

THE NETWORK SERVICES MARKET

W. EUROPE 1991 - 1996

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THE NETWORK SERVICES MARKET WESTERN EUROPE

1991-1996

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INPUT®
+44 71 493 9335
+33 1 46 47 65 65
+49 6447 7229

Researched and Published by

INPUT

Piccadilly House

33/37 Regent Street

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England

Network Services Programme - Europe

The Network Services Market

In Western Europe 1991-1996

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Abstract

This report analyses the Network Services market in Western Europe, providing market size and forecast data and rankings for leading competitors. Individual assessments for each country market are given, including for the first time in 1991 those for Greece, Ireland and Portugal.

The Network Services sector is defined by INPUT as comprising two major segments:

- Electronic Information Services (EI), which involves selling information to the user. Most typically these services are provided in the form of access to an on-line database (OLDB) or news service, but also include off-line access using a CD-ROM-based service.
- Network Applications, which involves providing some form of enhanced transport service in support of a user's information processing needs. These include network management services, managed network services (MNS), electronic data interchange (EDI), electronic information exchange (EIE) and other services, such as videotex or electronic funds transfer (EFT).

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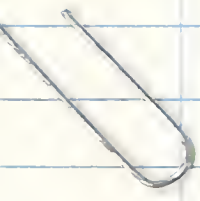


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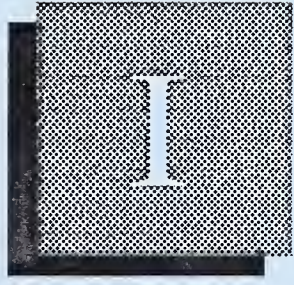
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Introduction



I Introduction

A Objectives

Network Services represents one of the fastest growing opportunity areas in the whole area of information services. Although still relatively small compared to the total IS market in Western Europe, \$4.7 billion in 1991 out of a total information services market of \$77 billion, it is anticipated to grow at 20% per annum over the next five years, compared to the 15% per annum growth rate of the whole industry.

The objectives of this study are to provide an analysis of this market opportunity, both for Western Europe as a whole and for the individual country markets within it.

Specifically the study sets out to provide current market size estimates, five year forecasts and an analysis of the leading vendors in the Network Services market.

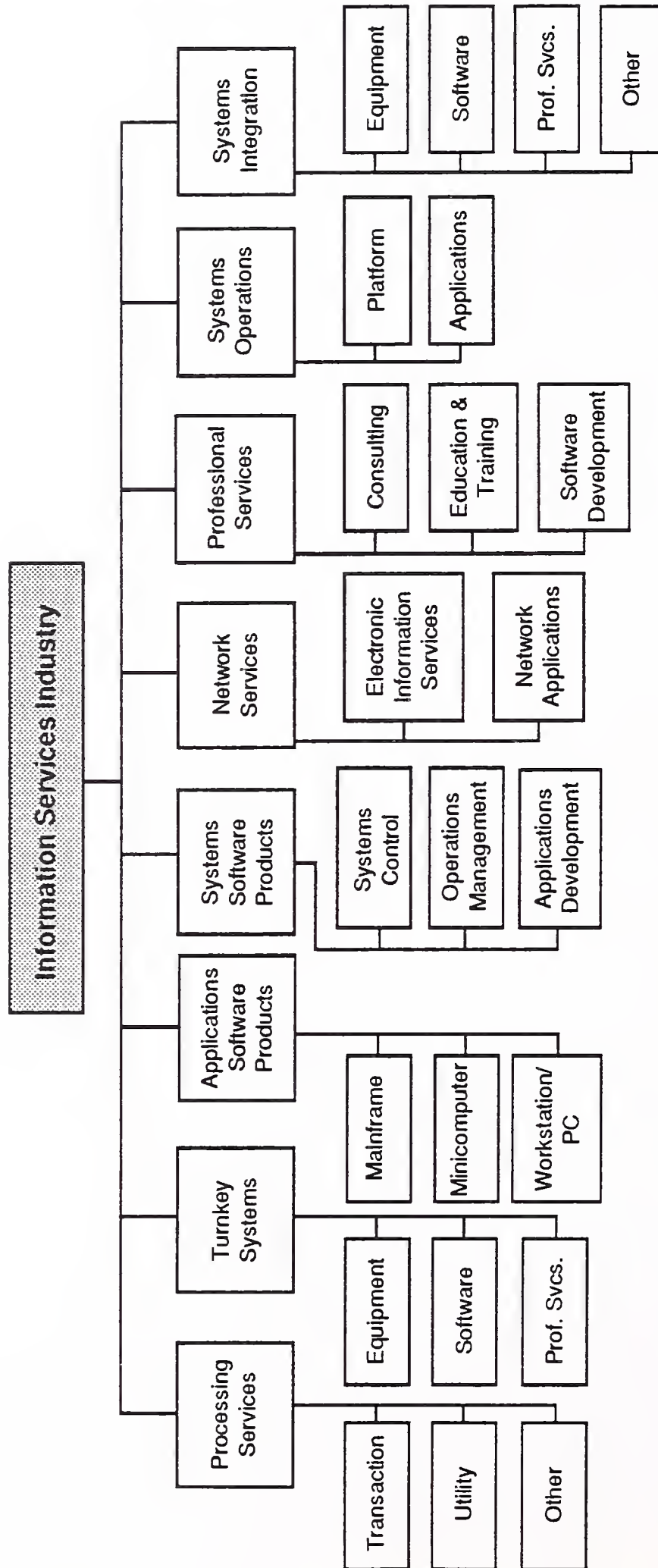
B Scope

Network Services typically includes a wide variety of network-based functions and operations. The key distinguishing feature is the involvement of the network. Exhibit I-1 positions the network services sector within the overall information services market which is further described in Section A - Chapter I Definitions in your binder. Network Services is divided into two major segments: Electronic Information services, which involve selling information to the user, and Network Applications, which involves providing a whole range of enhanced transport services in support of a user's information processing needs.

This study provides market size and forecast data for these two sectors. The market analysis provided in the study covers the whole of Western Europe and provides individual country market forecasts for 16 countries, including for the first time Greece, Ireland and Portugal.

Exhibit I - 1

Information Services Industry Structure



Source: INPUT

C **Methodology**

The research that contributed to this study was derived from a number of sources:

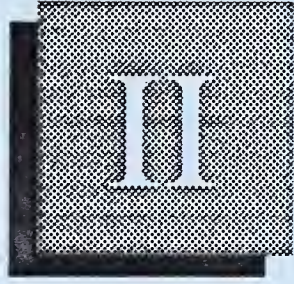
- A series of interviews specifically targeted at network services vendors active in the European market
- A series of in-depth interviews with telecommunications and IS managers in major international companies
- **INPUT's** continuous analysis of the computer software and services market which includes an annual programme of interviews with both vendors and users in Europe.

Additionally **INPUT's** extensive library and data-base of information relating to the software and services industry was utilised.

D **Report Structure**

The remaining chapters of this study are structured in the following way:

- Chapter II is an executive overview providing a concise summary of the salient points of the report.
- Chapter III provides an overview of the Western European network services market including the overall European forecast and the competitive analysis.
- Chapter IV contains the market analysis and forecast for each individual country market.
- The appendices to the study contain a detailed data-base of each country market forecast in local currency and in ECUs and a reconciliation of the differences between this forecast and previous **INPUT** forecasts for the network services market.



Executive Overview



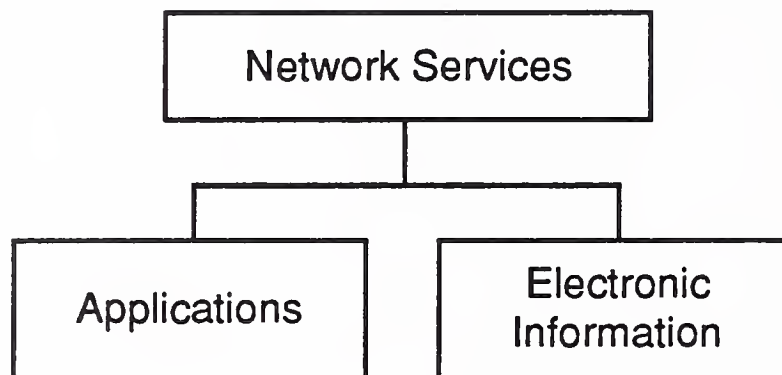
II Executive Overview

A Network Services - High Growth Market Opportunities Attract New Entrants

The network services sector continues to offer a number of high growth market opportunities. Both national and international vendors have spent 1991 consolidating their positions in the newly de-regulated markets and in newly emerging liberalised sectors. The business environment in 1991, already extremely competitive, was affected adversely by recession in many countries in northern Europe, although the economies of some of the less developed countries in southern Europe, eg. Spain, Portugal and Greece, continued to require Computer Software and Services. The application of networked electronic intelligence was seen by the user to be increasingly important as a strategic business tool. These factors maintained market growth at over 20% per annum, with much higher growth rates experienced in certain sectors. Market size is expected to reach an annual value of over \$11 billion by 1996.

One of the most important aspects in the analysis of the network services market is to define its component sectors as precisely as possible. INPUT's formal definition of network services shows a market which is comprised of two principal subsectors, network applications and electronic information services - as is shown in Exhibit II-1.

Exhibit II-1
Network Services



Electronic Information (EI) services are on-line data bases and news services.

Network Applications include the following:

- Value added network services which are network transport services supplied in addition to the provision of basic network transmission facilities, and include MNS.
- Electronic Data Interchange (EDI).
- Electronic Information Exchange (EIE) which comprises Electronic Mail (E-Mail) and Voice messaging.
- Other network services like network management services and videotex services.

B **Market Forecast**

The market forecast for the network services sector in Western Europe is shown in Exhibit II-2. This market has been stimulated out of the ongoing convergence of computer and communications technologies. INPUT differentiates it from other adjacent markets by the fact that the network is mandatory for its delivery.

Exhibit II-2

Market Forecast Network Services, 1991-1996

Subsector	User Expenditure \$ Billion		
	1991	1991-1996 CAGR (Percent)	1996
Network Applications	1.4	31	5.3
Electronic Information Services	3.3	13	6.3

The strong impetus towards deregulation of national telecommunications monopolies in Western Europe has led to the opening up of many new network services. However, the number of computing developments in the technology and the uneven nature of liberalisation across Europe have created a confused environment for both users and vendors.

A major driving force in the network services arena is the increasingly competitive nature of the economic environment within which organisations must operate. In this situation networked electronic intelligence is becoming increasingly important both as a strategic tool and as a cost saver. The wide availability of powerful personal computers with communications capabilities and the increasing acceptance of open systems standards in place of proprietary offerings are also factors causing greater pressure to use network services.

Within the network applications sector the two principal area of activity are represented by VANS and Messaging Services. VANS accounts for approximately 60% of the network applications market, and E-Messaging about 30%. The highest expectation for growth lies in the area of EDI and this service sub-sector is anticipated to grow in excess of forty percent per annum over the next five years. Users will increasingly seek to utilise third-party vendor network services for access to foreign subsidiaries and to their suppliers and customers in a speedy, efficient and secure fashion. The needs cannot all be met by private network services, which currently account for one-third of the network infrastructure investments being made in Europe.

The UK represents the largest individual country market in Western Europe due to the predominance of the Electronic Information (EI) services delivered to the London-based financial markets. Higher growth in this sector is now being experienced in other centres, notably in Germany and Switzerland, as these markets strive to counter the strength of the London market in the period leading up to 1993.

The overall dominance of the network services sector by the major country economies is shown in Exhibit II-3.

Exhibit II-3

Country Market Analysis Network Services

Country	1991 Market Size \$ Million	Percentage
United Kingdom	1,410	30
France	1,060	22
Germany	790	17
Italy	410	9
Others	1,050	22
Total	4,720	100

C Industry Markets

Exhibit II-4 provides an analysis of the leading industry sectors represented in the network services market. The predominance of the banking and finance sector is clearly indicated in the Exhibit. The insurance sector, which is not shown here separately, accounts for only five percent of the total market. The strength of electronic information services (EI) to the banking and finance sector is the key determinant of this position.

Exhibit II-4
Industry Market Analysis
Network Services

Industry Sector	Market Size 1991 \$ Million	Percentage
Banking & Finance	1,930	41
Distribution	370	8
Manufacturing	1,250	26
Others	1,170	25
Total	4,720	100

The second largest individual sector is that of distribution where EFTPOS (Electronic Funds Transfer at Point of Sale) and EDI represent two key sectors.

EDI services are continuing to penetrate the distribution sector. INS, the UK joint venture between ICL and GEIS, reported have over 1,000 companies in this sector currently in its Tradanet system. INS is the largest provider of EDI services to this sector in Europe.

EDI services are also significant to the manufacturing sector which is the third largest user of network services in Europe.

Strong growth is also forecast for the insurance sector as reliance continues to be placed on the development of specialist industry networks.

D

Competitive Analysis

Within the network services sector, two different sets of vendors compete within the two major sub-sectors of network applications and electronic information services. Accordingly the leading vendors in each of these areas are listed separately, for network applications in Exhibit II-5 and for electronic information services in Exhibit II-6.

Exhibit II-5

Leading Network Applications Vendors Western Europe

- **GEIS**
- **Infonet**
- **BT/Tymnet**
- **GSI**
- **France Telecom**

Exhibit II-6

Leading Electronic Information Services Vendors Western Europe

- **Reuters**
- **D&B**
- **Telerate**
- **Telekurs**
- **Citicorp/Quotron**

The network applications services sector supports vendors from a number of different backgrounds. The principal types of vendor are:

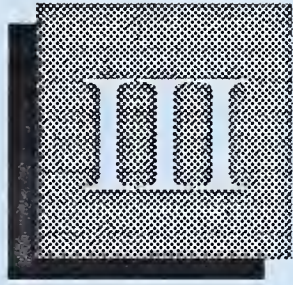
- Specialist independent network vendors such as GE Information Services and Infonet.

- Telecommunications companies such as BT/Tymnet, France Telecom and DBP Telekom, but also increasingly US companies such as AT&T and Sprint International.
- Computing and network equipment suppliers, such as IBM and Digital.

Vendors that have a considerable level of activity in other areas of the computer services business are also active in the network applications area. GSI, the French owned software and services company is a leading example from this group. Sligos, Telesystemes and AT&T Istel can also be cited in this category.

The electronic information services sector is dominated by the providers of financial data, namely Reuters, Dun & Bradstreet and Telerate. Reuters is by far the largest vendor in the market and accounts for almost 40% of the subsector. Reuters is the market leader in electronic information services (EI) in France, Germany, the UK and Italy.

Other vendors with a significant presence in the electronic information services (EI) market are the US based companies Citicorp, Mead and ADP. DAFSA, Extel and Telesystemes are the other principal European-owned vendors in this sub-sector.



Market Analysis and Forecast



III Market Analysis and Forecast

A Introduction

The convergence of computer and communications technology and the moves towards deregulation of national telecommunications monopolies have led to the opening up of many new network services. However, the relative newness of the new waves of technology, and the frequency with which new options appear, together with the liberalised or semi-liberalised environment within which they must operate have led to a confused environment for both users and vendors.

INPUT invests considerable effort throughout each research period to define the components and structure of the network services market as precisely as possible. Only by developing a good understanding of the principal service elements and how they might be packaged for the marketplace can vendors fully exploit the fast growing opportunities available.

The network services sector is currently a high growth and competitive market offering a plethora of new business opportunities. Networks provide the highways for carrying information which will become increasingly important for future economic development within Western Europe.

During 1991 the economic environment in Western Europe has become more demanding and challenging. In these conditions, networked electronic intelligence is becoming increasingly important as both a tactical and a strategic tool. The growing uses and capabilities of network services are being further enhanced by the wide availability of powerful personal computers with communications capabilities as well as by the acceptance of open system standards in place of proprietary offerings. These systems are also responsible for creating the demand for bandwidth which is driving the networking industry in an explosive manner.

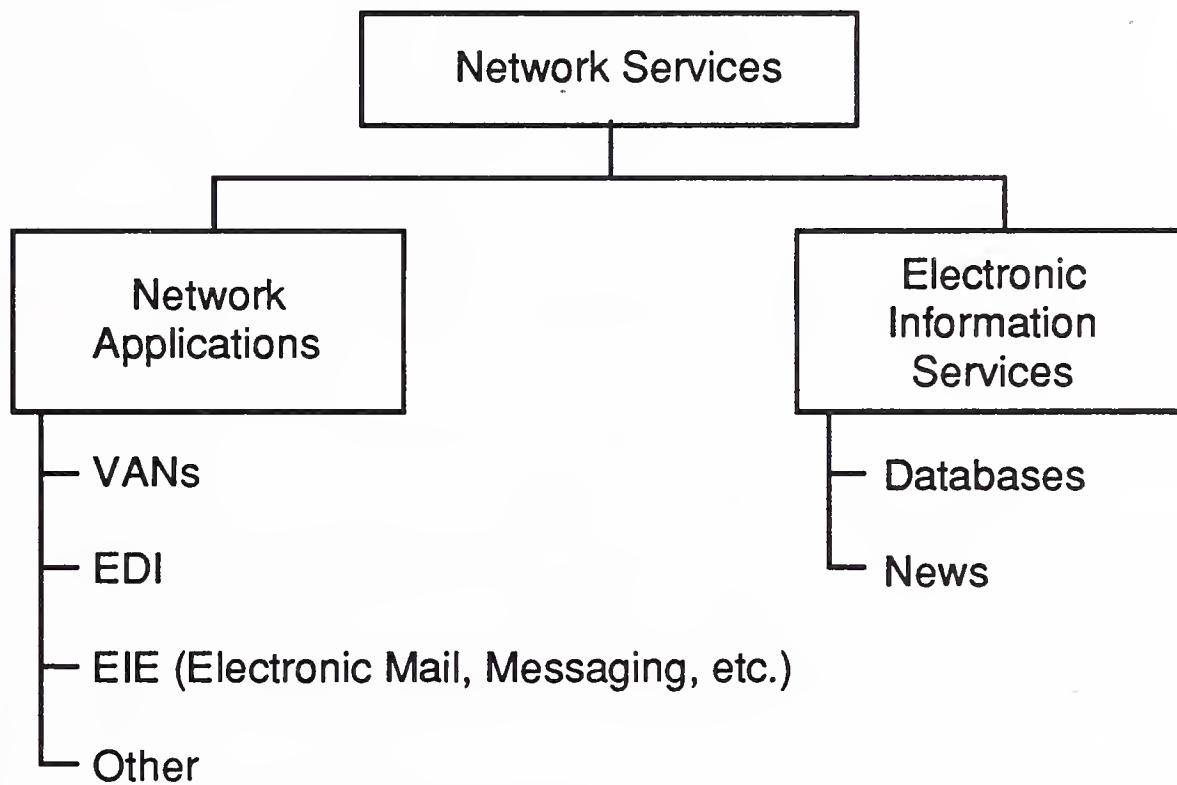
On the supply side the activities of many leading national and international vendors are continuing to provide considerable market stimulus. The level of merger and acquisition activity and the development of strategic alliances help individual vendors to develop their market presences, both nationally and on a pan-European basis.

The impact of new technology on network services supply and demand has been pervasive: digitalisation, fibre optics, mobile communications and satellite technology are all expanding access to sources of information - knowledge databases, software and image bank archives for example - and thus expanding the available range of services that can be provided.

B **Market Definition**

The structure of the Network Services market as defined by **INPUT** is shown in Exhibit III-1.

Exhibit III-1
Network Services Market Structure



The network applications sector comprises the following types of services:

- Value Added Network Services (VANS). VAN Services, sometimes referred to as Enhanced Services, are network transport services which provide such functions as automatic error detection and correction, protocol conversion and store and forward message switching in addition to the provision of basic network transmission facilities. Exhibit III-2 lists the principal types of services defined in this category.

Exhibit III-2

Value Added Network Services - Enhanced Services

- **Protocol Conversion**
- **Error Correction**
- **System Management**
- **Store and Forward**
- **Packet Switching**

- Electronic Data Interchange (EDI). Application-to-application exchange of standardised business documents between trade partners or facilitators.
- Electronic Mail (E-Mail). Also called Electronic Information Exchange (EIE), E-Mail involves the person-to-person transmission of messages across an electronic network managed by a services vendor. E-Mail is also used in conjunction with EDI services.
- Other Network Services. This category includes videotex and network management services.

Videotex uses a number of national standard delivery modes to provide network application support. Its prime focus is on the individual both as a consumer or in business. Videotex services provide interactive access to databases and offer the inquirer the capability to conduct transactions as well as to receive information - for such purposes as home shopping, home banking and travel reservations.

- Network management services included in this category must involve the vendor's network and network management system not merely vendor staff. People-only services, or services that involve the management of networks as part of the broader task of managing a user's information processing functions are included in Systems Operations. Network management services relate to the management of the physical network itself and not to the traffic (data) transmitted across it.

Electronic information services (EI) provide access to databases that provide specific information via a terminal-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers. Users typically inquire into and extract information from the databases. Although users may load extracted data into their own computer systems, the electronic information vendor usually provides no data processing or manipulation capability and the users cannot update the vendor's data bases.

The two kinds of Electronic Information Services are:

- On-line Data Bases - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products materials etc.
- News Services - Unstructured, primarily textual information on people, companies, events, etc.

While electronic information services continue to be delivered via on-line networks, there is a growing trend towards the use of CD ROM or optical disks to support or supplant on-line services. Such optical disk-based systems are included in the definition of EI under this delivery mode.

C **Market Size and Growth**

1. Forecast Assumptions

The market assessments and forecasts provided in this report cover the period 1989 through to 1995 and assess user expenditure for network services contracts. Market sizes and forecasts are assessed in local currency and converted into US dollars for aggregation and comparative purposes. The exchange rates used for this purpose are listed in Section A of your binder. Conversion of the country market forecasts from local currency into ECUs is provided in Appendix B, the ECU conversion rates also being listed in Section A.

Forecasts have been expressed in actual monetary terms and therefore include estimates for inflation. The inflation rates that have been used for each European country forecast are also listed in Section A.

2. Market Size and Growth

The Western European market forecast for the Network Services sector is shown in Exhibit III-3. Currently this market is dominated by the Electronic Information (EI) services sector, but the much higher growth expectation for Network Applications over the next five years will alter this position significantly. It is expected on current growth estimates that Network Applications will be the larger sector by 1997.

The relative size of the whole sector in comparison with that of the adjacent market of processing services is shown in Exhibit III-4. For a detailed analysis of the processing services sector see INPUT's study on this sector in the MEMAP Programme binder. Exhibit III-4 also shows the analysis of the network applications sector into the submodes of VANS and Other, EDI, and Electronic Mail.

Exhibit III-3

Network Services Market Forecast Western Europe, 1991-1996

Subsector	User Expenditure (\$ Millions Rounded)			
	1990	1991	1991-1996 CAGR (Percent)	1996
Network Applications	1,090	1,390	31	5,340
Electronic Information Services	2,940	3,320	13	6,250
Total	4,030	4,720	20	11,590

Exhibit III-4**Market Sector Comparisons Western Europe 1991**

Processing Services \$9.4 billion	Network Applications \$1.4 billion	Electronic Information Services \$3.3 billion
--------------------------------------	---------------------------------------	--

VANS & Other \$0.8 billion	EDI \$0.1 billion	EIE (Messaging Services) \$0.5 billion
-------------------------------	----------------------	---

Exhibit III-5 shows the market forecast for the network applications submodes in Western Europe. For a more detailed description of the EDI markets, reference should be made to the companion **INPUT** study, *The Western European EDI Market, 1991-1996*, which also appears in the Network Services Programme binder.

Exhibit III-5**Network Applications Services Market Forecast
Western Europe 1991-1996**

Sector	User Expenditure \$ Millions		
	1991	1991-1996 CAGR (Percent)	1996
VANS and Other	790	28	2,850
EDI	70	36	500
Electronic Mail	530	33	2,200
Total	1,390	31	5,340

D **Comparative Country Markets**

Exhibit III-6 shows the country market analysis of the total Western European network services market in US dollars. The UK market is forecast to remain the largest contributor to the sector as a result of the very large proportion of EI business generated in the London financial markets. However, the financial deregulation occurring in Western Europe in the progress towards 1993 is creating much higher growths in Germany, Italy and Spain.

The four largest economies in Western Europe - Germany, France, Italy and the UK - account for just under 80% of the total market a position not predicted to change significantly by 1996, although it will decline by a percentage point or so.

The Network Services sector shows greater concentration in the leading economies than for the software and services sector as a whole, 78% for network services against 70% for the entire sector.

Exhibit III-6

**Network Services
Comparative Country Market Forecasts
Western Europe, 1991-1996**

Country	User Expenditure (\$ Millions)*			
	1990	1991	1996	1991-1996 CAGR (Percent)
United Kingdom	1,245	1,410	2,950	16
France	910	1,060	2,560	19
Germany	635	790	2,380	24
Italy	360	410	995	19
Netherlands	180	205	425	16
Spain	125	160	535	28
Switzerland	130	155	415	22
Belgium	95	115	290	20
Sweden	105	125	325	21
Denmark	75	85	220	21
Austria	50	55	100	13
Finland	50	55	140	19
Norway	45	55	140	20
Ireland	15	20	45	18
Greece	10	15	50	29
Portugal	5	5	20	30
Total	4,030	4,720	11,590	20

* Rounded to nearest \$5 million at country level and to nearest \$10 at Total level

E Industry Market Analysis

The industry sector analysis of the network services market, shown in Exhibit III-7, clearly indicates the dominance of the banking and finance sector. A companion study in this year's programme is called *Financial Network Services, Western Europe 1991-1996*. It is devoted to a more detailed analysis of the role of network services to the financial services community. Due to the effects of recession worldwide this sector has not grown as fast as was anticipated in our previous reports.

Exhibit III-7

Industry Sector Analysis Network Services Western Europe, 1991-1996

Industry Sector	User Expenditure \$ Millions		
	1991	1991-1996 CAGR (Percent)	1996
Manufacturing	600	17	1,290
Distribution	900	25	2,740
Utilities	115	18	260
Banking & Finance	1,930	19	4,700
Insurance	265	19	640
Government	230	23	640
All other	680	14	1,320
Total	4,720	20	11,590

The banking and finance sector accounts for over 40% of the Network Services market and of this over 60% is generated by electronic information services (EI). Leading vendors addressing this market include Dun & Bradstreet (Datastream), Reuters, Telerate and Telekurs.

The two key areas within the distribution sector are EFTPOS (Electronic Funds Transfer at Point of Sale) and EDI. Due to the increasing adoption of the EDIFACT standard among European institutions, these two areas are now converging with banks offering services in conjunction with national and international service suppliers.

European distribution companies adopted strategies to make use of international networking. The adoption of a range of EDI standards will continue for some time in the distribution sector.

Strong growth is forecast for the insurance sector as more and more reliance is placed on utilising electronic information services and insurance industry networks. During 1991 many large insurance companies reported poor results.

The manufacturing sector primarily in the discrete rather than the process sector, and led by the motor manufacturers is already using EDI and to an increasing extent. This makes the discrete manufacturing industry the leading sector for EDI within Western Europe in 1990.

However, there remains considerable scope to extend the use of EDI (and E-Mail as a person-to-person control function associated with EDI) in terms of the number of organisations linked and the variety of transactions.

F **Competitive Analysis**

In interpreting the competitive analysis for the network services sector it is more meaningful to analyse separately the vendors active within the two major sub-sectors of network applications and electronic information services. Accordingly the leading European network applications services vendors are listed in Exhibit III-8, and the leading European electronic information services vendors are listed in Exhibit III-9.

Not only are these two sub-sectors of different size but are populated by vendors with different backgrounds in each case. In particular the electronic information services market is dominated by the specialist vendors of financial and business information namely Reuters, Dun & Bradstreet and Telerate.

In contrast the network applications services sector is competed for by a number of categories of vendor of which the principal types are:

- Specialist independent network vendors,
- Processing services vendors,
- Telecommunication companies (public and private owned),
- Increasingly computer and network equipment suppliers such as Digital, IBM and ICL (Fujitsu).

The ranking of leading vendors in the major country markets of France (Exhibits III-10 and III-11), Germany (Exhibits III-12 and III-13), the UK (Exhibits III-14 and III-15) and Italy (Exhibits III-16 and III-17) all show a significant number of changes in the listings due to INPUT's increasing accuracy in splitting vendor revenues across the emerging sectors of the Network Services market.

Exhibit III-8

Leading Vendors Network Application Services
Western Europe 1990

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues \$ millions
1	GEIS	10	105
2	Infonet	9	100
3	BT/Tymnet	8	90
4	GSI	8	85
5	France Telecom	7	75
6=	AT&T	6	60
6=	Sligos	6	60
8=	DBP Telekom	5	55
8=	IBM	5	55
10	Bull	4	45
	Others	33	360
	Total Market	100	1,090

Exhibit III-9

**Leading Vendors Electronic Information Services
Western Europe 1990**

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues \$ millions
1	Reuters	37	1,100
2	Telerate	8	240
3	Dun & Bradstreet	6	170
4	Telekurs	4	110
5	Citicorp/Quotron	3	95
6	DAFSA	2	70
7	Extel	2	65
8	Mead	2	55
9	ADP Financial	2	50
10	Telesystemes	1	30
	Others	32	955
	Total Market	100	2,940

Exhibit III-10

Top Vendor Rankings and Market Shares, 1990
Network Applications
France

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues FF millions
1	France Telecom	23	430
2	GSI	18	330
3	Sligos	13	240
4	Telesystemes	8	150
5 =	Bull	7	130
5 =	Infonet	7	130
7	SG2	5	85
8 =	Alcatel	4	80
8 =	Axime	4	75
10	Steria	4	70
	Others	7	130
	Total Market	100	1,850

Exhibit III-11

Top Vendor Rankings and Market Shares, 1990
Electronic Information Services
France

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues FF millions
1	Reuters	36	1,180
2	DAFSA	12	390
3	Telerate	11	350
4	Telesystemes	9	300
5	Dun & Bradstreet	6	195
6	Citicorp/Quotron	3	105
7	Mead	2	60
8	Telekurs	2	55
9	Extel	< 1	6
10	Quick	< 1	5
	Others	20	654
	Total Market	100	3,300

Exhibit III-12

Top Vendor Rankings and Market Shares, 1990
Network Applications
Germany

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues DM millions
1	DBP	50	95
2	IKOSS	10	18
3	IBM	8	15
4	Infonet	6	12
5	GEIS	5	10
6	Bull	3	6
7=	DAT-Gruppe	3	5
7=	Alldata	3	5
9=	Info AG	2	4
9=	GSI-Datel	2	4
	Others	8	16
	Total Market	100	190

Exhibit III-13

Top Vendor Rankings and Market Shares, 1990
Electronic Information Services
Germany

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues DM millions
1	Reuters	42	370
2	Telerate	7	65
3=	Bertelsmann	7	60
3=	Genios	7	60
3=	VWD	7	60
6=	Dun & Bradstreet	5	45
7	Telekurs	2	20
8	Mead	1	11
9	STN	1	6
10	Datastar	1	5
	Others	20	178
	Total Market	100	880

Exhibit III-14

**Top Vendor Rankings and Market Shares, 1990
Network Applications
United Kingdom**

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues millions
1	BT/Tymnet	29	45
2	AT&T Istel	19	30
3	GEIS	10	15
4	IBM	5	8
5	Compuserve	4	6
6	Sprint-Telenet	3	5
7	GSI	3	4
8	EDS	2	3
9=	Centre-file	2	3
9=	CMG	2	2
	Others	22	34
	Total Market	100	155

Exhibit III-15

Top Vendor Rankings and Market Shares, 1990
Electronic Information Services
United Kingdom

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues millions
1	Reuters	35	170
2	Telerate	9	45
3=	Citicorp/Quotron	6	30
3=	Extel	6	30
5=	ADP Financial	4	20
5=	Dun & Bradstreet	4	20
7	Quick	3	14
8	Mead	2	12
9	Infolink	2	11
10	Infocheck	1	5
	Others	26	128
	Total Market	100	485

Exhibit III-16

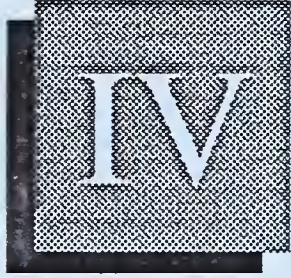
Top Vendor Rankings and Market Shares, 1990
Network Applications
Italy

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues Lira billions
1	Infonet	13	15
2	GSI	10	12
3=	IBM	7	8
3=	Intesa	7	8
5	GEIS	6	7
6	Lombardia Informatica	5	6
7=	Digital	4	5
7=	Olivetti	4	5
7=	Sligos	4	5
10	Bull	3	4
	Others	38	45
	Total Market	100	120

Exhibit III-17

Top Vendor Rankings and Market Shares, 1990
Electronic Information Services
Italy

Rank	Company	Estimated Market Share (% Rounded)	Estimated Revenues Lira billions
1	Reuters	38	120
2	Cerved	11	35
3=	Extel	8	25
3=	IRI	8	25
5=	Citicorp/Quotron	5	15
5=	Telerate	5	15
7	Intesa	3	10
8	Lombardia Informatica	2	6
9	Datitalia Processing	2	5
10	Mead	2	5
	Others	18	59
	Total Market	100	320



Country Market Analysis



IV Country Market Analysis

This chapter provides data on the network services market in the individual countries of Western Europe. Each country is identified separately. This year Greece, Portugal and Ireland, which were up to now treated as a group, have been broken out individually.

Exhibits IV-1 through IV-16 contain market analysis and forecast data for each country in local currency. All these tables have been based upon rounded figures at the individual cell and total levels. Therefore totals may not always tally to the sum of the individual cells shown.

Comparative country market sizes expressed in US dollars can be found in Chapter III section C. A complete data-base of country market forecasts expressed in local currencies can be found in Appendix A. Appendix B contains the forecast data base for each country expressed in ECU's.

Exhibit IV-1

Network Services Market Forecast, 1991-1996 France

Subsector	FF Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	1,850	2,300	2,900	27	7,500
Electronic Information Services	3,300	3,700	4,200	13	6,950
Total	5,200	6,000	7,100	19	14,500

Exhibit IV-2

**Network Services
Market Forecast, 1991-1996
Germany**

Subsector	DM Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	190	275	390	42	1,600
Electronic Information Services	880	1,050	1,200	18	2,400
Total	1,050	1,350	1,600	24	4,000

Exhibit IV-3

**Network Services
Market Forecast, 1991-1996
United Kingdom**

Subsector	£ Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	155	195	250	29	690
Electronic Information Services	485	530	580	9	830
Total	640	725	830	16	1,520

Exhibit IV-4**Network Services
Market Forecast, 1991-1996
Italy**

Subsector	Lira Billions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	120	155	210	32	630
Electronic Information Services	320	350	390	11	595
Total	440	505	600	19	1,225

Exhibit IV-5**Network Services
Market Forecast, 1991-1996
Sweden**

Subsector	SK Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	190	245	330	32	1,000
Electronic Information Services	400	445	500	13	810
Total	590	690	830	21	1,810

Exhibit IV-6

**Network Services
Market Forecast, 1991-1996
Denmark**

Subsector	DK Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	160	200	260	31	780
Electronic Information Services	305	345	385	13	640
Total	465	545	645	21	1,420

Exhibit IV-7

**Network Services
Market Forecast, 1991-1996
Norway**

Subsector	NK Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	90	115	145	28	390
Electronic Information Services	210	240	270	16	510
Total	300	360	420	20	900

Exhibit IV-8

**Network Services
Market Forecast, 1991-1996
Finland**

Subsector	FM Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	75	90	110	24	260
Electronic Information Services	115	135	155	17	300
Total	190	230	270	19	560

Exhibit IV-9

**Network Services
Market Forecast, 1991-1996
Netherlands**

Subsector	Dfl Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	95	115	140	20	290
Electronic Information Services	205	235	270	13	430
Total	300	350	410	16	720

Exhibit IV-10**Network Services
Market Forecast, 1991-1996
Belgium**

Subsector	BF Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	1,100	1,400	1,750	26	4,400
Electronic Information Services	2,200	2,550	3,000	17	5,600
Total	3,300	3,950	4,750	20	10,000

Exhibit IV-11**Network Services
Market Forecast, 1991-1996
Switzerland**

Subsector	SF Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	25	35	50	38	175
Electronic Information Services	140	160	185	17	350
Total	165	195	235	22	525

Exhibit IV-12**Network Services
Market Forecast, 1991-1996
Austria**

Subsector	Sch Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	75	100	130	27	330
Electronic Information Services	490	540	590	9	840
Total	570	640	720	13	1,170

Exhibit IV-13**Network Services
Market Forecast, 1991-1996
Spain**

Subsector	Pta Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	3,100	4,400	6,400	43	26,000
Electronic Information Services	8,900	10,500	13,000	18	24,700
Total	12,000	14,900	19,400	28	50,700

Exhibit IV-14

**Network Services
Market Forecast, 1991-1996
Portugal**

Subsector	Esc Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	190	270	380	43	1,600
Electronic Information Services	500	620	770	24	1,800
Total	700	900	1,150	30	3,400

Exhibit IV-15

**Network Services
Market Forecast, 1991-1996
Greece**

Subsector	Dra Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	500	700	900	38	3,500
Electronic Information Services	1,400	1,800	2,200	25	5,500
Total	1,900	2,500	3,100	29	9,000

Exhibit IV-16

**Network Services
Market Forecast, 1991-1996
Ireland**

Subsector	IR Millions				
	1990	1991	1992	1991 1996 CAGR (Percent)	1996
Network Applications	2	3	3	25	9
Electronic Information Services	5	6	7	15	12
Total	7	9	10	18	21



Vendor Profiles



V Vendor Profiles

A Introduction

The following five profiles are chosen to illustrate the variety of vendor companies active in the network services sector. The profiles are the standard INPUT profiles taken from the Vendor Analysis Programme, an INPUT subscription programme offering profiles on over 300 important software and services vendors active in Western Europe. All five have been updated or added in 1991.

The companies profiled and their significance in the marketplace are as follows:

- Cable and Wireless plc is a telecommunications company which has been trading for almost 100 years. It is a recent entrant into the Network Services sector. Its subsidiary Mercury Communications Limited is a public telecommunications operator (PTO) in the UK. It has recently established the infrastructure for an international managed network service to be offered in 1992.
- danNet is a joint venture in Denmark between IBM Denmark and one of the regional telecomms operators. It is active in a range of network application subsectors.
- France Telecom is represented by two of the subsidiaries which operate services outside the monopoly area of public telephony:
 - Telesystemes offers Electronic Information (EI) services and network management
 - Transpac, besides running France's national packet-switching network, is active in offering network applications services in France and recently in the UK also.
- GEIS is the historical market leader in network applications with a range of service lines, including EDI, EIE and network management besides its traditional processing services offered in the financial services sector.

B **Cable and Wireless Company Profile**

CABLE AND WIRELESS PLC

New Mercury House
26 Red Lion Square
London WC1R 4UQ
United Kingdom
Tel: 44 71 315 4000
Fax: 44 71 315 5000

CEO: The Rt Hon Lord Young of
Graffham, Executive Chairman
Status: Public Company
Number of Employees: 39,000
Revenue (FYE 31-3-91) £ 2,593m.

The Company

Cable and Wireless plc (C&W) is one of the world's leading international telecommunications groups. It provides to both business and domestic users various types of telecommunications services, which include:

- Telephone, facsimile, telex and data transmission.

It has operations in 50 countries and employs over 39,000 people. The group provides external telecommunications to more than 30 countries and internal telecommunications to more than 20.

It also:

- Owns and operates a fleet of ten vessels and three submersible vehicle systems for the laying, burial and maintenance of submarine cable systems;
- Has part ownership of two other vessels through associated undertakings.

The group also:

- Provides and manages communication facilities and services for public and private customers;
- Provides telecommunications consultancy worldwide.

During the 1990/91 trading year, C&W's turnover continued to grow.

Profit before tax and minority interests increased by some 16% (81.8 million). Trading profit was maintained at the 1990 level despite exchange rate movements and exceptional charges.

Latest results from associated undertakings showed an increase of 40% principally as a result of the acquisition of 49% of the Trinidad and Tobago Telephone Company in December 1989. Increased profits also arose in:

- Eastern Telecommunications Philippines Inc.;
- Pacific Telecom Cable Inc. (from sales of capacity in the newly laid North Pacific Cable).

These increases were partially offset by start-up losses in Asia Satellite Telecommunications Company Limited and Mercury Callpoint Limited (a Telepoint service company).

C&W recently restructured its management into two groups: one responsible for businesses within the Organisation for Economic Cooperation and Development, the other for operations in non-OECD nations.

Each group will be headed by an executive director reporting to the executive chairman. The change will become effective from October 1991.

Mercury Communications Ltd.'s chief executive, Peter van Cuylenburg, was named group director responsible for the OECD-based businesses, including North America, Western Europe and Japan.

Brian Pemberton, managing director at Cable & Wireless Worldwide Services, was appointed group director for non-OECD businesses, including the Caribbean, Mid-East, Asian-Pacific region and Hong Kong, where the company owns a majority stake in the colony's telephone monopoly, Hong Kong Telecommunications Ltd.

Other appointments were:

Director of finance Rod Olsen was named group director of finance and business planning.

Michael Harris, chief executive of Midland Bank PLC's First Direct phone-in banking services unit, was appointed chief executive of Mercury Communications.

Exhibit A lists the principal subsidiaries of the group as at 31st March, 1991. All subsidiaries are wholly owned unless otherwise stated.

Exhibit A

NAME OF SUBSIDIARY	COUNTRY OF INCORPORATION	AREA OF OPERATION
Cable and Wireless (Marine) Limited	England	Worldwide
Cable and Wireless (West Indies) Limited	England	West Indies
Mercury Communications Limited	England	U.K.
Mercury Personal Communications Network Limited (60 per cent owned)	England	U.K.
Telephone Rentals plc	England	U.K.
Barbados External Telecommunications Limited (60 per cent owned by a subsidiary)	Barbados	Barbados
Barbados Telephone Company Limited (65 per cent owned by a subsidiary)	Barbados	Barbados
Cable and Wireless (Network Services) Limited	Bermuda	Worldwide
Grenada Telecommunications Limited (70 per cent owned by a subsidiary)	Grenada	Grenada
Cable and Wireless (Far East) Limited	Hong Kong	Far East
Hong Kong Telecommunications Limited (HKT) (58.4 per cent owned including 32.5 per cent by subsidiaries)	Hong Kong	Hong Kong
Hong Kong Telecom International Limited (100 per cent owned by HKT)	Hong Kong	Hong Kong
Hong Kong Telecom CSL Limited (100 per cent owned by HKT)	Hong Kong	Hong Kong
Hong Kong Telephone Company Limited (100 per cent owned by HKT)	Hong Kong	Hong Kong
Telecommunications of Jamaica Limited (TOJ) (79 per cent owned by a subsidiary)	Jamaica	Jamaica
Jamaica International Telecommunications Limited (100 per cent owned by TOJ)	Jamaica	Jamaica
Jamaica Telephone Company Limited (100 per cent owned by TOJ)	Jamaica	Jamaica
Companhia de Telecomunicacoes de Macau S.A.R.L. (51 per cent owned)	Macau	Macau
Dhivehi Raajjeyge Gulhun Private Limited (51 per cent owned)	Maldives	Maldives
Paktel (PVT) Limited (80 per cent owned)	Pakistan	Pakistan
St. Kitts and Nevis Telecommunications Limited (80 per cent owned by a subsidiary)	St Kitts and Nevis	St Kitts and Nevis
Cable and Wireless (Seychelles) Limited	Seychelles	Seychelles
Cable and Wireless North America, Inc.	U.S.A.	U.S.A.
Cable and Wireless Communications, Inc. (100 per cent owned by a subsidiary)	U.S.A.	U.S.A.
Yemen International Communications Company (65 per cent owned)	Republic of Yemen	Yemen

Recent Events

In June 1990, C&W was granted a new 20 year licence to operate both the national and international telecommunications for the Turks and Caicos Islands.

In July 1990, C&W acquired the entire share capital of Direct Call Limited, a UK telemarketing agency trading under the name Adlink.

In September 1990, C&W acquired a 39.9% shareholding in Comvik Skyport AB (now Tele 2 AB), a Swedish company with a licence to offer services in competition to the national telephone company Televerket. Tele 2 AB commenced operations in October 1990.

In October 1990, C&W entered into an agreement with Toyo Information Services Co Ltd of Japan to form a new venture Fair-way Networks Limited (Fair-way), to provide international value-added telecommunications services in Japan. The new company, in which C&W has a 50% interest, commenced operations in January 1991.

In November 1990, C&W increased its shareholding in Telecommunications of Jamaica Limited from 59% to 79% by the purchase of additional shares from the Government of Jamaica.

In November, 1990, C&W acquired the assets of AlbaData Technology, a US company, trading under the name DataAmerica which provides domestic and international data networking services.

In December 1990, C&W announced a public offering of new shares in its 80% owned subsidiary, St. Kitts and Nevis Telecommunications Limited, and now holds some 70%, the islands' Government 18% and the public 12%.

In January 1991, C&W entered into an agreement to acquire TRT/FTC, a US domestic and international telecommunications carrier, subject to regulatory approvals.

In January 1991, Telecommunication Services of Trinidad and Tobago Limited was formed from a merger of the islands' two companies, in which C&W has a 49% interest.

Global Strategy

Two themes underlie the events of the last 12 months:

- One is the strengthening of C&W's position in its key centres around the world;
- The other is its strategy of linking the major centres in which it operates.

By virtue of its history, C&W is unlike any other telecommunications company in the world. Instead of having grown from a single home base, like most PTOs (Public Telecommunications Operators), it provides services in 50 different countries and supplies them in a variety of political, economic and regulatory environments.

1. Global requirements.

Over the last decade as more and more companies and organisations have begun to operate globally, although they have found that C&W has never been far away, what they need more than local presence is global telecommunications so that, for example, New York can communicate with Hong Kong or London or Japan, as easily as one floor might talk to another in a head office. Much of the group's efforts in the last five years have been devoted to making this possible.

2. Global network

A major endeavour has been the building of the Global Digital Highway, a broad-band fibre optic network connecting the main business and commercial centres of Europe, North America and the Pacific Rim countries. The last major section - the North Pacific Cable - was brought into service in May 1991. The commissioning of new cables connecting Hong Kong to Japan and Korea and to Taiwan took place in July 1990, while more cables are being planned in other parts of the Asia Pacific region.

By buying telecommunications capacity, leasing lines and forming alliances, C&W has added to the network in such a way that it now owns and operates telecommunications capacity right around the world. By putting intelligence in the network C&W is able to offer its customers an international network that looks and behaves like a private system with all the benefits of a common technology and common standards across the world.

One of the group's aims with its round-the-world capacity is to offer an international managed data network service. This already exists in parts - for example in Hong Kong and the UK. What is required now is the filling in of the gaps and to link the parts together. The acquisition of DataAmerica in the USA last November supplied another piece in the worldwide data-networking jigsaw. In Japan, the new joint venture, Fair-way, will fulfill a similar function.

3. Regional ventures

Fair-way is also important for taking C&W into the Japanese domestic market for the first time, complementing its shareholding in one of Japan's international network operators, IDC. In the USA the acquisition of TRT/FTC will give C&W new international capability to support its existing domestic US operation.

The growth in Europe implements the global strategy in a different way. Here the group is expanding its coverage in the main business centres with:

- . Sales offices in France, Italy, Germany and Ireland;
- . The launch of cross-border services as and when local regulators allow.

Market Analysis

The turnover of the C&W Group of companies is derived principally from public telecommunications services including:

- International and domestic telephone services (which include facsimile and data transmission);
- Other telecommunication services such as leased circuits and telex services;
- The sale and rental of telecommunications equipment manufactured by others.

Total turnover in the 1991 financial year was £2,592million, an increase of £276.6m. over 1990, an increase of 12% when expressed in pounds sterling, the currency of consolidation.

International services account for £1,194.2m., an increase of 13% over 1990. Growth in international telecommunications business included growth in both facsimile and data transmission.

Turnover from domestic telephone services was £580.8m., an increase of 23% over 1990. This increase was due largely to the material growth in both the customer base and the number of minutes of traffic carried by Mercury Communications in the United Kingdom (see separate profile). In the Asia and Pacific region the number of subscribers also increased, in both Macau and Hong Kong.

Turnover from other telecommunication services increased by 7% to £390.7m. Mercury Communications leased circuit revenue increased by over 50%. Mobile telephone business continued to grow in the Asia and Pacific region.

The following tables summarise the revenue breakdowns.

Financial Information

Exhibit B

1990/1991 REVENUE BREAKDOWN BY REPORTED PRODUCT GROUP (£ MILLIONS)

REGION	REVENUE*	PERCENT	ANNUAL GROWTH OVER PREVIOUS YEAR
International telephony (including facsimile and data)	1,194.2	46.1	+13%
Domestic telephone services	580.8	22.4	+23%
Other telecommunications services (leasing of circuits, mobile telephones, telex)	390.7	15.1	+7%
Equipment sales/rentals	295.0	11.4	-4%
Cableships and contracts	132.2	5.1	+19%
TOTAL	2,592.9	100.0	+12%

Exhibit C

1990/1991 REVENUE BREAKDOWN BY REPORTED GEOGRAPHIC REGION (£ MILLIONS)

REGION	REVENUE*	PERCENT	ANNUAL GROWTH OVER PREVIOUS YEAR
Asia and Pacific	1,163	45	+2%
Africa, Middle East and Indian Ocean	49	2	-3%
Western Hemisphere	547	21	0
Europe	834	32	+44%
TOTAL	2,593	100	+12%

* After elimination of inter-regional revenues

Exhibit D

1990/1991 REVENUE BREAKDOWN BY INPUT DELIVERY MODE (£ MILLIONS)

YEAR	MODE	£ REVENUE ⁺	PERCENT	ANNUAL GROWTH OVER PREVIOUS
	Processing Services	1	<0.1	+100%
	Network Services	63	2	+100%
	Professional Services	4	<0.2	+30%
	Turnkey Systems	5	<0.2	+10%
	Total Software and Services	73	3	+98%
	Telephone and Telegraph Services	2,093	81+	13%
	Equipment	295	11	-4%
	Other (eg cables) ships)	122	5+18%	
	TOTAL	2,593	100	+12%

⁺ INPUT Estimates

Exhibit E

FIVE-YEAR FINANCIAL SUMMARY (FYE 31-03) (£ MILLIONS)

YEAR	1987	1988	1989	1990	1991
Turnover	1,201.1	1,244.1	1,534.1	2,316.3	2,592.9
Trading profit	268.4	288.7	366.7	563.4	563.0
Profit before taxation	340.5	356.1	420.5	526.7	608.5
Profit after taxation	267.0	292.6	345.5	432.5	493.2
Minority interests	43.1	48.0	60.1	105.0	158.6
Profit before extraordinary items	223.9	244.6	285.4	327.5	334.6
Extraordinary items	(8.5)	15.9	128.7	487.1	(29.8)
Assets	1,890.6	2,022.3	2,942.3	4,371.2	4,384.9
Liabilities	696.5	754.2	1,361.6	1,639.0	1,665.5
Shareholders' funds	1,063.8	1,137.7	1,357.3	2,209.2	2,236.2
Earnings per share in pence	22.0p	24.0p	27.9p	31.3p	31.3p

C danNet Company Profile

danNet a/s

Blokken 9
3460 Birkerød
Denmark
Tel: 45 45 82 16 00
Fax: 45 45 82 16 44

Managing Director: Agner Mark
Status: Private
Number of Employees: 125
Revenue (FYE 31-12-90): DKK 90 million

The Company

danNet was founded in 1987 by IBM Denmark and The Copenhagen Telephone Company (KTAS) and started operating on January 1st 1989.

The purpose of danNet is to provide Value Added Network Services (VANS), Value Added Services (VAS) and Software Services to the Danish and Scandinavian business communities.

Exhibit A

SHAREHOLDERS

SHAREHOLDER	PERCENT OWNED
KTAS	50
IBM Denmark A/S	50

Exhibit B

OTHER EXECUTIVES

NAME	POSITION
Bent Baek Jensen	R&D Manager
Soeren Justesen	Sales Manager
Bente Hasgard	Finance Manager

danNet participates in the GAUCHO project (Generalised distributed Architecture for Unified Communication in Heterogenous Open system interconnection), a comprehensive research and analysis programme under the EEC's ESPRIT programme. Its purpose is to contribute to a common international basis for electronic communication.

danNet is also involved in TEDIS, an EEC programme with the aim of spreading the use of EDI in Europe.

In March 1991, danNet employed 125 staff.

Key Products and Services

danNet offers a full range of VANS including:

- **dN/Link**; connections of terminals and computer systems on various protocols and from different public data networks.
- **dN/Info**; access to databases and information providers.
- **dN/Post**; electronic mail service.
- **dN/Fil**; filetransfer.
- **dN/EDI**; electronic Data Interchange.

danNet has links to several other VAN's. These links enable danNet customers to communicate with users on other networks including:

- IBM Information Network
- GEIS
- KD-Nett (Norway)
- Televerket-TDL (Sweden)

danNet operates several "VAS solutions" (danNet's own phrase for Network Applications and Enhanced Services) including:

- **IndustriLink**; electronic trading system for suppliers of steel-, tools- and technical products.
- **AutoLink**; electronic trading system for suppliers to garages and repair shops.
- **dN/PBS**; link to Danish Payment Systems (PBS).
- **dN/GIRO**; link to the Danish GIRO system.

- dN/Told; link to the Danish Customs.
- dN/Nummeroplysning; link to the electronic telephone directory.

The IndustriLink system is also servicing Norwegian customers.

danNet's software services division delivers turnkey software solutions or participates in its customers' software projects.

Among the solutions supported by danNet is the maintenance of the Dankort cash/charge card system, which is among the most advanced electronic payment systems in the world.

Market Analysis

Exhibit C

1990 MARKET ANALYSIS BY INDUSTRY SECTOR (DKK MILLIONS)

INDUSTRY SECTOR	REVENUE	PERCENT
Manufacturing	27.90	31
Distribution	21.15	23.5
Transportation	19.80	22
Local/National Government	5.40	6
Services	15.75	17.5
TOTAL	90.00	100

Exhibit D

1990 MARKET ANALYSIS BY INPUT DELIVERY MODE (DKK MILLIONS)

DELIVERY MODE	REVENUE*	PERCENT
Processing Services	9	10
Network Services	58	64
Professional Services	3	3
Systems Operations	20	23
TOTAL	90	100

*INPUT Estimates.

Financial Information

Exhibit E

THREE YEAR FINANCIAL SUMMARY (FYE 31-12) (DKK MILLIONS)

YEAR	1988	1989	1990
Revenue	-	44	90
Profit/Loss	-12	-19	-25

D **France Telecom**

1. Telesystemes Company Profile

TELESYSTEMES

115 rue du Bac

75341 Paris

France

Tel: 33 1 45 49 85 00

Fax: 33 1 42 22 20 28

CEO: Denis Varloot

Status: COGECOM subsidiary

Number of Employees: 2,270

Revenue (FYE 31-12-90): FF 1.8 billion

The Company

Telesystemes is one of the leading French computer services and engineering companies. It is one of the six companies that comprises COGECOM which is a holding company owned by France Telecom. The function of COGECOM is to act as the holding group for a range of diverse activities which are outside the ambit of state telecommunications regulation. The other companies within COGECOM are:

- Transpac
- France Cables et Radio (FCR)
- L'Entreprise Generale de Telecommunications (EGT)
- La Compagnie Auxiliaire de Telecommunications (CAT)
- Telecom Systemes Mobiles (TSM)

Telesystemes' activities are in 4 major fields:

- Network Services
- Professional Services
- Processing Services
- Systems Operations.

Telesystemes has a number of subsidiaries (see Exhibit A).

Exhibit A

SUBSIDIARIES		
COMPANY	COUNTRY	% OWNED
Derif S.A.	France	90.31
Amitel	France	34.99
Infodiffusion S.A.	France	30.25
Servitel S.A.	"	99.80
Gie Bry-s-Marne	"	75.00
Intelmatique S.A.	"	9.41
Carte Expert S.A.	"	34.01
UFAP S.A.	"	99.83
Setib S.A.	"	99.97
Seifib S.A.	"	99.98
Regie T SARL	"	51.00
Thom 6 S.A.	"	100.00
Sesyl S.A.	"	96.50
Questel S.A.	"	99.99
Questel Inc.	U.S.A.	100.00
Videodial Inc.	"	100.00
Manifex	"	100.00
Telesystemes	Brazil	100.00
Atel	Spain	50.00

Telesystemes revenues grew by 40% in 1989 to over FF 1.42 billion, mainly due to the consolidation of Thom 6 SA accounts during that year. Organic growth represented 17% of total growth.

1990 saw a reorganisation of Telesystemes by market sector as opposed to the previous structure by services. Revenues in 1990 grew to FF1.8 billion i.e. by 27% over 1989.

Telesystemes' objective is to develop outside the French market. To this end, it is actively developing new and joint ventures as shown by the investment in ATEL in Spain, the acquisition of 33% of IOP, a Systems Operation and EDI company in Germany, and the formation of Telesystemes Datamont in Italy. Telesystemes aims to have 20% of its revenue derived from outside France by 1992, compared with 10% in 1990.

1990 acquisitions in France included: IPSI, GIA-Sysmedia and Syd-Synergie.

Principal areas of development during the next few years will be : VANS, video-communications and international operations.

Key Products and Services

Network Services

1) Data Bases

The Questel division (Questel) is Europe's number one indigenous serveur/host provider of business and professional data bases. The Questel data bases contain more than 60 million items of information in five main fields:

- Business
- Law
- Press and news
- Patents and trade marks
- Chemistry, medicine, science, and technology.

Questel benefits from the wide availability in France of Minitel terminals, for which it has developed the necessary interface software, and the Questel Plus language, which allows for full text searching. Telesystemes also makes this expertise available to businesses that want to have their own in-house database systems using microserveurs.

2) Financial Network Services

Telesystemes is involved in activities related to electronic payments and security systems, such as:

- Electronic funds transfer
- Remote collection
- Remote payment
- Transaction security
- Access control systems
- Smart card systems.

Professional Services

Telesystemes offers a range of services (audits, feasibility studies, consulting, software development, etc.), products for business communication systems and their project management and implementation. Its network products include:

- Communication and switching software packages
- File transfer programs
- Electronic mail interconnection systems
- Business local area networks (LANS products)
- Telematics, office automation communication serveurs.

Telesystemes also develops customised software products for France Telecom's accounting and payroll functions.

Additionally, Telesystemes has the licence to sell AT&T's Acumaster and Netminder network management products, as well as the Tex Base (Canada) MRP products, all running under UNIX.

Processing Services/Systems Operations

Telesystemes operates, in its own name or for third parties, more than thirty mainframes (Bull DPS7 and DPS8, IBM, Control Data) in 17 computer centres in all parts of France. In 1990 Telesystemes lost the contract for the billing of French telephone subscribers, which went to GSI and Steria.

Market Analysis

Software and services revenues for Telesystemes in 1990 were FF 1,800 million.

Exhibit B

1990 MARKET ANALYSIS BY INDUSTRY SECTOR (FF MILLIONS)

INDUSTRY SECTOR	REVENUE*	PERCENT
Telecommunications	700	39
Banking and Finance	145	8
Government	105	6
Manufacturing and Services	450	25
International	180	10
Other	220	12
TOTAL	1,800	100

*INPUT estimates

Exhibit C

1990 MARKET ANALYSIS BY INPUT DELIVERY MODE (FF MILLIONS)

DELIVERY MODE	REVENUE	PERCENT
Processing Services	428	25
Systems Operations	255	15
Network Services		
Network Applications	68	4
Electronic Information	175	10
Professional Services	590	35
Software Products	140	8
Turnkey Systems	54	3

TOTAL EUROPE	1710	100
Non-Europe	147	8
TOTAL	1,857	100

Just under 85% of Telesystemes' revenues were derived in France.

Financial Information

Exhibit D

FIVE YEAR FINANCIAL SUMMARY (FYE 31-12) (FF MILLIONS)

YEAR	1986	1987	1988	1989	1990
Revenues	846	982	1,015	1,418	1,8570
Annual Growth Rate	-	16%	3.4%	40%	31%
Profit before Taxes	NA	NA	17.05	(31.56)	NA
Profit after Taxes	NA	13.3	12.6	(35.3)	NA

2. Transpac Company Profile

TRANSPAC

Tour Montparnasse
33, avenue du Maine
75755 Paris Cedex 15
France
Tel: 33 1 45 38 88 88
Fax: 33 1 45 38 71 47

CEO: Pierre Fortin
Status: Groupe France Telecom
subsidiary
Number of Employees: 962
Revenue (FYE: 31-12-90): FF 3.47 billion

The Company

Transpac was founded in 1978. It is one of nine companies which are owned by Cogecom, a holding company controlled by France Telecom. The others are:

- Telesystemes (see separate profile)
- France Cables et Radio (FCR)
- L'Entreprise Generale de Telecommunications (EGT)
- Teledistribution de France (TDF)
- La Compagnie Auxiliaire de Telecommunications (CAT)
- Telecom Systemes Mobiles (TSM)
- VTCON
- Concables.

97% of Transpac's shares is held by the holding company Cogecom and 3% by AUTIPAC, the association of Transpac users.

Transpac owns the world's largest packet switching data transmission network, counting over 15,000 clients and 90,000 network access points. It was opened for service in 1978.

Services offered by Transpac include:

- The Transpac packet-switched data network
- ATLAS 400 - the X.400 messaging service
- Electronic data interchange (EDI)
- Other value-added services.

These services are essentially a set of network services offerings, but can be supplemented in specialized fields by systems engineering, maintenance, training, consultancy and other professional services.

Transpac serves all industry sectors.

In December 1990, Transpac employed 962 staff.

Exhibit A

1990 EMPLOYEE ANALYSIS FOR TRANSPAC

DEPARTMENT	NUMBER OF EMPLOYEES
Executives	300
Technicians and similar staff	400
Other employees	262
TOTAL	962

Transpac is divided into 23 network management centres, one national network supervision centre, six regional branches and the headquarters departments located in Rennes, Paris and Issy-les-moulineaux.

Exhibit B

SUBSIDIARIES

NAME	COUNTRY	% OWNED
Interpac	France	60
Intelmatique SA	France	56
Infonet	U.S.A.	16
COMCO SA	Switzerland	45

Interpac's main activity (as a majority owned subsidiary) is to connect Transpac subscribers to the international X.25 based Infonet network and to market that network in France. Interpac offers in association with Infonet a "turnkey" worldwide data transport service. Interpac's sales increased in 1989 by 61% to reach FF 25.3 million.

COMCO, another Transpac subsidiary, offers the COMCO smart card service for an easy, convenient and controlled worldwide access to X.25 networks and electronic mail services. The COMCO service is aimed in particular at business travellers seeking a permanent link with their company and/or their trading partners.

Intelmatique is responsible for sales of Minitel terminals and associated systems and services outside the Hexagon (France).

Transpac intends to diversify along three main lines:

- Setting up X.25 corporate networks: This will entail the allocation of part of its public network resources to business customers, but also means being involved in network design, operation and maintenance.
- Electronic data interchange (EDI): The aim is for Transpac to position itself as prime contractor and value-added network operator in cooperation with service companies who will develop the applications.
- International data exchange: The Interpac subsidiary offers businesses an international data exchange service. The recent acquisition by Transpac of a share in the Infonet international data transmission network as well as the share taken in COMCO gives Transpac a worldwide dimension.

Transpac has decided to put a strong emphasis on international activities in the framework of Groupe France Telecom's global policy.

Key Products and Services

The main business areas for Transpac are currently:

- The Transpac packet-switched data network
- Atlas 400 - the X.400 messaging service
- Electronic data interchange (EDI)
- Other value-added services.

The Transpac packet-switched data network

Network access services to the basic Transpac packet-switched network include:

- Direct Access via a leased line connection,
- Synchronous indirect access via the switched telephone network (PSTN or RTC in French),
- Indirect asynchronous access via the PSTN,
- Access via the Numeris ISDN network using a B channel,
- Network access via a concentrator: the CLE service.

Atlas 400 messaging service

The Atlas 400 messaging service was introduced in 1987.

Atlas 400 provides individual subscriber identification. It performs code and format conversions between different types of text: ASCII, teletex, videotex and telex. These formats can also be converted to facsimile code.

Message reception can be handled in a number of ways:

- By direct delivery,
- On-request delivery,
- With confidentiality processing and filtered delivery or limited storage as options.

The Atlas 400 client support team provides technical documentation, operating instructions, training courses, interactive dialogue based assistance guides and an information desk as part of the additional customer services programme.

Market Analysis

Exhibit C

1990 MARKET ANALYSIS BY INDUSTRY SECTOR (FF MILLIONS)

INDUSTRY SECTOR	REVENUE	PERCENT
Manufacturing	555	16
Retail/Wholesale	243	7
Banking/Finance	451	13
Insurance	521	15
Government/Public Sector	1,040	30
Services	660	19
TOTAL	3,470	100

Financial Information

A summary of Transpac's financial performance over the last five years is shown below:

Exhibit D

FIVE YEAR FINANCIAL SUMMARY (FYE 31-12)(FF MILLIONS)

YEAR	1986	1987	1988	1989	1990
Revenues	1,585	2,188	2,664	3,087	3,470
Profit after Taxes	NA	NA	83	404	435*
EPS	104.51	16.15	29.19	141.75	NA

* Estimated

100% of revenues were generated in France.

E GEIS Company Profile

GE INFORMATION SERVICES

Via San Gregorio, 34
I-20124 Milan, Italy
Tel: 39 2 667051

Giuliano Venturi, Vice-President Europe

Division of General Electric Company,
Communications and Services
Organization

Total Employees: 2,600

Total Revenue, Fiscal Year End

12/31/90:

\$575 million*

Noncaptive Revenue: \$525 million*

European Revenues: \$230 million*

* INPUT estimates

The Company

GE Information Services (GEIS) currently provides transaction and utility processing; inquiry/response, electronic data interchange, and value-added network services; systems integration; and software development and network management professional services to over 10,000 clients worldwide. Its focused industries include international banking and financial services, international trade and transportation, retail/apparel/merchandising, telecommunications, automotive/heavy equipment/manufacturing, petroleum/chemical, and high technology.

- GEIS was formed in 1979 as General Electric Information Services Company (GEISCO) to consolidate General Electric Company's (GE) MARK III worldwide interactive and remote batch processing services, originally introduced in 1965 under the MARK I name as the first interactive processing service commercially available in the U.S. The organization unified the U.S. operations handled by GE's Information Services Division with European and Australian operations run by Honeywell. Honeywell retained a 16% interest in GEISCO until January 1972, when GE purchased Honeywell's interest for approximately \$70 million.
- On January 1, 1984, GEISCO once again became an internal component of GE and its legal name became GE Information Services.

- GEIS now reports to GE's Communications and Services Organization (CSO), which was formed in 1986 to meld certain GE operations with former RCA units.
 - GE Consulting Services, based in Rockville (MD), was formerly part of GEIS and now operates as a separate unit under CSO.
 - GE Computer Services, based in Atlanta, was formerly part of GEIS and now operates as a separate unit under CSO.

INPUT estimates that GEIS's total 1990 revenue was approximately \$575 million.

- The company had almost 10,000 client by the end of 1990, compared to 6,000 clients in 1988 and 5,000 clients in 1987.
- Revenue provided to various units of General Electric Company is estimated at approximately 5% of total revenue.

Effective October 1989, Hellene S. Runtagh was appointed President of GEIS, replacing James McNerney Jr. who has been promoted to executive vice president of GE Capital.

During early 1989, GEIS sold its EMC*EXPRESS electronic medical claims business to GTE Information Services. Terms of the sale were not disclosed. INPUT estimates that EMC*EXPRESS contributed less than \$500,000 to GEIS' 1988 revenue.

GEIS' primary competitors include AT&T Istel, BT Tymnet, IBM IN, Infonet, Sprint International, Automatic Data Processing (Autonet), and Reuters.

- In the EDI and electronic mail area GEIS also competes with Sterling Software (Ordernet), MCI, AT&T Easylink, and various PTT-provided services.

Key Products and Services

INPUT estimates that approximately 85% of GEIS's 1990 revenue was derived from network and processing services, and the remaining 15% from professional services and systems integration activities.

By Network

GEIS offers its clients three delivery systems for its processing/network services as follows:

- The MARK III^R Service consists of the following major elements, serving over 8,000 clients worldwide around half of whom will be based in Europe or will have European operations:

- Foreground Service is the primary offering on the MARK III System, consisting of interactive remote processing on Honeywell/NEC computers. GEIS offers two libraries consisting of over 2,000 software products, a summary of which is found in Exhibit A.
 - Products are developed by GEIS or licensed from major software vendors. These third-party packages are fully supported by GEIS.
- The MARK 3000TM Service is an IBM-compatible companion service to the Honeywell/NEC-based offerings. Remote batch and interactive processing on large-scale IBM computers is available. Selected applications available on this service are shown in Exhibit B. Usage is split between general business applications and engineering, simulation, and statistical analysis applications.
- The MARK 9000SM Service, announced in January 1988, is a bundled offering of IBM MVS/XA operating environment processing, storage, and IBM-compatible network services.
 - The service is targeted to clients whose business requirements include multiple, distributed 9370s, remote access to one 9370, the integration of their 9370 systems with other mainframe systems, or a CICS capability. It can be used for departmental processing; development, prototyping, and conversions; in distributed configurations for store-and-forward processing and network switching/management; and as a component in custom systems for vertical applications, disaster recovery, and remote facilities management.
 - The MARK 9000 Service is available in Europe and the U.S. GEIS already has several contracts from the U.S., France, Italy, and the U.K. Current clients include National Westminster Bank.

Exhibit A

APPLICATIONS AVAILABLE ON MARK III SERVICE	
APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<p>OPERATING ENVIRONMENT</p> <ul style="list-style-type: none"> - HONEYWELL DPS 90/ACOS 1000 <p>PROGRAMMING LANGUAGES SUPPORTED</p> <ul style="list-style-type: none"> - FORTRAN 77 - PL1 - COBOL - BASIC <p>DATA MANAGEMENT SOFTWARE</p> <ul style="list-style-type: none"> - DMS III - FLEXIMIS - HISAM - SAS - DM IV - REQUEST - SYSTEM 2000- SITE II - MARK IV - EPICS - DCM - MARDATA <p>DATA BASES AVAILABLE</p> <ul style="list-style-type: none"> - MAP (ECONOMETRIC DATA BASE) - CURRENCY DATA BASE SERVICE - SECURITIES DATA BASE SERVICE - VALUELINE - NEMA (NATIONAL ELECTRICAL MFG.) - DEPARTMENT OF COMMERCE (SIC) - FEDERAL TRADE COMMISSION - CITIBASE - PETROLEUM INSTITUTE - DWIGHT'S ENERGYDATA - CORPORATE FINANCIAL DATA SERVICE - BUSINESS AND FINANCIAL DATA BANK - COMMODITY FUTURES - AHAM (HOME APPLIANCE MANUFACTURING) - DOW JONES NEWS/RETRIEVAL <p>FINANCIAL APPLICATIONS/TOOLS</p> <ul style="list-style-type: none"> - GENERAL BUSINESS ACCOUNTING - FINANCIAL ANALYSIS - FORECASTING - AUDITING <p>BANKING/CASH MANAGEMENT</p> <ul style="list-style-type: none"> - GLOBAL RISK MANAGEMENT SYSTEMS - TRADE WATCH - FUNDSNET - LEAPP <p>CHEMICAL</p> <p>COMMUNICATIONS</p> <ul style="list-style-type: none"> - TELEPHONE CO. OPERATIONS & FINANCE <p>CONSTRUCTION</p> <p>DISTRIBUTION MANAGEMENT</p>	<p>ELECTRONIC DATA INTERCHANGE</p> <ul style="list-style-type: none"> - EDI*EXPRESS SYSTEM - EDI*PC SYSTEM - EDI*CENTRAL SYSTEM - BANCOR*EXPRESS - BPS CENTRAL <p>ELECTRONIC MAIL</p> <ul style="list-style-type: none"> - BUSINESS CONNECT - BUSINESSTALK - QUIK-COM - QUIKNEWS - X.400 ACCESS <p>ENGINEERING</p> <ul style="list-style-type: none"> - CIVIL - MECHANICAL - ELECTRICAL AND ELECTRONIC <p>HUMAN RESOURCE MANAGEMENT</p> <p>INSURANCE</p> <p>INVESTMENT RESOURCE MANAGEMENT</p> <p>INVENTORY CONTROL/ORDER SERVICE</p> <p>GRAPHICS AND PLOTTING</p> <p>LINEAR PROGRAMMING</p> <p>MANUFACTURING</p> <ul style="list-style-type: none"> - INDUSTRIAL ENGINEERING - PLASTICS ENGINEERING - MANUFACTURING MANAGEMENT - NUMERICAL CONTROL - PRODUCTION SCHEDULING - QUALITY CONTROL <p>MARKETING AND SALES</p> <p>MATHEMATICS</p> <p>OPERATIONS RESEARCH AND MODELING</p> <p>PROJECT PLANNING AND MANAGEMENT</p> <p>SIMULATION AND MODELING</p> <p>STATISTICAL ANALYSIS AND FORECASTING</p> <p>TRANSPORTATION</p> <ul style="list-style-type: none"> - MARINE MANAGEMENT - EQUIPMENT MANAGEMENT SYSTEMS - SHIPMENT TRACKING SYSTEM <p>MISCELLANEOUS</p> <ul style="list-style-type: none"> - GENIE

Exhibit B

APPLICATIONS AVAILABLE ON MARK 3000 SERVICE	
APPLICATION AREA/PRODUCT NAME	APPLICATION AREA/PRODUCT NAME
<p>OPERATING ENVIRONMENT</p> <ul style="list-style-type: none"> - IBM 3081, MVS, TSO, CICS - IBM 4381, VM - IBM 9000 <p>PROGRAMMING LANGUAGES SUPPORTED</p> <ul style="list-style-type: none"> - FORTRAN 77 - COBOL - PL/1 - BASIC <p>UTILITY SOFTWARE</p> <ul style="list-style-type: none"> - LIBRARIAN <p>DESIGN</p> <ul style="list-style-type: none"> - REMOTE MEDIA SERVICE - SYNC SORT <p>PRODUCTIVITY TOOLS</p> <ul style="list-style-type: none"> - ACCOLADE - DOS/OS CONVERSION PACKAGE - ISPF/PDF <p>DATA BASE MANAGEMENT</p> <ul style="list-style-type: none"> - FOCUS - IDMS - SQL/DS <p>FINANCIAL APPLICATIONS/TOOLS</p> <ul style="list-style-type: none"> - GENERAL ACCOUNTING - FINANCIAL PLANNING (FCP-EPS, IFPS) - FORECASTING (SIMPLAN) - BUDGETING AND MODELING (CPL/TACTIX) <p>GRAPHICS</p> <ul style="list-style-type: none"> - TELL-A-GRAF - DISSPLA - GDDM <p>STATISTICS</p> <ul style="list-style-type: none"> - SAS 	<p>OTHER INFORMATION MANAGEMENT</p> <ul style="list-style-type: none"> - DCF - OXYCALC - MEGACALC - SCRIPT/VS - WYLBUR <p>PROJECT MANAGEMENT</p> <ul style="list-style-type: none"> - PROJACS - PROJECT/2 <p>SCIENTIFIC AND ENGINEERING</p> <ul style="list-style-type: none"> - MECHANICAL ENGINEERING AND ù NASTRAN ù SUPERB ù ANSYS - CIRCUIT ANALYSIS ù ASTAP <p>ORDER SERVICE</p> <p>MANUFACTURING</p> <ul style="list-style-type: none"> - PLASTICS ENGINEERING <p>DISTRIBUTION</p> <ul style="list-style-type: none"> - VEHICLE ROUTING - VSPX (VEHICLE SCHEDULING) <p>MATHEMATICS</p> <ul style="list-style-type: none"> - MPS III - MPSX/370 - SPSS <p>PLANNING AND MODELING</p> <ul style="list-style-type: none"> - BMDP (PRODUCTION SCHEDULING) - CSMP III (SIMULATION) - DYNAMO III/F (SIMULATION) - GPSS V (SIMULATION) - KETNET - MAGEN (MATRIX GENERATOR) <p>OTHER</p> <ul style="list-style-type: none"> - GE*TUTOR

- The GEIS Network is the company's worldwide teleprocessing network based on a proprietary packet-switching protocol. It permits multisite organizations to achieve data transmission to dispersed terminals and host computers around the world with approximately 600 access points in the U.S. and in-country direct access in 35 countries.
- The GEIS network supports asynchronous, IBM-compatible synchronous (including 3270 BSC, 3270 SNA/SDLC, 2780/3780 BSC, 3770 SNA), and X.25 protocols.
- In addition to supporting SNI interconnections among SNA networks, it offers a variety of error-correcting protocols, such as MNP and XMODEM, and it provides 3270 emulation via NET*CONNECT 3270 and Simware's SIM 3278, SIMPC, and MAC3270.

By Application

GEIS services are categorized into the following application areas:

- Financial Information Services
- Electronic Data Interchange Products and Services
- Business Communications Products and Services
- Value-Added Network Services
- Managed Network Services
- On-line Consumer Information Services

Financial Information Services:

GE Financial Information Services, a unit of GEIS formed in 1989, supports international network applications for banking and financial institutions. GEIS offers the following products/services which are generally used as part of a distributed processing service:

- FUNDSNET™ Money Transfer System is a microcomputer-based automated money transfer service targeted to corporate treasurers. Through a joint marketing agreement with Racal-Guardata, the Money Transfer System includes end-to-end authentication as a means of protecting the money transfer instructions.
- FUNDSNET™ Balance Reporting System is an automated balance and transaction reporting service used by corporate clients to manage their global cash in an environment of differing time zones and multiple currencies.

- The Global Limits System is a customized software package designed to assist international banks manage and control their risk exposures in money markets, in credit granting and other operations, 24 hours a day, in trading centers around the world.
- TRADEWATCH™, introduced in September 1989, is a settlement instructions and reporting system for international securities settlement institutions.
- The BANCOR*EXPRESS™ System is an electronic transfer and tracking system designed to facilitate and expedite the worldwide exchange of financial data.
- BPS*CENTRAL™ System, announced in December 1989, allows banks to accept electronic payment/order remittance advices from EDI users, reformat them into ACH payment instruction format, and forward them to a third party's bank through the ACH network for settlement.
 - Incoming ACH instructions may be reformatted to ANSI 820, 823, or BAI lockbox formats. Banks can also use the BPS*CENTRAL System for their internal EDI processing with their customers and suppliers.
 - The first two banks to use the BPS*CENTRAL System are First Interstate Bank (Los Angeles) and SEAFIRST (Seattle).
- In November 1989, GEIS introduced the availability of Leveraged EDI and Payments Program (LEAPP), a multilevel EDI/EFT program for banks. LEAPP provides banks the opportunity to combine their corporate client relationships and payments expertise with GEIS' EDI network capabilities.

Electronic Data Interchange Products and Services:

EDI products and services support the electronic processing and transmission between trading partners of standard formatted data for business documents in a variety of public and private formats using different protocols and access methods.

- GEIS' EDI services are used by clients in the trade and transportation, manufacturing, and retail industries. GEIS' EDI network currently connects more than 6,000 trading partners worldwide, of whom over 4,000 trade in Europe.
- The EDI*EXPRESS™ System, introduced in November 1985, provides the capabilities for sending, receiving, translating, and compliance checking of EDI messages. The system also provides document and/or interchange level auditing and reporting to the user for tracking and monitoring system usage.
 - Two levels of service are available. The Interchange Level Service, announced in December 1989, enables customers to select a level of service commensurate with the requirements of their applications. The service performs control verification and provides tracking reports for interchanges. The Document Level Service, available since 1987, offers network control verification and tracking at both the interchange and document levels.

- EPS*EXPRESS™ Service, introduced in January 1990, permits EDI*EXPRESS clients to initiate electronic payments to their vendors.
- The EDI*PC™ System, introduced in November 1985, is a software package for IBM and compatible microcomputers that allows trading partners to send and receive EDI documents and status reports in a standard format to and from the EDI*EXPRESS System. It can be used as a workstation or as a front-end to an in-house computer for translation. The software licenses for \$1,450.
- The EDI*CENTRAL™ System, introduced in July 1988, is a mainframe software package supporting COBOL 74 for mainframe EDI gateways supporting multiple distributed business applications. It allows the client to send EDI data to and from its in-house application system and provides EDI translation between application data and EDI standard formats. The system licenses for \$20,000 for the first copy, with additional copies per company at \$12,000 each. The annual subscription service fee is \$2,400 after the first year.
- The DESIGN*EXPRESS™ System is a family of products that allows engineering/manufacturing design data to be processed and transmitted electronically in several types of document formats. DESIGN*EXPRESS products became commercially available in the U.S. in 1989.
 - GEIS has designated Microdynamics (Dallas) as a Value-Added Service Provider for DESIGN*EXPRESS to the sewn-goods industry.
 - In February 1989, GEIS announced an alliance with International TechneGroup Inc. (ITI) whereby ITI will provide CAD translation software and consulting services to users of GEIS' DESIGN*EXPRESS services.
- UPC*EXPRESS Catalog is a service that manages and distributes Universal Product Code (UPC) numbers and their description information for vendors and their retailers. This data base of UPC information is integrated with the EDI*EXPRESS System so that vendors and retailers can use EDI to electronically maintain and receive UPC catalog updates.
- GEIS also supports several private and industry association networks, including Catspeed (Caterpillar Tractor Company's private EDI implementation), Haggar Apparel Company's HOP (Haggar Order Processing), LeviLink (Levi-Strauss), PetroEx (the Petroleum Data Exchange System), The Poand Transnet (operated by the Motor Equipment Manufacturers Association, Englewood Cliffs, NJ).
- Other EDI-related activities include the following:
 - In November 1989, Sea-Land Service Inc., Rotterdam, selected GEIS' EDI network service to connect EDI trading partners in the U.K.
 - In June 1989, GEIS was awarded a one-year contract (with two option years) by the General Services Administration (GSA) to provide EDI services to the

GSA/Federal Supply Service. GEIS will provide EDI*CENTRAL software for a Honeywell DPS8 mainframe and will provide EDI*EXPRESS network services as the interface to GSA's electronic trading partners.

- GEIS is supplying network-based services in six European countries to Electronic Data Systems as part of EDS' EDI project for General Motors.
- Working with Baxter Travenol (Deerfield, IL), GEIS is expanding the scope of that company's ASAP Express private EDI purchasing clearinghouse system for hospitals.
- GEIS Ltd. has joined with ICL (now 80% owned by Fujitsu of Japan) to form International Network Services Ltd.(INS), offering EDI services in the U.K.. In February 1988, INS launched its international "Bridge," joining the INS U.K. EDI services to the EDI service provided by GEIS.
- GEIS was selected by CEFIC, the European Council of Chemical Manufacturers' Federations, as the single clearinghouse to provide EDI services to the CEFIC EDI trial for the European Chemical Industry.
- With Finland's Nokia Information Network Services, the company established a processing center in 1988 for domestic and international EDI, licensing its EDI software to the partner.
- GEIS and Swedish software firm Transtema are integrating their systems and services, targeting the freight and shipping industries.
- In May 1988, GEIS was selected by the Port Authority of New York & New Jersey to provide the EDI*EXPRESS System to the Port's Automated Cargo Expediting System. The system became commercially available in May 1989.
- GEIS has EDI-related alliances with various third parties to sell its services along with their software and equipment. The company currently has agreements with:
 - ACS Network Systems (Concord, CA) for sales to the apparel industry.
 - American Business Computer (Farmington Hills, MI) for the automotive industry.
 - Can/Am Tech (Hamilton, Ontario) for sales and support in the metals industry.
 - Microdynamics (Dallas, TX) for marketing DESIGN*EXPRESS to the sewn-goods and apparel industry.
 - Supply-Tech (Southfield, MI) for sales to the automotive industry.

- GEIS also provides EDI implementation services, including training, conducting trading partner conferences, follow-up conferences with technical support, developing specialized test procedures, customizing documentation, and providing overall project management.

Business Communications Products and Services:

GEIS offers a family of products for office communications and automation linking geographically dispersed operations via its worldwide teleprocessing network.

- The BusinessTalk™ System is an intelligent communications capability designed to process, distribute, and retrieve information for members of a geographically dispersed business community via the MARK III Foreground Service through an Apple Macintosh or IBM PC-compatible computer. BusinessTalk combines the functions of textual data bases with a key word search, bulletin boards, electronic mail, and graphics.
- The QUIK-COMM™ System is a global electronic mailbox service that is designed to integrate multisite, multinational business communications for public and private mail systems. The system accommodates eight languages in addition to English.
- Personal Computer Mailbox is a microcomputer-based integrated application program designed to provide a user with the tools necessary to write, send, receive, and file QUIK-COMM messages.
- PC Mailbox Multiuser allows for mail administration for multiple QUIK-COMM users and allows a microcomputer to function as an internal message center.
- Bulletin Board provides electronic information sharing with large public and private audiences via one-way and two-way electronic communications.
- Telex Access permits QUIK-COMM users to send messages to and receive messages from Telex addresses during a QUIK-COMM session.
- QUIK-GRAM™ Service enables QUIK-COMM users to deliver electronically produced paper mail messages to virtually anyone with a U.S or Canadian postal address.
- QUIK-COMM to FAX allows QUIK-COMM messages to be send directly from a PC to fax machines.
- QUIK-COMM Service Connectors are interface capabilities that permit users of IBM PROFS, DISOSS, DEC All-In-1, Wang OFFICE, Rydex Messaging System (IBM AS/400 or System/3x), 3+ Mail LAN System, or CC:Mail LAN Systems to send messages/documents to QUIK-COMM users.

- In October 1989, GEIS announced the commercial availability in the U.S. of X.400 standard access to the QUIK-COMM family of products. In February 1990, GEIS announced an X.400 interconnect to Western Union's EasyLink electronic messaging service.
- In March 1991, GE announced that it had a contract from the Netherlands Ministry of Internal Affairs agency (called GBA) to develop and operate an electronic message handling service for Dutch government and municipal offices (some 1,000 offices all told). This X.400 based service follows from a pilot service set up for GBA in 1987.
- GEIS has X.400 service interconnection agreements with the following vendors and services:

Vendors	Country	Service
AT&T	US	ATTMAIL
BT Tymnet	US	DIALCOM
IBM IN	GB	IBMX400
MCI	US	MCI
Sprint Int'l (US)	US	TELEMAIL
Sprint Int'l (UK)	GB	TMAILUK
Western Union	US	WESTERN UNION
Helsinki Tel Co	FI	ELISA
Radio Austria	A	ADA400
Swiss Telecom	CH	ARCOM
BT Plc	GB	GOLD400
PTT Tel Netherlands	NL	NET400

Agreements with eight others are under negotiation.

Value-Added Network Services:

The MARK*NET Service is a value-added network service offered only to clients in the U.S. and Canada through direct access, based on the GEIS Network and local support services in both countries.

- A MARK*NET client who has users outside of North America typically accesses the service via Public Data Network (PDN) access in the local country, interconnected to MARK*NET via International Record Carrier (IRC) gateways. GEIS provides international access to MARK*NET in this manner from approximately 70 countries.
- MARK*NET Service has all the technical functionality inherent in the GEIS network, including multiple protocol support, protocol conversion services, error correcting protocols, full network redundancy, a security administration and control system, and on-line monitoring capabilities.
- Access nodes include dedicated leased line access, private dial access, and public dial access.

Managed Network Services:

Managed Network Services (MNS), introduced in 1987, is a specialized teleprocessing service that provides client organizations with custom-tailored network and session management of their international information and communications systems. It is sold worldwide and in June 1991 had over 70 clients:

- MNS is a single, integrated service that provides the following:
 - GEIS consultants, with expertise in applications, networking, and client support, prepare tailored proposals designed for specific client requirements
 - Network and session management using MNS Session Manager, a network management teleprocessing application
 - Support in managing the global integration of information by coordinating with third-party vendors such as Postal Telephone and Telegraph (PTT) authorities and by offering the client a single worldwide contract.
 - Worldwide support 24 hours a day, seven days a week once service is in place.
- There are currently approximately 70 multinational clients using MNS, of whom some 30 are Europe-based companies.

On-line Consumer Information Services:

GENie™ (GE Network for Information Exchange) is an electronic consumer information service for microcomputer end users.

- GENie permits access to a variety of services, including news and information, financial, travel, shopping, computer games and references, electronic mail, and real-time conferences.
- Services added to GENie during 1989 include Charles Schwab's discount brokerage and investment information services, Newsbytes News Service, and the Executive Desk Register of Publicly Held Corporations.
- In October 1989, GEIS announced expanded GENie service access to 166 cities throughout Canada via Telecom Canada's iNet 2000 gateway service.
- First marketed in October 1985, GENie now has over 180,000 individual subscribers throughout the U.S. and Canada and in 20 cities in Japan.
- By June 1991, it was available in Europe in Austria, Germany and Switzerland.

Other network-related announcements include the following:

- In February 1990, U.S. 2400 bps asynchronous dial-up service availability was expanded from 393 cities as of year-end 1989 to 510 cities. In November 1989, GEIS also eliminated the \$1.00/hour 2400 bps access surcharge in its VAN service. GEIS is continuing to expand its international 2400 bps capability. 9600 bps asynchronous dial-up capability had by mid-1991 been made available in all US cities and in all major European centres of business.
- Credit*PRO™, announced in September 1989, is a fully integrated credit management system that automates and manages all the functions required for a retailer to offer credit to customers. Credit*PRO is available as a software package or on a service bureau basis.
- In June 1989, GEIS signed a joint venture agreement with STET, the telecommunications and electronics holding company of the Italian industrial conglomerate IRI.
 - Under the agreement, STET acquired a 40% interest in GEIS-Italy, GEIS's wholly-owned subsidiary in Italy. The company will be operated as a joint venture of STET and GEIS to provide value-added network services in Italy.

Professional services provided by GEIS include systems development and consulting, training, and documentation services.

Industry Markets

GEIS' 1990 revenue was derived approximately as follows:

	Worldwide	Western Europe
Banking	40%	45%
Manufacturing	32%	17%
Telecommunications	10%	3%
Trade and Transportation	10%	16%
Retail	5%	10%
Other	<u>3%</u>	<u>9%</u>
	100%	100%

GEIS currently has a client base of over 10,000 corporations and trade associations.

Geographic Markets

Approximately 50% of GEIS's 1990 revenue was derived from the U.S. and 50% from international sources.

GEIS products and services are offered through approximately 50 U.S. offices and offices in 34 countries, with global support and access provided by distributors, affiliates, or private data networks in 60 additional countries.

- U.S. regional offices are located in New York City, Atlanta, Chicago, and San Francisco.
- International offices are located in Australia, Austria, Belgium, Canada, France, Germany, Hong Kong, Ireland, Italy, The Netherlands, Norway, Singapore, Spain, Sweden, Switzerland, and the U.K.

Software Development Centers are located in Rockville (MD), Nashville (TN), and Dublin (Ireland).

GEIS's network provides clients with local dial-up services in 750 cities in more than 30 countries worldwide and is available 24 hours a day, seven days a week, 365 days a year. Coverage is extended to more than 90 countries by interconnections with public data networks and international record carriers.

Exhibit C**DELIVERY MODE ANALYSIS FOR GEIS IN EUROPE (\$ MILLIONS)**

INPUT DELIVERY MODE	REVENUE*	PERCENT
Processing Services	100	43
Network Services	105	46
Professional Services	10	4
Equipment	15	7
TOTAL	230	100

* INPUT estimates

Financial Information

The company's 1990 revenue of approximately \$230 million was derived across the whole of Western Europe.

Exhibit D**FIVE-YEAR FINANCIAL SUMMARY FOR GEIS IN EUROPE (\$ MILLIONS)**

YEAR	1986	1987	1988	1989	1990
Revenue	165*	180*	175*	200*	230*
Annual Growth Rate (Percent)	-	9	(3)	14	15

* INPUT estimates.

Computer Hardware and Software

The GEIS network uses over 6,000 processing and communications computers, including over 500 minicomputers. Over 400 of these are BULL PMSDs, used to handle communications. Large-scale IBM, BULL and NEC processors are concentrated in supercenters in Rockville, Cleveland, Ohio, U.S.A., and Amstelveen, Netherlands. These consist of:

- Twenty-seven BULL/NEC DPS 90/ACOS 1000s and two BULL DPS-9000s operating under GEIS proprietary software for interactive processing, on the MARK III service.
- One IBM 3090, one IBM 3081, one IBM 9121 and one IBM 4381 for interactive and remote batch processing on the MARK 3000 Service.

GEIS's teleprocessing network handles over 400,000 user sessions per day, transmitting over 300 million characters of data in and out of the system per hour.

The network uses VSAT satellite links, microwave links, 25 trans-oceanic undersea cables, and 350,000 miles of land-lines.

Appendices

Vertical line

A Forecast Data Base Local Currency

Please note that totals may not agree to the sum of the detail lines due to rounding.

Exhibit A-1

Network Services Market Forecast in Local Currency by Market Segment, 1991-1996 France

Subsector	FF Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	3,300	12	3,700	4,200	4,750	5,350	6,100	6,950	13
Network Applications	1,850	24	2,300	2,900	3,700	4,700	5,900	7,500	27
Total	5,200	15	6,000	7,100	8,500	10,100	12,000	14,500	19

Exhibit A-2

Network Services Market Forecast in Local Currency by Market Segment, 1991-1996 Germany

Subsector	DM Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	880	19	1,050	1,200	1,400	1,700	2,000	2,400	18
Network Applications	190	45	275	390	560	800	1,200	1,600	42
Total	1,050	29	1,350	1,600	1,950	2,500	3,200	4,000	24

Exhibit A-3

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
United Kingdom**

Subsector	£ Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	485	9	530	580	630	685	750	830	9
Network Applications	155	26	195	250	320	415	540	690	29
Total	640	13	725	830	950	1,100	1,290	1,520	16

Exhibit A-4

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Italy**

Subsector	Lira Billions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	320	9	350	390	435	480	535	595	11
Network Applications	120	29	155	210	280	370	480	630	32
Total	440	15	505	600	715	850	1,015	1,225	19

Exhibit A-5**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Sweden**

	SK Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	400	11	445	500	560	630	715	810	13
Network Applications	190	29	245	330	440	580	770	1,000	32
Total	590	17	690	830	1,000	1,210	1,485	1,810	21

Exhibit A-6**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Denmark**

	DK Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	305	13	345	385	435	490	560	640	13
Network Applications	160	25	200	260	340	450	600	780	31
Total	465	17	545	645	775	940	1,160	1,420	21

Exhibit A-7**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Norway**

Subsector	NK Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	210	14	240	270	315	370	435	510	16
Network Applications	90	28	115	145	185	235	300	390	28
Total	300	20	360	420	500	610	740	900	20

Exhibit A-8**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Finland**

Subsector	FM Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	115	17	135	155	175	210	250	300	17
Network Applications	75	20	90	110	140	170	210	260	24
Total	190	21	230	270	320	380	460	560	19

Exhibit A-9

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Netherlands**

	Dfl Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	205	15	235	270	310	350	390	430	13
Network Applications	95	21	115	140	170	210	240	290	20
Total	300	17	350	410	480	560	630	720	16

Exhibit A-10

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Belgium**

	BF Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	2,200	16	2,550	3,000	3,500	4,100	4,800	5,600	17
Network Applications	1,100	27	1,400	1,750	2,200	2,750	3,500	4,400	26
Total	3,300	20	3,950	4,750	5,700	6,850	8,300	10,000	20

Exhibit A-11

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Switzerland**

Subsector	SF Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	140	14	160	185	220	260	300	350	17
Network Applications	25	40	35	50	70	100	135	175	38
Total	165	18	195	235	290	360	435	525	22

Exhibit A-12

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Austria**

Subsector	Sch Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	490	10	540	590	650	710	780	840	9
Network Applications	75	33	100	130	170	220	300	330	27
Total	570	12	640	720	820	930	1,080	1,170	13

Exhibit A-13**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Spain**

	Pta Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	8,900	24	11,000	13,500	16,500	20,500	25,000	31,000	23
Network Applications	3,100	42	4,400	6,400	9,100	13,000	18,500	26,000	43
Total	12,000	28	15,400	19,900	25,600	33,500	43,500	57,000	30

Exhibit A-14**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Portugal**

	ESC Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	500	24	620	770	950	1,200	1,500	1,800	24
Network Applications	190	42	270	380	550	790	1,200	1,600	43
Total	700	29	900	1,150	1,500	2,000	2,700	3,400	30

Exhibit A-15

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Greece**

Subsector	Dra Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	1,400	29	1,800	2,200	2,800	3,500	4,500	5,500	25
Network Applications	500	40	700	900	1,300	1,800	2,500	3,500	38
Total	1,900	32	2,500	3,100	4,100	5,300	7,000	9,000	29

Exhibit A-16

**Network Services Market Forecast in
Local Currency by Market Segment, 1991-1996
Ireland**

Subsector	IR Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	5	20	6	7	8	9	10	12	15
Network Applications	2	50	3	3	4	5	7	9	25
Total	7	29	9	10	12	14	17	21	18

B Forecast Data Base ECUs

Please note that totals may not agree to the sum of the detail lines due to rounding

Exhibit B-1

Network Services Market Forecast in ECUs by Market Segment, 1991-1996 France

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	426	12	480	545	615	690	790	900	13
Network Applications	239	24	295	375	5	610	760	965	27
Total	665	15	775	915	1,090	1,300	1,550	1,865	19

Exhibit B-2

Network Services Market Forecast in ECUs by Market Segment, 1991-1996 Germany

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	382	19	455	520	610	740	870	1,045	18
Network Applications	83	45	120	170	240	345	520	695	42
Total	465	29	575	690	850	1,085	1,390	1,740	24

Exhibit B-3

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
United Kingdom**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	689	9	755	825	895	975	1,065	1,180	9
Network Applications	221	26	275	355	455	590	765	980	29
Total	910	13	1,030	1,180	1,350	1,565	1,830	2,160	16

Exhibit B-4

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Italy**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	189	9	205	230	260	285	315	350	11
Network Applications	71	29	95	125	165	220	285	375	32
Total	260	15	300	355	425	505	600	725	19

Exhibit B-5**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Sweden**

	ECU Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	51	11	60	65	75	80	95	105	13
Network Applications	24	29	32	45	55	75	100	130	32
Total	75	17	90	110	130	155	195	235	21

Exhibit B-6**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Denmark**

	ECU Millions								
Subsector	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	35	13	40	45	50	55	65	75	13
Network Applications	20	25	23	30	40	50	70	85	31
Total	55	17	63	75	90	105	135	160	21

Exhibit B-7

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Norway**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	23	14	25	30	35	40	50	55	16
Network Applications	10	28	13	16	20	27	34	45	28
Total	33	20	38	46	55	67	84	100	20

Exhibit B-8

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Finland**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	21	17	25	30	30	40	45	55	17
Network Applications	14	20	17	20	26	31	40	50	24
Total	35	21	42	50	56	71	85	105	19

Exhibit B-9

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Netherlands**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	88	15	100	115	135	150	170	185	13
Network Applications	42	21	50	60	73	90	105	125	20
Total	130	17	150	175	208	240	275	310	16

Exhibit B-10

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Belgium**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	46	16	55	65	75	85	100	120	17
Network Applications	23	27	30	37	47	58	75	93	26
Total	70	20	85	102	122	143	175	213	20

Exhibit B-11

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Switzerland**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	80	14	90	105	125	150	170	200	17
Network Applications	14	40	20	30	40	58	80	100	38
Total	95	18	110	135	165	208	250	300	22

Exhibit B-12

**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Austria**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	30	10	35	35	40	45	50	50	9
Network Applications	5	33	6	8	10	14	19	20	27
Total	35	12	41	43	50	59	65	70	13

Exhibit B-13**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Spain**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	68	20	80	100	115	140	160	190	18
Network Applications	24	42	35	50	70	100	145	200	43
Total	92	26	115	150	185	240	305	390	28

Exhibit B-14**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Portugal**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	2	24	4	4	5	7	9	10	24
Network Applications	1	42	2	2	3	5	7	9	43
Total	4	29	5	7	9	11	15	19	30

Exhibit B-15**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Greece**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	7	29	10	12	15	19	24	30	25
Network Applications	3	40	4	5	7	10	14	19	38
Total	10	32	14	17	22	29	38	49	29

Exhibit B-16**Network Services Market Forecast in ECUs
by Market Segment, 1991-1996
Ireland**

Subsector	ECU Millions								
	1990	1990-1991 Growth (Percent)	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (Percent)
Electronic Information Services	6	20	8	9	10	12	13	16	15
Network Applications	3	50	4	4	5	7	9	12	25
Total	9	29	12	13	16	18	22	27	18

C Forecast Reconciliation 1990-1991

Exhibit C-1 shows the changes made in this years forecast in comparison to that of the previous year.

Converted to US dollars, virtually no change is shown in the assessment of the 1990 Western European market. Given a general appreciation of European currencies against the dollar during 1991 accounting for an approximate 3% increase it can be seen that overall **INPUT** has reassessed the 1990 market for EI marginally downwards, the Network Applications market assessment remains virtually the same.

In terms of future forecast growth it can clearly be seen in the table that the 1991 research indicates slightly lower growth for the Network Applications sector and considerably lower growth for the EI sector than forecast last year.

Exhibit C-1

Network Services Reconciliation of Market Forecast Western Europe

	1990 Market			1995 Market			1990-1995 CAGR Forecast in 1990	1991-1996 CAGR Forecast in 1991
	1990 Report (\$ M)	1991 Report (\$ M)	Variance (%)	1990 Report (\$ M)	1991 Report (\$ M)	Variance (%)		
Network Applications	1,080	1,090	+0.1	4,550	4,130	-9.2	33	31
Electronic Information Services	2,610	2,940	+13	6,500	5,450	-16	20	13
Total	3,690	4,030	+9	11,050	9,590	-13	25	20

