers to potential electronic information customers could overwhelm publishers without distinctive delivery mechanisms. Some vendors currently believe that the PTTs are a way of expanding the market for their own offerings.

This may prove to be a shortsighted view. Without a distinctive delivery mechanism, many vendors will find themselves in a position of acting as a wholesaler to the PTTs. The approach of Reuters should be noted and contrasted with the moves made by British Telecom, France Telecom, Telekom and AT&T in the field of mergers and acquisitions, which it has been forming strategic alliances or acquiring companies in order to develop network reach.

4. Strategic Perspectives

Electronic information services have not as yet revolutionised our way of doing business in quite the way that was anticipated almost a decade ago. The reasons that this phenomena has not reached its full potential have been discussed in previous sections and can be summarised as follows:

- End users still suffer from techno-fear.
- Customers are not sophisticated enough to fully utilise on-line data.
- On-line searching is expensive.
- The industry has failed to accommodate its biggest revenue-producing market: the Western European corporate sector.

This last reason may seem flawed when over half the industry's revenues are derived from the use of financial and credit-related databases. But examination of the EIS market's history suggests that vendors have been slow to target the business market. Some of the key EIS niches are listed in Exhibit V-10 and include:

EXHIBIT V-10

EIS Niches	
Sector	Leading Vendors
Financial	Reuters, Telerate, Dow Jones, Dun & Bradstreet
Economic	IP Sharp, Dialog
Business	Dialog, BRS
Full-text	Mead, Dow Jones, Reuters
Legal/medical	Mead (commanding premium prices)

- Government
- Bibliographic—Dialog and BRS are top vendors and are the favourites of librarians
- Catalogue utility
- Full-text—Mead Data Central is the leading vendor, followed by Dow Jones. Full-text records are a mainstay of the legal profession and the news media
- Newspaper
- Legal—MDC' Lexis commands premium prices
- Financial—Dow Jones, Dialog, and Dun & Bradstreet are leading vendors
- Numeric data—Compustat are principal vendors, along with Dialog and IP Sharp

From its origin as a supplier of data to government and library markets, to its belated entry and success in business markets, the on-line database industry is now reaching a new watershed: the buyer's market. Even the business information market is becoming deluged with databases. Vendors are less likely to be able to dictate the market.

Participants in each of the four EIS categories approach the on-line database industry with different strategic perspectives:

- Information Providers often find their objectives at odds with earlier and stronger commitments to print media.
- Systems Vendors are seeing their revenues squeezed by publishers who are able to bypass traditional networks and reach end users more directly.
- Infrastructure Companies are threatened by increasing competition from other infrastructure companies, as well as changes in government regulations.
- Information Brokers/Service sponsors are looking at database markets as vehicles for extending their existing vertical market services into new areas.

The Systems Vendors (formerly Remote Computing Services Vendors) market the service on behalf of the database creator or information provider, in some cases merely providing the computer host facilities while the information provider takes charge of the marketing (as with scientific and/or technical databases, for example).

Of the vendors interviewed for this study, over 50% fell into this category. Increasingly, systems vendors are establishing separate divisions or business units to service the electronic information services marketplace, e.g. GSI-ECO and Télésystèmes Questel.

A further category of activity is that of the totally specialist electronic information service, a "supermarket amongst hosts". In the case of Dialog, for example, the entire operation is dedicated to the use of electronic information.

The information broker is at an intermediary stage between the database service and the end user, and has become significant on account of the generally perceived difficulty in accessing electronic information services. With the increase in the number of services, the broker has seen the role assume further significance resulting in reduction of on-line time and in the number of accesses.

A number of organisations are specifically information brokers and a list of some of the more prominent ones in Western Europe are included in Exhibit VI-11.

EXHIBIT V-11

Information Brokers in Western Europe

Country	Information Broker	Hosts
France	<ul style="list-style-type: none"> • Bureau Marcel van Dijk • Information on Demand 	Dialog, ESA-IRS, Infoline, Mead; Questel, G-CAM, Kompass, Fiz-Technik, STN
U.K.	<ul style="list-style-type: none"> • FT Business Information • Information Unlimited 	Blaise-line, Datasolve, Dialog, Kompass, Data-Star, ESA-IRS, Questel, BRS, Pergamon Orbit Infoline, STN
West Germany	<ul style="list-style-type: none"> • GBI • Siedel & Bonin 	Data-Star, Dialog, ESA-IRS, Fiz-Technik, Genios, Questel, Pergamon, Dimdi, STN, BRS, Datasolve, Genios
Italy	<ul style="list-style-type: none"> • Online SAS • Systel SRL 	Dialog, Data-Star, IP Sharp, Pergamon, ESA-IRS, Questel, G-CAM, Profile, STN, Cerved, SEAT
Belgium	<ul style="list-style-type: none"> • Bureau Marcel van Dijk • Bibliotheque Royale Albert I^{er} 	ESA-IRS, Intea
Netherlands	<ul style="list-style-type: none"> • Cobidoc BV • Infotech Research 	Datasolve, Genios, STN, Dimdi, Dialog, Questel, ESA-IRS, Pergamon
Denmark	<ul style="list-style-type: none"> • Alberg • Universtatbibliothek 	Alba, Aramis, Blaise-line, Byggak, Data-Star, Dialog, Dimdi, ESA-IRS, Nordisk BDI-Indiks, Pergamon, IP Sharp
Sweden	<ul style="list-style-type: none"> • Update Scandinavia 	Tess
Spain	<ul style="list-style-type: none"> • Generalitat Valenciana • Impiva 	Data-Star, Dialog, ESA-IRS, RPI, IP Sharp, Questel

Information brokers have a vital role to play in furthering the acceptance of electronic information services. This is because many hosts, Dialog for example, are becoming more selective about what they include in their catalogues. Dialog's Business Connection contains data from many leading business information providers, including Disclosure Incorporated, and Dun & Bradstreet. Moody's Investors Service, Predicasts, Standard & Poor's Corporation and Trinet are organised into five separate applications:

- Corporate intelligence
- Financial screening
- Sales prospecting
- Products and markets
- Travel planning

Reportedly, only a small percentage (10%) of products are selected from the hundreds of databases it evaluates each year.

A parallel trend is the continuing profusion of small databases. Products are repackaged to serve smaller and smaller niche markets. In addition, the declining cost of producing and distributing information is at last giving smaller publishers an opportunity to enter new markets. Their entry into the EIS market, either directly or through alliances or agreements with commercial services sponsors or with the national PTTs (as distributors), will be likely to accelerate the trend towards a fragmented users' market.

a. Joint Ventures

Joint ventures and strategic alliances are only one manifestation of the competitive forces at work in the electronic information services industry. Since alliances often represent a firm's earliest attempts to develop new products or enter new markets, alliances can be excellent advance indicators of company strategies or market trends. The recent moves by British Telecom in acquiring Tymnet and AT&T's acquisition of Istel are the most obvious indications of restructuring in the market.

However there are two other types of joint activities to consider:

- Product development agreements—Joint product developments enable companies to share development costs and risks as well as stake out emerging markets. Most on-line industry alliances observed over the past year have aimed at the development of either:
 - User friendly software for database searching, or
 - CD ROM products

- Joint distribution agreements—These are often used by infrastructure firms to interconnect networks, or by database publishers to reach wider markets. For example, CompuServe and MCI Mail signed an electronic mail interconnect agreement, and Dow Jones News/retrieval agreed to distribute legal data from West Publishing.

Deviation from this familiar pattern, i.e., linkups between information providers and commercial service sponsors, for example, would be of particular concern to systems vendors.

Mergers and acquisitions are more intense forms of alliances, generally requiring longer, deeper and more costly commitments. For most industries, merger and acquisition activity is a primary indicator of increasing consolidation and how an industry is changing shape.

Some territories where merger and acquisition activity is reshaping the EIS industry include boundaries between:

- Hardcopy and on-line information providers—Many of the major publishers have accelerated their moves into electronic publishing.
- Information providers and systems vendors—The demarcations between database publishers and database vendors have been eroding for years. As early as 1986, Pergamon acquired System Development Corporation's Orbit service.
- Infrastructure companies and information providers—Equipment vendors and other infrastructure companies are joining integration publishers and vendors.

Beyond the cross-territorial moves, the EIS industry still has its share of intramural consolidations. Two examples are the Uninet-Telenet network combination (following the United Telecom-GTE merger), and the acquisition of Chase Econometrics by its smaller rival, Wharton EFA.

b. Western European Cross-Flow

Though most of the world's database publishers and vendors are concentrated in Europe and North America, electronic information respects national boundaries no more than do global telephone networks.

Concern in previous years over transborder data flow and offshore data entry has been supplanted by official worry over how on-line databases compromise national security. Entry by foreign firms into the domestic EIS marketplace is also of concern.

Some examples of foreign penetration include: the Pergamon acquisition of Orbit, British Telecom's takeover of ITT's Dialcom, (developer of the U.S. electronic mail standards) and Swiss vendor Data-Star's opening of a U.S. office.

Electronic information providers are aware of the boon of 1992 and the need to integrate national systems into international networks. The demand for standardised and comparable information about European companies has been met by ICC On-line Databases, for example, one of the leading U.K. vendors in business information, which has made its service available throughout Europe.

There are still serious problems with regard to the provision of pan-European electronic information. Firstly, the relative parochialism; there are many national databases, but few that are truly pan-European. Those which are more international tend to duplicate information on large quoted companies but neglect the smaller and medium-sized organisations. Neither Dun & Bradstreet, the U.S.-based credit agency, nor Kompass and Eure, the Europe-wide directories, cover the bulk of European industries.

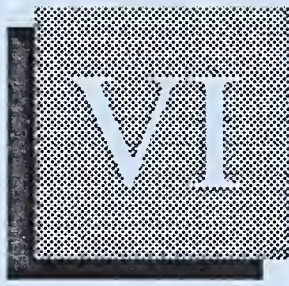
Companies like ICC are trying to overcome this problem by integrating national databases in similar formats. Jordans has set up a CD ROM system with Bureau Marcel van Dijk of Belgium to provide company information about the U.K., France and Belgium.

Also, Extel is planning to move into the market with a new international database called Global Vantage, offering detailed analysis of more than 6,000 international companies. Dafsa in France, and Handelsbank in West Germany are offering similar products.

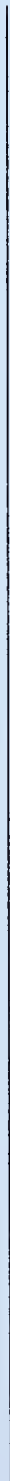
The problems with attempting to provide comparable data are considerable: there are different accounting practices, varying availability of information in different countries, different classifications of business activity, currency fluctuations and different languages, (ten in the EC alone). From a technological standpoint, the lack of standardised retrieval systems is again a key problem.

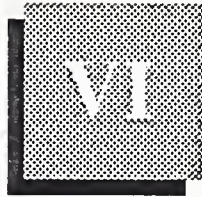
Whilst expert systems will ultimately be used to overcome most of these difficulties by using reasoning techniques to eliminate inconsistencies, companies are currently having to use analysts to interpret the data.

Companies such as Dun & Bradstreet, aware of this opportunity are sidestepping the issue of accounting procedures by using data supplied directly by the companies concerned. Although such data is traditionally used for credit ratings, the credit companies are looking to attack the West European business market as 1992 approaches.



The User Environment





The User Environment

This chapter presents analysis and results of INPUT's user survey regarding European EIS market needs, concerns, drivers and inhibitors. With the European market in different stages of development, INPUT's user research provides an insight to the concerns and interests expressed by user management, as well as enabling an evaluation of the issues raised in preceding chapters.

A

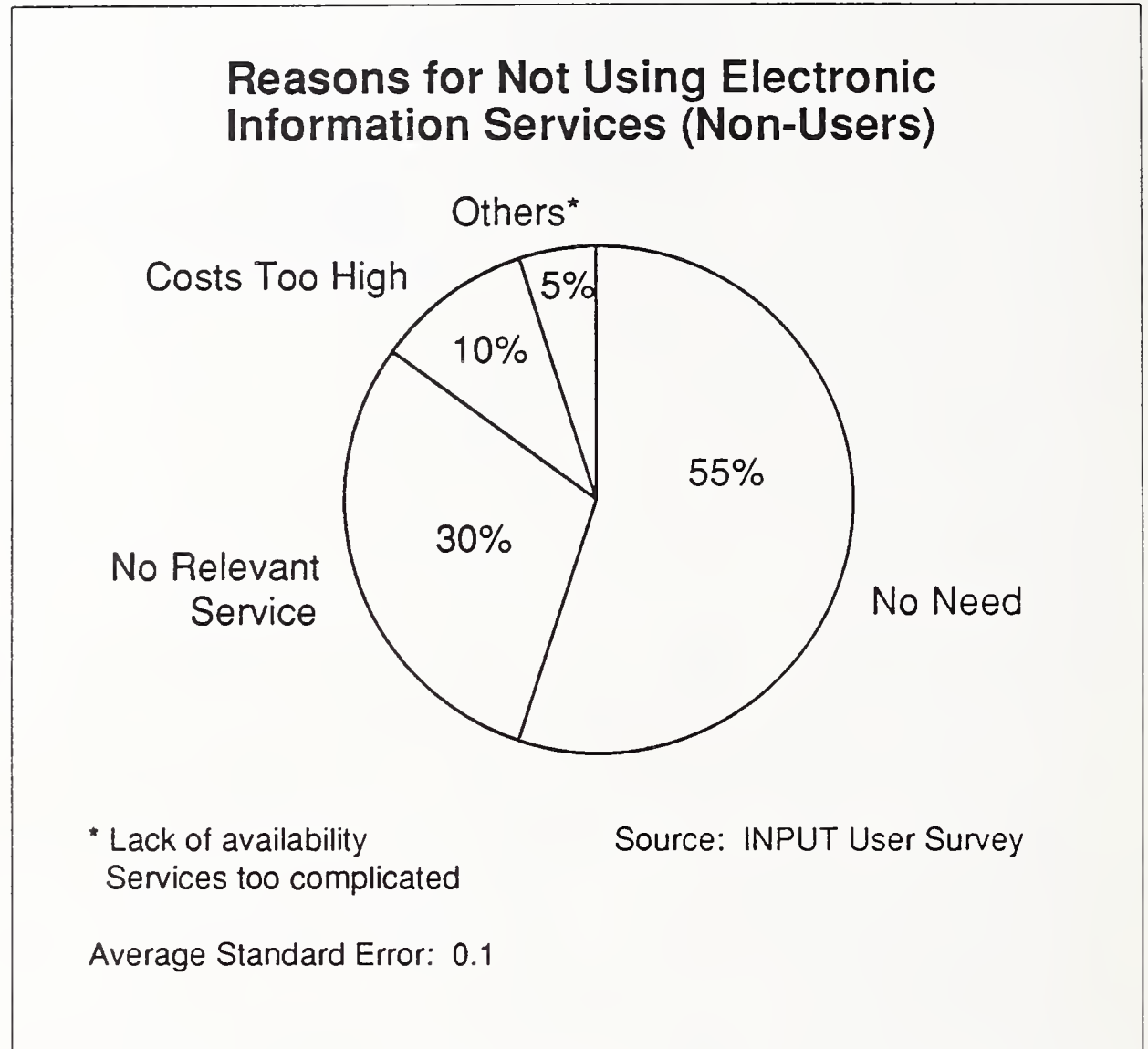
Implementation Issues

1. Reasons for Not Implementing

More than half the companies that were not using any of the specified electronic information services indicated, as Exhibit VI-1 illustrates, that they felt there to be no need. This reaffirms the importance for vendors to concentrate and improve their marketing effort.

A further 30% responded by saying that there was no relevant service, which is a high percentage of commercial users for whom there is no market. Although this may be true of the manufacturing sectors, the booming market for relational databases indicates a probable underlying reason for rejecting EIS:—that the services were too complicated. Only 10% felt the costs were too high.

EXHIBIT VI-1



2. Method of Access

User choice of access method shows that the public packet-switched network is the favoured method of access. INPUT would expect the number of users accessing both to decrease as vendors resolve gateway development issues. Exhibit VI-2 illustrates the breakdown.

3. Growth

Anticipated growth rates amongst current users was uniformly high. The Scandinavian market recording the highest anticipated average annual growth of 75%, reflecting the development of the financial market. France too, at 65%, indicates that vendors should be looking to lock in current heavy-volume users with service enhancements.

These figures are listed in Exhibit VI-3 with only the Benelux countries expecting an average annual growth rate of under 50%.

EXHIBIT VI-2

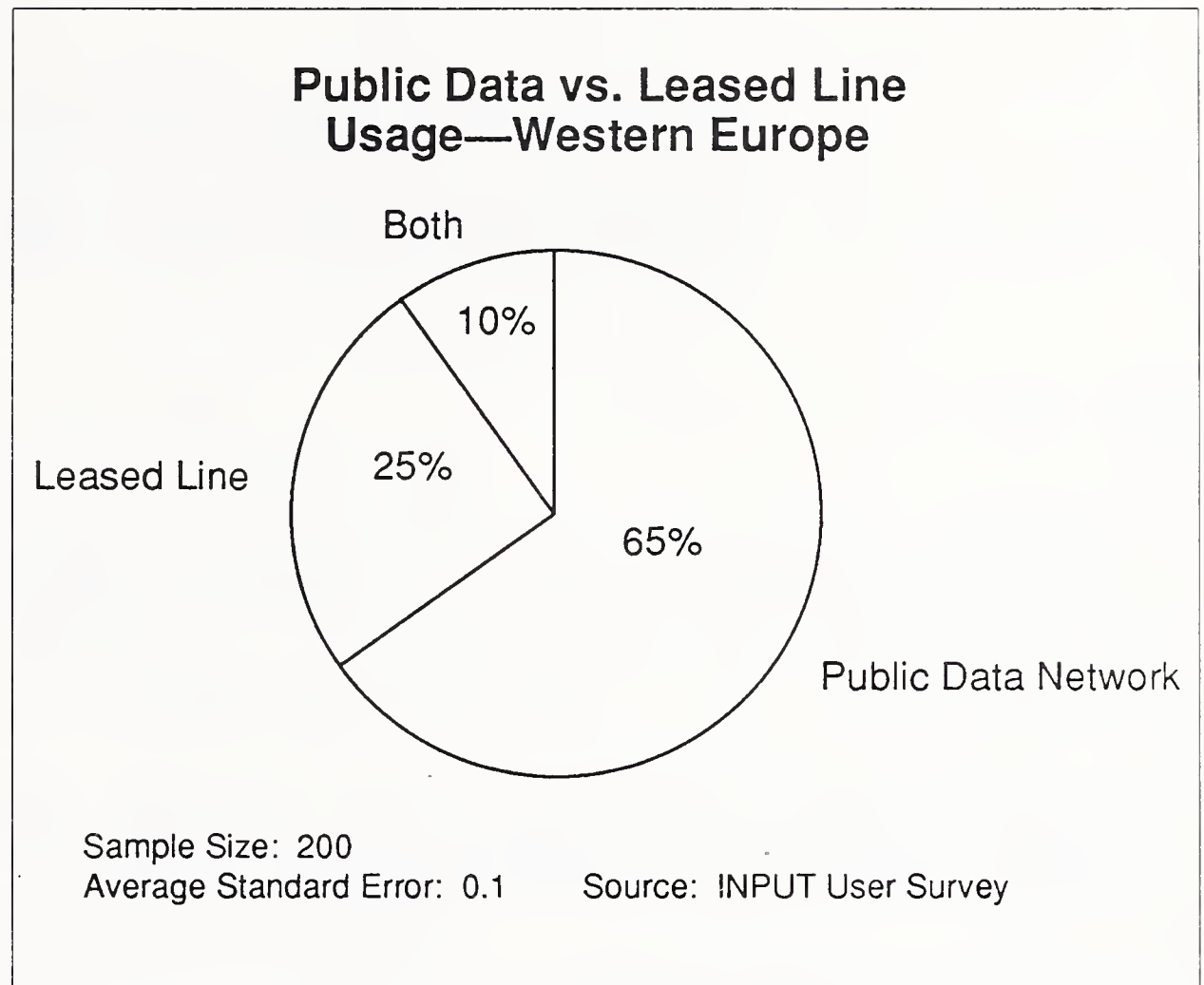


EXHIBIT VI-3

Anticipated Average Annual Growth

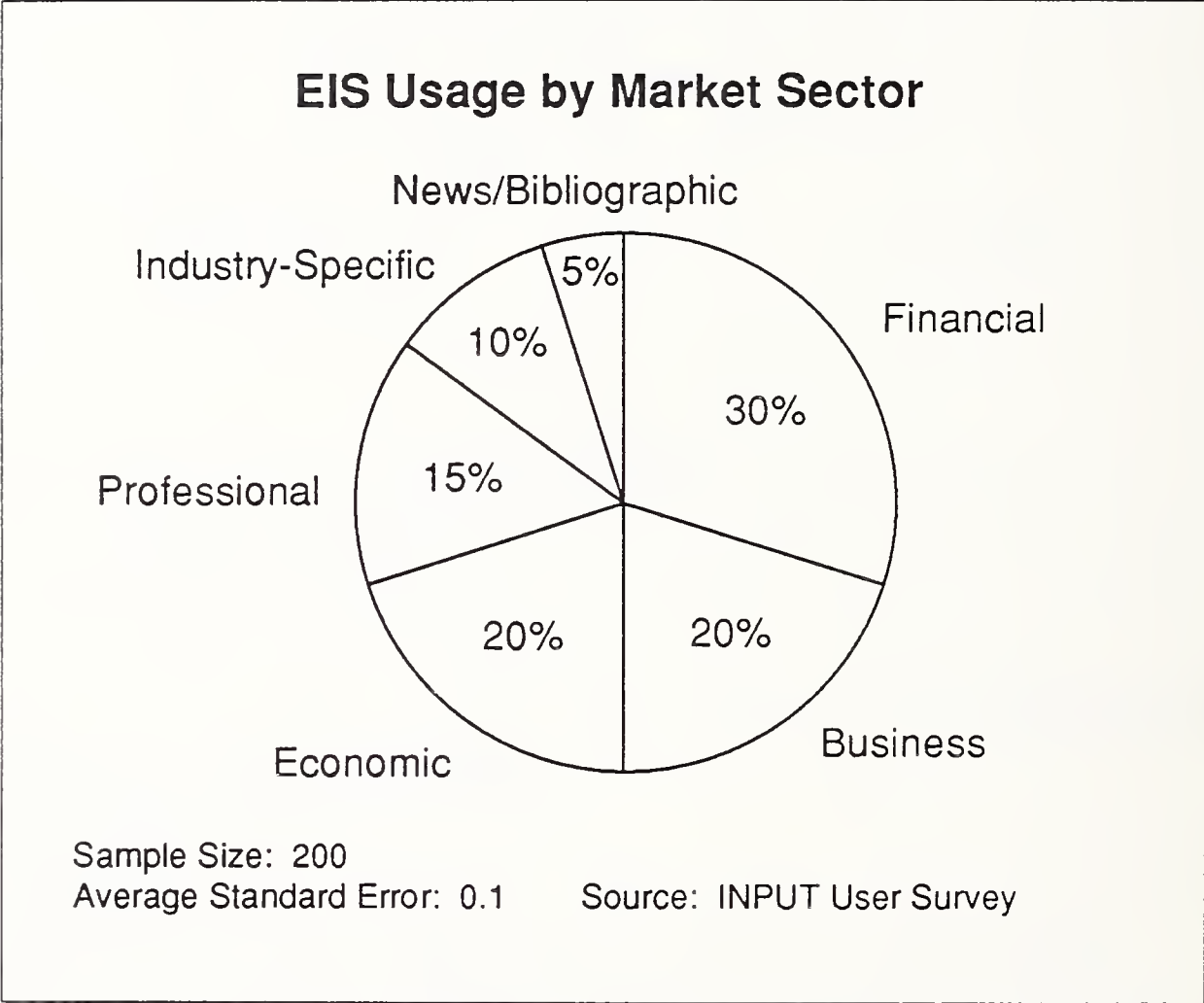
Country	Percent Anticipated Average Annual Growth
France	65
U.K.	55
West Germany	48
Italy	57
Benelux	43
Scandinavia	75
Spain	53

Source: INPUT User Survey

4. Market Sector Usage

Financial services are the most used of the EIS sectors. These figures show the dominance of financial and economic information. More targeted niche services are now being adopted by users, and the market share for business and professional information services is expected to increase during the forecast period. Current use is illustrated in Exhibit VI-4.

EXHIBIT VI-4



B**User Ratings of
Electronic
Information Services****1. Overall Service**

Users were questioned concerning their overall level of satisfaction for the particular services that they used. Satisfaction levels were requested, on a scale of 1-5, on the following criteria:

- Quality of data or information
- Ease of use
- Overall service

Within the total sample of 200 users, over 70 vendors were identified. Exhibit VI-5 lists the services that were mentioned with a frequency of five times or more, the frequency of mentions in the countries surveyed being shown in each case. It also shows the user ratings for these services against the criteria listed above.

The Dialog service was by far the most frequently mentioned. Over half the respondents were on-line with this host. Data-Star was the second-most mentioned, with ESA-IRS, Orbit, BRS, and IP Sharp receiving a high percentage of mentions.

In general, the quality of data or information in the database was rated higher than ease of use and overall service. The average weighted score for all these services against these criteria were:

- Quality of data: 4.25
- Ease of use: 3.56
- Overall service: 3.75

Reuters, Textline and Data-Star were rated highly for quality of data. G-CAM and Dialog stood out as far as ease of use was concerned, whilst Dialog, Reuters and ESA-IRS were the top-rated companies for overall service. Exhibit VI-6 provides a detailed breakdown of these ratings by vendor.

EXHIBIT VI-5

Most Frequently Mentioned EIS (At Least Five)

EIS	Total	Number of Mentions						
		F	UK	WG	I	BNL	SK	E
Dialog	55	10	22	7	4	5	4	3
Data-Star	38	6	13	6	5	3	3	2
ESA-IRS	33	8	14	5	3	3		
Telesystemes Questel	33	19	4		4	6		
BRS	25	3	12	3		4		3
ECHO	25	4	4	8	3	6		
Pergamon	20	3	13	4				
GSI-ECO	18	9		4		5		
IP Sharp	18	3	11	4				
Reuters	16		16					
G-CAM	16	12				4		
Maid	15	3	8	4				
Cerved	14				14			
Dafsa	14	11				3		
GEIS	13	3	3	4		3		
Orbit	13	4	7	2				
OR-Telematique	11	8				3		
Bertlesmann	9			9				
WEFA	8		8					
Mead	8		8					
Belindis	8		4	4				
STN	8	2	4	1	1			
Telerate	7		6			1		
Affarsdata	5						5	

EXHIBIT VI-6

User Ratings of Electronic Information Services (Total Western Europe)

Name of Service	Average User Rating		
	Quality of Data	Ease of Use	Overall Service
Dialog	4.6	4.8	4.8
Data-Star	4.8	4.6	4.5
ESA-IRS	4.6	4.6	4.8
Orbit	4.3	4.5	4.4
BRS	4.5	4.6	4.5
IP Sharp	4.7	4.7	4.7
GEIS	4.5	4.6	4.5
Maid	4.7	4.5	4.6
Questel	4.6	4.6	4.6
STN	4.5	4.4	4.5
Reuters	4.8	4.7	4.8
Pergamon	4.6	4.5	4.5
Mead	4.8	4.5	4.5
Telerate	4.6	4.2	4.3
GSI-ECO	4.5	4.4	4.5
G-CAM	4.6	4.8	4.7
Dafsa	4.7	4.6	4.6
Cerved	4.6	4.5	4.5
Bertlesmann	4.3	4.6	4.5
Affarsdata	4.4	4.5	4.5
WEFA	4.2	4.3	4.4
Telekurs	4.5	4.3	4.4
Belindis	4.4	4.5	4.4
AP Dow Jones	4.3	4.4	4.4
ECHO	4.5	4.4	4.4
OR-Telematique	4.6	4.6	4.5

Rating Scale 1-5, where 1 = Poor, 5 = Excellent

Average Standard Error: 0.1

2. Service Considerations

The major service considerations that are facing the vendors of electronic information services are discussed under the following headings:

- User rating of vendor services—user ratings of electronic information services with regard to access, information and customer services.
- Pricing—assessments of pricing levels and vendor attitudes towards pricing.
- Market opportunities—vendor assessments of new areas of opportunity.

a. Service Features

As illustrated in Exhibit VI-7, the speed of access to data and information was seen by users as of overriding importance. Other features that scored highly were information quality, ease of access and flexibility.

EXHIBIT VI-7

User Ratings of Best Features of Electronic Information Services (Total Western Europe)

Feature	Total W. Europe	F	UK	WG	IT	BNL	SK	E
Speed of access	4.4	4.8	4.5	4.3	4.1	4.4	4.4	4.3
Access to information	4.4	4.8	4.6	4.4	4.0	4.3	4.3	4.3
Information quality	4.4	4.6	4.7	4.6	4.4	4.1	4.2	4.0
Ease of access	4.3	4.8	4.3	4.4	4.5	4.1	4.1	4.0
Flexibility	3.8	4.0	4.2	3.9	3.7	3.6	3.9	3.6
Customer support	3.5	3.6	3.5	3.6	3.4	3.3	3.9	3.2
Customer service	3.5	3.6	3.5	3.6	3.4	3.3	3.9	3.2
Communications links	3.4	3.8	3.7	3.3	2.9	3.7	3.8	2.8
Retrieval software	3.4	3.4	3.4	3.4	3.3	3.4	3.6	3.3

Rating Scale 1-5, where 1 = Poor, 5 = Excellent

Source: INPUT User Survey

Sample Size: 200

Average Standard Error: 0.1

A consistent theme running through users' comments on these issues was that electronic information services gave them access to information, both in depth and across a wide range of subjects, that would be impossible to cover in any other way. Quite often it represents the only way for the user to get the answer.

Exhibit VI-8 illustrates the features which got the lowest ratings: U.S. bias (a large percentage of electronic information services originate in the U.S.), cost, and range of different command languages were cited as the most important deficiencies. The cost of electronic information services is a recurring theme, and is discussed below in the section on pricing.

EXHIBIT VI-8

User Ratings of Most Serious Deficiencies of Electronic Information Services (Total Western Europe)

Deficiency	Total W. Europe	F	UK	WG	IT	BNL	SK	E
Host accuracy	3.3	3.5	3.5	3.3	3.2	3.2	3.3	3.1
Response time	3.2	3.4	3.3	3.0	3.0	3.3	3.4	3.2
Languages	3.1	3.1	3.8	3.0	2.9	3.1	3.3	2.8
Command languages	3.0	3.2	3.1	3.0	3.1	2.9	3.0	2.7
Cost	2.9	2.8	2.9	2.6	3.1	3.0	3.1	2.8
U.S. bias	2.6	2.5	3.5	2.2	2.5	2.5	2.7	2.3

Rating Scale 1-5, where 1 = Poor, 5 = Excellent

Source: INPUT User Survey

Sample Size: 200

Average Standard Error: 0.1

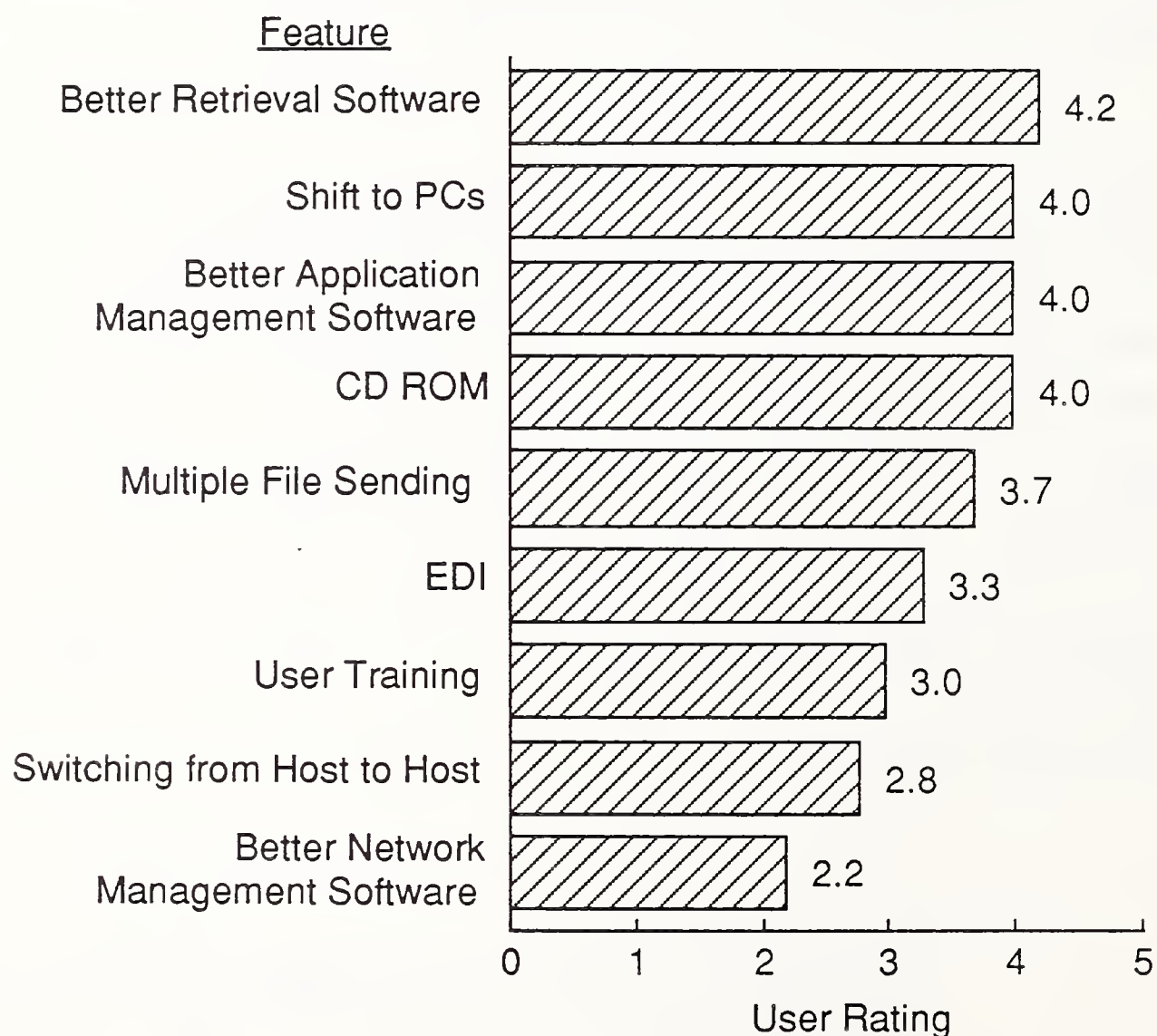
Standardisation of command languages would clearly be in many users' interests. However, many practical problems exist regarding the implementation of such a concept. From the user ratings it is clear that there are other deficiencies, most notably host breakdowns, the lack of full text, and difficulties with cross-file searching. Clearly, a number of those problems will relate to specific services and specific types of databases. Vendors should examine their product offerings accordingly.

As a corollary to the above, vendors were asked to rate the importance of various features and services that are considered important in the electronic information market. Exhibit VI-9 shows the results of the analysis in tabulated form. The most significant are:

- Better retrieval software
- Use of a PC rather than a dedicated terminal
- Better application management software
- CD ROM
- Multiple file searching
- User training

EXHIBIT VI-9

Vendor Rating of Important Features of Electronic Information Services



Rating Scale 1-5, where 1 = Unimportant, 5 = Extremely important

Average Standard Error: 0.1

Sample Size: 200

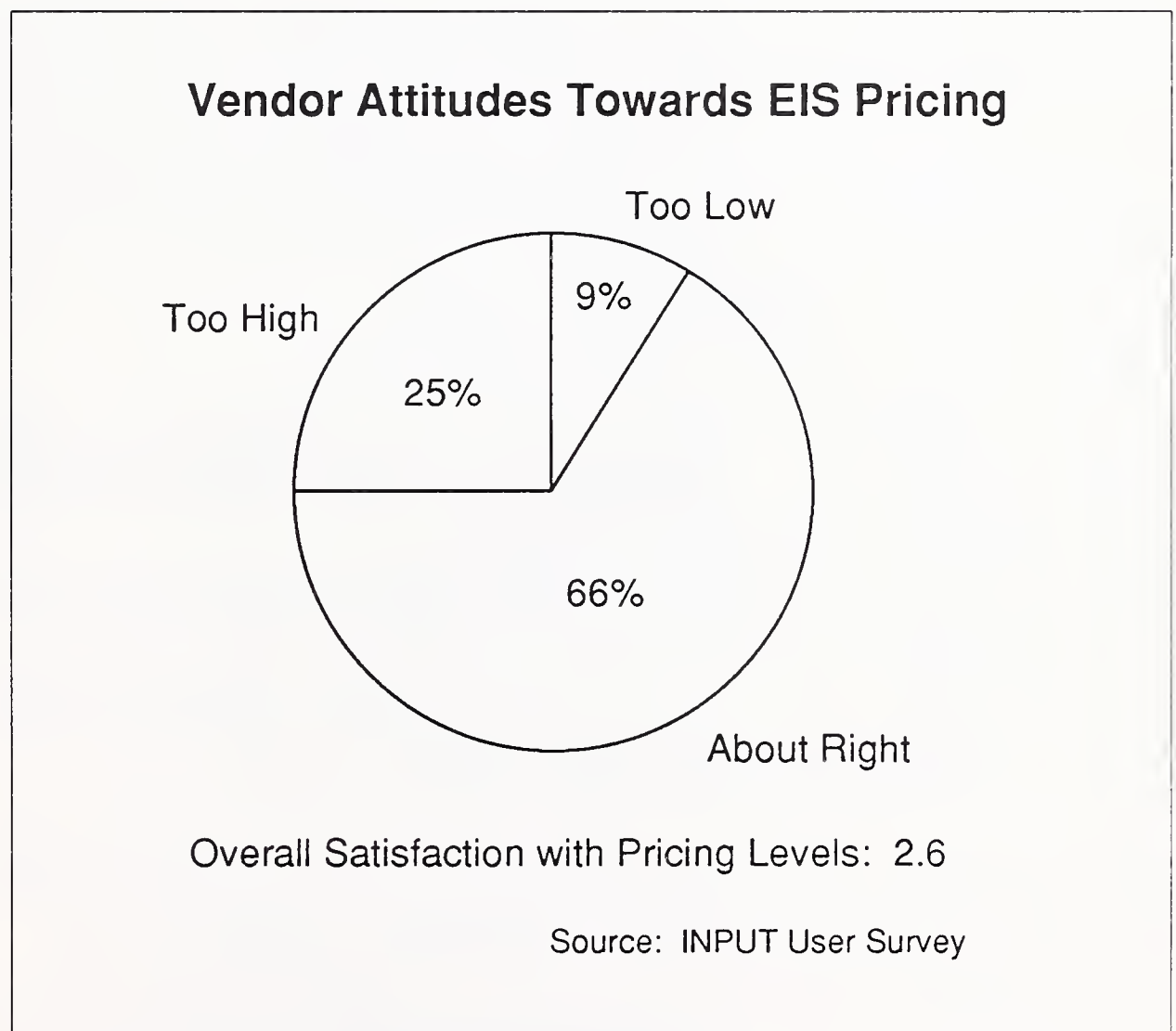
Source: INPUT User Summary

New software products and the increased use of personal computers represent an area of new and expanded opportunity for vendors. From the standpoint of an existing PC user, CD ROM represents a further level of complexity.

b. Pricing

Vendors are in the difficult position of needing to raise prices to achieve profitability, and to reduce prices to attract a wider range of customers. The difference in vendor attitudes towards current pricing levels is illustrated in Exhibit VI-10. Many electronic information services are still unprofitable. Whilst high levels of profitability are being achieved in specialist areas, particularly the financial sector, vendors are tolerating losses in an attempt to achieve a strategic position in the market or to offer a service in order to maintain or extend business in other related areas.

EXHIBIT VI-10



Whilst raising prices is an obvious counter to loss-making operations, vendors finding their markets being squeezed by increased competition from other vendors and other media are naturally reluctant to follow this route.

Whilst users rated the high cost of services as a serious deficiency, end users are prepared to pay a price for a computer service when genuine value is delivered. For example, many European users are prepared to pay for relatively expensive U.S.-based services in comparison to cheaper European-based alternatives. One of the keys to the pricing issue is the need to add value to the basic services being provided through software, new media and professional services.

Another means of gauging pricing levels for electronic information services lies in the nature of the use to which the data or information is to be put. The more information that is needed to support a decision or to conduct a transaction, then the higher the price it can command.

The immediacy of availability carries a high value in many circumstances, particularly in the financial world, and consequently users are prepared to pay a higher price for these services. In terms of pricing techniques, there is widespread dislike of techniques committing users to a minimum expenditure over a certain time period. Only amongst the more expensive financial services is it possible to adopt such marketing techniques.

c. Market Opportunities

Producers and providers evaluating new opportunities for electronic information services should certainly measure the service against the following criteria:

- The quantity of data is large and expensive to collect
- The data requires expert and frequent updating
- The data is unique
- No satisfactory alternative service is available
- The data is suitable for display on a VDU
- Users require access to specific facts, rather than the need to review a large mass of material

The greater the degree to which the potential service characteristics meet these criteria, the more likely it is to be successful as an electronic information service.

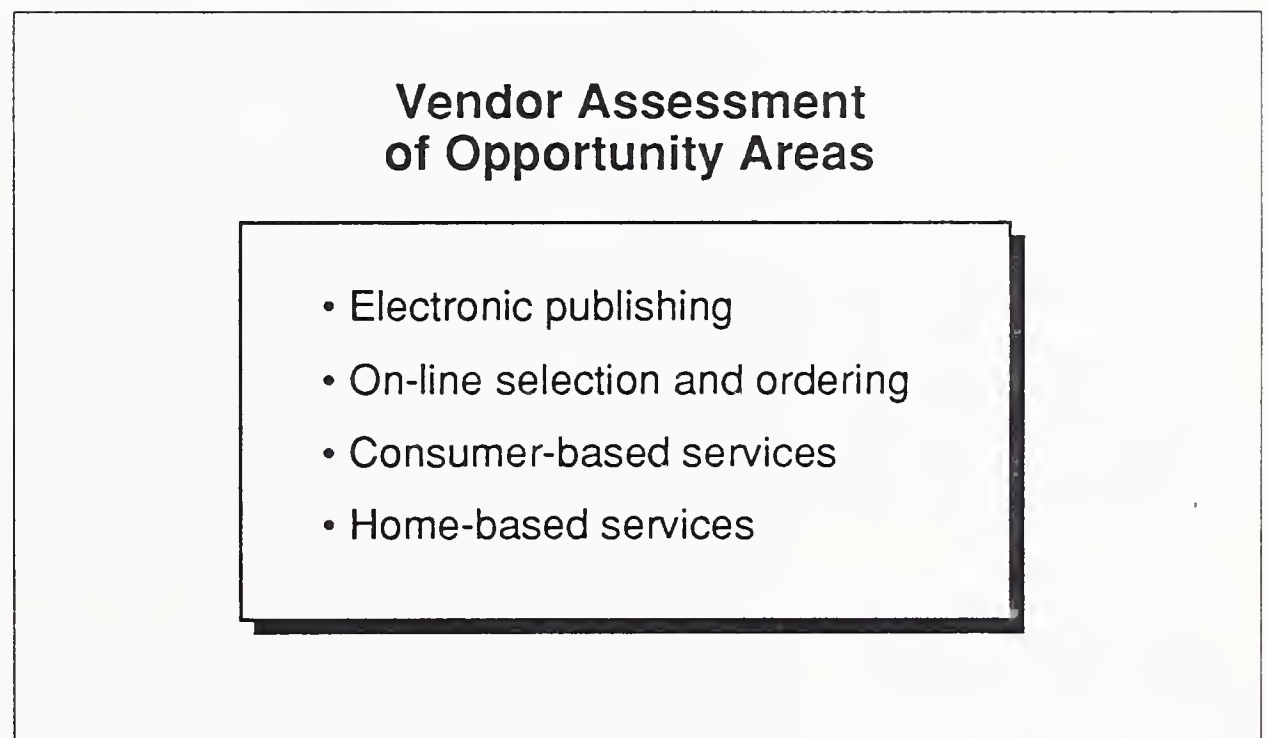
In any new product assessment, the users' needs and the potential number of users must be thoroughly analysed. As mentioned in the previous section, the type of use to which the retrieval data is to be put is an important criterion of the likely value of the service. Information that is required to affect some immediate transaction or that will be used to support a direct decision will be of relatively high value. In contrast, data that is only supportive to making decisions has less value.

Vendors must evaluate the potential for value-added services, for these will offer greater potential for higher-margin services. In the more consumer-orientated applications, vendors need to investigate the degree to which the potential service can either:

- Be subsidised by advertising or a commercial service (e.g., a banking transaction)
- Augment another supportive service that already bears major elements of the cost

Exhibit VI-11 shows the four broad areas of opportunity of interest to current electronic information services providers.

EXHIBIT VI-11



i. Electronic Publishing

This is a critical area for electronic information services providers. Business and financial data is largely the subject of these developments.

ii. On-line Selection and Ordering

The strongest level of interest was expressed in France via the Minitel medium. One of the strategic errors made by vendors in the past who have attempted to offer this type of public service has been the service's independence from other services. There are not enough users to attract sufficient numbers of companies prepared to offer their products or services (because a fee is required) and a vicious circle is created.

Some fundamental business factors that are proving important in developing successful services are:

- Developing the service as an add-on or adjunct to an existing service or operation, to reduce its exposure to low initial revenues
- Seeking out high payoff opportunities, implying vigorous examination of the proposed business products or services being offered

Examples of this are services like the consumer offering on-line services of used cars for sale by private individuals.

Other application areas mentioned by vendors were:

- Software sales from a database catalogue
- Catalogues available through the Dialog service
- Drugs and medical supplies for general practitioners

iii. Consumer and Home-based Services

Vendors remain cautious on this issue. The experience in the U.S. with services like CompuServe and the slow build-up of videotex in Western Europe have not encouraged vendors to be enthusiastic in this area. One of the strongest concerns is pricing and the reluctance of the general public to pay an economic charge for electronic information services. As discussed elsewhere, INPUT does not believe that the market can be supported in this way. Advertising or subsidies will be required.

The entry of commercial service sponsors into the on-line industry will further complicate the industry's evolution. Whilst advertiser-supported information is customary in videotex, it has yet to impact on-line services.

An indicator of the effect of advertising can be seen in the newspaper, magazine and commercial television and radio businesses. Vendors are able to reduce the costs of their information products and services by a factor of two or more.

Despite these reservations, a number of vendors did see opportunities in this market. This is particularly so in France, where Teletel and Minitel has been a considerable success. Particular types of applications mentioned as opportunities by vendors for the general consumer or home user are:

- On-line credit authorisation
- Home banking
- Sales of software from on-line database catalogues
- Homeworking

Better opportunities lie in developing existing commercial services that have already become well-established. For example, tour operators' videotex systems have been extended to home use.

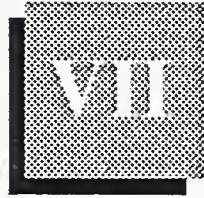
Many electronic information services vendors feel that the market for their services is still developing too slowly. Given the rapid development of the overall Western European market, it is the vendors who are running unprofitable services, particularly bibliographic services, who feel this way.

Over half the vendors felt that more market conditioning was required to make potential users more aware of the benefits of using electronic information services. Only 20% of vendors felt that this was not the case, that the marketing efforts were more than satisfactory.

Although it is undoubtedly the case that vendors of unprofitable services have probably found it difficult to allocate sufficient funds to marketing, there is also evidence of a lack of management direction, in that the electronic information services available have suffered a lack of understanding through a failure of marketing. More precisely, some vendors have not been able to identify what users want at what price. They have suffered from an "overhyped" market. It may well be that the "single market" initiative will help to focus on their information needs for the 1990s.



Conclusions and Recommendations



Conclusions and Recommendations

A

Publishing Issues

Electronic publishing dramatically alters the economies of scale so important to traditional publishing. There is a much more flexible relationship between the information and the delivery system; once in electronic form, information may be sent out through any number of networks. Single sources of distribution offer little economic advantage over multiple sources.

This altered relationship between information and delivery has profound implications for industry participants, some of which might be summarised as follows:

- Information providers are becoming less willing to accept exclusive contracts with systems vendors.
- Information providers are demanding from vendors a greater portion of the revenues generated by their information.
- Some information providers, such as Dun & Bradstreet, are bypassing systems vendors by developing their own distribution systems.

However, beyond the information providers' relationship with distributors, the major strategic question facing providers is how they move into electronic media without jeopardising their revenue base from other media. This dilemma is now occurring at two levels:

- The revenue impact of EIS on hardcopy media
- The revenue impact of "local" media (e.g., CD ROMs on "remote" EIS services

There are now further issues for information providers to confront as competition intensifies in the build-up into the single European market, and companies become increasingly aware of the power of competitive information:

- The overabundance of electronic information services in certain subject areas is forcing information providers to retrench and pursue industry market strategies.
- The arrival of a second tier of information providers is emerging from services sponsors, who lack the revenue loss problems of the older publishers and are willing to underwrite their EIS activities with revenues from commercial sources.
- Opportunities are opening up for publishers to endow their products with new capabilities made possible by optical media, artificial intelligence, computer graphics and nonsequential presentation.
- The entry of more international players into the Western European on-line market is just one manifestation of increasing EIS market globalisation.
- The single European market is making a large number of firms realise their levels of relative "parochialism". Information is the key to bridging this gap.
- Other key "global" issues include how to form mutually advantageous overseas marketing alliances, and the impact of scanning and speech processing technologies.

INPUT suggests the following marketing strategies for information providers:

- Differentiate EIS products
- Develop innovative products cost-effectively
- Identify value elements and offer additional value-added service
- Offer new elements continually
- Pursue international agreements

These recommendations are listed in Exhibit VII-1.

EXHIBIT VII-1

Information Provider Issues

- Differentiate EIS products
- Respond to competitive threats
- Develop innovative products cost-effectively
- Pursue international strategy

B**Distribution Issues**

Two decades of growth in electronic information services have been accompanied by a proliferation of distribution channels. This proliferation presents systems vendors with a major problem: how to handle information products that are being unhooked from existing systems.

Technological change has strengthened the role of the information provider with respect to the systems vendor. Back in the 1960s, systems vendors were sole possessors of the critical expertise and computer hardware needed for the distribution of electronic information.

This is no longer the case. Now the tools to disseminate information electronically are available to almost anyone, as the electronic bulletin board phenomenon indicates. In other words, many can send information, but only a few retain ownership rights.

Local EIS media, like CD ROM, present a parallel challenge to systems vendors. For anything but the most current data, local media can offer an attractive option to users seeking to reduce their pay-per-view systems.

Some large systems vendors have responded to the threat toward local media by offering portions of their services in the optical media format. Dialog is one example. The vendors recognise that they are entering a new pricing territory here and are acting with caution.

Yet another major challenge comes from the information cornucopia of other vendors: how to differentiate products. Product offerings in some areas (e.g., stock prices) may already be pushing against market saturation.

The response among the larger systems vendors has been to redesign their pricing and product bundling strategies. They profess similar objectives:

- Bringing together the most relevant information services
- Presenting them in the most usable forms

Maintaining vigilance over publishers, new technologies and other vendors' product mix is only part of the management concerns of systems vendors. Managers also need to be alert to impact on their business from other directions. Contributing to these impacts are:

- Infrastructure companies—The PTTs as well as computer firms and cable TV operators have expressed interest in EIS involvement.
- Commercial systems sponsors—The involvement of new, heavily capitalised entrants into the EIS marketplace could further destabilise the systems vendors' position. Banks, airline reservations companies and product distribution firms are among those that see electronic services as a means of gaining competitive advantage.
- Evolving distribution technologies—Future EIS distribution options will be impacted by a wide variety of changing technologies. Candidates are fax, E-mail, cable TV, satellite, fibre optics and ISDN.

An additional uncertainty for systems vendors to ponder is whether markets will continue to mature in the so-called heavy user niches that have developed so far. The enormous variety of electronic bulletin boards may give a hint.

C

User Issues

The end user is the target for both information providers and system vendors. There is a series of influencing factors:

- The fluidity of electronic information encourages its eventual commoditisation. Stock quote services are a good example. Although they once had the highest margins in the industry, intense competition among new entrants soon resulted in price erosion and marginal profitability. Survival in the business has become a matter of low-cost production.
- Users are becoming more sophisticated EIS consumers due to the PC user base, consumer on-line services, bulletin boards, videotex and other interactive technologies. Customers are more willing to pick and choose between information products and vendors.

- A vision of how end users interact with electronic information is central to publishers and vendors. Increasingly, both groups are providing the user with packages of services. Some information providers are now developing their own product bundles and encouraging vendors to pass them directly to their end users. At times, providers bypass the systems vendors entirely.
- In contrast, systems vendors are themselves evolving into service organisations that add value to publishers' products through additional software and support. To this end, vendors are acquiring their own alternative information resources.

Until now, the most successful services have focused on heavy user niche markets. Composed of corporate researchers, securities traders and the like, these markets are relatively price-insensitive. Yet the heavy user group is very small in relation to the population as a whole, or even to those with computer equipment.

Among the factors often used to explain failure of EIS market penetration are that users:

- Are resistant to computers
- Are not motivated to embrace more productive patterns of information use
- Are used to receiving free or highly subsidised information
- Have diffuse and unpredictable information needs

There is reason for hoping that past rigidities will gradually dissolve as people develop familiarity with electronic information. The French success with Minitel should be taken as an indicator.

How significant market expansion would affect the fortunes of existing market participants depends on user perceptions and user assessments of competing media. Price certainly will be a much larger factor than it has been up to now. So will new technologies—especially optical media—that have the power to radically transform EIS use patterns.

If and when the EIS market approaches maturity, it is fair to speculate that users will have far more control over the industry than has been the case until now.

D

Strategic Issues and Recommendations

Europe is overprovided with hosts, especially in the bibliographic sector, where many are only viable thanks to public subsidies. In the cases where customers use dedicated terminals, such as with Reuters' financial database and trading services, this situation is unlikely to change in the near future. These vendors have much greater control over the market and this strategy helps create a captive user base.

There is a need for software products that can accommodate the increasing amount of external data coming into an organisation. Users require software to integrate external and in-house data and bringing multilingual information together in an understandable form.

INPUT's recommendations for vendors in the EIS market involve four key areas, and are listed in Exhibit VII-2.

EXHIBIT VII-2

Revenue-Building Strategies

- Expand customer base
- Expand volume usage
- Increase prices on existing products
- Add new products

- Expand the customer base—This is unquestionably the greatest challenge, especially expanding the existing base of heavy users
- Expand the per-customer use of the service—This is likely to present a problem as customers become more adept at finding what they want
- Increase prices on existing products—This is not a viable option, as there are competing products at comparable prices
- Add new products—This is a fundamental challenge, involving assessment of which products users value most highly

These themes can be amplified to identify additional options in the area of product and pricing policies. Within these four overall areas, there are other key strategies:

- Product differentiation—Publishers and vendors have considerable latitude for differentiating their offerings. Products can be distinguished by subject matter, delivery modes, geography, specific industries and professions.

- Pricing—The big question for most vendors is how to use pricing as an expansion tool. Pricing becomes all the more critical when vendors attempt to move beyond heavy user markets. There is also the problem of pricing competing products to avoid revenue erosion. Some options include:
 - Using simplified pricing schemes
 - Using simplified billing arrangements that give the user a single bill for all services received
 - Using reduced rates for off-hour use
 - Creating a second version of service with fewer features and a lower cost than primary service
 - Pricing electronic products as a premium over print
 - Selling underwriting from commercial sponsors

Naturally, the appropriateness of any particular strategy mix depends on the firm's perspective within the industry. In Exhibits VII-3 through VII-5, INPUT offers a synthesis of typical strategic issues and approaches facing the four key electronic information services.

EXHIBIT VII-3**Information Providers
Strategic Approaches**

- Avoid exclusive deals with systems vendors
- Develop new distribution channels either independently or through alliances
- Publish on a variety of electronic media
- Sell electronic services directly to comparable networks

1. Information Providers

The central strategic issue for information providers is to prevent erosion of their print media by electronic information services. INPUT recommends the following approaches:

- Avoid exclusive deals with systems vendors
- Develop new distribution channels either independently or through alliances
- Publish on a variety of electronic media
- Sell electronic services directly to corporate networks

EXHIBIT VII-4

Systems Vendors Strategic Approaches

- Eliminate services with low market penetration
- Bundle services to vertical market sectors
- Improve and simplify billing procedures
- Add value to products (analysis, interactive databases)
- Develop alliances

2. Systems Vendors

For systems vendors, the issues are differentiation of service and maintaining market share in the face of the fluidity of electronic information. INPUT believes that there are several approaches which will be relevant to systems vendors to differing degrees dependent on their targeted markets. Such strategies would include:

- Eliminate services with low market penetration
- Bundle services to vertical market sectors
- Improve and simplify billing procedures
- Add value to products, (analysis, interactive databases)
- Alliances with information publishers and infrastructure companies

3. Infrastructure Companies

The key issue for infrastructure companies is simple: to stimulate demand for core services. This can be achieved in several ways:

- Encourage the growth of private networks
- Acquisition

4. Service Sponsors/Brokers

For service sponsors and information brokers, the key issue is to maintain presence in niches and to add value to vertical market businesses. INPUT believes this can be achieved by doing the following:

- Underwrite new electronic information services
- Develop alliances
- Provide specialised services

EXHIBIT VII-5

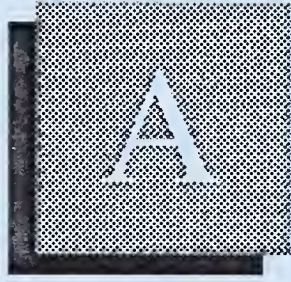
Recommendations for Vendors of Financial Information Services

- Exploit opportunities of new adaptive technology
- Dominate selected niche via comprehensive service and strategic partnering
- Develop relationships with software houses
- Establish effective brand engineering
- Differentiate via service, implementation and support
- Develop customised services
- Foster customer closeness

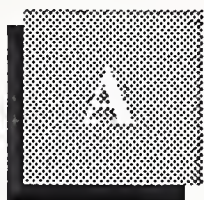
5. Financial Information Services

The financial information services market is so specialised that there are strategic issues unique to this market. As a highly profitable, specialised niche market, it has become highly competitive. INPUT makes the following recommendations to vendors of financial information services:

- Exploit opportunities of new adaptive technologies
- Dominate selected niche via comprehensive service and strategic alliances
- Develop relationships with software companies
- Develop customised services
- Differentiate via service and customer support



Appendix: List of Database Hosts and Producers



Appendix: List of Database Hosts and Producers

U.K.:

ADP Comtrend
ADP Financial Information
ADP Network Services
AP-Dow Jones News Services
Agra Europe
Associated Press
Blaise-Line
British Library
BRS
Business Direction (British Telecom)
Butterworths Telepublishing (distributors of LEXIS)
CISI Wharton
Citibank
Compu-Mark
CCN Systems
Datasolve
Data-Star
Datastream (subsidiary of Dun & Bradstreet)
Derwent Publications
Dialog
Dun & Bradstreet
ESA-IRS
EDICLINE
Economist Intelligence Unit
Euromonitor
Financial Times
GE Information Services
GSI (U.K.)

ICC
Infocheck
Infomat (Predicasts subsidiary)
Jordans
Kompass Online, Reed Information Services
Lotus Development Corporation
Maid Systems
McCarthy Information
Mead Data Central
Orbit Search Service (division of Pergamon Orbit Infoline)
Pergamon Financial Data Services
Prestel Citiservice
PROFILE Information
Reuters Holdings
IP Sharp
STN
Telecom Gold
Telesystemes Questel
Telekurs

France:

Agence France Presse
Banque Francais du Commerce exterieur
Cedocar
Dafsa
Dialog
Dun & Bradstreet
DUPLEX
ESA-IRS
FININFO
Fiz-Technik
G-CAM Serveur (Data-Star agent)
GSI-ECO
GAMA
Groupe DPV
Groupe Galande
Infoline
Kompass
Mead
Merlin Gerin
OR-Telematique
Questel (Telesystemes Questel subsidiary)
Reseaux Commerciales Informatiques (RCI) Calvacom sevice
STN
Telekurs
Telesystemes Questel

West Germany:

Bayer AG
BRS
BTX Sudwest GmbH
Burda GmbH
Bertlesmann
Business Datenbanken GmbH
Datasolve
D-S Marketing (Data-Star)
Deutsche Bibliothek Institut (DBI)
Dialog
DIMDI
ESA-IRS
FIZ
Genios
GBI (Gesellschaft für Betriebswirtschaftliche Information mbH)
Hoppenstedt
Nomos Datapool
ICONDA
Online GmbH
Pergamon
STN (INKADATA)
Telekurs
Telesystemes Questel

Italy:

Assolombarda
Cerved
Confindustria
Data-Star
Data Resources (DRI) Division of Standard & Poor's FEICO
Dialog
ESA-IRS
G-Cam
GIANO
Istituto Centrale di Statistica (ISTAT)
Pergamon
Profile
SARIN SpA
SEAT SpA
IP Sharp
STN
Sirio
Telesystemes Questel

Belgium:

Université de Bruxelles
Belindis
C & L Belmont
Compu-Mark
Credoc asbl
ESA-IRS
Intea

Holland:

ABC Voor Handel en Industrie
Datasolve
Datastream
DIMDI
Dialog
ESA-IRS
ESTC
Genios
Pergamon
STN
Telekurs
Telesystemes Questel

Luxembourg:

ECHO
EUROSTAT

Switzerland:

Data-Star (Radio Suisse) FIZ-Technik agent
Telekurs

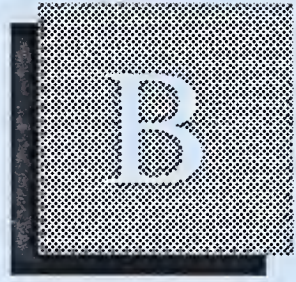
Scandinavia:

Aarhus School of Economics
Affarsdata AB (Data-Star agent)
Alba
Aramis
BDI-Indiks
Blaise-Line
Borsinformation Telecom
Byggak

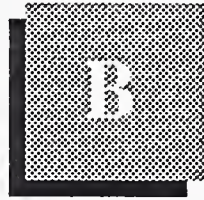
Datacentralen
Data-Star
Dialog
DIMDI
ESA-IRS
Esselte On-Line
IP Sharp
NORDICOM
Nordisk
Pergamon
SCB Statistics
Tess

Spain:

Bolsa de Madrid
Camerdata
Data-Star
Dialog
ESA-IRS
Entel SA
IP Sharp
RPI
Telesystemes Questel



Appendix: Analysis of Research Sample

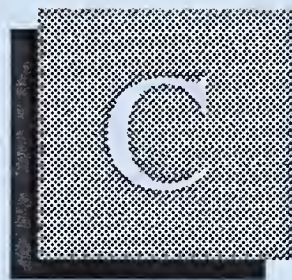


Appendix: Analysis of Research Sample

EXHIBIT B-1

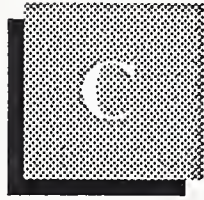
Analysis of Research Sample

Country	Vendors	Users	Others	Total
France	8	40	3	51
U.K.	12	40	4	56
West Germany	6	40	2	48
Italy	3	20	1	24
Benelux	2	20		22
Scandinavia	2	20		22
Spain	2	20		22



Appendix: Electronic Information Services— Vendor Questionnaire





Appendix: Electronic Information Services—Vendor Questionnaire

Role in EIS market:

Are you:

- ☐ An information provider
- ☐ A systems vendor
- ☐ An infrastructure company
- ☐ A service sponsor

Are you a:

- ☐ Generator
- ☐ Publisher
- ☐ Broker
- ☐ User

Types of:

Computer systems: _____

Hosts: _____

Services: _____

Type of EIS:

Corporate/Government/Academic/Consumer:

Type of information:

- ☐ Financial
- ☐ Economic
- ☐ Business
- ☐ Professional
- ☐ Industry-specific
- ☐ News

Mainline business:

Support:

Incidental:

Radical change:

Pricing: Charging structure: _____

- ☐ Too High ☐ Okay ☐ Too Low

Communications:

- ☐ Packet-switched network
- ☐ Private network
- ☐ Third party
- ☐ Videotex
- ☐ Other

Market inhibitors:

Communication standards:

Transmission service:

Communication costs:

Videotex:

Language:

Data privacy/protection:

User acceptance:

Number of databases/services

Issues:

- Technological: (Standards/VTX/Bulletin Boards/Network Services/AI)
- Economic
- Use
- Regulation
- Market

CD ROM:

Image systems:

Shift to PCs:

Better network management software:

Better application management software:

Better retrieval software:

User training:

Text services:

EDI:

Switching from host to host:

Multiple file searching:

Copyright:

Market players—significance:

EEC

Government agencies

PTTs

Publishing companies

TV companies

Finance institutions

Network services

On-line companies

Other

Market size:

Current size of national/international market for EIS you provide:

Growth: 1 year: 3 years: 5 years:

Opportunities:

Is critical mass to be achieved by more advertising/PR, etc.? How?

Areas:

Distribution channel for publishers

Home-based PCs

On-line product ordering/selection

Travel

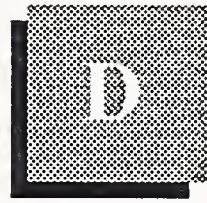
Industrial

Financial

Consumer products/services



Appendix: Electronic Information Services— User Questionnaire



Appendix: Electronic Information Services—User Questionnaire

Are you currently using any on-line database services or some other type of information service?
(please state)

- ☐ Personal use
- ☐ Through a member of your department
- ☐ Internal librarian service
- ☐ External information broker

Comments: _____

(Answer if not a user or not planning to be a user of an on-line database service.) What are your reasons for not using or planning to use on-line database services?

OLDB services/
CD ROM

- ☐ No need
- ☐ No relevant services
- ☐ Costs too high
- ☐ Communication costs too high
- ☐ Services too complicated
- ☐ Lack of available intermediary or information brokerage to supply data
- ☐ Other (please state)

Comments: _____

Please indicate areas of professional interest to you in the table below: (highlight major sectors first, i.e., "Business Information," "Marketing," etc.) using a scale of 1-5 where 1 = low interest and 5 = high interest.

	1 (low)				5 (high)
<u>Business Information</u>	1	2	3	4	5
Securities & commodities	1	2	3	4	5
Historic/current data on companies	1	2	3	4	5
Economic & financial time-series data	1	2	3	4	5
Commercial credit	1	2	3	4	5
Consumer credit	1	2	3	4	5
Credit card verification	1	2	3	4	5
Other	1	2	3	4	5
<u>Marketing</u>	1	2	3	4	5
Market research data	1	2	3	4	5
Demographic	1	2	3	4	5
Address lists	1	2	3	4	5
Other	1	2	3	4	5
<u>Industry-specific</u>	1	2	3	4	5
Chemicals	1	2	3	4	5
Pharmaceuticals	1	2	3	4	5
Petrochemicals	1	2	3	4	5
Estate agents	1	2	3	4	5
Travel & entertainment	1	2	3	4	5
Other	1	2	3	4	5

<u>Bibliographic</u>	1	2	3	4	5
Business abstracts	1	2	3	4	5
News	1	2	3	4	5
Scientific & technical	1	2	3	4	5
Professional	1	2	3	4	5
Medical	1	2	3	4	5
Legal	1	2	3	4	5
Patents	1	2	3	4	5
Accountancy	1	2	3	4	5
Other	1	2	3	4	5
<u>Other</u>	1	2	3	4	5
Non-business news	1	2	3	4	5
Resources	1	2	3	4	5
Other	1	2	3	4	5

Comments: _____

Please name the service or services that you are using:

Name of service:

- a)
- b)
- c)
- d)

How would you rate your overall level of satisfaction with the services you use, on a scale of 1 (low) to 5 (high) rating?

Quality of data in the database	<u>Ease of use</u>	<u>Overall</u>	<u>Service</u>
a)			
b)			
c)			
d)			

How do you rate the following features of on-line database services?

<u>Feature</u>	<u>Rating</u>				
Speed of access	1	2	3	4	5
Access to range of information	1	2	3	4	5
Information quality	1	2	3	4	5
Ease of access	1	2	3	4	5
Retrieval software	1	2	3	4	5
Customer support	1	2	3	4	5
Flexibility	1	2	3	4	5
Cost	1	2	3	4	5
Customer service/support	1	2	3	4	5
Command languages	1	2	3	4	5
Communication links	1	2	3	4	5
Host quality	1	2	3	4	5
Response time	1	2	3	4	5
U.S. bias	1	2	3	4	5
Language (mother tongue)	1	2	3	4	5

Comments: _____

Can you give me an approximate idea of how much per month/year you are spending on on-line database services?

Comments: _____

What growth are you anticipating in your use of on-line database services over the next year?

Comments: _____

Is your access to on-line database services via the public data network or via leased lines?

Comments: _____

What is your usage of on-line database services?

Now

On-line Database

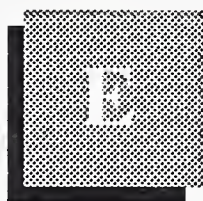
Average connect time per session

Number of sessions per month

Thank you. We will be happy to send you summaries of INPUT research studies in appreciation of your help and cooperation.



Appendix: Detailed Forecast Data



Appendix: Detailed Forecast Data

EXHIBIT E-1

Detailed Forecast Data

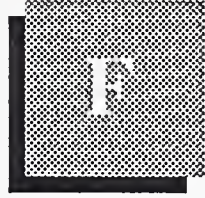
	Currency	User Expenditures (Local Total Currency)							
		1988	1989	1990	1991	1992	1993	1994	CAGR
France	FF (M)	2,031	2,751	3,537	4,389	5,437	6,616	7,664	23
U.K.	£ (M)	323	427	561	671	769	854	1,037	19
West Germany	DM (M)	521	714	946	1,197	1,544	1,814	2,220	26
Italy	Lira (B)	254	352	465	592	648	775	902	21
Benelux	BF (M)	4,050	5,265	6,885	8,505	10,125	12,150	14,175	22
Scandinavia	SK (M)	655	852	1,114	1,376	1,638	2,031	2,424	23
Spain	Pst (M)	3,630	7,260	10,285	12,100	14,520	18,150	21,780	25
Rest of Europe	\$ (M)	80	120	150	200	230	255	320	22

M = Millions

B = Billions



Appendix: Reconciliation of 1988 and 1989 Forecasts



Appendix: Reconciliation of 1988 and 1989 Forecasts

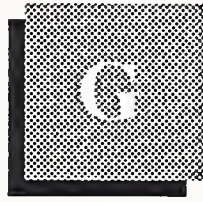
In INPUT's *1988 Western European Market for Computer Software and Services* report, the electronic information services market was assessed at \$685 million.

During the detailed research carried out for this 1989 report on the electronic information services market in Western Europe, INPUT made a fundamental reassessment of this market subsector to incorporate non-on-line database activities, such as videotex applications, as well as a detailed reappraisal of the real-time financial information sector, in which Reuters' and other leading vendors in this sector were deemed to be receiving end-user revenues not previously attributed to this sector.

As a result, INPUT has reassessed its valuation of the 1988 market to \$1600 million. The resultant change in CAGR (compound annual growth rate) is from 25% (1988-1993) in the 1988 report to 22% (1989-1994) in this report.



Appendix: Definition of Terms



Appendix: Definition of Terms

A

Revenue

- *Captive Computer Services Revenue* - Revenue received from users who are part of the same parent corporation as the vendors.
- *Noncaptive Computer Services Revenue* - Revenue received for computer services provided from users who are not part of the same parent corporation as the vendor.
- *Other Revenue* - Revenue derived from lines of business other than those defined above.
- *Total Company Revenue* - Revenue received from total computer services and other sources of revenue.
- *Total Computer Software and Services Revenue* - Revenue received from services provided by vendors that perform data processing using the vendors' computers (processing services), assist users to perform such functions on their own computers (software products and/or professional services), provide a combination of hardware and software integrated into a total system (turnkey systems), include consulting, education and training, programming analysis, and facilities management (professional services), provide for systems design, integration and installation (systems integration), or offer network, enhanced management services, electronic mail, electronic data interchange, or electronic information services (network services).

B

Service Modes

- *Processing Services*
 - Transaction Services: uses vendor equipment and software at vendor site or customer site; may be interactive or remote-batch-oriented.

- Utility Services: access to basic software tools enabling the users to develop their own problem solutions (language compilers, assemblers, DBMS, sorts, scientific library routines, etc).
- Other Services: carry-in batch processing, computer output microfilm services (COM), data entry services, disaster recovery/backup services.
- Facilities Management (Systems Operations): vendor provides a complete operating information system for customer including equipment, software, personnel and facilities.
- *Professional Services* - Management consulting activity related to EDP systems consulting, production of custom software, education and training, and systems operations of client-owned computers (formerly identified as facilities management), where the vendor provides human resources to operate and manage the client facility.
- *Systems Integration* - delivery of large, multidisciplinary, multivendor systems, incorporating some or all of these functions: systems design, programming, integration, equipment, networks, installation and acceptance. Systems can encompass multiple product delivery modes.
- *Software Products*
 - Systems software and/or applications software packages purchased by users.
 - Systems Software Products

Systems Control Software: operating systems, communications monitors, network control, library control, windowing, access control, security, etc.

Data Center Management Software: capacity management, scheduling, job accounting, performance monitors, tape management, utilities, downtime/repair monitoring management, etc.

Application Development Tools Software: application generators, assemblers, compilers, 4GLs, automated documentation, languages, translators, database management systems, data dictionaries.
 - Applications Software Products

Cross-Industry Applications Software: used by clients in many or all vertical markets (i.e. payroll, word processing, spreadsheets, accounts receivable).

Industry-Specific Applications Software: unique to a specific vertical market and sold into that market only (i.e., demand deposit accounting, MRP II, hospital patient tracking).

- *Network Services*

- Network Management and Enhanced Services: network management functions, network transmission facilities, augmented with computerized switching and features such as packet switching, electronic mail, store-and-forward message switching, terminal interface and error detection and correction.
- Network Applications
 - Electronic Data Interchange (EDI): application-to-application electronic communication, based on established business document standards.
 - E-Mail: a range of services that transmits documents consisting of text and graphic material to be read by a person—with the quality of document being high.
 - All other application services in which the network is the principal part of the service, e.g., electronic funds transfer and some videotex services.

- *Electronic Information Services*

- Databases that provide specific information via terminal-based inquiry such as stock prices, legal precedents, economic indicators, airline schedules, etc.
- News services that offer current information, either general or for a specific category; i.e., financial or political
- Other services that provide interactive access to databases and offer the inquirer the capability to send as well as receive information for such purposes as home shopping, home banking, travel reservations, etc.

- *Turnkey Systems* - an integration of systems software, packaged or customized applications software, CPU, equipment, and peripherals. These systems are developed to meet a specific set of user requirements. The value added by the vendor is primarily in the software, either packaged or custom-developed. Most CAD/CAM systems and many small business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, and process control systems.

C

Other Considerations

When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint. Expenditures are then categorised according to what users perceive they are buying.

