U.S. NETWORK SERVICES MARKET

1992 - 1997

INPUT

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U.S. Information Services
Market Analysis Program
(MAMAP)

U.S. Network Services Market, 1992-1997

Abstract

This report offers the 1992-1997 analysis and forecast for the network services sector of the U.S. information services industry.

The network services sector consists of two delivery submodes: network applications and electronic information services. Network applications includes electronic data interchange, electronic mail, value-added applications and other applications-related services. Electronic information services includes on-line data bases and news services.

The report offers an assessment of the issues and trends affecting these rapidly growing segments of the U.S. information services industry, projects the growth in market size for 1992 through 1997, and profiles significant vendors in this market sector. Market growth estimates are provided for fifteen industry sectors.

The report contains 136 pages and 60 exhibits.

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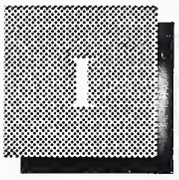
Exhibits (Continued)

Exhibits (Continued)



Introduction

This report is part of a series of market analysis reports written each year by INPUT on the key segments (delivery modes) of the U.S. information services industry. The delivery modes analyzed during 1992 are as follows:

1. Applications software products
2. Turnkey systems
3. Processing services
4. Systems software products
5. Network services
6. Professional services
7. Equipment services
8. Systems integration
9. Systems operations

INPUT's Market Analysis Program (MAP), a planning service for information services vendors, covers the first seven delivery modes. INPUT's systems integration and systems operations programs cover the last two delivery modes in the market analysis reports.

A
Purpose and Organization

1. Purpose

This report analyzes the network services delivery mode of the U.S. information services industry.

- The report includes five-year forecasts, an assessment of market drivers, analysis of competitive trends, and identification of leading vendors.

- The report assesses issues, trends, and events within the U.S. economy, the U.S. information services industry, and the systems software delivery mode to provide the reader with a comprehensive foundation for understanding this market sector and for anticipating future directions.

The report provides readers with insights and information that will help them to:

- Review the forces shaping the market
- Develop internal corporate financial projections
- Identify new market, product, and service opportunities
- Assess the competitive trends
- Determine potential market directions
- Assist in prioritizing investments

2. Organization

Exhibit I-1 organizes and describes this report. Each delivery mode report within the Market Analysis Program follows this format. The industry and cross-industry sector reports, described below, follow a very similar format.

EXHIBIT I-1

Market Reports Format

I. Introduction
- Introduction and definition of the delivery mode and its substructure or segments.

II. Executive Overview
- Synopsis of the entire report written at the end of the year.

III. General Business Climate
- An overview of the business climate within the information services industry as a whole and the particular market segment of each report.

IV. Information Systems Environment
- The information systems environment and user perspective as it relates to the specific delivery mode or market.

V. Issues and Trends
- An assessment of the significant issues and trends.

VI. Information Services Market Forecast
- Presentation of the information services market forecast by delivery mode and submode.

VII. Competitive Environment
- Discussion of the competitive environment for information services within the delivery mode—with vendor profiles.

VIII. Conclusions and Recommendations
- Summary of risks and opportunities.

A. INPUT Definition of Terms
- Definitions and descriptions of market structure and terms used throughout INPUT's reports.

B. Forecast Data Base
- A detailed forecast by delivery mode, submode, and industry/cross-industry sector. Contains a reconciliation to the previous year's Appendix B.

This report is published in segments throughout the year to subscribers of INPUT's Market Analysis Program. Subscribers will receive the material as the research and analysis are completed, with the first chapters shipped in the second quarter. The forecast is shipped in the third quarter.

B
Scope and Methodology

1. Scope

This report addresses the U.S. information services industry for the network services sector (delivery mode). It includes user expenditures that are non-captive and generally available to vendors. Many large organizations have portions of their information services requirements satisfied by internal divisions. The resulting expenditure is not available for competitive a bid by the general vendor community and is not included in INPUT's projections. The non-captive distinction is important and is addressed in more detail in Appendix A, Definition of Terms.

a. Information Services Industry Structure

Exhibit I-2 defines the structure of the information services industry as used by INPUT in its market analysis and forecasts. The industry consists of eight delivery modes, each of which contains a number of submodes.

- Delivery modes are specific products and services that satisfy a given user need. Market sectors specify who the buyer is, and delivery modes specify what the user is buying.
- INPUT develops a five-year forecast for the delivery mode and each of the submodes.

EXHIBIT I-2

INPUT also publishes market sector reports analyzing 15 industry and 7 cross-industry market sectors. These reports, published annually by INPUT, analyze the information services opportunities in industry sectors such as insurance, transportation, and discrete manufacturing and in cross-industry sectors such as accounting, human resources, and office systems.

Exhibit I-3 shows the relationship between delivery mode forecasts and market sector forecasts.

EXHIBIT I-3

Delivery Mode versus Market Sector Forecast Content

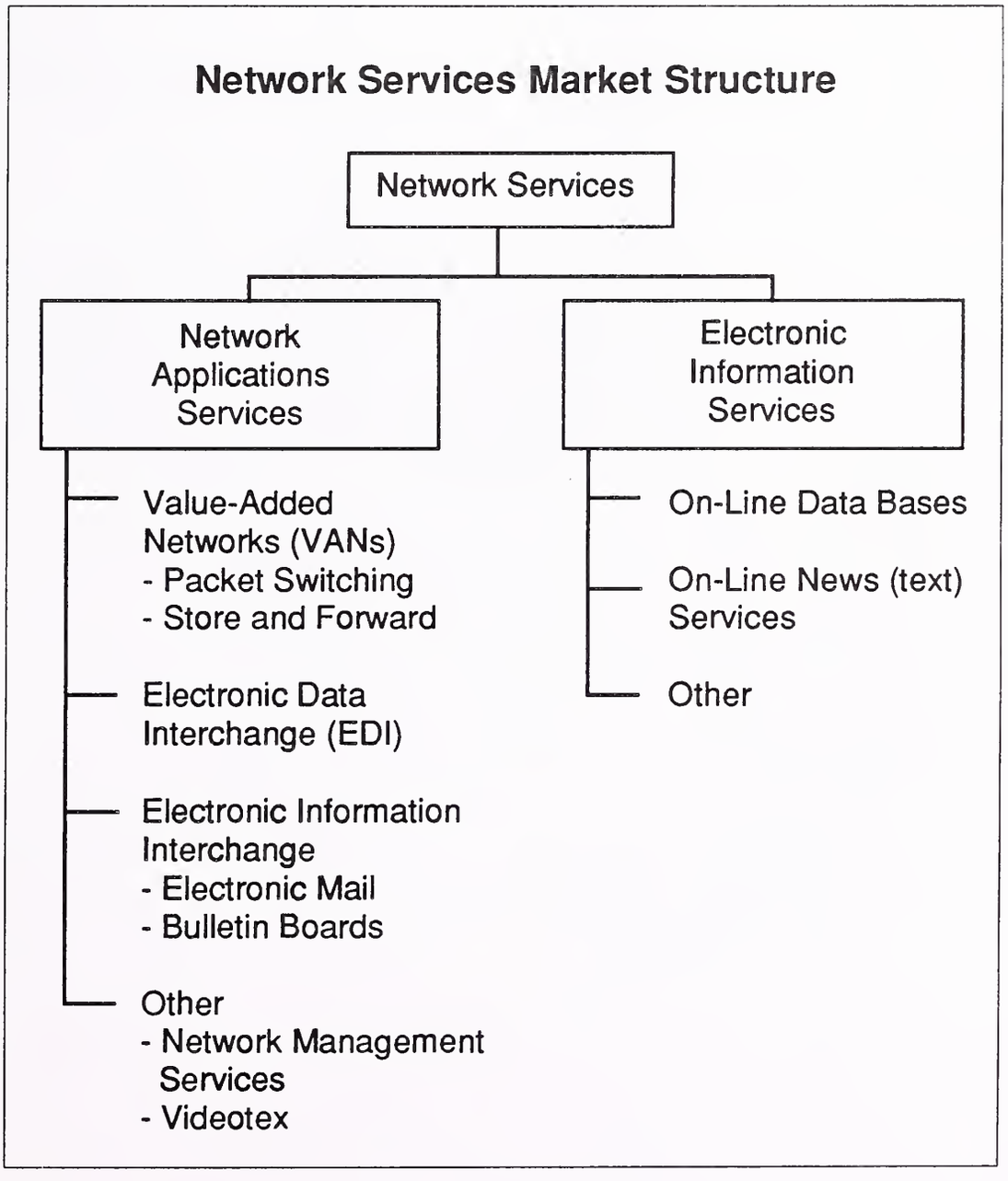
Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	Other
Processing Services	Transaction	X	X	
	Utility			X
	Other			X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform	X		
	Applications	X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications	X		
	Electronic Information Services	X		X
Systems Software Products				X

For a more complete discussion of INPUT's information services industry structure and market sector definitions, please refer to INPUT's Definition of Terms.

b. Delivery Mode Description

The structure of the network services delivery mode, as shown in Exhibit I-4, is composed of electronic information services and network applications.

EXHIBIT I-4



- The two submodes within the network services delivery mode—electronic information services and network applications—are described in full in Appendix A.

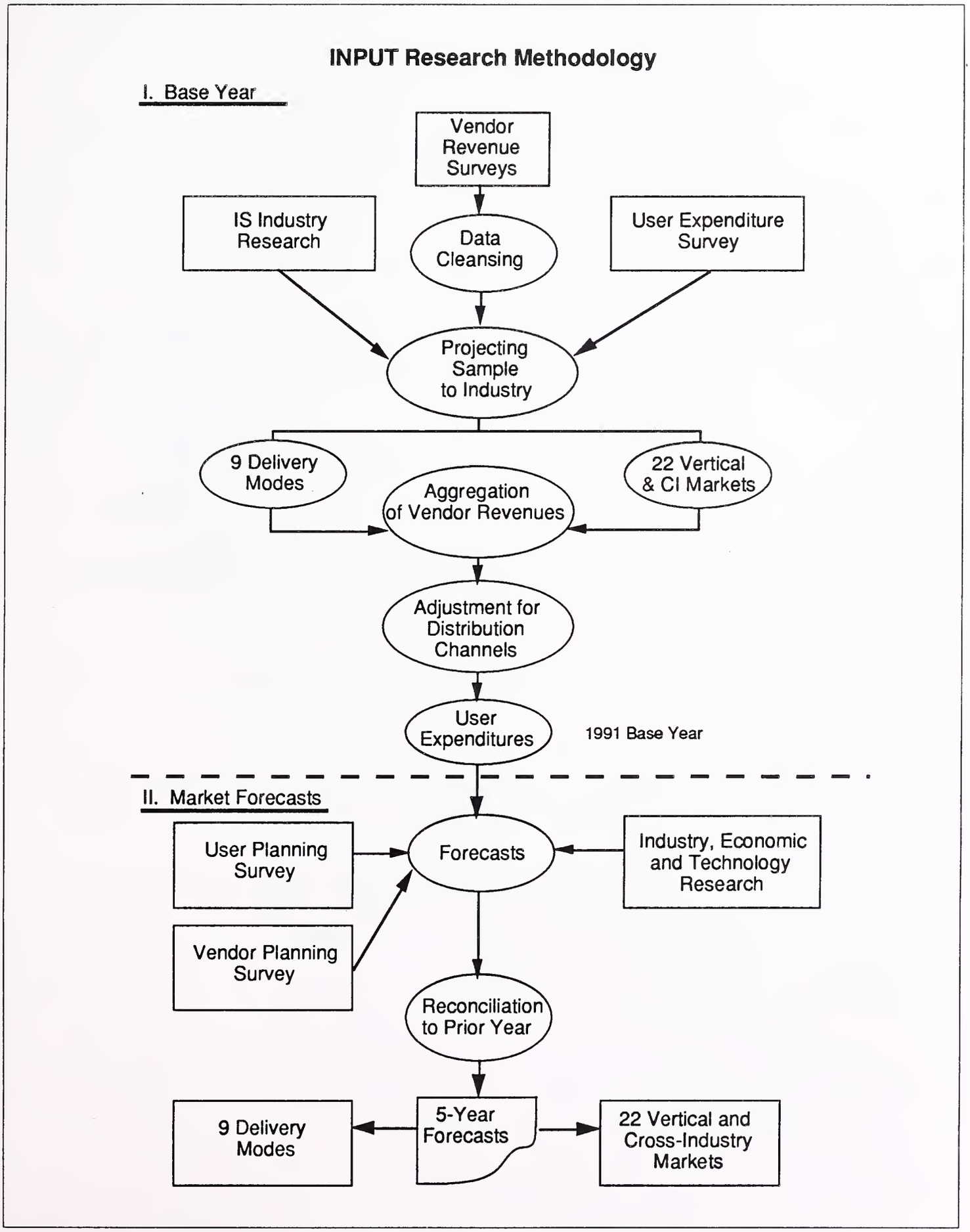
- All network application services are considered as purchased by specific industry sectors, that is, they are industry-specific. Thus, the forecasts for network applications within the 15 industry sectors add to the total of the forecasts for the delivery mode as a whole. Electronic information is purchased as industry-specific, as well as on a generic basis across industries.

- Network services sold in conjunction with processing services are included in the definition of the network services sector.

2. Methodology

Exhibit I-5 summarizes INPUT's methodology for market analysis and forecasting. As in past years, INPUT has continued to survey information services vendors to determine their U.S. information services revenues, and to query user information systems organizations about expenditures and outside services acquisition plans. INPUT interviewed vendors a second time to understand their views of market opportunities over the short and long terms.

EXHIBIT I-5



INPUT's annual forecasting process is broken into two major parts: base-year expenditure calculations and market forecasts. Each is briefly described below.

a. Base-Year Expenditure Calculations

- INPUT determines previous-year information services revenues for the nine delivery modes and 22 industry and cross-industry sectors for hundreds of vendors. Estimates rely upon interviews, public data, and INPUT's own estimates.
- The initial data are projected to represent the entire information services industry.
- Adjustments are made to eliminate duplications due to distribution channel overlap and to assure that captive information services expenditures are not included.
- The result is a base-year (1991) user expenditure for each of the 22 vertical and cross-industry sectors and the 8 delivery modes.

b. Market Forecasts

- In the forecasting step, INPUT surveys information systems executives to determine their projected expenditure levels, both in aggregate and for each of the outside information services categories.
- In addition, a second set of vendor interviews is conducted later in the year to obtain an understanding of how key vendors view the market and its opportunities.
- The result is a five-year forecast for each of the 22 vertical and cross-industry sectors and the 8 delivery modes. The delivery mode and market sector forecasts are correlated according to the diagram in Exhibit I-3.

To complete the process, INPUT reconciles its new forecasts with those from the previous year. Differences due to market restructuring and other factors are explained. One may use these projections to track INPUT's forecasts from year to year.

C
Economic Assumptions

INPUT forecasts are presented in current dollars (i.e., 1997 market sizes are in 1997 dollars, including inflationary forecasts). In developing the five-year forecasts, INPUT has incorporated economic assumptions for the U.S. economy as a whole.

The GNP and GNP Deflator growth rates used in INPUT's market projections for 1992 through 1997 are from the CONSENSUS™ forecast, a product of Blue Chip Economic Indicators of Sedona, Arizona. The Blue Chip CONSENSUS forecast is derived from a leading panel of economists representing leading financial, industrial, and research firms across the U.S. and has a 14-year track record of balanced and accurate projections.

The 1992-1997 assumptions are contained in Chapter VI, Market Forecast.

D
Related Reports

Related reports of interest to the reader are:

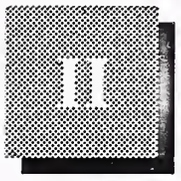
1. U.S. Markets

- *U.S. Application Solutions Market Analysis Report, 1992-1997*
- *U.S. Processing Services Market Analysis Report, 1992-1997*
- *U.S. Systems Software Products Market Analysis Report, 1992-1997*
- *U.S. Systems Integration Market Analysis Report, 1992-1997*
- *U.S. Systems Operations Market Analysis Report, 1992-1997*
- *U.S. Industry Sector Markets, 1992-1997* (15 reports on all major industry sectors—e.g., insurance)
- *U.S. Cross-Industry Sector Markets, 1992-1997* (7 reports on information services markets that serve all vertical industry sectors, e.g., accounting)

2. European Markets

- *The Western European Market for Computer Software and Services, 1992-1997*
- *Systems Software Products—Western Europe, 1992-1997*
- *Trends in Processing Services—Western Europe, 1992-1997*
- *Systems Integration Market Forecast—Western Europe, 1992-1997*
- *Systems Operations Market Forecast—Western Europe, 1992-1997*
- *Western European Network Services Markets, 1992-1997*

The European markets are also analyzed on a vertical basis for discrete and process manufacturing, insurance, banking and finance, and retail and wholesale distribution.



Executive Overview

A
User Issues

As Exhibit II-1 shows, the depressed revenues and earnings of companies have been a major issue affecting buyers of network services. Although, certain IS budgets are starting to show signs of improvement.

EXHIBIT II-1

Network Services
Major Buyer Issues

- Revenues and earnings remain flat, but recession waning
- Desire for increased vendor productivity
- Need to interconnect disparate network technologies
- Need for network planning
- Recognition of product/service need

Listed in order of importance.

The overall result of this recession has caused buyers to become more interested in locating competitors that can deliver similar services at reduced prices.

Buyers are also interested in obtaining additional services and aid from network services vendors as part of buyers' present service and fee agreements. Buyers want a means of improving productivity, as well as a way to offset reductions in user staffs.

Upgrades in the interfacing of a given user's multiple network technologies (LANs, MANs, and WANs) will drive networks to be redesigned. This redesign effort will support the need for all of these networks to interoperate, which is sometimes referred to as enterprise networking.

Standards in network technology are being developed to allow common interface points to facilitate the interconnection of multiple network platforms.

Buyers have also shown more concern about planning and justifying the use of network services, as noted in Exhibit II-1.

While vendors have attempted to meet these developments in the marketplace, their earnings have suffered. This is due to increased competition, their own downsizing efforts, and their attempts to supply these additional services.

According to several corporations that INPUT contacted, the increased use of network systems can put pressure on the present or planned use of network capabilities. INPUT found that as the user's need for increased traffic and connectivity between company sites grew, vendors had difficulty in meeting throughput requirements.

The positive element in buyer attitudes is the recognized need for network services.

- In this marketplace there is not a strong recessionary reaction that would lead to an aggregate reduction in the use of electronic information services, value-added networks, EDI, or other network applications. Although, the recession has caused individual firms to limit planned use.

- Buyers feel that these services are a necessary way of doing business rather than an enhancement to business activities.

B

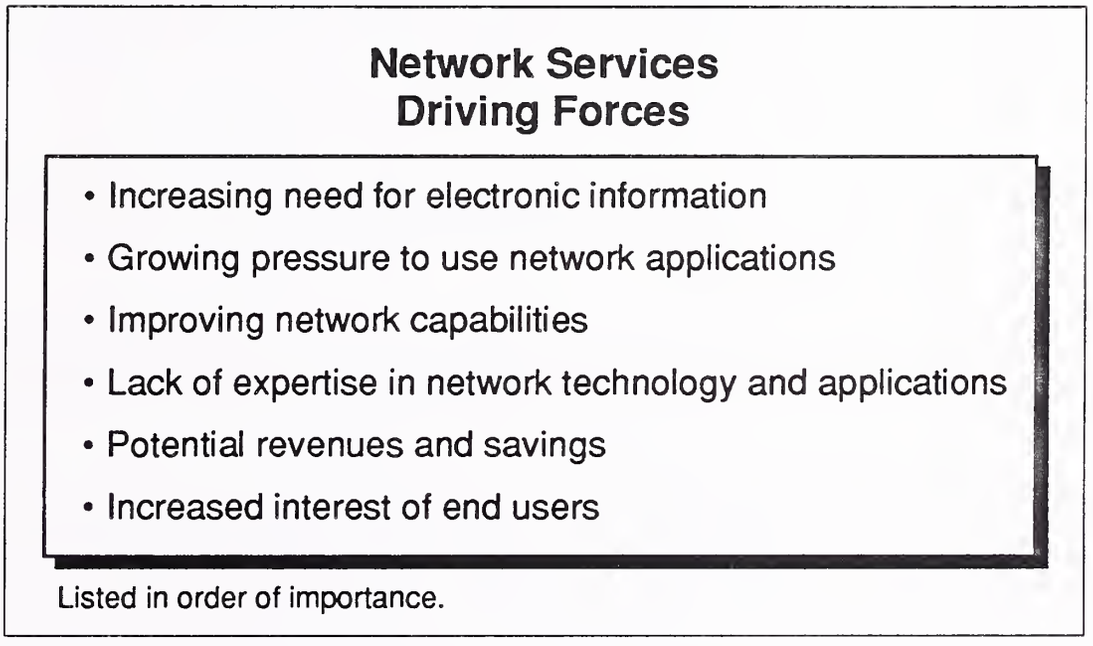
Driving Forces

One of the paramount forces driving the network services market is the increasing demand for electronic information, as indicated in Exhibit II-2.

- Additional information about materials, production processes, drugs in use, business activity, financial markets, and a host of other topics is constantly becoming available and producing an increase in the amount of on-line information.

- The on-line information in use can have setbacks related to the economic conditions of users, more effective methods of using information, limitations in the auditing and control of information, and other factors, but these factors are not causing users to project reduction in EIS.

EXHIBIT II-2



The forces producing increased use of EDI, electronic mail, and other network applications stems predominantly from two trends:

- Pressures by corporations on their suppliers or customers
- The desire to save time and funds by moving information electronically

Constantly improving network capabilities that make it possible to contact more end points in the U.S. and globally, and the technology leading to faster access and transmission of data, are the major forces driving the use of EIS and network applications:

- Electronic mail and EDI can reach more company locations, clients, and suppliers.
- According to users, the increased speed in obtaining information that has occurred in the last few years has resulted in more opportunities to gain revenues and save costs.

Many users do not have sufficient ongoing research and development of network capabilities or enough technically trained staff to take advantage of increased connectivity or speed of transmission. Major corporations indicate that it is difficult to address the scope of technological change. This uncertainty is another force that drives the use of network services vendors.

Although many users talk about network services as a way of doing business, users expect that EIS and network applications will increase revenues or reduce costs:

- A regional sales manager at Merrill Lynch stated that it would be impossible to handle work for clients without having on-line quotes. He pointed out that the quality of his quotation systems was partially responsible for his performance in selling.

- Several users who emphasized the convenience of using EDI for ordering and payment pointed out that cost savings were their primary motivation.

- A systems planner at a large energy company has promoted the use of network services as the goal for many administrative functions, but he noted that monetary justifications were the primary drivers for expanded use of these services.

End users show increasing interest in network services, and this interest is also a force leading to increased use of these services.

- The energy company referred to above has made use of VANs to provide customers with on-line information that can help customers order products. End-user demands led to this use of VANs.

- Several vendors report that users have been active in suggesting the use of additional EIS, EDI, and videotext services and other network applications.

C
User Expenditures

In response to an extended economic downturn, pressures continue on the revenues and earnings of some vendors in the marketplace . However, Exhibit II-3 illustrates a continuation of relatively favorable prospects and compares differences in the outlook of the market between 1991 and 1992:

- The $9.4 billion 1991 forecast for user expenditures was more optimistic than the actual expenditures in 1991.

- The 1991 preliminary forecast for user expenditures for 1992 projected $10.8 billion as opposed to an adjusted $10.4billion. This allows for a slowing in growth due to the continued economic downturn, reflected in the 1992 forecast. The forecast for growth during the next five years remains at 17%.

EXHIBIT II-3

Network Services Market Overview ($ Billions)

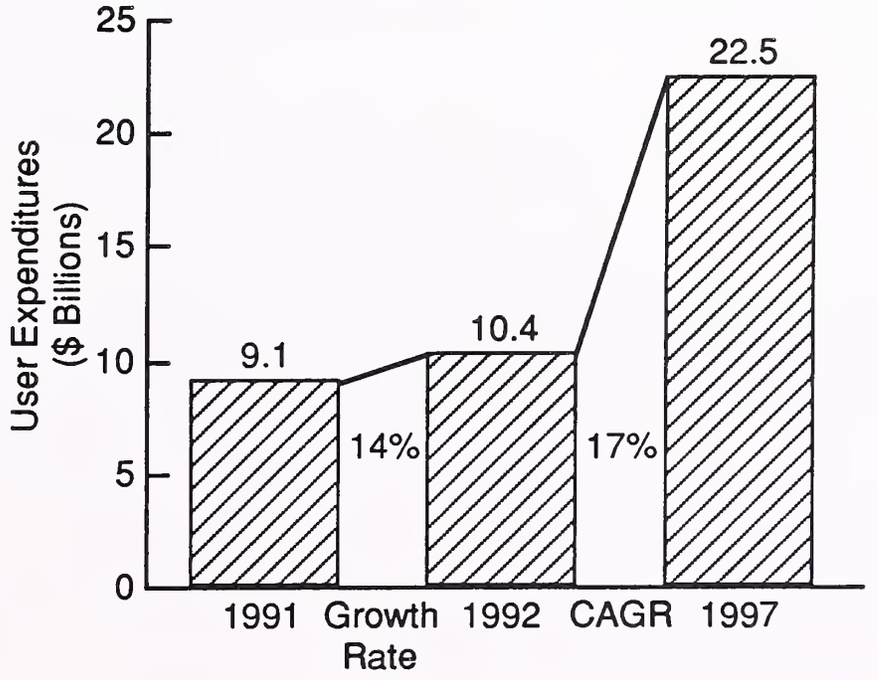
1991 Outlook		1992 Outlook
1991 Forecast - 9.4	versus	1991 Actual - 9.1
1992 Forecast - 10.8	versus	1992 Forecast - 10.4
1991-1996 Forecast Growth Rate - 17% (CAGR)	versus	1992-1997 Forecast Growth Rate - 17% (CAGR)

The market for network services is growing from a 1991 level of $9.1 billion in user expenditures to a level of $10.4 billion in 1992 - a growth rate of 14%. User expenditures will grow at a compound annual growth rate (CAGR) of 16% during the next five years to reach $22.5 billion in 1997.

The 1991/1992 forecast rate in Exhibit II-4 has been lowered by 2% to reflect the continuing impact of the economic downturn, regulatory impacts, and the growing maturity of the market.

EXHIBIT II-4

U.S. Network Services Market, 1991-1997



The continuing expansion in network services is due to the fact that growth can assist in revenue generation, or cost reduction, while creating a more automated way of conducting business.

- Network applications provide electronic means, rather than paper means, of handling business with customers, suppliers, service companies, and government offices—as well as with other offices in an organization. Instructions, messages, data, and payments can be handled more quickly and save time and costs.

- Information necessary to make decisions, conduct research, aid clients, or keep processes functioning, can be accessed more rapidly and on an automated basis.

D
Vendor Competition

The top five vendors of network services in Exhibit II-5 include only vendors of one submode of network services, EIS. There are two network applications vendors among the next five largest vendors (not shown in Exhibit II-5).

Four of the top five vendors have EIS products for financial subjects, and the other vendor, Mead Data Central, has EIS products that offer legal information and news.

- Two of the vendors, TRW and Equifax, offer credit-related EIS.

- Dow Jones (Telerate) and Dun & Bradstreet offer financial details and corporate product and market information.

Four of the top five vendors are subsidiaries of companies that have substantial revenues in non-information services areas. Four of the next five vendors have the same characteristic.

Only two of the top five vendors offer other modes of information services. Dun & Bradstreet offers software products, and Equifax offers processing services as a result of its acquisition of Telecredit.

The top five vendors continue to control 29% of the U.S. market for network services, and the next five vendors control about 16% of the market. Altogether, the top 10 vendors control just under half of the market.

EXHIBIT II-5

Leading Vendors of Network Services in 1991

Rank	Vendor	Estimated Revenue ($ Millions)	Market Share (Percent)
1	TRW (including Chilton)	765	9
2	Dow Jones (Telerate)	438	5
3	Dun & Bradstreet	435	5
4	Mead Data Central	425	5
5	Equifax	398	5

A most significant competitive event occurred in late 1992. It was the formation of IBM's Integrated Systems Solution Corporation (ISSC) and Sears Technology Corporation (STC). The new partnership is named Advantis, with IBM's ISSC division owning 75% of the venture. While the venture's combined revenue equals $1 billion, INPUT estimates the partnership's actual network services market revenues to be $470 million. This is exclusive of captive internal revenues.

Based on this revenue estimate, the Advantis organization will become second only to TRW and will be incorporated within INPUT's 1992 ranking. This represents a significant repositioning within the network services marketplace.

E

Conclusions and Recommendations

1. Conclusions

As indicated in Exhibit II-6, one conclusion about the network services market is that the recession has had an impact on business in almost all industries. Recent economic indicators point to a positive trend in business improvement, signaling an end to one of the most protracted economic downturns in U.S. history.

However, the impact of this recession was more than offset by a significant and continuing need for network services. This was due to the increasing need for electronic information.

- Information about materials, production processes, business activity, financial markets, and a host of other topics, contribute to the increases in the amount of on-line information.

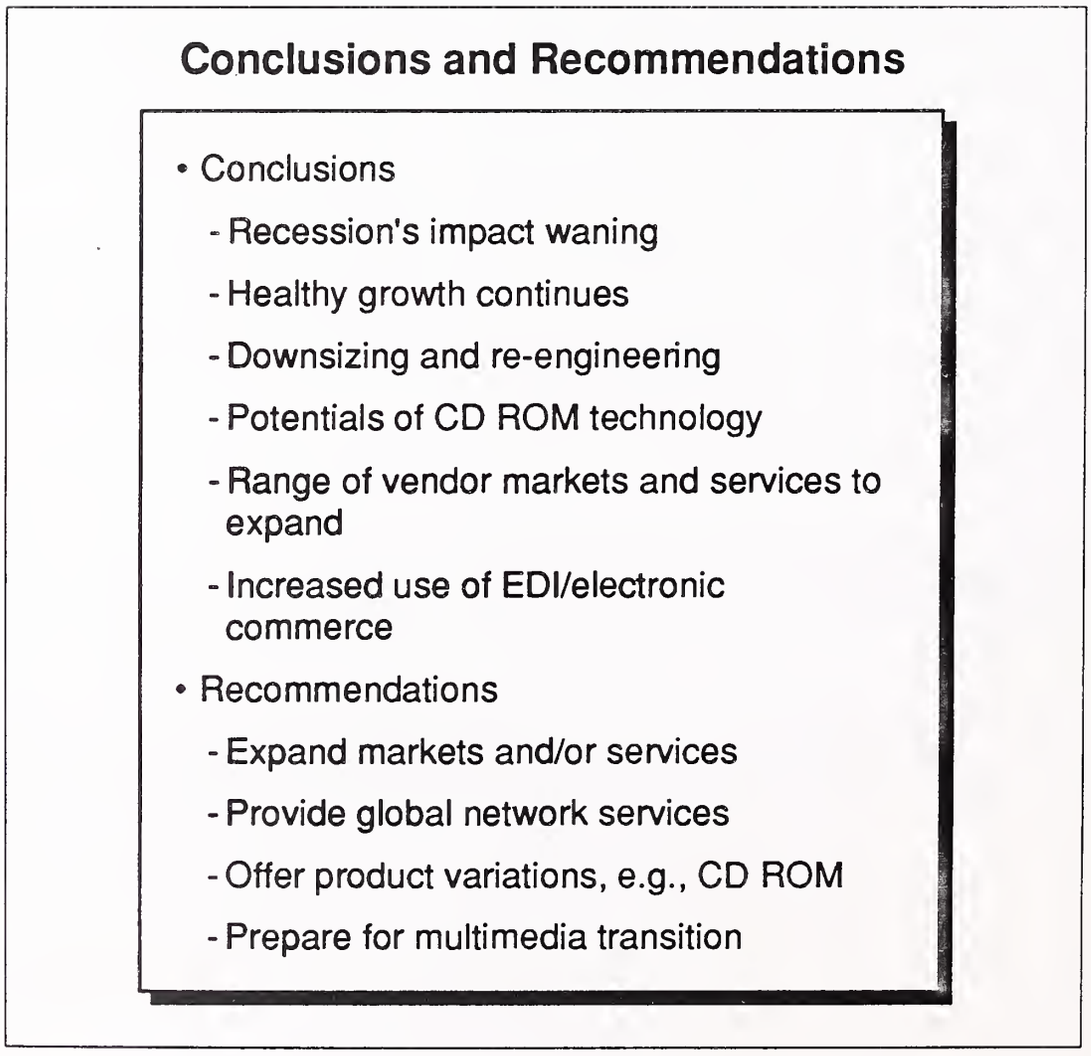
- In addition, forces producing increased use in EDI, electronic mail, and other network applications, stem from pressures of corporations on their suppliers or customers, and/or the desire to save time and funds by moving information electronically.

In conjunction with the economic downturn, there has been a significant trend in business downsizing. This reduction in network size and cost has created a need for better network planning.

Having fewer capable resources, users have more difficulty analyzing and re-engineering the needs of network service requirements.

Vendors have attempted to meet this development by providing increased aid in planning these network services.

EXHIBIT II-6



The interaction of technology and business has had a noticeable impact on network services:

- Significant developments in the use of CD ROM technology have led to the consideration and/or use of CD ROMs for economic, technical, legal, and other information that does not require real-time updates.

- Information that is more static can be provided much more economically on CD ROM than from on-line data bases. There are now economic and financial data bases available on CD ROM which include, in some cases, data that is also available from on-line data bases.

The addition of Advantis, a new major full-service player in the vendor arena, will cause network services vendors to re-evaluate their offerings.

Many of the vendors of network services have offered a limited number of EIS or network application products and/or sell products in a limited number of markets. Vendors who serve a wide range of products and industries, such as CompuServe, GEIS, and Advantis, will be better positioned in the marketplace.

Another observation that should be made about the network services market is the increase in user demand for to employ EDI or related electronic commerce services.

2. Recommendations

Network services vendors should review the actions of other vendors offering products in their delivery mode, as Exhibit II-6 points out.

- Vendors should consider moves made by other vendors to use mergers or alliances with those in other service modes including transaction processing and network connectivity to help them increase services, and improved productivity, or share costs. The recent IBM/Sears alliance has provided such benefits.

- It is becoming apparent that users are focusing more on their core businesses than in the past. Vendors can take advantage of this need by offering a tailored service that performs all transaction/network services including the ancillary business functions currently performed by the user.

Because users need to meet the demands of a global economy, their organizations will take on international functionality.

- Network service capabilities should be available to support these inevitable requirements. For the smaller niche market vendor, alliances with foreign carriers may be beneficial.

An additional service that vendors of EIS should consider is providing data on CD ROM together with new software products.

- Rather than letting competitive vendors provide this medium for static data in on-line data bases, vendors of EIS could provide CD ROMs along with software products that could organize or provide references between the on-line data and the data on the CD ROMs.

With technology changing so rapidly, it is imperative that vendors stay in tune with its evolution and plan for potential opportunities.

- Vendors need to position themselves to support any-to-any network connectivity. This connectivity will include the interoperability of EDI, electronic commerce (E-mail), imaging, and even the possibility to support certain segments of a user's enterprise networks.

As multimedia technology develops and associated pricing comes down, users will begin to make significant commitments to this audio, image, full motion video, and textual medium. It has been suggested that the most logical springboard to create this service would be electronic mail.

III

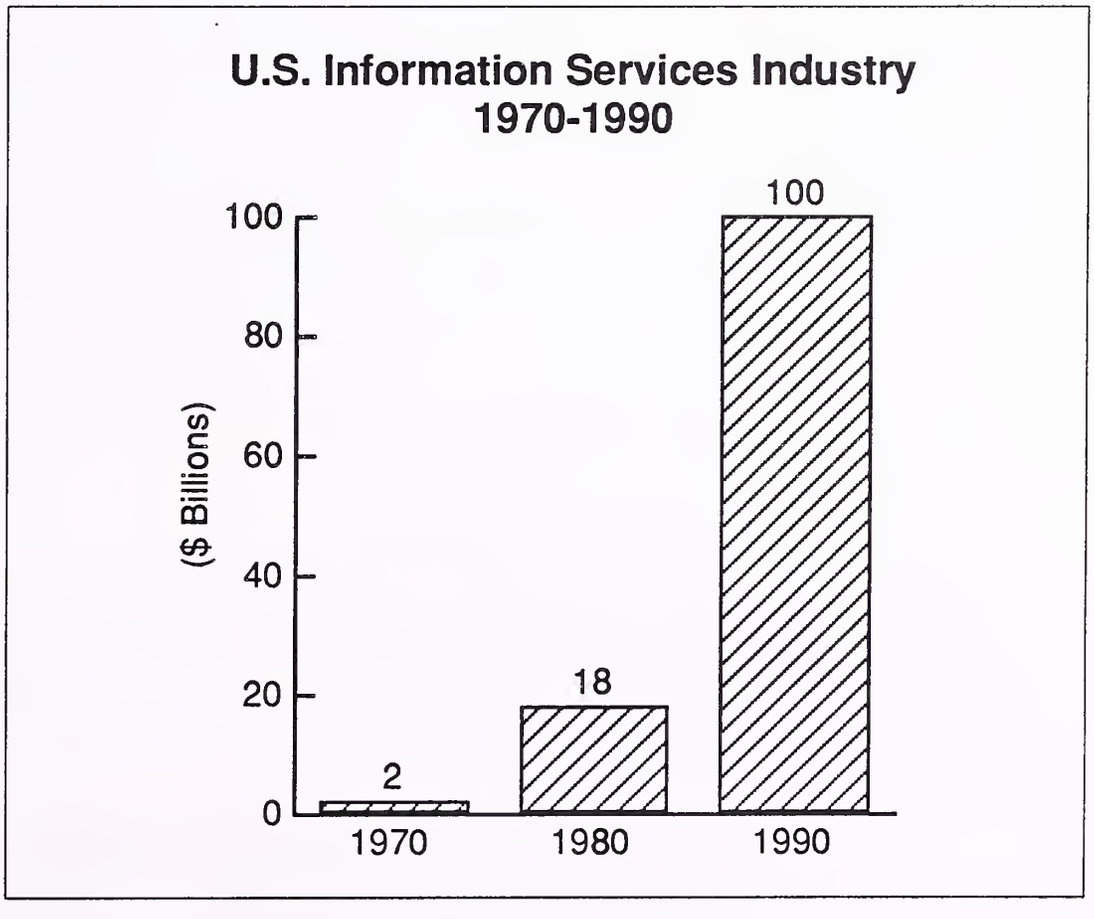
General Business Climate

A

1991 Results

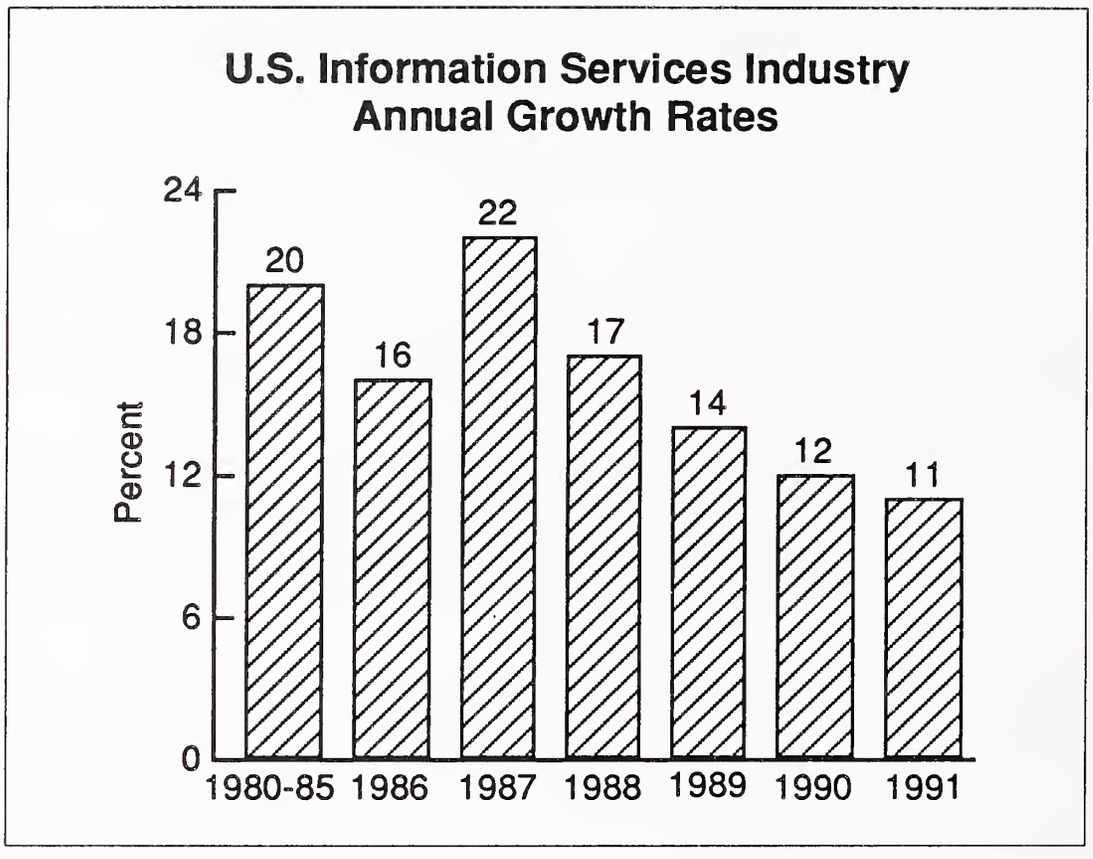
In 1990, the U.S. information services industry reached a milestone, ending the decade at about $100 billion in size. As Exhibit III-1 shows, the industry increased in size over five times during 1980s and is 50 times larger than it was in 1970, when the industry represented $2 billion in user expenditures.

EXHIBIT III-1



During 1991, the industry grew at about 11%—from around $100 billion to $110 billion. As Exhibit III-2 indicates, 1991 reflects a further intensification of a decline that started in 1988. In contrast, the average annual growth during the first eight years of the decade was over 19%.

EXHIBIT III-2



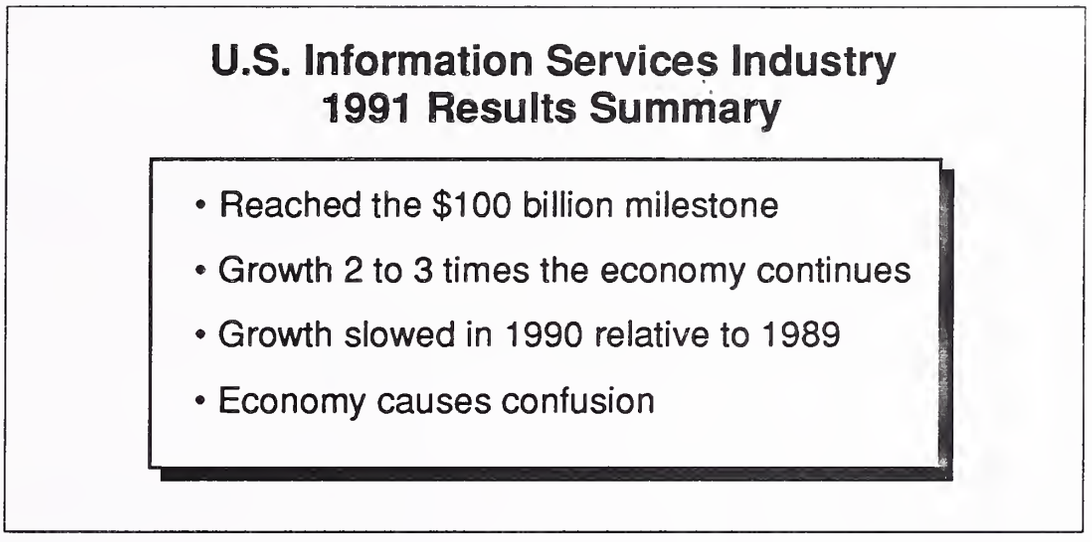
Worldwide, the industry continues to experience greater growth rates of close to 20%, and many U.S. vendors are experiencing growth that exceeds the U.S. industry as a whole. This growth is primarily due to international sales, but is also due to the focus on specific industry markets. Inflation rates and somewhat stronger economies are driving the industry to higher growth levels overseas.

On a delivery mode basis:

- The smaller systems integration, systems operations, and network services delivery modes are growing faster than the rest of the industry.
- The software products sectors grew at or slightly above the industry average.
- The larger professional services and processing services sectors, as well as the smaller turnkey systems sector, are growing slower than the industry average.

Exhibit III-3 summarizes 1991 results.

EXHIBIT III-3



The five-year forecast for network services growth fell slightly from 17% to 16% in 1992. Growth in the use of EIS also fell due to further decreases in market activity, and plans for network applications were delayed due to the economic downturn.

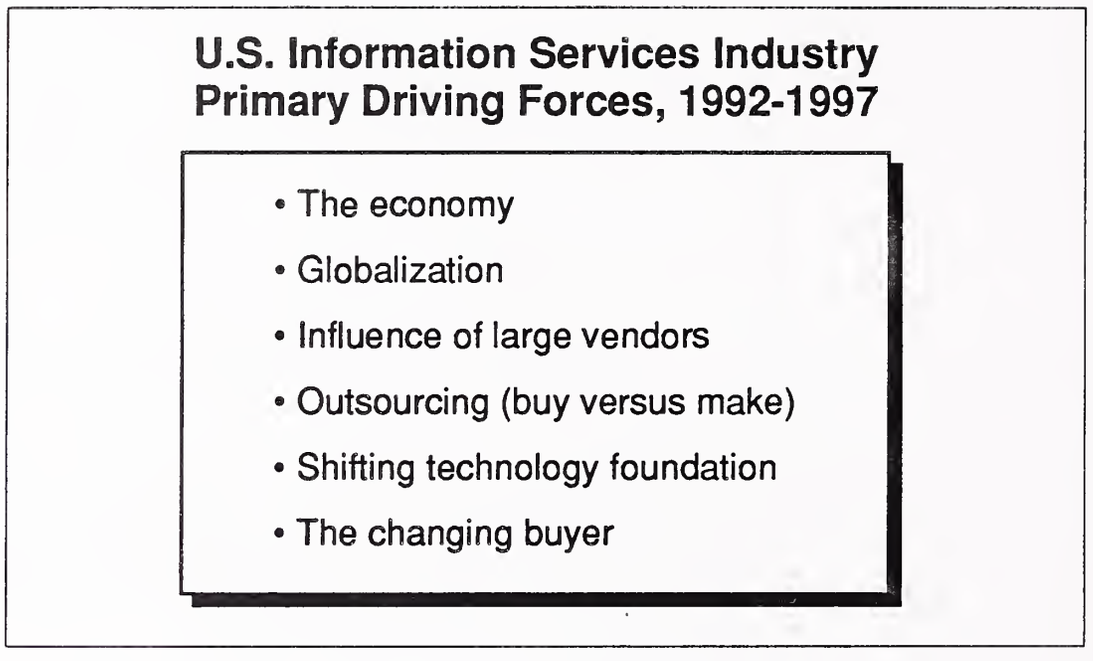
Although the economic downturn was the continuing principal factor causing the drop in growth of information services, it did not have an equal impact on the use of network services in different markets or on the vendors offering these services. Most major vendors, as well as some smaller ones, grew at less than 10%, with only one major vendor reaching 20%. As a result, many vendors continue to evaluate changes in objectives and market strategies, as well as changing downsizing tactics in operational staffing and processing, to reduce costs.

B
Driving Forces

The fundamental force impacting the information services industry in the 1992-1993 time frame is an apparent end to the recessionary period. This force will affect the industry as a whole, and each of the nine delivery mode sectors used by INPUT to analyze the industry and its key trends.

Exhibit III-4 identifies six primary driving forces impacting the U.S. information services industry. The impacts are multidimensional, fundamental, and long lasting. Each is discussed in this chapter and throughout this report.

EXHIBIT III-4



C
Key Trends

Downsizing, re-engineering and outsourcing can be considered major business trends that have emerged in the early 1990s as concepts that will influence and drive American business for the balance of this decade. Although some apply the term rightsizing (instead of downsizing), the concept affects all segments of business and involves a migration away from over-funded, over-staffed, over-equipped centralized resources towards distributed assets that more effectively meet contemporary needs for cost-effective, responsive business activities that are placed closer to, or under the control of, the ultimate user.

Re-engineering is an implementer or facilitator of downsizing, and is also indicative of the current trend in business to move away from traditional, less effective practices and moves towards more competitive, cost-effective and efficient activities. Re-engineering and downsizing are logical responses to increased worldwide and domestic business competition. These two areas are an inevitable result of the production and staffing excesses of the 1980s, and the economic downturn in 1991 and 1992.

Both of these concepts affect all areas of American industry—especially the IS and IT functions—and have a strong influence on the trends noted below.

1. Economic Impacts

The economy, as well as the overall size of the information services industry, was a significant factor in the user expenditure level for information services and software products.

- The inflation rate of the past few years has been much more modest than in the mid-1980s. INPUT forecasts and market sizes are in current dollars; thus, lower inflation implies lower growth.

- Real economic growth had been modest over the past few years prior to the recession that started in late 1990. Deferred and canceled expansion plans in all industry sectors, certainly slow the expansion of information services expenditures.

- The shift of information processing to smaller computers lowered the investment in software products, based on current pricing practices. Quantities of software products sold increased, but revenue levels grew at more modest rates.

In 1991, a year with minimal growth in the overall economy and inflationary growth of about 5%, the information services industry grew 100%.

- INPUT's 1991 and 1992 economic assumptions were for nominal GNP growth of 3 to 5%; real GNP growth was 1% or less in 1991 and about 2% in 1992.

- In the fourth quarter of 1992, the economy appears to be in a slight upward growth status, with continued improvement expected in 1993. At the same time, inflationary pressures are minimal. INPUT expects continuation of this modest growth in 1992 and again in 1993. The continued slow upturn will have the following positive and negative impacts on the U.S. information services industry in the near term.

Positive impacts include:

- Increased motivation to buy rather than make, in particular for larger systems requirements. Response time and impact on business operations are the key criteria.

- The interest in systems operations, which permits organizations to redeploy capital investments and lower direct headcount, is being reinforced.

- A tight economy is helping develop interest in lower-cost solutions that come from client/server-based applications software products.

Negative impacts include:

- Decision processes are lengthened in a tight economy, causing deferral of major information systems projects and the use of services such as network applications.

- With tight information systems budgets, the internal information systems staff can be favored over contracted professional services vendors, thus negatively impacting a major segment of the industry.

2. Globalization

INPUT has cited globalization as a driving force for the past three years. During that time markets have opened, vendors have expanded their international focus, and users have begun to expect global capabilities. This is particularly true for network services, in which financial electronic information and international network applications are of increasing interest.

- The European market is making progress toward a single market. In addition, the European market is stronger than the U.S. market, although both are suffering in the current economy.

- The worldwide orientation of the larger services vendors is verified by the investments in Europe by Computer Sciences Corporation, Digital Equipment and by the ever-expanding interest of Japanese vendors in the U.S. information services industry.

The primary positive impact of globalization is the ability of larger vendors to balance their businesses in multiple markets, with less impact from market downturns.

The primary negative impact of globalization is that it may make it harder for smaller vendors to grow and/or maintain independence.

3. Influence of Large Vendors

The influence of the larger information services vendors has increased significantly over the past few years.

- The newer systems integration and systems operations sectors, though smaller than more traditional sectors such as professional services and processing services, are growing faster than the traditional sectors and are dominated by the leading vendors.

- Even in network services, large information services vendors—including TRW, ADP, Equifax, GEIS, and the newly formed joint venture of IBM and Sears called "Advantis", play strong roles. However, they are joined by information providers and communicators such as Dun & Bradstreet, Dow Jones, and BT Tymnet.

- Certainly there are numerous smaller firms that are also growing, but overall, the dominance of the larger vendors continues.

The large-vendor influence is increasing in other ways as well:

- Starting with IBM, many large services vendors are making minority and majority investments to gain influence on technology, access to software products for remarketing, and market share.

- DEC's investment in Kienzle in Europe, and EDS' investment in ASK Computer Systems are two examples of large vendors seeking new channels and resources.

- Consolidation is also a factor. Mergers among the major accounting firms have reduced the number of players, but have given two of the firms, Ernst & Young and Deloitte Touche, added resources to follow the example of Andersen Consulting. In network services, the acquisition of Chilton by TRW illustrates this consolidation.

The increasing use of business consulting linked to professional services has provided a means for the large accounting and consulting firms, as well as some large information services firms, to gain a greater share of the industry. INPUT expects this trend to continue over the next few years. The opportunity for the smaller, more specialized software product or services vendors is not disappearing, but it is changing character.

- Alliances with larger vendors will be essential, at least as secondary sales and support channels.

- Specialization—in terms of the technology used or the industry served—will become more important and common.

The continuing increase in the strength and impact of the larger vendors will have the following positive and negative impacts:

Positive impacts include:

- The larger vendors have the financial strength to minimize the risk of systems management services.

- The larger vendors have financial resources available to invest in new technologies, often through investment in smaller or specialized firms.

Negative impacts include:

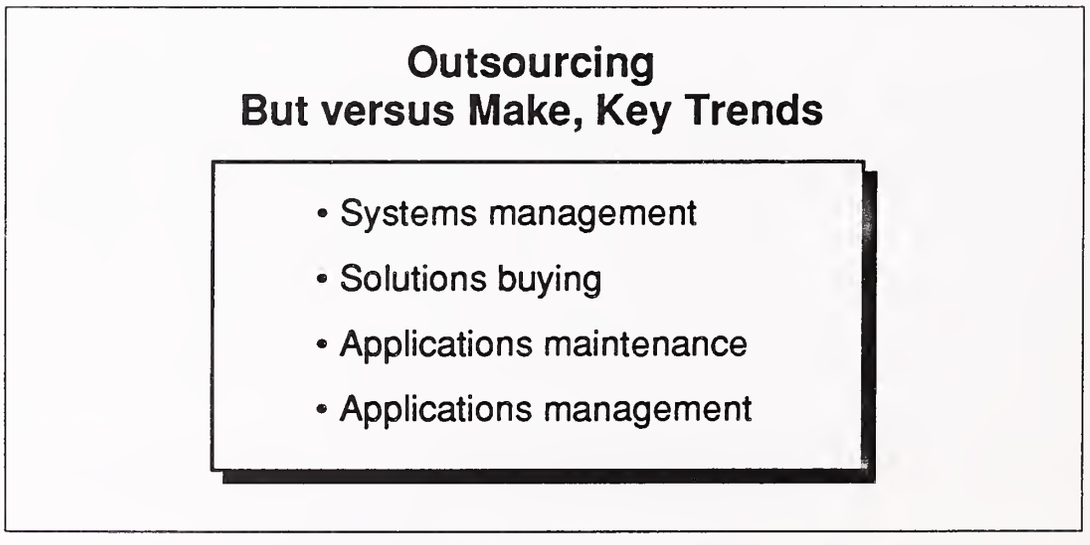
- Alliances may become a requirement for smaller technology firms to survive and prosper.
- The dominance of the larger vendors will continue.
- Larger vendors tend to move more slowly, which will hamper development and acceptance of new technology. This slowness will provide opportunity to small vendors that seize the technology initiative.

4. Outsourcing (Buy versus Make)

Since its inception, the information services industry (services and software products) has tended to outgrow the internal information services budget by continuously creating new products and services that permit the information systems function to be outsourced (bought versus made). This has always been an outsourcing industry. Even though growth has declined, the internal information systems budget and the computer hardware sector will permit continued expansion that exceeds growth in the economy.

Exhibit III-5 lists key trends in outsourcing.

EXHIBIT III-5



a. Systems Management

Outsourcing the management of information systems, or at least significant elements of information systems, continued to gain momentum during 1991. Helped more than hindered by the recessionary economy, the inclination of large organizations' general management increased their consideration of outsourcing.

The ability to transfer much of the financial risk and, perhaps more importantly, the technological risk of a project or operations to a specialist, has numerous attractions for general management:

- The attraction that will become more important will be the ability to disconnect the information technology part of the solution from the business decision. General management is concerned with business results, and does not want to debate the pros and cons of a technology. The appeal of the vendor's offer to take on risk either in a project (systems integration), or in system operations can only grow during the 1990s.

- The nature of most outsourcing activities within larger organizations often makes them favor the large vendors, adding impetus to the trend described above. If there is major risk involved, the buyer will bet on the company most able to accept risk and take responsibility.

- Perhaps the most important attraction is the ability of buyers to gain access to a broad information technology on an arm's-length business basis in a single decision.

  - The systems integration vendor can provide all the needed expertise in a new technology at the beginning of a project. There is no internal training lag time while the information systems staff gains the knowledge and experience required.

  - The systems operations vendor can provide a full utility-based service at a predictable cost over a number of years. This should make for fewer surprises from the overall information systems program.

b. Solutions Buying

Buying applications software is a well-established practice in the U.S. market where the use of packaged software is commonplace. However, the current change in the way U.S. organizations are managed and, the availability of low-cost, high-performance client/server computing, is bringing new impetus to the application solutions market.

- The fundamental decentralization of U.S. business management, with the corresponding reduction of corporate staffs, are creating a major requirement for business unit (distributed) application systems. Furthermore, the buyer is not an information systems professional and is willing to outsource (buy) with some customization.

- Just when the smaller business unit needs independent application solutions, there is a hardware revolution to support the need. Client/server technology provides affordable, high-powered computing.

The ability to find a VAR that can provide a package, plus customized systems on client/server-based software, is bringing the solution value of systems integration to the decentralized business unit.

c. Applications Maintenance and Applications Management

In line with the shift to outsourcing systems management to systems integrators and systems operations firms, the buyer is also seeking to gain more relationships with more traditional professional services vendors. Instead of contracting for temporary personnel, the buyer is beginning to contract for services like applications maintenance and applications management.

- Applications maintenance is 24-hour contracted support of existing applications systems. The vendor provides a set level of services and interacts directly with the end user.

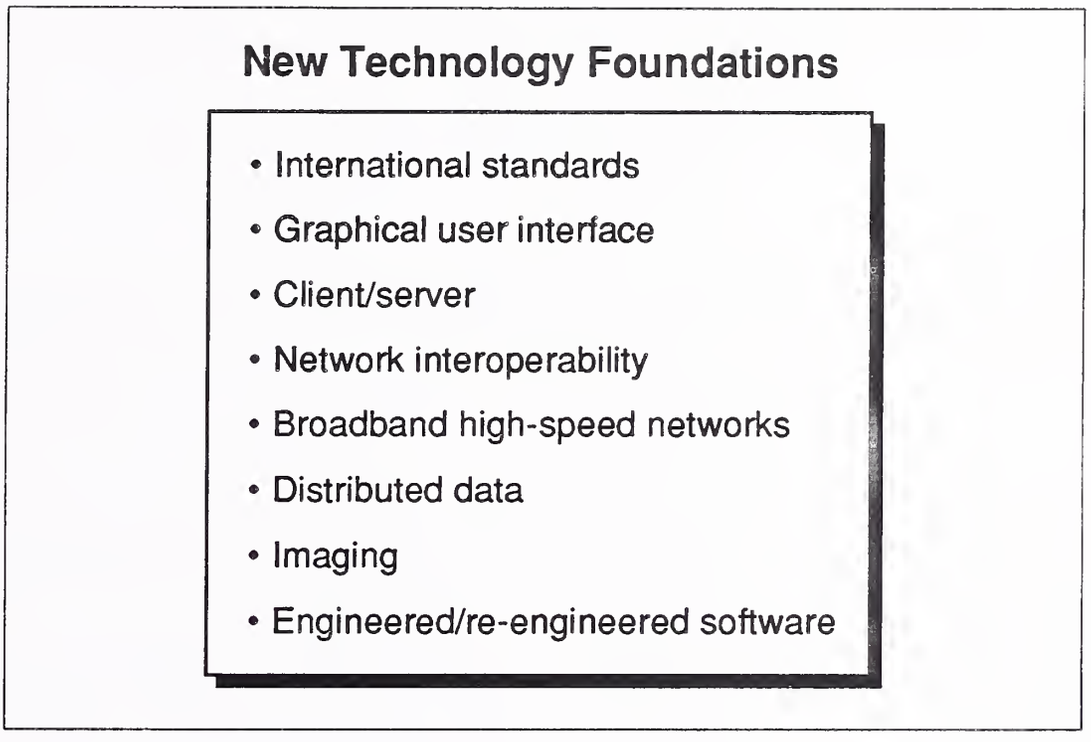
- Applications management is contracted development and maintenance of a set of applications. The vendor provides the software and all of the expertise and staff to ensure that the application is successfully used over an extended period. Applications software products firms can become applications management vendors for their clients or let some other vendor do it.

5. Shifting Technology Foundation

Significant new technologies became available in the late 1980s and are gaining momentum in the 1990s. An underlying characteristic of much of this new technology is a shift in the technological foundation.

Exhibit III-6 lists the key elements of this shift in underlying technology. Each element causes organizations to stop and rethink key aspects of their information systems infrastructure strategies. Rethinking can slow the adoption in the short term, and create new vendor opportunities over the longer term.

EXHIBIT III-6



All of these new technologies and foundations cause confusion in the industry and with the buyer. Confusion slows buyers' and vendors' decision making because strategies need to be revised, investment plans shifted, and education is required.

Standards are driving every major computer manufacturer and software products developer to revise strategies and change product development plans. New products are delayed and then require longer initial sales introductions.

From now on, the user interface of the personal computer in its graphical pull-down menu and windowing form will be the only interface acceptable to users from now on. The text-based interfaces of the 1970s and 1980s will no longer be tolerated. Every major software product developer is re-engineering the user interfaces to its products.

Downsizing, the common term for moving an application to a client/server-based installation, will be the greatest phenomenon of the 1990s. Whether or not the installation is actually downsized, it will be moved to a new processing location and take on new characteristics. Major re-engineering of internal systems by the information systems function and a shift to buying server-based application products are in progress. All of the impacts are not known; however, software products pricing based on the size of the platform will have to change. Certainly some confusion exists and is impacting buying decisions.

The growing use of PCs, workstations, and LANs has mandated a move to integrate the information networks of large and small organizations. Today's networking products support any-to-any network connections through interoperable architectures. This permits a company's distributed applications to be folded into an all encompassing "enterprise" network configuration that has been discussed for years, but was never possible.

The way data is stored and turned into information has been fairly constant since the creation of the first hierarchical DBMS in the early 1970s. Since then the challenge was to build data bases, not to consider building them with new types of components. The shift started with commercial use of relational DBMSs, but it is the distributed DBMS, and more important than DBMS, image processing, that will cause major re-engineering of the data base architectures of larger organizations. Major new investment is required, and will come over time out of necessity.

- The age of truly engineered and re-engineered software through CASE technology is dawning. In five years, the approach to maintenance will have finally changed and there will have been major advances in programmer productivity.

The positive and negative impacts of the shift in technological foundation are listed below. Certainly over the five-year period of this forecast the positives greatly offset the negatives.

Positive impacts from this shifting technology foundation include the following:

- New types of solutions will become available.
- The role of the end user in information systems can continue to expand.
- Opportunities for new as well as existing vendors are created.
- Application systems can be increasingly molded to the character of the organizations that they support.
- Improved price/throughput performance of networks

Negative impacts are:

- Any shift causes confusion and hesitation in the near term. The magnitude of the current technology shift could cause confusion and slow investment through the middle of the decade.
- The size of the task to shift to client/server technology in organizations with large centralized systems causes conflicting priorities between re-engineering and meeting new requirements.

- The technology shift now in process is creating a significant additional training and education requirements.

- Growth is slowed while the new technology is learned.

6. The Changing Buyer

The decision maker for the purchase of information services remained relatively constant until the late 1980s. The information systems executive and key staff (systems development and data center operations managers) decided when to go outside and with whom to contract.

This leadership has changed significantly in the past few years and promises to change even further. As the information services vendor moves to provide a full long-term service, or a full solution, the general manager is becoming the buyer. The impacts are significant:

- Technology becomes less important and the business or operational impact becomes more important.

- The impact of the information systems function becomes more consultative and less direct.

- The ability to try new ideas and approaches is increased.

- The time to completion is controlled by the organization's ability to afford, not the ability of information systems to develop.

D
Summary

Significant changes continue to evolve from the 1980s. As the economy recovers from recession, these changes will resume their moderate growth for the information services industry.

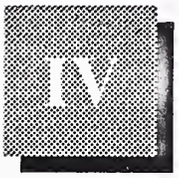
- An economy that does not shift quickly helps management make longer-term decisions, albeit at a slower pace.

- A market of $100 billion that is strongly impacted by the direction of the larger vendors should be expected to grow somewhat more slowly.

- The increasing tendency of larger organizations to turn to vendors for services. These include elements of systems management that are solutions-oriented and will lead to larger, longer term decisions; decisions that can take longer to make, but have a lasting impact.

- The shift in the underlying technology foundation moves in a positive direction because more valuable and productive applications solutions will occur; however, shifts bring re-engineering, reinvestment, retraining, and require time and money.

- The role of the general manager concerning the deployment of information technology continues to increase. In many instances the general manager is more influential than the information systems manager, particularly regarding major decisions. Over time, the general manager's influence will have positive impacts on the size and growth of the information services industry—as long as the vendors provide satisfaction.



Information Services Environment

A

Current Usage Determinants

As Exhibit IV-1 indicates, the growth rate for network services varies markedly by industry. This exhibit also shows that network services has a wide range of growth rates among different industries:

EXHIBIT IV-1

Growth in Network Services in Selected Industries

Industry	Growth in Calendar Year (Percent)			
	1989	1990	1991	1992
Banking	33	22	21	9
Telecommunications	28	29	26	19
Discrete Manufacturing	22	26	21	21
Insurance	19	9	10	7
Utilities	21	5	8	8
Federal Government	21	10	10	4

- Four of the twenty industries and cross markets tracked by INPUT had growth rates above 20% for network services in 1991, but five had growth rates of 12% or less.

- Both components of network services—EIS and network applications—display a wide range of growth rates, although network applications had the widest range in 1992 (from 4% to 21%) due to the expanding use of EDI in retail distribution, which resulted in a growth rate of 27% in that industry in 1992.

Although the use of network services has considerable variance from industry to industry, the estimated expenditures reported to INPUT indicate a slight decline from 16% in 1990 to an overall growth rate of 14% in 1991.

In order to uncover why the use of network services is strong in certain industries or companies, it is necessary to examine the factors that encourage organizations to use network services; these factors are shown in Exhibit IV-2. INPUT obtained the information used in Exhibit IV-2 from interviews with information services users, and current validation of an in-depth study of network services users, which were completed in 1991 and used in that year's report for that delivery mode. For instance, information was also obtained from recent interviews with clients of network services vendors who used on-line data bases of market prices for equities, textual information, tables of technical data, electronic mail, EDI, videotext, voice mail and VANS. The user interviews, which were performed for the production of this report, produced responses consistent with the 1991 study, and the various factors influencing the use of network services are noted below.

EXHIBIT IV-2

Factors Encouraging Use of Network Services

Factor	Average Importance to Respondents
Service or information needed to support business function	H
On-line information needed for equity and financial markets	H/M
Service or information needed for marketing and customer support	M
Network services needed to save cost and/or time	M
Clients require network services	M/L
Technological improvements stimulate use of network services	L
Network service made necessary by decentralization	L

H = High
M = Medium
L = Low

Some of the factors illustrated in Exhibit IV-2 refer more to one submode of network services—EIS or network applications—than to the other:

- The use of on-line information for market trading or financial evaluation relates to the use of EIS.
- Services required to support decentralization of information networks for distributors, manufacturers, and financial institutions relate to network applications.

Other factors that were used to save time and money and to support marketing were mentioned in relation to submodes, service and other business functions.

The interviewed clothing and food distributors and manufacturers emphasized that they had become impressed during the last few years with the savings in time and money that EDI could generate. The savings are now real and measurable.

- Banks, brokerage houses and other companies stated that the use of on-line credit, equity, technical, and textual information reduced the time and cost of obtaining information from other sources.

According to respondents, both submodes of network services were used to facilitate marketing and service. Clients of brokers, bankers and other companies make use of the on-line information from vendors to aid in sales and marketing. For example, a representative of a brokerage firm may access pricing data or information on stocks to help a customer evaluate an investment decision. Many companies use on-line data to approve credit decisions.

Demands that users, such as manufacturers and large retail establishments, put on their network application suppliers, combined with improvements in technology that increase line speed, have aided EDI growth.

Decentralization has also led to increased requirements for electronic mail and the use of EIS from separate sites. Respondents were asked to rank their reasons for using EIS and network applications. Their responses are shown in Exhibit IV-3.

EXHIBIT IV-3

Primary Reasons for Use of Network Services

Reason	Average Importance to Respondents in Reference to EIS	Average Importance to Respondents in Reference to Network Applications
Save money and/or time	M/L	H
Improve our service	H/M	H/M
Use for competitive advantage or to meet competition	H	L
Mandated by management	M	M

H = High
M = Medium
L = Low

Respondents feel that EIS must be used for trading in equity and financial markets to meet competitive capabilities as much as to serve the needs of users. The regional executive of a major brokerage firm said that he is very interested in the on-line services that might be attractive to his customers due to competitors who may add this service.

Users of credit data bases feel that there is a competitive factor involved as well. They can not afford to have delays in obtaining credit when competitors can close deals sooner because they can investigate credit worthiness more rapidly through use of their data bases.

Although users of on-line information for technical, legal, or economic research feel that competitive pressure is involved, most are concerned with the savings in time and money using other alternatives to obtain information.

Users of EDI said that savings of time and money are the chief reasons for employing the system, but commented that the situations surrounding its use, and the resultant benefits, could be more complex than saving time and money.

A large clothing manufacturer stated that payment by EDI was one step in a process of reducing costs and interacting more efficiently with distributors.

The major problem in improving the process was that many distributors were accustomed to receiving periodic shipments of goods, whether they needed them or not. However, when using EDI, they were required to pay for these products immediately, which was undesirable.

Procedures had to be set up to initiate orders based on current sales.

The clothing manufacturer set up techniques at some distributors for transmitting data from bar code scanners, and for pasting up sheets of bar coded sales tickets at sites that did not have scanners that could then be sent by fax to the manufacturer's data center for input. Timely data on sales at each distributor has led to better planned shipments and agreement to pay more quickly through EDI.

- The manufacturer has saved money in receivables and processing because payments have been more timely.

- The distributors have reduced inventory costs and increased sales since fast-moving items were more often available.

Another manufacturer found that while the benefits of EDI emphasize savings in cost and time and faster payment, it also found that there are savings in the entire process of supplying and monitoring the flow of goods to the market.

The respondents discussed above, including others who use network applications, said that the vendors with whom they dealt did not fully understand the situation they were trying to improve. One respondent, who uses EDI and VANS, stated that several vendors did not analyze what he was doing. They were more interested in telling his company how to set up an EDI activity.

Exhibit IV-4 shows why the users of EDI, other network applications, and EIS, expect vendors to work with them in a consultative manner.

EXHIBIT IV-4

Network Services Characteristics Expected by Clients/Prospects

Characteristic	Average Importance to Respondents
Low incidence of problems	H
High uptime and availability of service	H/M
High quality: accuracy, timeliness, completeness, and presentation on screens	H/M
Prompt response and action on inquiries	M
Reasonable pricing	M/L
Planning for future needs of clients	M/L
Consultative assistance on needs	M/L

H = High
M = Medium
L = Low

As Exhibit IV-4 also illustrates, respondents expect network services vendors to:

- Ensure low incidence of problems that would interrupt operations
- Provide high-quality service relating to accuracy, completeness of information, and presentation formats on screens
- Provide prompt response and action to inquiries
- Offer reasonable pricing
- Plan for future client needs

Price does not outrank the other service characteristics clients and prospects desire.

- The most critical items, such as low incidence of problems and availability of data, are more important than price in choosing among vendors, particularly for an EIS product.
- Users of network applications tend to give more weight to pricing, but users state that support services, adherence to standards, and communication capabilities still outweigh pricing in selecting vendors.

Clients and prospective clients of network services also expect vendors to plan for their future needs.

- This could involve research on needs for data that are not met with current products, or on alternate means of delivering information.
- Planning could also be involved with new or changing standards, new communication capabilities, or software products that support network applications.

As in all aspects of the information services industry, consulting services are a growing factor in the network services sector.

According to respondents, improvements in technology, such as those shown in Exhibit IV-5, can stimulate the use of network services. One of the greatest improvements is an expanded ability to interface with additional networks. This interoperability can expand the end points that an electronic mail or EDI system can contact, or potentially provide the means of obtaining electronic information from additional sources.

EXHIBIT IV-5

Technological Factors Encouraging Use of Network Services

Factor	Relative Importance to Respondents
Expanded network interfaces	H/M
Expanded data inquiry/manipulation from client's PC	M
High-speed line capability	M/L
Image processing capability or plans	L

H = High
M = Medium
L = Low

The availability of higher speed line capabilities has convinced companies that it makes more sense to use electronic mail between sites, or to reach customers to aid in sending information to order points or manufacturing sites. Higher speed has also led to more use of EDI and future applications with multimedia.

Image processing planning is another factor reported to encourage the development of network capabilities. Application systems that will use image processing are now being planned and implemented in various industries.

Respondents also reported that higher speed line capabilities and image processing could be of interest in future EDI systems.

B

User Evaluation of Network Services

Exhibit IV-6 indicates that there are factors that could discourage or limit the use of network services. Poor service and cost rank the highest, but difficulties in planning the use of network services, or obtaining aid from vendors, could also have an inhibiting effect.

EXHIBIT IV-6

Factors That Can Discourage Increased Use of Network Services

Factor	Relative Importance to Respondents
Poor service	H
Cost of network services	H/M
Present systems or services with enhancements might be able to handle needs	M
Difficulty in planning use, or selecting alternatives	M
Insufficient aid from vendors	M/L
Alternatives such as CD ROM or fax may meet needs	L

H = High
M = Medium
L = Low

Attempts to add functions to existing applications to meet network application needs, or to use alternatives such as CD ROM for EIS data, can discourage the use of network services as well.

Exhibit IV-7 indicates that alternatives to network services receive a moderate degree of attention from respondents.

- An unsystematic employment of fax messages is sometimes implemented to meet EDI and electronic mail needs.

- CD ROM is sometimes used in place of on-line data when data does not have to be updated frequently. Another alternative is to enhance present IS application systems, or systems developed to provide a network application capability, which would take the place of vendors' network application products.

EXHIBIT IV-7

Alternatives to Network Services

Alternative	Average Importance to Respondents
Fax	H/M
CD ROM	M
Use of enhancements to IS application systems	M
Alternate in-house systems	M/L
The use of another company's capabilities	L

H = High
M = Medium
L = Low

A large energy company noted that it had developed an alternative to EDI that would involve less communication and cost. An end user had been instrumental in devising this alternative.

One of the factors that can have an impact on the selection of an alternative to network services is the role of end users.

- As Exhibit IV-8 displays, users are frequently involved in decisions to evaluate and purchase network services.
- Some end users are also interested in steps that can make network services easier to use.

There is general recognition that end users must be involved in the planning and the operation of EIS, EDI, electronic mail and other network applications systems. Contacts report that problems continue to emerge in systems developed and operated for users when users are inadequately involved in the planning and implementation.

EXHIBIT IV-8

Impact of End Users on Network Services Selection and Operation

Impact	Average Likelihood Indicated by Respondents
Involved in evaluation and purchase of network services	H
Presently use network services	H/M
Cooperation or participation of end users required to run service	M
Advocate more control of services by end users	M/L
Other responses, including want service brought in-house or made more user friendly	M/L

H = High
M = Medium
L = Low

The problems and complaints about network services that respondents reported in Exhibit IV-9, originated mostly from end users. The problems focus chiefly upon the difficulties that end users encounter in evaluating, selecting, and operating a network service; however, several other problems are also mentioned.

- The problem of selecting data from multiple sources. Means of selecting current market prices from multiple feeds have been provided to some extent through vendor products, but means of using combinations of on-line and CD ROM data have not been fully developed.

EXHIBIT IV-9

Problems/Complaints about Network Services

Problem	Average Importance Reported by User
Difficult for user to specify means of obtaining data from multiple sources	H/M
Difficult for users to evaluate new services that might reduce costs or improve service	M
Difficult to evaluate and select a service	M/L
Difficult to combine resources of provider (vendor) with in-house resources	M/L
Services are not simple to use	L
Difficult to explore needs or new ideas with vendors	L

H = High
M = Medium
L = Low

Means of combining vendor and in-house resources to obtain data or serve network applications is an area of interest to some users.

The problem that appears to be most significant to some end users is the difficulty of working with vendors. Vendors that are involved with these users may have to utilize a consultative approach and walk through the use of network applications, or the use of software provided with an EIS, in order to help users understand and evaluate what their network services can accomplish.

The network environment, as with other elements of the information network, has become heavily influenced by the end users. Network services vendors must recognize this evolution.

C
Future Opportunities

The improvements and changes listed in Exhibit IV-10 reflect the problems discussed above. Respondents are interested in simplified ways of using EIS, means of being steered to data, and techniques for using multiple EIS or EIS and CD ROM sources of data.

EXHIBIT IV-10

Improvements and Changes Desired in Network Services

Services Mentioned	Average Importance to Respondents
Better means of using multiple EIS products (including EIS and CD ROM data sources)	H/M
Simplified means for users to operate EIS products	M
Products that would steer a user to sources of electronic data	M/L
Means of allowing an organization to "piggyback" network needs for EDI or electronic mail (or information access) on the capabilities of another company	L

H = High
M = Medium
L = Low

Users report, as noted in Exhibit IV-11, that they would be interested in sharing capabilities of other companies or vendors. As in other areas of information services, vendor alliances between network services vendors may now be required to meet user expectations and the growing preference for one-stop shopping.

EXHIBIT IV-11

Future Plans of Users of Network Services

Plan	Average Likelihood by Users of Network Services
Continue to use services	H
Have a vendor handle an increased amount of service	H/M
Bring some functions/components in-house	M/L
Bring a large share of network services in-house	M/L
Use systems operations	L
Share the use of services with another company	L

H = High
M = Medium
L = Low

One respondent also stated that an improvement his company just gained, through using software that accomplishes automatic network management, represented significant opportunity for vendors and users to grow.

Despite the mention of problems and consideration of alternate means of meeting needs, respondents feel that it is very likely that the use of network services will be continued or will expand. Users are more inclined to have one vendor handle an increasing amount of service rather than have their own company take an expanded role in obtaining network services.

Overall, respondents expect a healthy growth for network services, as shown in Exhibit IV-12.

EXHIBIT IV-12

Growth of Network Services Foreseen by Users and Prospects

Growth Rate Anticipated	Average Level of Expectations	
	1992	1992-1997
15% to 20%	H	H
10% to 15%	L	L
5% to 10%	L	-
0% to 5%	-	-
Drop Service	-	-

H = High
M = Medium
L = Low

- The most likely level of growth expected by respondents is between 15 and 20% in 1992, and between 1992 and 1997. However, there is still some uncertainty about growth in 1992 due to the continuing impact of the economic downturn that started in 1990.

- An evaluation of respondent estimates suggests that the expected growth for 1992 appears to be close to 14%, and for the 1992 to 1997 period at about 16%. Chapter VI will explore INPUT's forecast of growth for 1992 to 1997.

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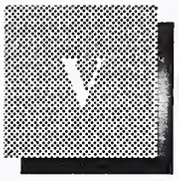


Issues and Trends

A
Introduction

The network services mode grew so rapidly during the 1980's that it appeared to be impervious to many of the factors that affected other information services modes.

- However, by 1991, it was apparent that vendors in the network services market were encountering economic decline-problems similar to those suffered by vendors in other information services.

- While the network services growth rate has moderated compared to other businesses in general, it has remained exceptionally strong.

- It now appears that the slow-down may be coming to an end as some users report more latitude in their budgets for these services.

This chapter reviews the issues and trends involved in the situation discussed above, the growth of user expenditures for network services, and current pressures on vendor performance. Succeeding chapters will develop a forecast for the market and examine the performance of leading vendors of network services.

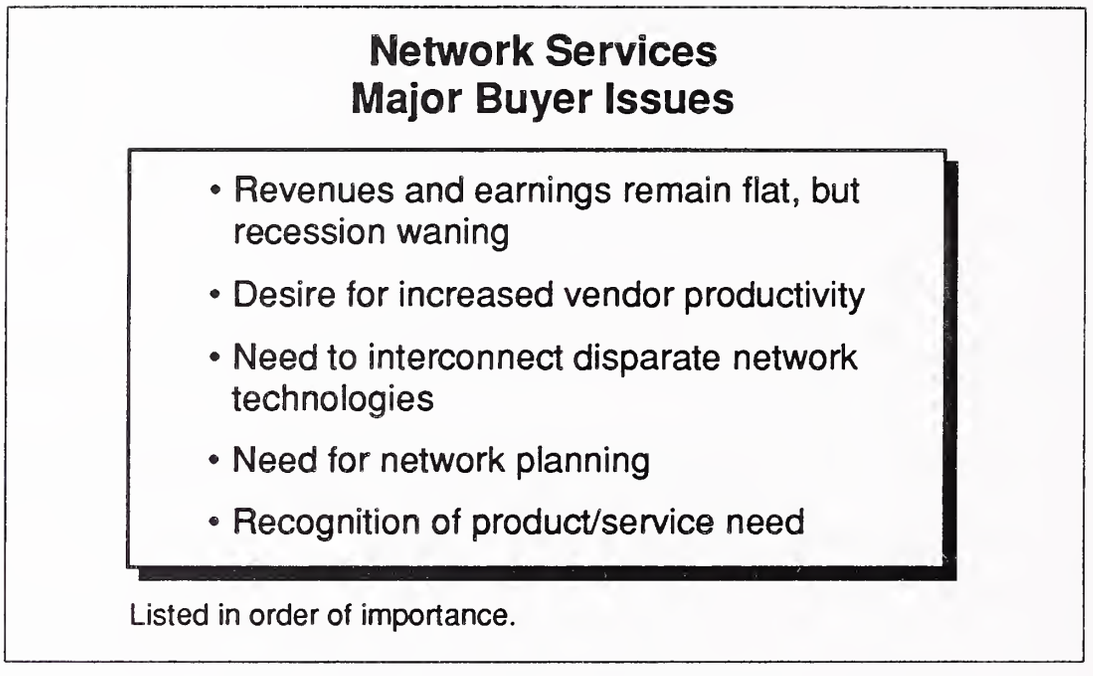
B
Major Issues of Network Services Buyers

As shown in Exhibit V-1, the depressed revenues and earnings of companies has been a major issue affecting buyers of network services. However, certain IS budgets are starting to show signs of improvement.

- The overall result of this recession caused buyers to become more interested in locating competitors that can deliver similar services at reduced prices.

- Buyers are also interested in obtaining additional services and aid from network services vendors as part of buyers present service and fee agreements. Buyers want a means of improving productivity, as well as a way to offset reductions in user staffs.

EXHIBIT V-1



Upgrades in the interfacing of a given user's multiple network technologies (LANs, MANs, and WANs) will drive networks to be redesigned. This redesign effort will support the need for all of these networks to interoperate. Sometimes this is referred to as enterprise networking.

Standards in network technology are being developed to allow common interface points to facilitate the interconnection of multiple network platforms.

As Exhibit V-1 notes, buyers have also shown more concern about planning and justifying the use of network services.

While vendors have attempted to meet these developments in the marketplace, their earnings have suffered. This is due to increased competition, their own downsizing efforts, and their attempts to supply these additional services.

According to several corporations that INPUT contacted, the increased use of network systems can put pressure on the present or planned use of network capabilities. INPUT found that as the user's need for increased traffic and connectivity between company sites grew, vendors had difficulty in meeting throughput requirements.

The positive element in buyer attitudes is the recognized need for network services.

In this marketplace, there is not a strong recessionary reaction that would lead to an aggregate reduction in the use of electronic information services, value-added networks, EDI, or other network applications; however, the recession has caused individual firms to limit planned use. Buyers feel that these services are a necessary way of doing business rather than an enhancement to business activities.

C

Major Issues of Network Services Vendors

Pressure on earnings from increased user demands, due to downsizing by users and vendors, continue to be the vendors' major concern. This also reflects the issues discussed in the previous section. Users are demanding increased aid in planning these network services. Some are considering the use of competitors as opposed to their current suppliers in order to obtain lower prices and commitments for increased services.

In order to reduce costs and meet user service demands, vendors report that the means of improving productivity have become a major issue. In addition, as a result of pressure from users to reduce the cost of services, vendors are responding by reducing operating costs to achieve a lower pricing structure.

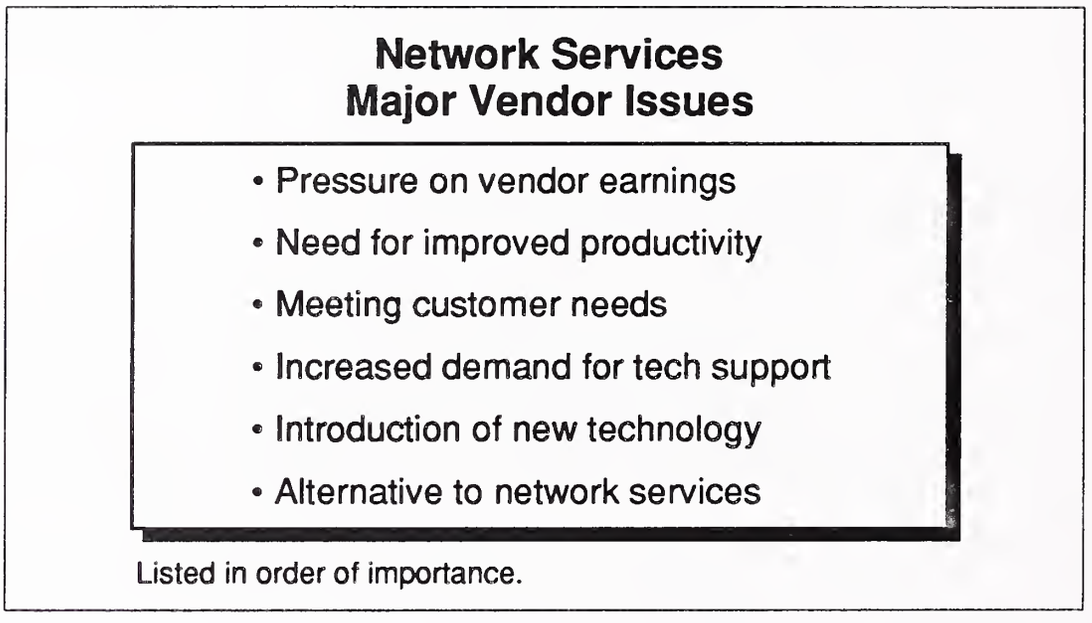
Vendors report that they plan to introduce new products and services with lower price points to meet customer demands for service improvements. Vendors consider these efforts as a key to the promotion of growth in the network services industry.

Some of these new products and enhancements include: additional consulting services, systems and application integration, end-user services, integration of messaging services, migration to open systems, construction of a distributed, integrated platform, and enhancements to network throughput.

As previously mentioned, planning the introduction of new technology and services has also become a major vendor issue. Increasing costs and narrowing profit margins have made many vendors less prone to replace older technology or expand services unless there is sufficient demand to ensure success. However, some of the firms expanding most rapidly in the network services market have done so through the continued introduction of new services.

The network services marketplace is becoming more complex. As a result, it has caused vendors to become more sophisticated in providing quality support services. Vendors now provide a twofold, value-added service by providing users with a complete business solution that includes people and technological delivery systems. Essentially, vendors are now focusing their efforts on the support of increased user business efficiencies by mapping solutions to business issues.

EXHIBIT V-2



The use of new technology can be a critical issue in the sale of network services.

- The use of new workstations, PCs, and client/server distributed architecture has made it possible to develop systems that facilitate the use of EIS and network applications.

- The introduction of frame relay systems has improved throughput efficiencies over the traditional packet transmission methods.

- While client/server and frame relay technologies are here today, the impact of emerging technologies and competitive events among carriers will change the way network services are provided over the next three to five years. Any-to-any user connectivity will be accomplished through flexible and standardized protocol conversion. Coupling these protocol conversions with advanced switching and increased transmission speeds will allow multimedia applications to exist on a demand basis.

- By increasing the bandwidth or throughput of vendor networks through the use of faster transmission technologies such as Asynchronous Transfer Mode (ATM), Switched Multimegabit Distribution Service (SMDS), and Synchronous Optical Network (SONET), vendors will be able to support demands for imaging and multimedia applications.

Delivering these new applications to the end user has been an expensive challenge; however, the Regional Bell Operating Companies (RBOCs) are committed to gearing up to support computer "backplane" data rates. In addition, legislation and regulation will create the foundation for cross-fertilization of markets between local carriers and cable TV companies.

Ultimately, a highly competitive market will be developed to support these technologies by local phone companies, cable TV organizations, and alternative "bypass" carriers. Coupling these events with plans to provide fiber optics, "to the curb," will enable these technologies to expand rapidly.

As illustrated in Exhibit V-2, however, an item of concern to vendors is whether the introduction of alternate technology or application approaches will unfavorably impact the use of network services.

- Significant developments in the use of CD ROM technology have led to the consideration and/or use of CD ROMs for economic, technical, legal, and other information that does not require real-time updates.

- A system has been developed that records each time a particular piece of information has been accessed on a CD ROM. This will enable CD ROM vendors to bill each time a user accesses the CD ROM data base.

- Users are also discussing the segmentation of data, which they currently obtain from a vendor source, so that they can use an on- line data base for real-time needs and a CD ROM for more static needs.

Vendors are also concerned about the development of alternate systems to deliver payments electronically.

One energy company reports that its internally developed system, which takes advantage of newly installed network capabilities, now handles payments formerly routed through a vendor's EDI service.

- Other users report that improved fax capabilities have taken the place of EDI.

Major banks and other companies also report that they have developed sophisticated new networks rather than use the VANs available from vendors.

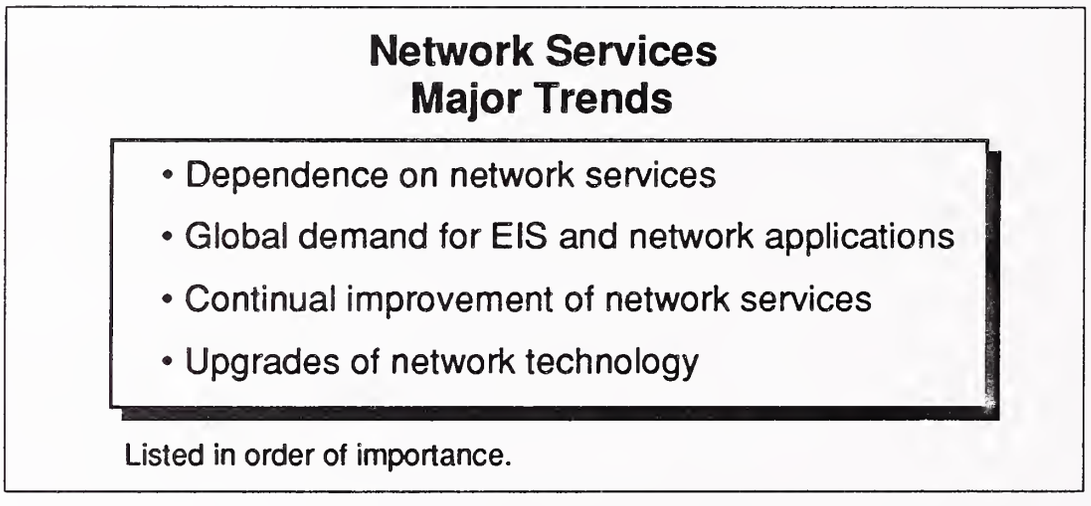
D

Major Trends in Network Services

During the past decade, systems integration, systems operations, and network services became recognized as separate information services; however, network services had been in use for some time. Interactive Data, and other vendors had been supplying on-line data on equity prices, products, service schedules, technical subjects, and other subjects because remote processing services became operational.

According to respondents, network services have become a function for many organizations, and respondents expect the use of these services to increase. The dependence of businesses on the use of network services can only grow, as Exhibit V-3 shows.

EXHIBIT V-3



Significant expansion in global network services is occurring as a result of user demand in a global economy. This is because the functions that these services provide—trading, shipping, credit checking, travel, and engineering—are being handled on a global basis. Particularly in trading situations, the availability of on- line data is essential for evaluating opportunities on a global basis.

In addition to on-line data or EIS, network applications serve banks, other financial institutions, and corporations on a global basis. Messages and payment instructions from one country to another are necessary to eliminate delays in initiating business activities or resolving problems.

The trend of greater dependence and global expansion on network services has supported a corresponding trend of continual improvement for these services.

Developments in network technology in the last five years include:

- The use of new technology to increase transmission speeds and connectivity
- Conversion of media
- Simplification of user operations
- The use of new techniques in obtaining data or implementing network applications

E

Driving Forces in the Network Services Market

One of the paramount forces driving the network services market is the increasing demand for electronic information, as indicated in Exhibit V-4.

EXHIBIT V-4

Network Services
Driving Forces

- Increasing need for electronic information
- Growing pressure to use network applications
- Improving network capabilities
- Lack of expertise in network technology and applications
- Potential revenues and savings
- Increased interest of end users

Listed in order of importance.

- Additional information about materials, production processes, business activity, financial markets, and a host of other topics is constantly becoming available and producing an increase in the amount of on-line information.
- The on-line information in use can have setbacks related to the economic conditions of users, more effective methods of using information, limitations in the auditing and control of information, and other factors—but these factors are not leading users to project reduction in the use of EIS.

The forces producing increased use of EDI, electronic mail, and other network applications stem predominantly from two trends:

- Pressures by corporations on their suppliers or customers
- The desire to save time and funds by moving information electronically

Constantly improving network capabilities that make it possible to contact more end points in the U.S. and globally, as well as technology leading to faster access and transmission of data, are the major forces driving the use of EIS and network applications.

- Electronic mail and EDI can reach more company locations, clients, and suppliers.
- According to users, the increased speed of obtaining information that has occurred in the last few years has resulted in more opportunities to gain revenues and save costs.

Many users do not have sufficient ongoing research, development of network capabilities, or enough technically trained staff to take advantage of increased connectivity or speed of transmission. Major corporations indicate that it is difficult to address the scope of technological change. This uncertainty is another force that drives the use of network services vendors.

Although many users talk about network services as a way of doing business, users expect that EIS and network applications will increase revenues or reduce costs.

- A regional sales manager at Merrill Lynch stated that it would be impossible to handle work for clients without having on-line quotes. He pointed out that the quality of his quotation systems was partially responsible for his performance in selling.
- Several users pointed out that cost savings was their primary motivation to use EDI for ordering and payment
- A systems planner at a large energy company has promoted the use of network services as the goal for many administrative functions, but he noted that monetary justifications were the primary driver for expanded use of these services.

End users have shown increasing interest in network services, and this interest has also been a force leading to increased use of these services.

- The energy company referred to above has made use of VANs to provide customers with on-line information that can help customers order products. End-user demands led to this use of VANs.

Several vendors report that users have been active in suggesting the use of additional EIS, EDI, and videotext services and other network applications.

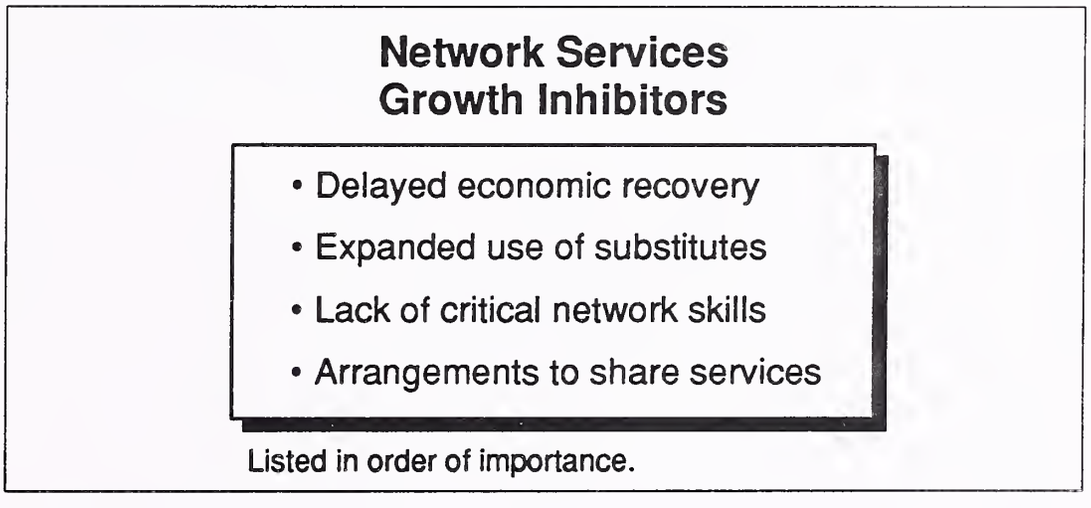
F

Growth Inhibitors in the Network Services Market

As Exhibit V-5 illustrates, the inhibitor mentioned most often by users and vendors is delayed economic recovery. In some instances, users reported decreased use of EIS or delayed plans for use of network applications as a result of economic conditions. Other users have reported initiating operation or expanding use of these services to stimulate business.

However, as previously noted, it appears that this economic downturn may be coming to an end with slight improvements forecast for 1993.

EXHIBIT V-5



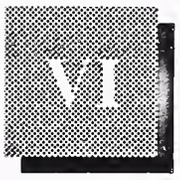
Use of alternative solutions can also inhibit use of network services. Users report that they have found vendors that supply some information on CD ROM, which users had previously obtained from EIS. Users have also found means of using fax and internal systems in place of network applications.

The lack of network skills or knowledge can be an inhibitor rather than a driving force for the use of network services.

- Several users report that as a partial result of downsizing, they are left with fewer capable staff to evaluate the needs and the possible use of vendor network services. This has resulted in the delay of network service implementation.

One user noted that improved demonstrations, easy-to-use services such as the EDI*Express service of GEIS, or the training seminars of Sterling ORDERNET, were needed as an aid to the use of EDI.

According to the comments of respondents, arrangements between users to share services such as networks, or the joint development of network applications, could also be an inhibitor to the growth of network services. However, it is not apparent that these arrangements could result in the best use of technology for all partners or amount to a significant dollar savings on an aggregate basis.



Market Forecast

A
Market Overview

Pressures continue on the revenues and earnings of some vendors in the marketplace in response to an extended economic downturn. However, Exhibit VI-1 illustrates a continuation of relatively favorable prospects and compares differences in the outlook of the market between 1991 and 1992.

- The $9.4 billion 1991 forecast for user expenditures was more optimistic than the actual expenditures in 1991. The reconciliation in Appendix B illustrates the differences in more detail than the scale of comparison in Exhibit VI-1.

EXHIBIT VI-1

Network Services Market Overview ($ Billions)

1991 Outlook		1992 Outlook
1991 Forecast - 9.4	versus	1991 Actual - 9.1
1992 Forecast - 10.8	versus	1992 Forecast - 10.4
1991-1996 Forecast Growth Rate - 16% (CAGR)	versus	1992-1997 Forecast Growth Rate - 17% (CAGR)

- The 1991 preliminary forecast for user expenditures for 1992 had projected $10.8 billion as opposed to an adjusted $10.4 billion. This allows for a slowing in growth due to the continued economic downturn, reflected in the 1992 forecast. The forecast for growth during the next five years will be at 17%.

B
Industry Structure

In order to analyze the performance of the information services industry, INPUT divides it into eight delivery modes that serve 15 industry sectors and five generic markets. The delivery modes are:

- Processing services
- Network services
- Turnkey systems
- Application software products
- Systems software products
- Systems integration
- Professional services
- Systems operations

The network services market, which is being analyzed in this report, is broken by INPUT into two segments:

- Electronic information services (EIS)
- Network applications services (NAS)

C
Market Structure

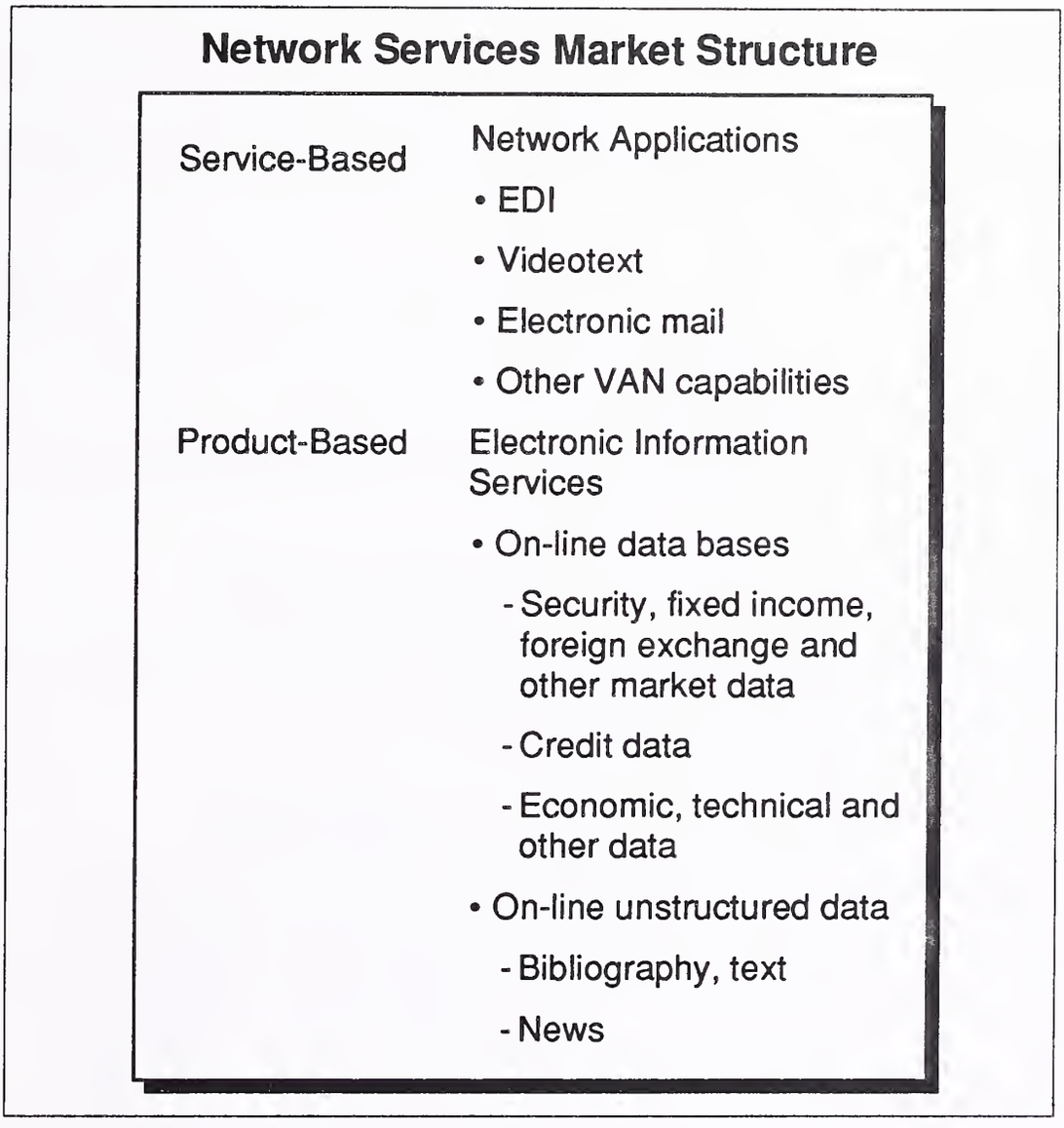
The structure of the network services market is related to the development of network capabilities by vendors. The first step in that process was the connection of networks to computing installations by General Electric (GE) and other vendors during the 1960s.

- In addition to their use for remote processing and program development, these networks began to be used for electronic messages and payment instructions.

- Providers of electronic information tended to come to the network and remote computing services vendors from organizations that used information, or became aware of the value of proprietary data bases.

As discussed above, the network services market developed historically from services involved with moving data to product-based services. The current structure of the market reflects that division of services, as shown in Exhibit VI-2.

EXHIBIT VI-2



The services shown in Exhibit VI-2 can be further divided into those that supply financial, product, technical, or other data and those that supply unstructured information such as news. Vendors that provide product-based services—such as TRW and Dun & Bradstreet—do not always provide network applications.

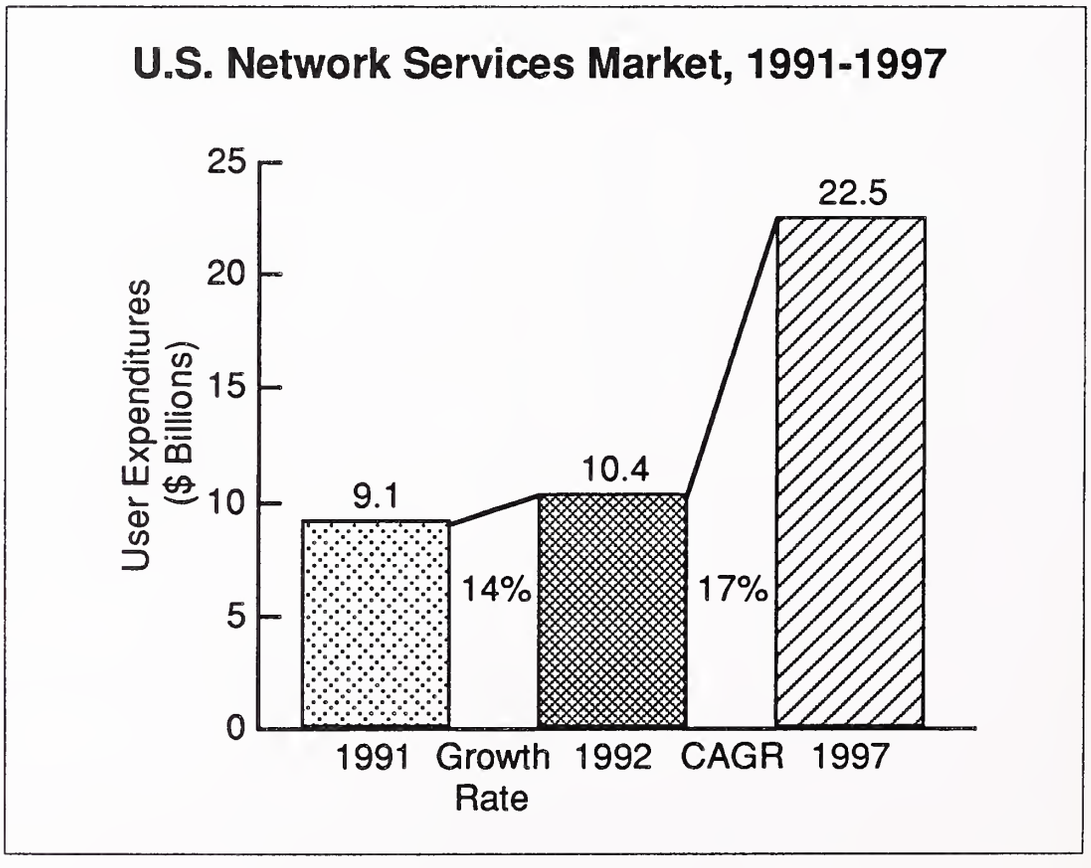
D
Network Services Market

1. Overall Market

The market for network services is growing from a 1991 level of $9.1 billion in user expenditures to a level of $10.4 billion in 1992—a growth rate of 14%. User expenditures will grow at a compound annual growth rate (CAGR) of 17% during the next five years to reach $22.5 billion in 1997.

The 1991/1992 forecast rate in Exhibit VI-3 has been lowered by 2% to reflect the continuing impact of the economic downturn, regulatory impacts, and the growing maturity of the market.

EXHIBIT VI-3



The continuing expansion in network services is due to the fact that growth can assist in revenue generation, or cost reduction, while creating a more automated way of conducting business.

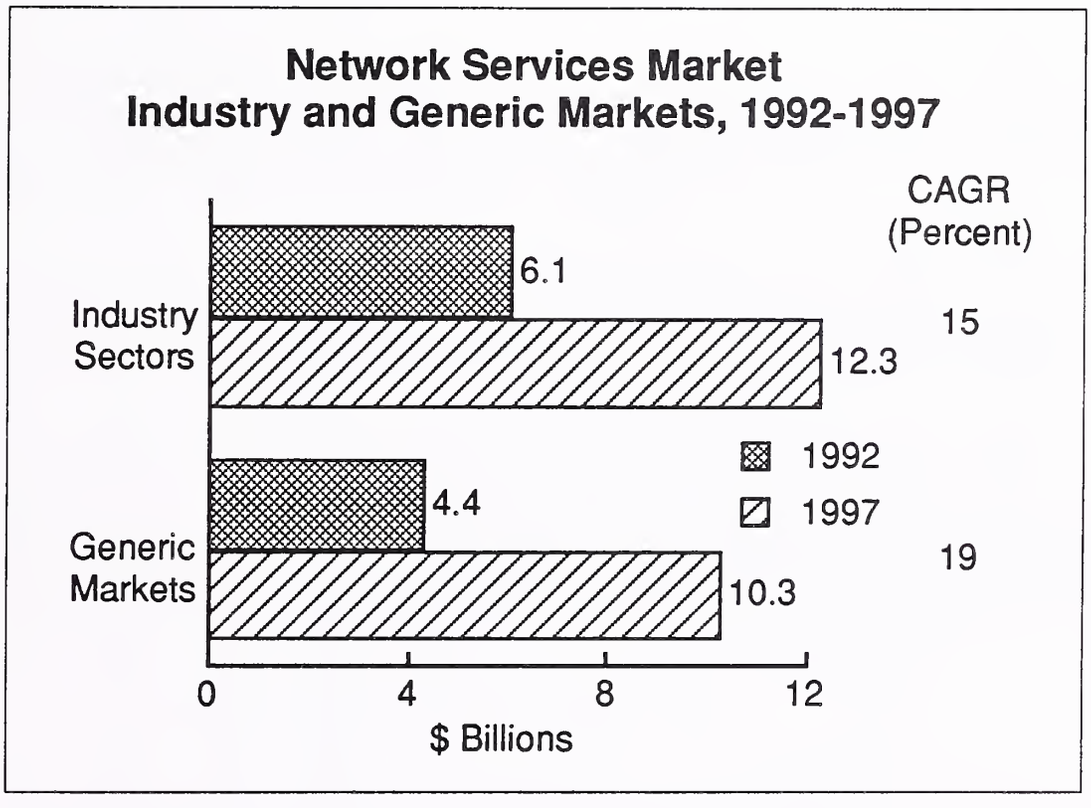
- Network applications provide electronic, rather than paper, means of handling business with customers, suppliers, service companies, and government offices—as well as with other offices in an organization. Instructions, messages, data, and payments can be handled more quickly and save time and costs.

- Information necessary to make decisions, conduct research, aid clients, or keep processes functioning, can be sought and accessed more rapidly on an automated basis.

2. User Expenditures by Industry and Generic Sectors

The user expenditures of $10.4 billion for network services in 1992 can be divided among industry and generic markets, as shown in Exhibit VI-4. By generic, INPUT means that use can be made of this service in such a broad or general way across industries, or in applications that it is impossible to divide the use by cross-industry, or industry categories. Network services have certain EIS offerings—such as on-line data bases of securities, credit, and economic data—that qualify as generic markets.

EXHIBIT VI-4



Fifty-eight percent of the network services market is in industry markets at the present time, but the percentage will reduce slightly to 54% by 1997.

The differences in use of network services between industry markets are pronounced, as shown in Exhibit VI-5.

- In 1992, only one industry shows user expenditures of under $100 million, one has expenditures of over $1 billion, and others are divided above and below $400 million.

- In 1997, one still has an expenditure level of below $100 million and five have expenditures of above $1 billion.

The wide range of results by industries indicates that vendors should be selective about the markets to which they offer network services.

Vendors that offer information services products in industry markets—such as process manufacturing, banking and finance, and business services—but do not offer network services in those markets, should definitely explore opportunities for offering those services.

EXHIBIT VI-5

Network Services Market
User Expenditures by Industry, 1992-1997

Industry Sector	User Expenditures $ Millions		1992-1997 CAGR Percent
	1992	1997	
Discrete Manufacturing	104	280	22
Process Manufacturing	949	2,079	17
Transportation	354	859	19
Utilities	30	42	7
Telecommunications	118	279	19
Wholesale Distribution	326	913	23
Retail Distribution	221	602	22
Banking and Finance	790	1,626	16
Insurance	236	397	11
Medical	579	1,351	18
Education	216	478	17
Business Services	628	1,275	15
Federal Government	1,275	1,530	4
State and Local Government	125	310	20
Miscellaneous Industries	138	271	14
Industry-Specific Total	6,089	12,283	15
Generic Markets	4,354	10,258	19
Total Network Services	10,443	22,541	17

Vendors in other industries, however, should be more selective in considering this marketing approach.

The federal government is the largest user of network services—the federal government made expenditures of $1.2 billion in 1991—based mainly on the use of network applications to meet the needs of civilian and defense agencies.

- The federal government is presently the largest user of network applications and ranks fourth in the use of EIS.

- The growth rate for federal government use of network services is down to a CAGR of 4% as a result of continued pressure to reduce federal expenditures as a whole.

The markets that follow the federal government in expenditures for network services, banking and finance, process manufacturing, and business services have more expenditures for EIS than the federal government, but the other markets spend less on network applications.

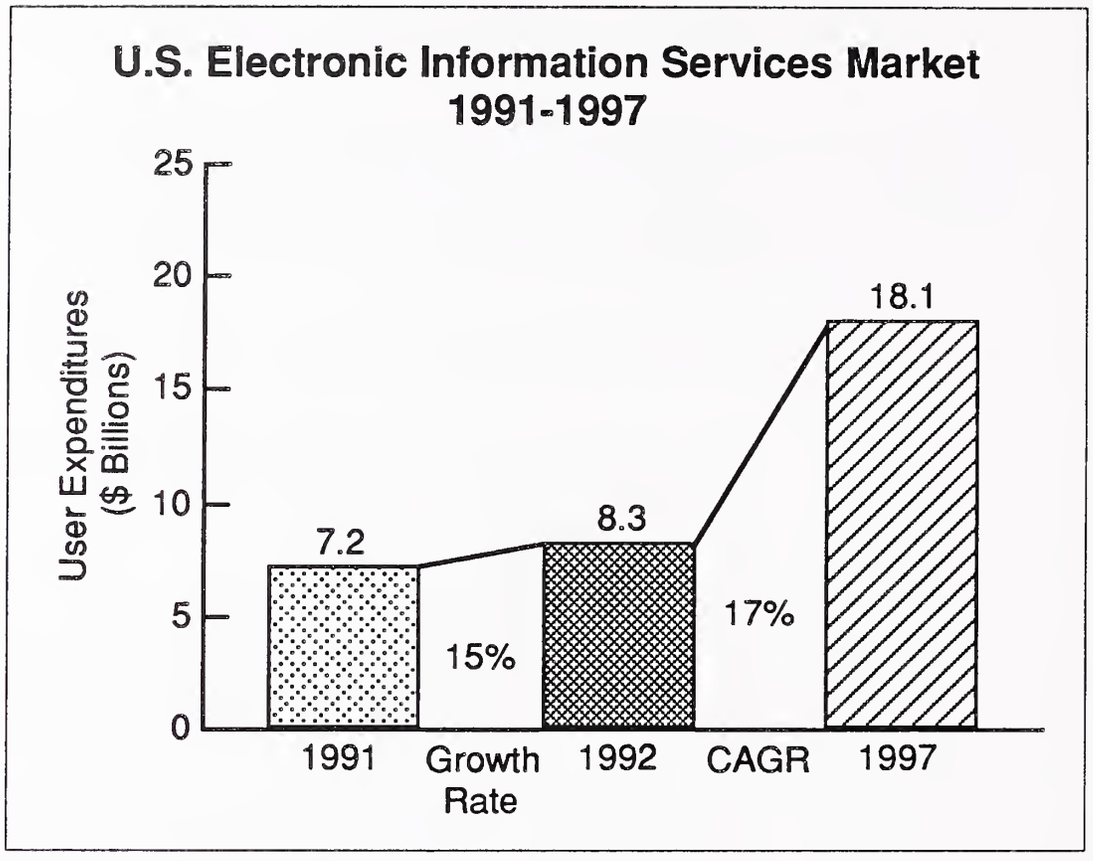
One of these three markets, process manufacturing, has a CAGR of 17%, which is above the growth figure for network services as a whole between 1992 and 1997. The banking and finance market grew at 16% and the Business Services grew at 15% for network services.

Expenditures in generic markets will grow more rapidly than in industry markets over the next five years, as was shown in Exhibit VI-5. This more-rapid growth is due to the fact that the market for generic services is composed of a subset of EIS that includes equity pricing, other financial information, and on-line news services that are entering and growing in a number of submodes and niches in retail distribution simultaneously.

3. Electronic Information Services (EIS) Market

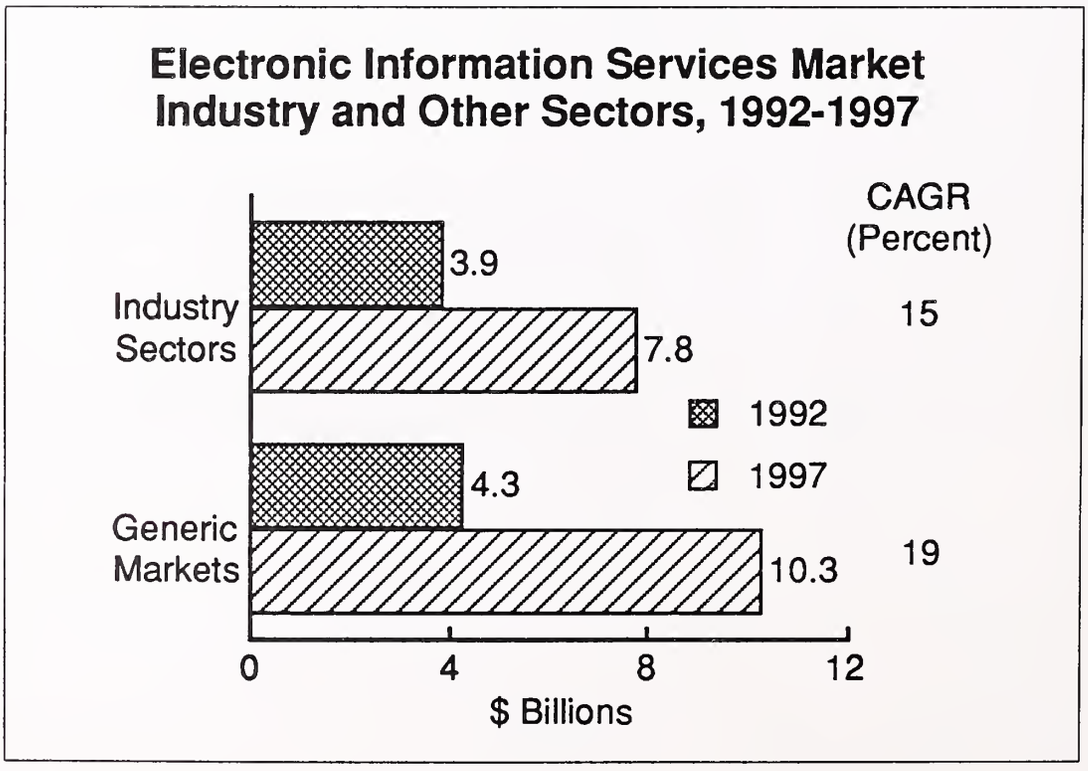
Exhibit VI-6 shows that user expenditures for EIS will grow at a rate of 15% in 1992 to $8.3 billion and rise at a CAGR of 17% between 1992 and 1997 to a level of $16.4 billion in 1997.

EXHIBIT VI-6



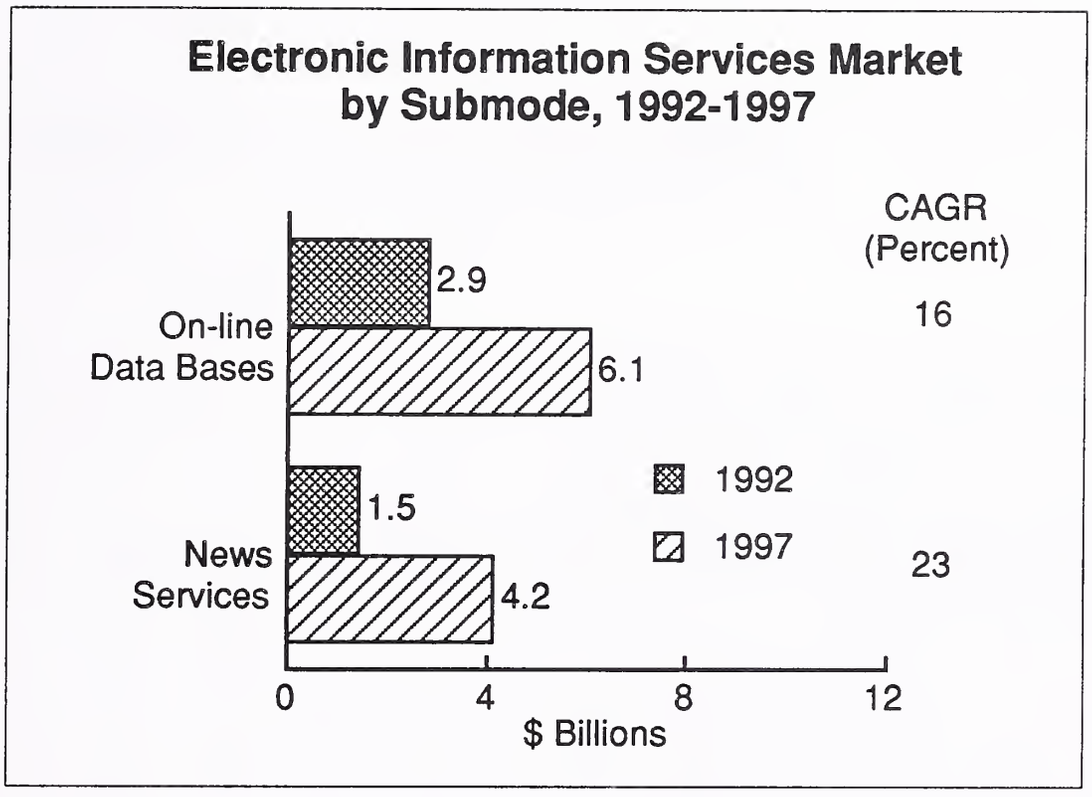
Expenditures for EIS are divided into industry and generic components in Exhibit VI-7. The expenditures for each will be nearly equal in 1992, but the expenditures for generic markets continue to grow at a faster rate because vendors selling access to generic data for one market usually find that the data can be sold to other markets.

EXHIBIT VI-7



The type of information delivered through EIS is divided into two main types in Exhibit VI-8: on-line data bases and news services.

EXHIBIT VI-8



- Expenditures for on-line data bases are more than twice as large, at $2.9 million, as expenditures for news services.

- Expenditures for news services are growing at a CAGR of 23%—almost 25% larger than the rate for on-line data bases—because news services can be utilized in a much wider range of industries and activities.

The use of EIS is driven in general by improvements in the use of communications and computing technology that can result in lowered user costs, more timely data, and improved means of accessing and utilizing data. In addition, the recent deregulation of Regional Bell Operating Companies and local exchange carriers may now offer content-based information services, which involve these two delivery modes.

Improvements can also include easier means of accessing data through new terminal or PC features, interactive voice response, or graphical interfaces. These developments and improvements are needed to cope with the expanding amount of information available.

Developments in PC software have added to the ability to use EIS by facilitating access to multiple data bases and by accessing data on preset schedules—as well as by manipulating and combining data with the use of spreadsheet, data base, statistical, graphics, and other programs.

As shown in Exhibit VI-9, the leading industries in the use of EIS continue to be banking and finance, process manufacturing, and business services.

EXHIBIT VI-9

Electronic Information Services Market
User Expenditures by Industry, 1992-1997

Industry Sector	User Expenditures $ Millions		1992-1997 CAGR Percent
	1992	1997	
Discrete Manufacturing	51	127	20
Process Manufacturing	708	1,400	15
Transportation	821	1,724	16
Utilities	27	38	7
Telecommunications	97	222	18
Wholesale Distribution	69	127	13
Retail Distribution	145	332	18
Banking and Finance	695	1,431	16
Insurance	178	306	11
Medical	344	662	14
Education	137	313	18
Business Services	610	1,227	15
Federal Government	330	370	2
State and Local Government	50	80	10
Miscellaneous Industries	130	250	14
Industry-Specific Total	3,949	7,804	15
Generic Markets	4,354	10,288	19
Total EIS	8,303	18,062	17

- Expenditures in the banking and finance industry are driven by the use of on-line data bases to supply pricing and other financial and economic information to price or evaluate equities, portfolios, collateral, alternate courses of action, or other business situations.

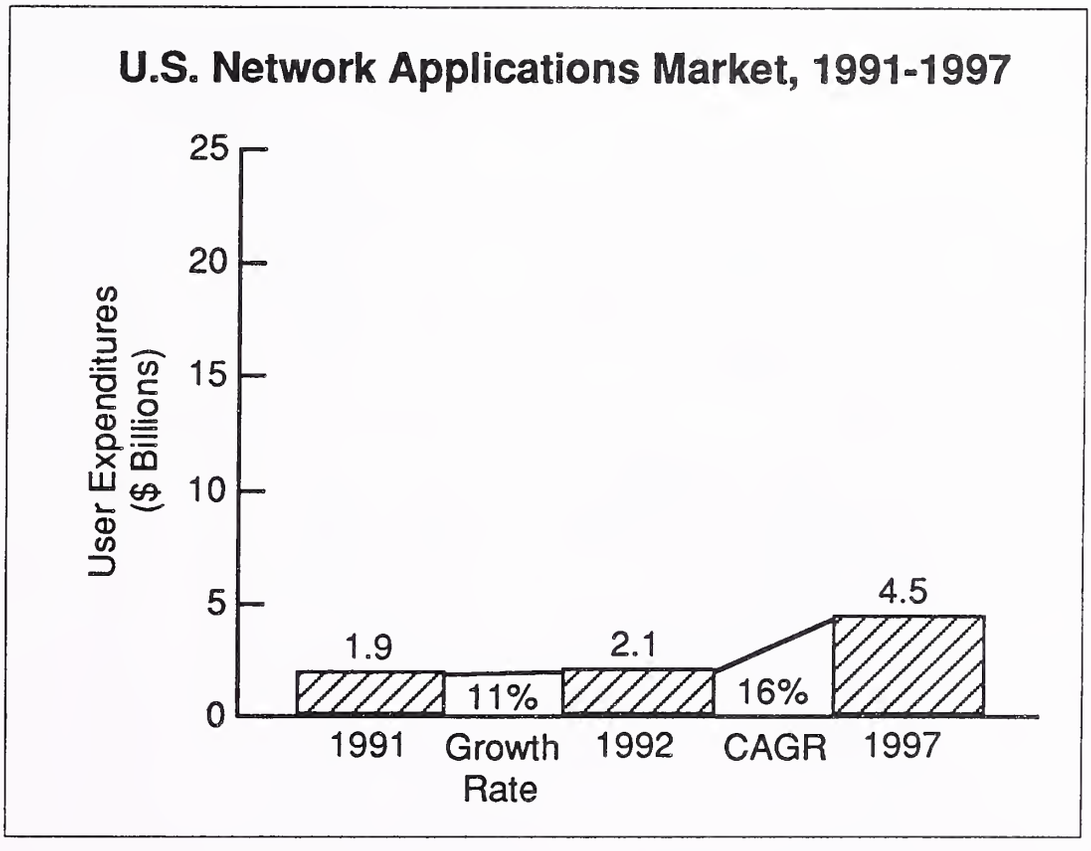
- Process manufacturing includes a number of industries—such as chemicals, pharmaceuticals, and petroleum—that are heavy users of on-line technical information used in manufacturing, storing, shipping, pricing, and a variety of other purposes.

- Expenditures in business services are driven by the use of on-line data bases of financial, legal, and other business data to help in preparing analyses, reports, or other products or services.

4. Network Applications Market

User expenditures in the network applications market are growing at a rate of 11 %—from $1.9 billion in 1991 to $2.1 billion in 1992, as shown in Exhibit VI-10. Growth will continue at a CAGR of 16% to a level of $4.5 billion in 1997.

EXHIBIT VI-10



- Network applications amounted to about one-fifth of network services expenditures in 1991.

Similar to the use of EIS, network applications are driven by needs or demands of clients and by developments in communications. However, network applications also save postage, office labor, and other costs—thereby encouraging the use of electronic payment and mail versus paper-based media.

Developments that improve network quality and service capabilities promote the use of EDI, electronic mail, videotext, and other network applications.

In addition to reducing costs, saving time, and promoting business, network applications provide means of improving work and organizing better communication with suppliers and customers.

Exhibit VI-11 shows the expenditures for network applications by industry markets.

EXHIBIT VI-11

Network Applications Market
User Expenditures by Industry, 1992-1997

Industry Sector	User Expenditures $ Millions		1992-1997 CAGR Percent
	1992	1997	
Discrete Manufacturing	53	153	24
Process Manufacturing	128	346	22
Transportation	89	264	24
Utilities	3	5	11
Telecommunications	21	57	22
Wholesale Distribution	257	786	25
Retail Distribution	76	270	29
Banking and Finance	95	195	15
Insurance	58	91	9
Medical	235	689	24
Education	79	165	16
Business Services	18	48	22
Federal Government	945	1,160	4
State and Local Government	75	230	25
Miscellaneous Industries	8	21	21
Industry-Specific Total	2,140	4,480	16
Generic Markets	NA	NA	NA
Total Network Services	2,149	4,480	16

- The expenditures in the federal market are about four times larger than in any other market. The explanation is due to the heavy use of network applications: EDI, VANs, and electronic mail.

- Expenditures in some industries—such as utilities and miscellaneous industries—are very small.

A group of industries—including discrete and process manufacturing, wholesale and retail distribution, and state and local government—have high growth rates. These growth rates reflect a continuing trend in the increased use of EDI in most cases.

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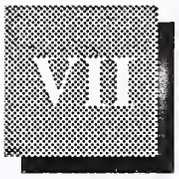


Competition

A
Introduction

Vendors competing in the network services market and segments thereof are discussed in this chapter, along with information about fast-growing services and characteristics of vendors in the market. The two segments or submodes of the market that this chapter discusses are:

- Electronic information services (EIS) that involve data bases of electronic data, which can be accessed, but not changed by users who wish to satisfy information needs.
- Network applications or electronic communication—including EDI, electronic mail, videotext, and VANs.

B
Market

1. Market Leaders

The list of top vendors of network services in Exhibit VII-1 illustrates that competitors in this marketplace come from a variety of industries.

- The competitors include publishers of financial information: Dow Jones and Dun & Bradstreet, book publishers such as McGraw-Hill Citicorp, IBM, a newspaper holding company, two subsidiaries of manufacturers of non-computing products, and vendors of information industry services.
- Information services vendors that offer network services tend to be known chiefly for services in other delivery modes, such as ADP and CSC.

EXHIBIT VII-1

Leading Vendors of Network Services in 1991

Rank	Vendor	Estimated Revenue ($ Millions)	Market Share (Percent)
1	TRW (including Chilton)	765	9
2	Dow Jones (Telerate)	438	5
3	Dun & Bradstreet	435	5
4	Mead Data Central	425	5
5	Equifax	398	5
6	Reuters	363	5
7	McGraw-Hill	332	4
8	BT Tymnet	256	3
9	Sprint	236	3
10	ADP	225	3
11	Knight-Ridder (& Dialog)	197	2
12	Citicorp (Quotron)	175	2
13	GEIS	169	2
14	CompuServe	155	2
15	IBM	130	2

Exhibit VII-1 illustrates that the market is dominated by a group of large vendors.

- The top ten vendors in this exhibit account for 45% of the 1991 revenue of network services.

- The next five vendors add 10% more to the total revenue. There have been no appreciable changes in these percentages compared to 1990 revenues.

The leading firms in the market provide EIS, on-line data bases of information for credit, investment analysis, and equity pricing. Exhibit VII-2 shows the product focus of these firms.

EXHIBIT VII-2

Product/Service Focus of Leading Network Services Vendors

Rank	Vendor	Product Focus
1	TRW	Credit data
2	Dow Jones (Telerate)	Financial market prices and news
3	Dun & Bradstreet	Financial and other corporate data
4	Mead Data Central	Legal and news texts
5	Equifax	Credit data
6	Reuters	Current financial market news and prices
7	McGraw-Hill	Econometric and other industrial data
8	BT Tymnet	EDI and other network applications
9	Sprint	Network applications for multiple purposes
10	ADP	Current security and commodity prices
11	Knight-Ridder (Dialog)	News and bibliographic, financial data/prices
12	Citicorp (Quotron)	Current security and commodity prices
13	GEIS	EDI, VANs, other network services
14	CompuServe	EIS and network applications
15	IBM	Financial and other network services

- More than half of the top 15 vendors in Exhibit VII-2 have products that focus on financial users. The most common focus is credit or security pricing.

- The vendor with the largest revenues from network services, TRW, is devoted chiefly to credit functions. The second largest firm in this market, Dow Jones, concentrates on equity pricing and related financial information.

In addition to the product uses, there are a large number of other (EIS) on-line data base products that provide information on chemicals, agriculture, construction materials, audience ratings, and other subjects.

A most significant competitive event occurred in late 1992. It was the formation of IBM's Integrated Systems Solution Corporation (ISSC) and Sears Technology Corporation (STC). The new partnership is named Advantis with IBM's ISSC division owning 75% of the venture. While the venture's combined revenue equals $1 billion, INPUT estimates the partnership's actual network services market revenues are $470 million. This is exclusive of captive internal revenues.

Based on this revenue estimate, the Advantis organization will become second only to TRW and will be incorporated within INPUT's 1992 ranking. This represents a significant repositioning within the network services marketplace.

It was also announced in mid-1992 that Citicorp's Quotron network has been outsourced to the IBM ISSC division.

2. Market Segments

The largest segment or submode of network services is EIS.

- EIS provides almost 80% of the revenue for the network services delivery mode.
- Eight of the top ten vendors of EIS in Exhibit VII-3 are among the 10 leading vendors in the overall network services market.

EXHIBIT VII-3

Leading Vendors of Electronic Information Services in 1991

Rank	Vendor	Estimated Revenue ($ Millions)	Market Share (Percent)
1	TRW (including Chilton)	765	11
2	Dow Jones (Telerate)	438	7
3	Dun & Bradstreet	435	6
4	Mead Data Central	425	6
5	Equifax	398	6
6	Reuters	363	6
7	McGraw-Hill	332	5
8	Knight-Ridder (& Dialog)	197	3
9	Citicorp (Quotron)	175	2
10	ADP	161	2

- The largest vendors tend to be those that devote themselves to the development of comprehensive EIS that can be sold apart from other services.

- Many vendors with lower volumes of revenue from EIS—such as Policy Management and Triad—direct their attention to the sale of EIS and other products outside the EIS marketplace. Other vendors, such as CompuServe, focus on service concepts that include EIS.

As shown in Exhibit VII-4, most of the larger EIS vendors offer on-line credit information or security prices, but not both. Four of the companies in the exhibit offer credit information, six offer pricing data, and two—Mead Data Central and CompuServe—offer neither credit nor pricing data.

EXHIBIT VII-4

Leading On-Line Data Base Vendor Market Focus

Company	Credit Information	Securities Prices	Vertical Specialty	Business Information
Dun & Bradstreet	X	-	-	X
Equifax	X	-	X	-
TRW	X	-	-	-
Reuters	-	X	-	-
ADP	-	X	-	-
Citicorp (Quotron)	-	X	-	-
McGraw-Hill	-	X	X	X
Dow Jones (Telerate)	-	X	-	X
Mead Data Central	-	-	X	-
Computer Sciences Corp.	X	-	-	-
CompuServe	-	-	-	X
Knight-Ridder (Dialog)	-	X	-	X

A number of information providers now supply paper-based products or processing services that could expand into EIS in the future.

- IRI and other vendors that capture sales data, organize it into data bases, and prepare reports and sets of information about buying patterns use disks, paper, or other media to deliver this information to clients. Some of these vendors have been considering plans to make more information available to clients through on-line data bases.

- Some of the telemarketing and TV buying services—such as information resources—that utilize data bases in their internal work have been considering means of allowing clients to access data on-line.

- Companies that have data bases of printing templates, overlays, or text to aid in processing, which are necessary to create catalogs or directories, have mentioned services that would allow clients to use terminals or PCs to access information for in-house work.

Exhibit VII-5 shows differences between the network services, EIS, and network applications submodes. There are considerably more large and small vendors devoted to EIS than to network applications. The explanation is that data base information related to business, technical, and other areas are available from intermediate specialized vendors.

Exhibit VII-5 also points out that earnings for network applications are substantially smaller than EIS.

A comparison of the list of leading vendors of network applications in Exhibit VII-6 with the list of vendors in Exhibit VII-3 shows that there are fewer vendors obtaining high levels of revenue from network applications rather than from EIS.

The submodes of network services do not tend to cross-sell each other and may not have business characteristics that would make it sensible to combine submodes.

EXHIBIT VII-5

Comparison of Electronic Information Services and Network Application Vendors

Characteristic	EIS	Network Application
Largest Vendors	Publishers. Subsidiaries of large companies interested in revenue potential of EIS.	Communication vendors. IS vendors exploiting network capabilities.
Mid-sized and Smaller Vendors	Chiefly companies that offer EIS products related to their businesses. There are many small vendors.	IS vendors and users gaining revenue from their investments in network applications. Few small vendors.
Other Vendors	More than half of large vendors and a higher percentage of smaller specialize in EIS.	Larger venders offer multiple information services. A number of EDI providers also market EDI software.
Revenue of Vendors	There are seven vendors earning over $300 million.	Five vendors earn over $100 million.

EXHIBIT VII-6

Leading Vendors of Network Applications in 1991

Rank	Vendor	Estimated Revenue ($ Millions)	Market Share (Percent)
1	BT Tymnet	256	13
2	Sprint	236	12
3	GEIS	169	9
4	IBM	130	7
5	MCI	118	6
6	CompuServe	81	4
7	ADP	67	3
8	CSC	59	3

As Exhibit VII-5 notes, the leading vendors of network applications tend to be companies (such as BT Tymnet, MCI, and GEIS) that have sizable investments in network capabilities and can take advantage of these capabilities in the network applications market.

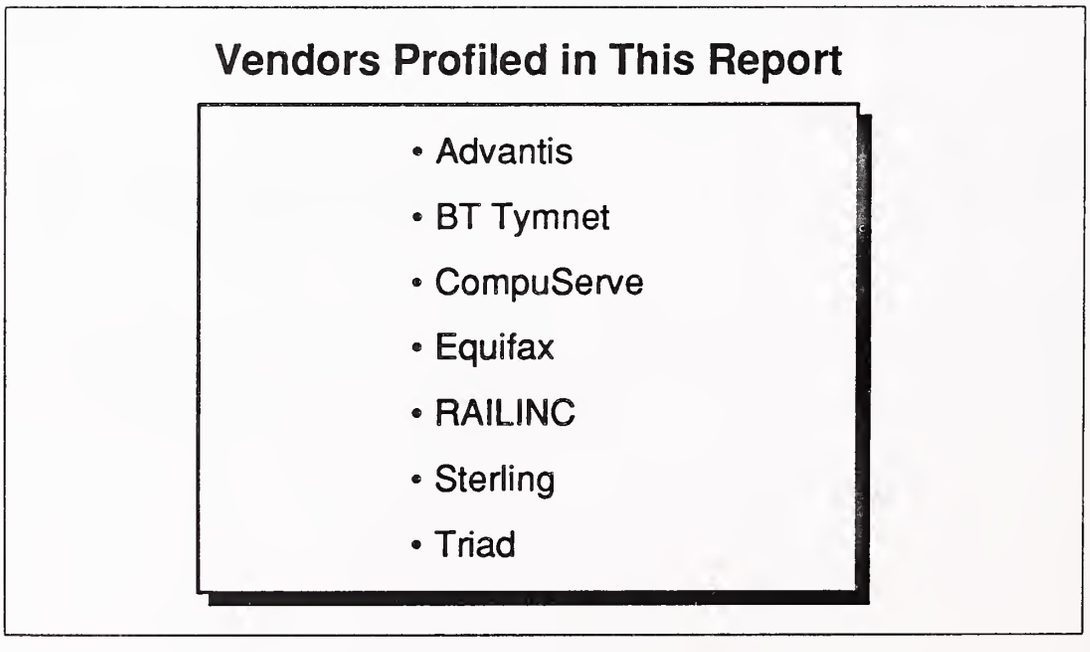
Other vendors in the network applications market have a high level of interest in specific products, particularly EDI.

- Sterling Software has invested in EDI software products and network capabilities based on an evaluation of the future potential of the EDI market.
- Users of EDI—such as Sears—have also become vendors of this service because they have established capabilities to meet their own EDI needs and are currently leveraging these services.

C
Vendor Profiles

Exhibit VII-7 presents information about the vendors in this section to aid in the analysis of the network services market.

EXHIBIT VII-7



- Included are selected details about the network services offered by vendors, the other information services offered, vendor strategies, and company background.

- Additional information about these vendors, and other vendors active in the network services market, are in reports published by INPUT's Vendor Analysis Program.

1. Advantis 231 No. Martingale Road, Schaumburg, IL 60173-2254 (813) 878-5472

a. Company Strategy

Advantis offers a full spectrum of networking technology solutions, from value-added network services, to custom network solutions and total network outsourcing. The company provides complete customer solutions that encompass all these services so customers can concentrate on their core business while allowing Advantis to handle their networking needs. Advantis plans to provide a full range of services and support for electronic markets with extensive, any-to-any interconnection. They plan to become the leader in networking technology. Primary target markets include retail, state and local government, health care, insurance, manufacturing and transportation.

b. Company Background

Advantis was formed on December 1, 1992 through a joint venture between IBM Information Network (INN) and Sears Technology Services, Inc. (STS). IBM's Integrated Systems Solutions Corporation (ISSC) will hold the majority interest in Advantis in addition to providing networking support. Advantis combines two of the world's largest information networks into one company providing customers network access from 650 cities in more than 90 countries through their worldwide affiliates.

With a running start of 3,000 employees, Advantis will earn 47% of its estimated $1 billion in first year revenues from non-captive customers. This extensive, non-captive base includes 9,000 U.S. customers supporting more than one million users.

c. Products and Services

Advantis network services grew at more than twice the industry average in 1992 by providing a full spectrum of network services including VAN's, custom network solutions, and total network outsourcing. Offerings include design, re-engineering, integration and outsourcing, and value-added network services.

Advantis has 20% of the EDI market and ranks second to GEIS. Other services include electronic mail, EIS, remote computing, access to more than 2,000 commercial data bases, bulletin boards, electronic catalogs, and industry specific services.

Advantis plans to provide more value-added services, e.g., client/ server and distributed systems, support for LAN's, multiprotocol networking, ISDN, Frame Relay, multimedia, digital broadcast service, increased bandwidth, mobile access to host applications (cellular), and international X.25.

The Sears Technology Services component of this alliance is also significant. STS' 20,000 nationwide phone access sites, combined with INN's greater throughput capability, provides customers with any-to-any connectivity and high-volume traffic capacity. Their network services provide customers with a ready-to-use, fully managed and secure domestic and international networking technology. Included with these features is the ability to configure almost any combination of terminal-to-host, host-to-host, and peer-to-peer connections.

2. BT Tymnet, Inc. 2560 North First St., San Jose, CA 95131 (408) 922-0250

a. Company Strategy

BT Tymnet aims to be one of the world's largest providers of a wide range of shared, dedicated, and hybrid network solutions. The company operates the TYMNET public packet data communications network and provides access to dial-up services, major on-line data bases, EDI services, card authorization/electronic data capture, and other services in support of the BT Tymnet strategy.

b. Company Background

In 1969, the TYMNET data network began providing remote-processing services to timesharing clients. In 1977, TYMNET became an FCC-regulated specialized common carrier. McDonnell Douglas acquired the service in 1984. In 1989, British Telecom PLC acquired TYMNET and a value-added service provider active in Japan. These acquisitions, together with Dialcom, which BT acquired in 1986, were reorganized in 1989 as BT Tymnet, a subsidiary of British Telecom.

c. Products and Services

The TYMNET network consists of intelligent communications processors and network capabilities that allow clients to communicate between attended or unattended terminals and their own or other computers in a variety of locations. A number of different protocols, error correction, protocol conversion, data security, and other services are provided by the network. Access to major on-line data bases is also provided through this network.

EDI*Net is the principal EDI service of BT Tymnet and provides third-party value-added communications services for automated exchange of business documents—such as purchase orders, invoices, and bills of lading. There are over 1000 clients who are mostly in the transportation, grocery, electronics, telecommunications, aerospace, oil, and warehousing industries.

Credit card and electronic data capture are provided for all major credit cards and private-label programs.

Private and hybrid data networks are also provided to clients in a number of industries.

3. CompuServe, Inc., 5000 Arlington Centre Blvd., Columbus, Ohio 43220 (614) 457-8600

a. Company Strategy

CompuServe concentrates on offering on-line and other services to individual personal computer owners. These services will support CompuServe's position as the largest on-line provider. Over 550,000 members around the world use CompuServe services. CompuServe revenues derive from network services, software products, and communication and information-processing services.

CompuServe leverages the use of its capabilities to gain revenue from electronic mail, transaction processing, software products, and value-added networks for about 2,000 major U.S. corporations and government agencies.

b. Company Background

CompuServe was founded in 1969 to provide network-based services to users of computing systems. CompuServe has grown through expansion of its services, as well as from the acquisition of vendors of network services, software products, and network capabilities. One important acquisition was the Source from Readers Digest. The Source provided on-line information to a variety of clients.

CompuServe has operated as a wholly owned subsidiary of H.R. Block since it acquired CompuServe in 1980.

c. Products and Services

Through the Information Services Division, CompuServe provides access to a range of data bases that cover business, research, demographics, and news as well as access to electronic mail, interactive conferencing, home shopping, financial transaction, and travel planning services for individual users of microcomputers.

Through the Business Services Division, corporate and government users have access to application software products, financial data bases, communication services, and network services—including electronic mail, EDI, videotext, and VANs.

The Software Products Division provides data base management, spreadsheet modeling software products and industry-specific software products for the financial, human resources, and newspaper management fields.

The Support Services Division provides systems engineering, product development, operational services, and general support to the foregoing three fields .

4. Equifax, Inc., 1600 Peachtree St., N.W. Atlanta, GA 30309 (404) 885-8000

a. Company Strategy

Equifax provides a range of services for credit reporting. This includes information that can be obtained electronically for consumer and commercial services credit reporting, and insurance underwriting. These services entail the use of processing and network services. In addition, Equifax uses its resources to provide a set of related marketing services to customers.

With the acquisition of Telecredit at the end of 1990, Equifax found itself with a new set of products and strategies related to the check guaranty and credit card businesses. Telecredit's experience with low-cost processing centers was also of value to Equifax because its margins were narrow.

b. Company Background

Equifax began in 1899 as a credit-reporting agency, and grew into a company that provided credit reporting, insurance underwriting, and product marketing. In 1976, the company took its present name, Equifax. Equifax has been expanding its operations through the acquisition of companies in the U.S., Canada, and Europe. Equifax Europe, with headquarters in the U.K., supports the company's products outside North America. Service in England expanded through the acquisition of Next PLC in 1990. This resulted in the provision of consumer credit-reporting, credit-scoring, marketing, and other services throughout the U.K.

c. Products and Services

Credit Information Services, one of Equifax's business units, is a national credit bureau that provides information for consumer and commercial credit reports, services for the management, collection of accounts receivable, and the detection and prevention of fraud.

The Insurance and Special Services business unit provides risk management, automated claims information exchange, motor vehicle reports, and electronic information on rate and price to the property and casualty industry.

The Marketing Services Unit provides market research, market data analysis, statistical modeling, and target marketing information to clients. These clients include direct marketing firms, manufacturers, and advertising agencies.

5. RAILINC Corporation, 50 F St. N.W., Washington, D.C. 20001

a. Company Strategy

RAILINC is attempting to meet network services and related needs for segments of the transportation industry, and for companies that interact with these segments. About 80% of RAILINC revenue was from network services and 20% was from software products.

RAILINC's software products support and expand network service offerings to meet the needs of transportation companies and users.

In addition to the railway industry, RAILINC serves ocean and motor carriers, manufacturers, and distributors that use transportation services.

b. Company Background

RAILINC was founded in 1982 and is a subsidiary of the Association of American Railroads. Almost half of the company's revenues come from members of this association.

c. Products and Services

Network applications include:

- The CLM Collection Service, which electronically collects Car Location Messages from most rail carriers and provides shippers with a single source of CLM information

- The Data Exchange System, which consolidates car hire and repair bills from over 95 railroads and supplies the bills to rail car owners in computer-processable form. Over 90% of this type of information is handled by RAILINC.

- EDI traffic among over 300 clients including rail carriers, manufacturers, ocean carriers, and trucking companies.

On-line data base services offered by RAILINC include:

- Information on freight car, trailer, and container movement across the U.S., Canada, and Mexico. This information is used for car hire calculations by over 100 subscribers.

- A computerized version of the Official Railroad Equipment Register that contains information on the physical characteristics of more than 3 million registered freight cars, trailers, and containers.

Other services include a rail car tracing and pool management system and microcomputer software that:

- Traces rail shipments and also makes use of CLM data from RAILINC

- Automates car repair billing that makes use of data from RAILINC data bases

- Provides for data entry and transmission of data by using EDI and other standards, and for access to RAILINC data bases.

6. Sterling Software, Inc., EDI Group 4600 Lakehurst Court, P.O. Box 7160, Dublin, OH 43017 (614) 793-7000

a. Company Strategy

Sterling's EDI Group has developed and acquired a comprehensive set of EDI services, and related software and services, that have established the company as a major competitor and source of expertise in EDI.

As part of Sterling strategy, the EDI Group focuses on maintaining a close relationship with clients and supplying client needs as use of EDI expands. This strategy is supported with education and by encouraging the most extensive user group activity in the EDI market.

b. Company Background

The EDI Group was created in October, 1990, and includes the ORDERNET Services Division, the EDI Labs Division, and an EDI International Division, which has headquarters in London. The REDINET Services Division of CDC was acquired in 1991 and folded into the U.S. ORDERNET Division.

c. Products and Services

About 55% of the EDI Group's revenue comes from software products and 45% from network services. Both software products and network services are offered though the ORDERNET division to over 2,700 customers in the pharmaceutical, grocery, hardware and housewares, retail, medical distribution, mass-merchandising, warehousing, transportation, and automotive industries.

ORDERNET provides an on-line network to manage and control the flow of standardized business documents among over 2,000 trading partners.

Services to certain industries are provided through vendors active in those industries. ORDERNET services are made available to hospitals through GTE Health Systems. Services include a data base on drug usage and are made available to the medical industry through International Health Applications. Internetwork traffic for the grocery industry is supported through BT Tymnet.

Electronic transmission of charge-back information between wholesalers and pharmaceutical manufacturers is provided in three formats established by national druggists' associations.

Software from the EDI Group provides translation between established standards for EDI and other standards, and between a variety of record formats, as well as support of existing protocols on different hardware platforms.

A data base service is also available to build on EDI documents, including purchase orders and invoices.

Security services, education, and software maintenance are also offered in support of EDI products and services.

7. Triad Systems Corporation, 3055 Triad Drive, Livermore, CA 94550 (415) 449-0606

a. Company Strategy

Triad is principally concerned with providing information services that will ensure a strong and ongoing relationship and recurring revenues from selected industries including retail and wholesale segments of the automotive aftermarket, retail hardgoods firms, and dentists.

Services for the automotive aftermarket have been expanded to include turnkey systems that will address the processing and communication needs of a wide range of retail and wholesale establishments. This is in addition to software products and maintenance services. Triad's strategy of obtaining recurring revenue led to the provision of electronic information services that supply automotive parts pricing and catalog updates.

b. Company Background

Triad was formed in 1972 to offer turnkey systems to selected markets. The company has also engaged in leasing and third-party maintenance services.

Triad has over 10,000 customers worldwide.

Over 85% of Triad's revenues derive from turnkey systems and associated maintenance and support functions, 9% derive from EIS, and the remainder derive from leasing. The EIS services were one of the fastest growing components of Triad.

c. Products and Services

The Automotive Division of Triad markets turnkey systems with inventory, billing, and accounting functions to distributors, jobbers, retailers, and auto repair shops in the automotive aftermarket. The Information Services Division provides two proprietary data bases for automotive parts pricing and catalog updating to the same automotive aftermarket clients.

The Hardgoods Division provides turnkey systems to hardware stores, home centers, lumber/building materials dealers, and decorating retailers. The Dental Division provides turnkey systems to dental practices.

The Customer Services Division provides pre-delivery and installation services, customer training, hardware maintenance, software support, and third-party maintenance. Triad also has a leasing subsidiary.

Conclusions and Recommendations

A
Conclusions

As Exhibit VIII-1 indicates, one conclusion about the network services market is that the recession has had an impact on business in almost all industries. Recent economic indicators point to a positive trend in business improvement, signaling an end to one of the most protracted economic down-turns in U.S. history.

EXHIBIT VIII-1

Conclusions

- Recession's impact waning
- Healthy growth continues
- Downsizing and re-engineering
- Potentials of CD ROM technology
- Range of vendor markets and services to expand

However, the impact of this recession was more than offset by a significant and continuing need for network services. This was due to the constantly increasing need for electronic information.

- Information about materials, production processes, drugs in use, business activity, financial markets, and a host of other topics, contribute to the increases in the amount of on-line information.

- In addition, forces producing increased use in EDI, electronic mail, and other network applications, stem more from pressures of corporations on their suppliers or customers, and/or the desire to save time and funds by moving information electronically.

In conjunction with the economic downturn, there has been a significant trend in business downsizing. This reduction in network size and cost has created a need for better network planning.

Having fewer capable resources, users find it more difficult to analyze and re-engineer the needs of network service requirements.

Vendors have attempted to meet this development by providing increased aid in planning these network services.

The interaction of technology and business has a noticeable impact on network services, as noted in Exhibit VIII-1:

- Significant developments in the use of CD ROM technology have led to the consideration and/or use of CD ROMs for economic, technical, legal, and other information that does not require real-time updates.

- Information that is more static can be provided much more economically on CD ROM than from on-line data bases. There are now economic and financial data bases available on CD ROM that include, in some cases, data that is also available from on-line data bases.

- A system has been developed that records each time a particular piece of information has been accessed on a CD ROM. This will enable CD ROM vendors to bill each time a user accesses the CD ROM database.

- Users are also discussing the segmentation of data that users now obtain from a vendor source. This would be done so that users can employ an on-line data base for real-time needs, and a CD ROM for more static needs.

The addition of Advantis, a new major full-service player in the vendor arena, will cause network services vendors to re-evaluate their offerings.

Many of the vendors of network services have offered a limited number of EIS or network application products and/or sell products in a limited number of markets. Vendors who serve a wide range of products and industries, such as CompuServe and GEIS, will be better positioned in the marketplace.

- Users have difficulty in keeping track of the many companies offering products that could be useful.

- It is also difficult to find out which vendors have the best combination of products and prices and which are the most stable as suppliers.

- Vendors will have to consider offering a broader selection of services to meet the new venture's all-encompassing competitive challenge.

Another observation that should be made about the network services market, as mentioned in Exhibit VIII-1, is the increased pressure for the use of EDI or related electronic commerce services.

- Major stores and manufacturers have put more pressure on trading partners to conform to their EDI programs so that costs can be lowered and business can be more quickly facilitated.

- Services, such as EDI*Express from GEIS, have made it easier for companies to respond to trading partners who want them to use EDI.

According to vendors, number of EIS vendors have allowed their operations to become relatively costly. A few of the larger EIS vendors have taken steps to reduce costs in view of shrinking profit margins.

Vendors of network applications have tended to be more cost effective due to their other business, as well as to the fact that they sometimes have to compete with in-house systems or fax.

B
Recommendations

Network services vendors should review the actions of other vendors offering products in their delivery mode, as Exhibit VIII-2 points out.

- Vendors should consider moves made by other vendors to use mergers or alliances with those in other service modes, such as transaction processing and network connectivity, to help them increase services, improve productivity, or share costs. The recent IBM/Sears alliance has provided such benefits.

It is becoming apparent that users are focusing more on their core businesses. Vendors can take advantage of this need by offering a tailored service that performs all transaction/network services, including the ancillary business functions, currently performed by the user.

EXHIBIT VIII-2

Recommendations

- Expand markets and/or services
- Provide global network services
- Offer product variations, e.g., CD ROM
- Stay current with network technology evolution
- Prepare for multimedia transition

Because users need to meet the demands of a global economy, their organizations will take on international functionality.

- Network service capabilities should be available to support these inevitable requirements. For the smaller niche market vendor, alliances with foreign carriers may be beneficial.

An additional service that EIS vendors should consider is providing data on CD ROM together with new software products.

- Rather than letting competitive vendors provide this medium for static data in on-line data bases, EIS vendors could provide CD ROMs along with software products that could organize or provide references between the on-line data and the data on the CD ROMs.

- The approach suggested above could open up opportunities to provide data in new fields, or to relate data in different subject areas, which could become a need in the use of on-line data.

With technology changing so rapidly, it is imperative that vendors keep up with its evolution and plan for potential opportunities.

- Vendors need to position themselves to support any-to-any network connectivity. This connectivity will include the interoperability of EDI, electronic commerce (E-mail), imaging, and even the possibility to support certain segments of a user's enterprise networks.

- Benefits can be derived from the support of standards, which include open systems and protocols, that promote commonality of network interfacing.

As multimedia technology develops and associated pricing comes down, users will begin to make significant commitments to this audio, image, full motion video, and textual medium. It has been suggested that the most logical springboard to create this service would be electronic mail.

- To accommodate the high-speed data rates of multimedia's full motion video component, it will be necessary to make appreciable increases to the capacities of current telephone circuitry. Network services vendors should monitor local exchange carriers (LECs)—as well as inter-exchange carriers—in their development of high-speed, switched networks that will support multimedia.

- New transmission protocols will need to be developed that are designed to specifically support full motion video. Among other challenges, current protocols tend to send more control information than is necessary.

- Currently, these high-capacity, broadband circuits provided by the LECs and Regional Bell Operating Companies (RBOCs) are very expensive; however, regulators and legislators are strongly promoting the cross-fertilization of markets between telephone, cable TV, and alternative local access carriers. Ultimately, the combination of the fiber optic medium, in conjunction with new, high speed switching systems, will become the technological foundation for multimedia.

- Potentials for a multimedia data network, supported through some form of wireless interface (Cellular), are more speculative at this time. Alliances with local television broadcasters or Cellular Vision of New York (just licensed by the FCC) may provide the needed high-capacity transmission requirements to support the full motion video component.

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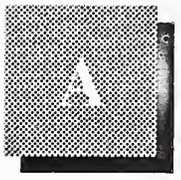


Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit 1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programs for a number or years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry as defined by INPUT. Other portions of this market (such as software support) are already included.

- Two new submodes have been defined in the *Systems Operations* delivery mode - *desktop services* and *network management*. They are defined on pages 5 and 6.

- A fourth submode has been defined within the Professional Services delivery mode—*applications management*. This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.

A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definitions of Terms* are indicated with a ☆.

B

Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)
- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section C describes the delivery modes and their structure in more detail.

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called "industry-specific" markets.

- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called "cross-industry" markets.

- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organizations—commercial and non-commercial—involved in producing a good or services.

- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Program.

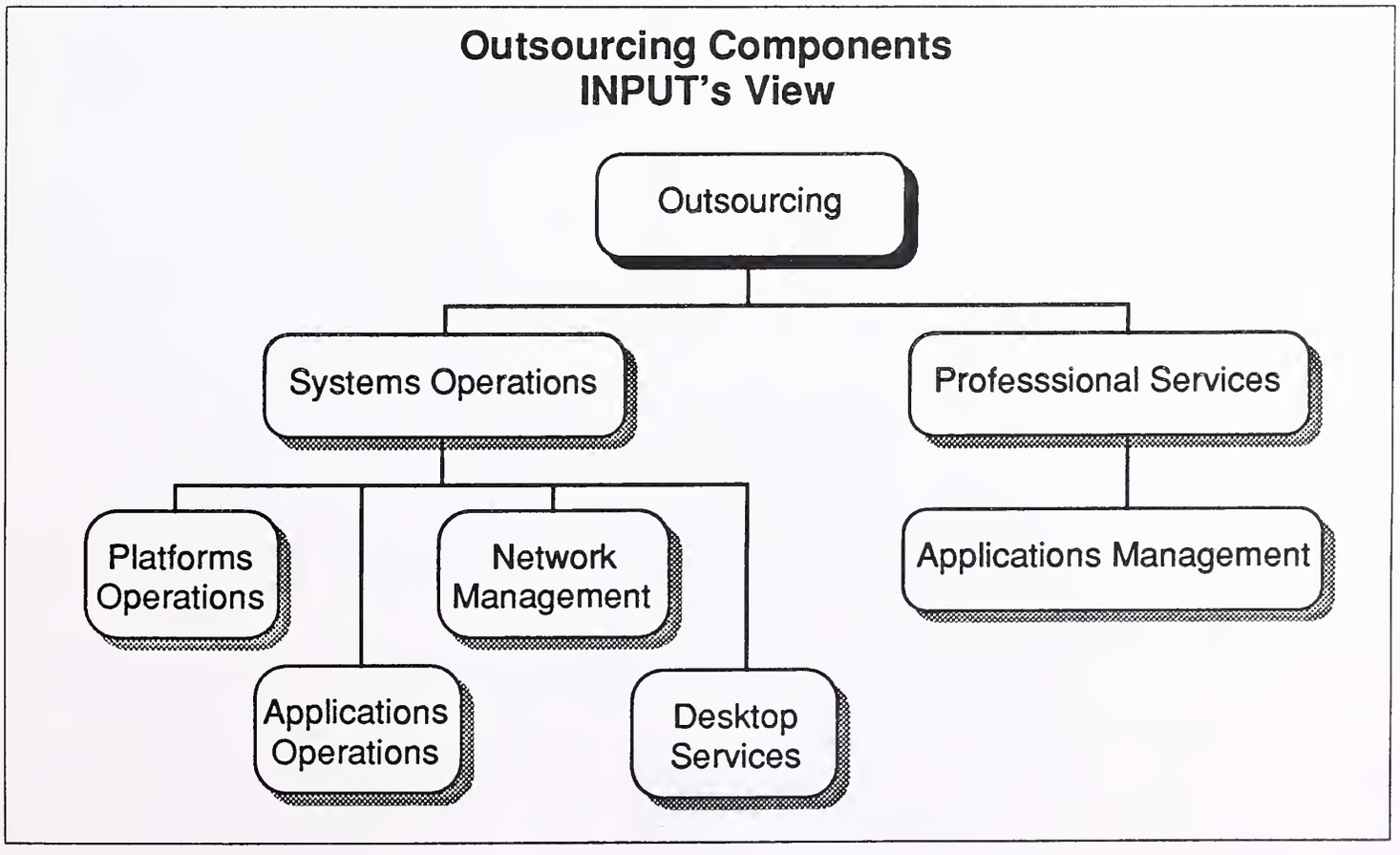
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit 1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT 1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.

- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.

☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.

☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organization. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit 2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

1. Software Products

INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

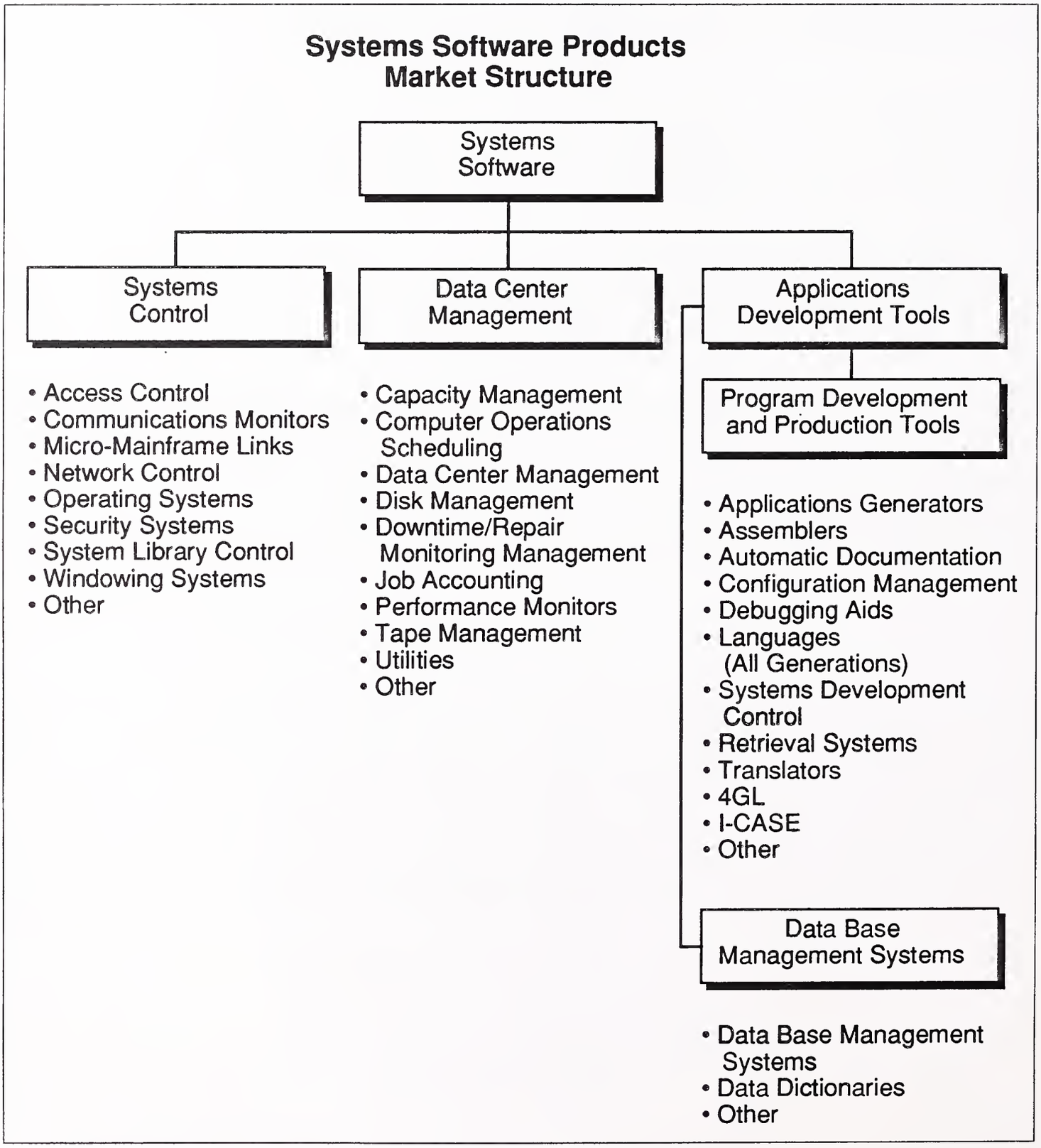
Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

EXHIBIT 2

a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into three submodes. See Exhibit 3.

EXHIBIT 3



- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit 4.)

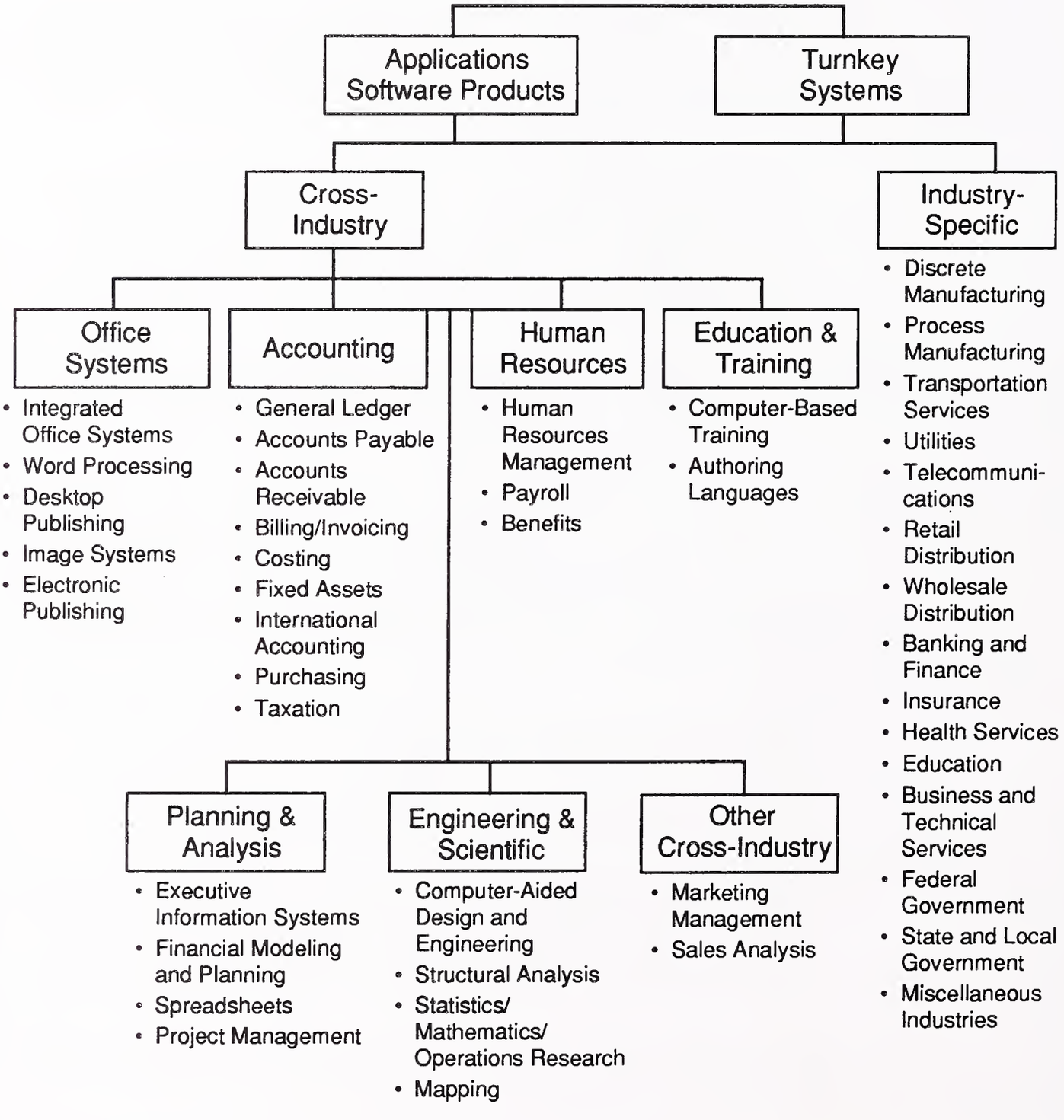
- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

EXHIBIT 4

Application Products and Turnkey Systems



2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit 4.)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

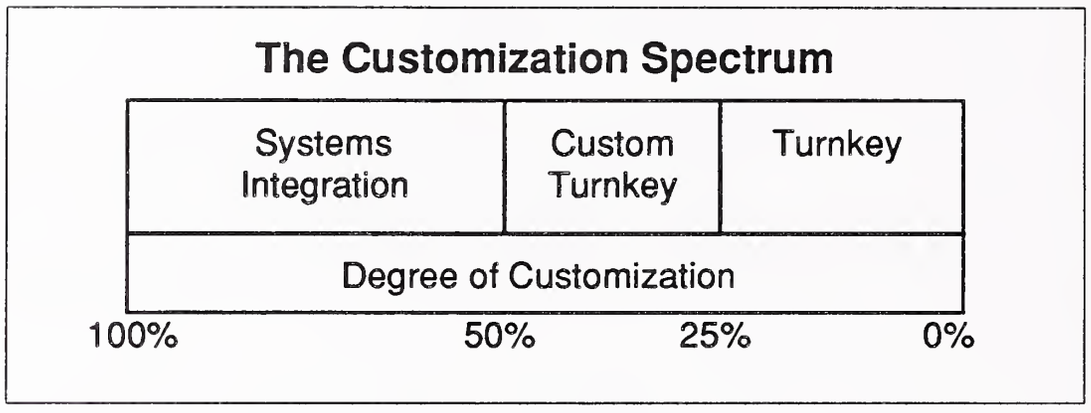
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit 5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

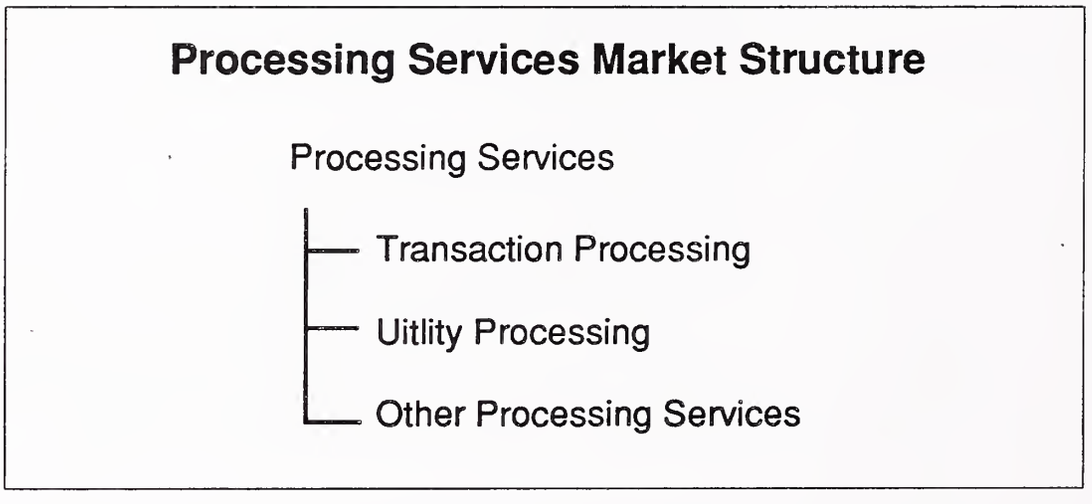
EXHIBIT 5



3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and "other" processing services. See Exhibit 6.

EXHIBIT 6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.

- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.

- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programs. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit 7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software products* - prepackaged applications and systems software products.

- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.

- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT 7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit 8 provides additional detail.

- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.

- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems are not included. General education and training products are included as a cross-industry market sector.

- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

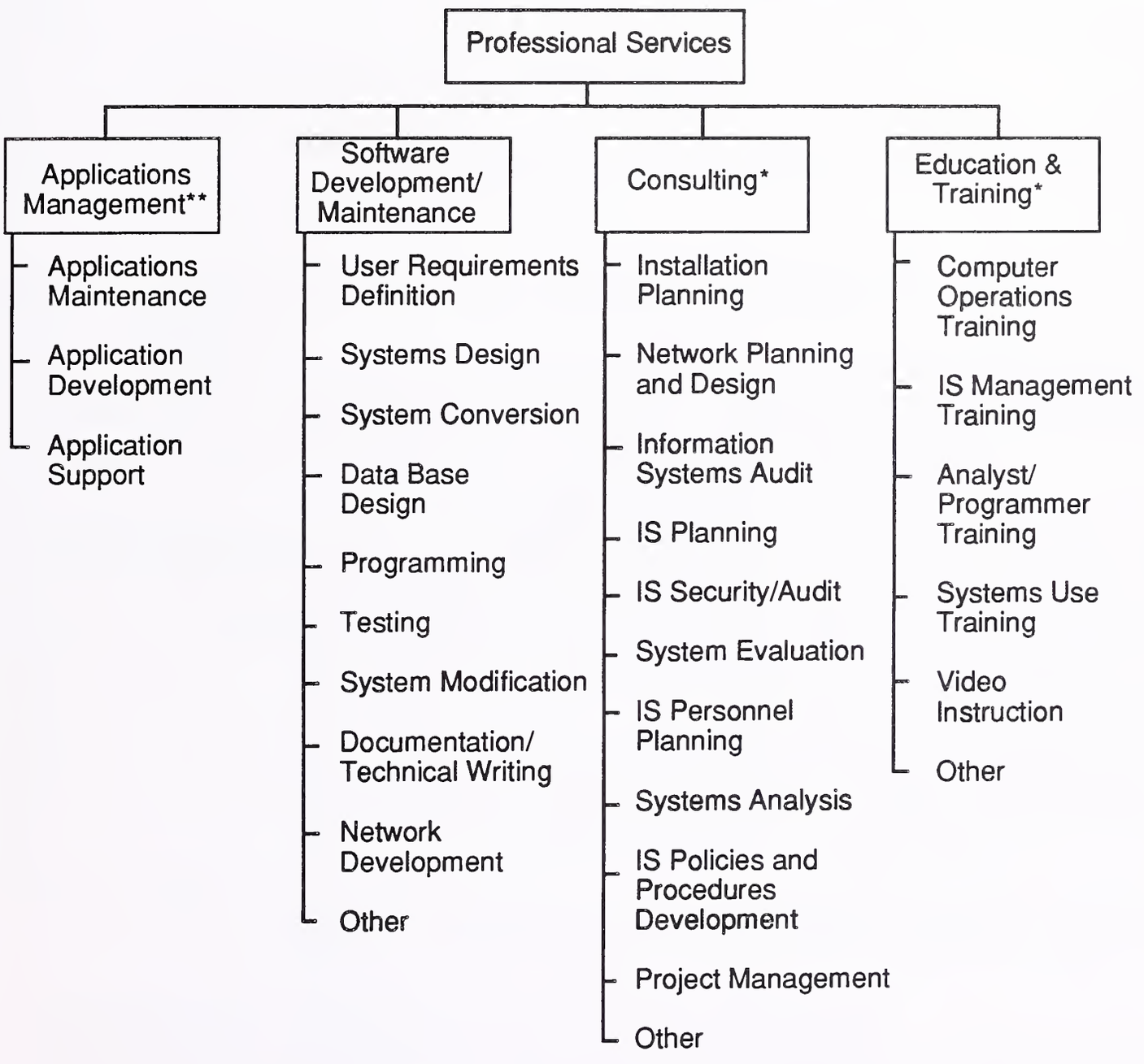
☆ *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

EXHIBIT 8

Professional Services Market Structure



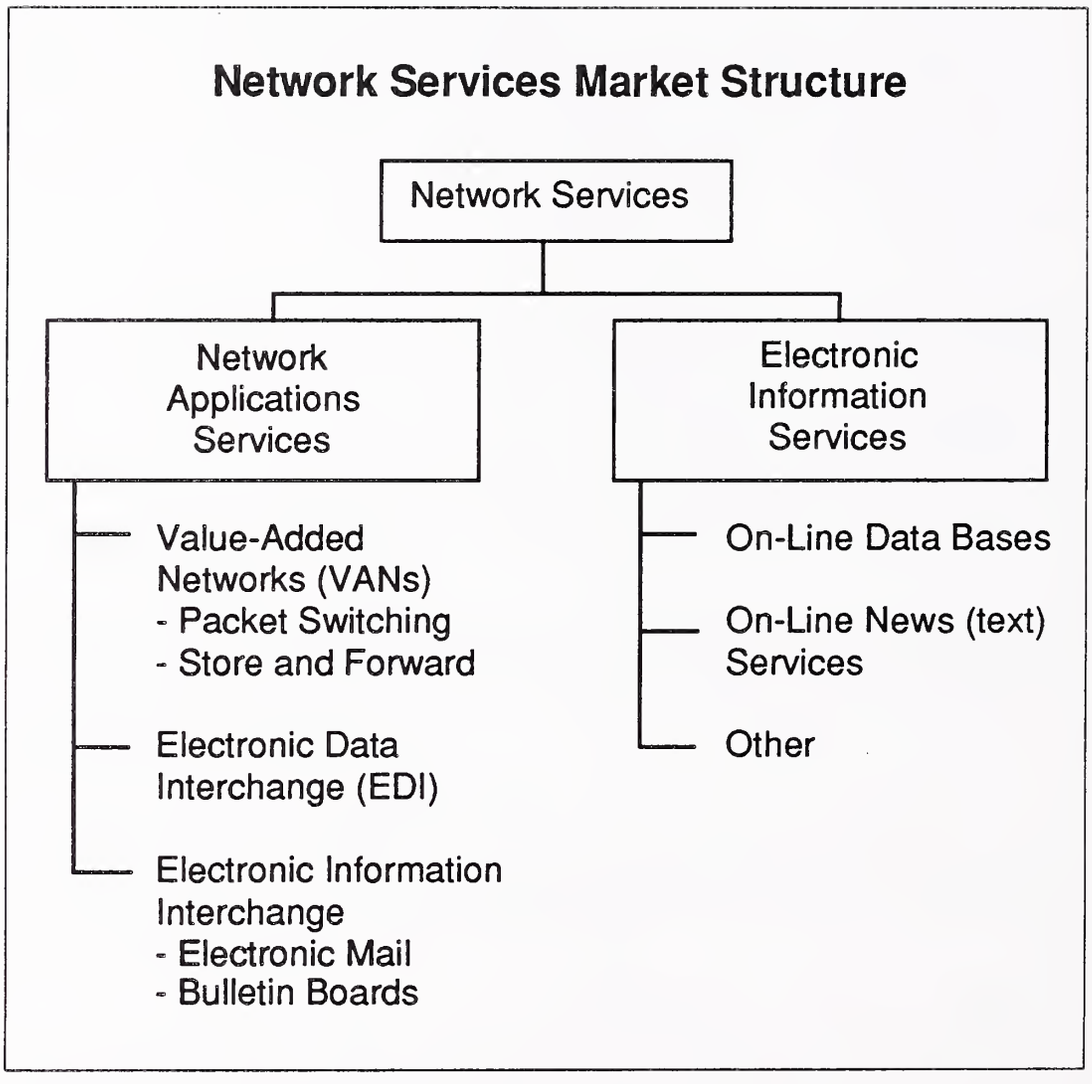
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit 9.

EXHIBIT 9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-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 inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

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.

- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

☆ The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.

☆ *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.

☆ *Environmental Services* - Composed of equipment and data center related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D
Computer Equipment

☆ These definitions have been included to provide the basis for market segmentation in the software products markets.

☆ *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

☆ *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.

☆ *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.

☆ *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

☆ *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control

☆ *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than $5,000.

☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.

☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from $15,000 to $350,000. Many of the emerging client/server computers are in this category.

☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than $350,000.

E
Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit 10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit 9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

EXHIBIT 10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetalic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Distribution	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx 67xx	Depositary institutions Nondepositary institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Electronic publishing
- Image systems

- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.

- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programs.

- The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.

- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:

  - Sales analysis
  - Marketing management
  - Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit 11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.

- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.

- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.

- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Electronic publishing
- Image systems

- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.

- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programs.

- The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.

- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

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Other encompasses marketing/sales and electronic publishing application solutions.

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- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.

- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

EXHIBIT 11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction	X	X	
	Utility			X
	Other			X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform	X		
	Applications	X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications	X		
	Electronic Information Services	X		X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

  Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.

- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F

Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the valued added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

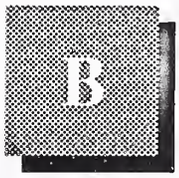
To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

Exhibit 12 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.

EXHIBIT 12

Vendor Revenue to User Expenditure Conversion

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	0.95
Systems Integration	0.95
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95
Equipment Services	0.99



Forecast Data Base

A
Forecast Data Base

Exhibit B-1 presents the overall 1991-1997 forecast of user expenditures for the network services delivery mode. Forecasts for the electronic information services and network applications submodes are presented in Exhibits B-2 and B-3.

B
Forecast Reconciliation

Exhibits B-4, B-5 and B-6 present reconciliations of the forecast data bases for network services and its two submodes with the previous data base forecasts.

User expenditures were down slightly from previously forecasted results for network services and its two submodes in 1991. This is a result of continued recessionary pressures.

Banking and finance continue their downward trend resulting from the recession and the continued use of CD/ROM in lieu of on-line data services.

The federal government sector will slow down in response to reduced spending. It is anticipated that the state and local government will acquire some of those services that are no longer provided by the federal government.

EXHIBIT B-1

Network Services
User Expenditure Forecast by Market Sector, 1991-1997

Market Sectors	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Del. Mode Total	9,141	14	10,443	12,072	14,079	16,418	19,193	22,541	17
Vertical Industry Markets	5,465	11	6,089	6,912	7,960	9,155	10,565	12,283	15
Discrete Mfg.	86	21	104	126	153	186	228	280	22
Process Mfg.	813	17	949	1,108	1,295	1,513	1,770	2,070	17
Transportation	306	16	354	418	493	582	696	859	19
Utilities	28	8	30	32	35	37	40	42	7
Telecommunications	101	17	118	141	167	199	235	279	19
Retail Distribution	184	19	221	269	328	400	490	602	22
Whsl. Distribution	267	21	326	400	490	602	741	913	23
Banking & Finance	725	9	790	909	1,070	1,227	1,417	1,626	16
Insurance	221	7	236	256	298	337	366	397	11
Medical	508	14	579	684	809	957	1,137	1,351	18
Education	187	15	216	253	297	348	407	478	17
Business Services	586	7	628	723	834	961	1,107	1,275	15
Federal Government	1,225	4	1,275	1,285	1,330	1,380	1,435	1,530	4
State & Lcl. Govt.	105	20	125	150	180	220	260	310	20
Misc. Industries	123	12	138	158	181	206	236	271	14
Generic Markets	3,676	17	4,354	5,160	6,119	7,263	8,628	10,258	19
Online Data Bases	2,472	15	2,873	3,338	3,879	4,508	5,239	6,089	16
-Securities	1,001	15	1,161	1,346	1,562	1,812	2,101	2,437	16
-Credit	1,212	14	1,406	1,631	1,892	2,194	2,545	2,952	16
-Economic/Other	259	18	306	361	425	502	593	700	18
Online News Srvcs.	1,204	22	1,481	1,822	2,240	2,755	3,389	4,169	23
-Bibliography/Text	372	24	458	563	692	851	1,047	1,288	23
-News	832	22	1,023	1,259	1,548	1,904	2,342	2,881	23

Numbers may not add due to rounding.

EXHIBIT B-2

Electronic Information Services
User Expenditure Forecast by Market Sector, 1991-1997

Market Sectors	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Del. Mode Total	7,226	15	8,303	9,658	11,301	13,201	15,422	18,062	17
Vertical Industry Markets	3,550	11	3,949	4,498	5,182	5,938	6,794	7,804	15
Discrete Mfg.	43	19	51	61	73	87	105	127	20
Process Mfg.	708	16	821	952	1,104	1,281	1,486	1,724	16
Transportation	231	15	265	308	358	418	493	595	18
Utilities	25	8	27	29	31	33	35	38	7
Telecommunications	83	17	97	115	135	160	188	222	18
Retail Distribution	124	17	145	171	202	238	281	332	18
Whsl. Distribution	61	13	69	78	88	99	112	127	13
Banking & Finance	638	9	695	799	944	1,088	1,250	1,431	16
Insurance	166	7	178	192	228	260	282	306	11
Medical	307	12	344	392	447	509	581	662	14
Education	118	16	137	162	191	225	265	313	18
Business Services	570	7	610	701	807	928	1,067	1,227	15
Federal Government	315	5	330	335	340	345	355	370	2
State & Lcl. Govt.	45	15	50	55	65	75	75	80	10
Misc. Industries	116	12	130	148	169	192	219	250	14
Generic Markets	3,676	17	4,354	5,160	6,119	7,263	8,628	10,258	19
Online Data Bases	2,472	15	2,873	3,338	3,879	4,508	5,239	6,089	16
-Securities	1,001	15	1,161	1,346	1,562	1,812	2,101	2,437	16
-Credit	1,212	14	1,406	1,631	1,892	2,194	2,545	2,952	16
-Economic/Other	259	18	306	361	425	502	593	700	18
Online News Srvcs.	1,204	22	1,481	1,822	2,240	2,755	3,389	4,169	23
-Bibliography/Text	372	24	458	563	692	851	1,047	1,288	23
-News	832	22	1,023	1,259	1,548	1,904	2,342	2,881	23

Numbers may not add due to rounding.

EXHIBIT B-3

Network Applications
User Expenditure Forecast by Market Sector, 1991-1997

Market Sectors	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Del. Mode Total	1,915	12	2,140	2,413	2,777	3,217	3,781	4,480	16
Vertical Industry Markets	1,915	12	2,140	2,413	2,777	3,217	3,781	4,480	16
Discrete Mfg.	43	23	53	65	80	99	123	153	24
Process Mfg.	105	22	128	156	191	232	284	346	22
Transportation	75	19	89	110	135	164	203	264	24
Utilities	3	0	3	3	4	4	5	5	7
Telecommunications	18	17	21	26	32	39	47	57	22
Retail Distribution	60	26	76	98	126	162	209	270	29
Whsl. Distribution	206	25	257	322	402	503	629	786	25
Banking & Finance	87	9	95	109	125	139	167	195	16
Insurance	55	5	58	64	70	77	84	91	9
Medical	201	17	235	292	362	448	556	689	24
Education	69	14	79	91	106	123	142	165	16
Business Services	16	12	18	22	27	33	40	48	22
Federal Government	910	4	945	950	990	1,035	1,090	1,160	4
State & Lcl. Govt.	60	24	75	95	115	145	185	230	25
Misc. Industries	7	15	8	10	12	14	17	21	21

Numbers may not add due to rounding.

EXHIBIT B-4

1992 MAP Data Base Reconciliation
Network Services Market

Delivery Modes	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Network Information Services Market	9,350	9,141	-209	-2	20,052	15,422	-193	-1	16	16
Vertical Industry Markets	5,627	5,465	-146	-4	11,635	10,565	-1,070	-9	16	15
Discrete Mfg.	86	86	-	-	268	228	-40	-15	25	22
Process Mfg.	825	813	-	-	1,920	1,770	-150	-8	18	17
Transportation	300	306	5	2	686	696	10	1	18	19
Utilities	28	28	-	-	43	40	-3	-7	9	7
Telecomms	110	101	-7	-8	258	235	-23	-9	19	19
Retail Distribution	187	184	-1	-1	507	490	-17	-3	22	22
Whsl. Distribution	275	267	-2	-3	777	741	-36	-5	23	23
Banking & Finance	850	725	-112	-15	1,710	1,417	-293	-17	15	16
Insurance	228	221	-5	-3	402	366	-36	-9	12	11
Medical	504	508	3	1	1,126	1,137	11	1	17	18
Education	191	187	-2	-2	419	407	-12	-3	17	17
Business Services	592	586	-5	-1	1,201	1,107	-94	-8	15	15
Federal Govt.	1,234	1,225	-19	-6	1,825	1,435	-390	-21	8	4
State & Lcl. Govt.	92	105	1	2	248	260	12	5	22	20
Misc. Industries	125	123	-2	-2	245	236	-9	-4	14	14
Generic Markets	3,723	3,676	-47	-1	8,417	8,628	211	3	18	19
Online Data Bases	2,530	2,472	-58	-2	5,260	5,239	-21	-	16	16
-Securities	1,014	1,001	-13	-1	2,110	2,101	-9	-	16	16
-Credit	1,257	1,212	-45	-4	2,570	2,545	-25	-1	16	16
-Economic/Other	259	259	-	-	580	593	13	2	18	18
Online News Srvcs	1,193	1,204	11	1	3,157	3,389	232	7	22	23
-Bibliography/Text	65	372	7	2	976	1,047	71	7	22	23
-News	828	832	4	1	2,181	2,342	161	7	22	23

Numbers may not add due to rounding.

EXHIBIT B-5

1992 MAP Data Base Reconciliation
Electronic Information Services Market

Delivery Modes	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Network Information Services Market	7,419	7,226	-193	-3	15,615	15,422	-193	-1	16	16
Vertical Industry Markets	3,696	3,550	-146	-4	7,198	6,794	-404	-6	14	15
Discrete Mfg.	43	43	-	-	114	105	-9	-8	21	20
Process Mfg.	708	708	-	-	1,400	1,486	86	6	15	16
Transportation	226	231	5	2	486	493	7	1	17	18
Utilities	25	25	-	-	37	35	-2	-5	8	7
Telecomms	90	83	-7	-8	204	188	-16	-8	18	18
Retail Distribution	125	124	-1	-1	286	281	-5	-2	18	18
Whsl. Distribution	63	61	-2	-3	118	112	-6	-5	13	13
Banking & Finance	750	638	-112	-15	1,500	1,250	-250	-17	15	16
Insurance	171	166	-5	-3	317	282	-35	11	13	11
Medical	304	307	3	1	556	581	25	4	13	14
Education	120	118	-2	-2	269	265	-4	1	18	18
Business Services	575	570	-5	-1	1,154	1,067	-87	-8	15	15
Federal Govt	334	315	-19	-6	440	355	-85	-19	6	2
State & Lcl. Govt.	44	45	1	2	90	75	-15	-17	15	10
Misc. Industries	118	116	-2	-2	227	219	-8	-4	14	14
Generic Markets	3,723	3,676	-47	-1	8,417	8,628	211	3	18	19
Online Data Bases	2,530	2,472	-58	-2	5,260	5,239	-21	-	16	16
-Securities	1,014	1,001	-13	-1	2,110	2,101	-9	-	16	16
-Credit	1,257	1,212	-45	-4	2,570	2,545	-25	-1	16	16
-Economic/Other	259	259	-	-	580	593	13	2	18	18
Online News Srvcs.	1,193	1,204	11	1	3,157	3,389	232	7	22	23
-Bibliography/Text	365	372	7	2	976	1,047	71	7	22	23
-News	828	832	4	1	2,181	2,342	161	7	22	23

Numbers may not add due to rounding.

EXHIBIT B-6

1992 MAP Data Base Reconciliation
Network Applications Market

Delivery Modes	1991 Market				1992 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Network Applications Market	1,931	1,915	-16	-1	4,437	3,781	-656	-15	18	16
Vertical Industry Markets	1,931	1,915	-16	-1	4,437	3,781	-656	-15	18	16
Discrete Mfg.	43	43	-	-	154	123	31	-20	29	24
Process Mfg.	117	105	-12	-10	520	284	-236	-45	35	22
Transportation	74	75	1	-	200	203	3	2	22	24
Utilities	3	3	-	-	6	5	-1	-17	14	7
Telecomms	20	18	-2	-10	54	47	-7	-13	22	22
Retail Distribution	62	60	-2	-3	221	209	12	-5	29	29
Whsl. Distribution	212	206	-6	-3	659	629	-30	-5	25	25
Banking & Finance	100	87	-13	-4	210	167	-43	20	16	16
Insurance	57	55	-2	-4	85	84	-1	-1	8	9
Medical	200	201	1	-	570	556	-14	-2	23	24
Education	71	69	-2	-3	150	142	-8	-5	16	6
Business Services	17	16	-1	-6	47	40	-7	-15	22	22
Federal Govt	900	910	10	1	1,385	1,090	-295	-21	9	4
State & Lcl. Govt.	48	60	12	25	158	185	27	17	27	25
Misc. Industries	7	7	-	-	18	17	-1	-6	21	21

Numbers may not add due to rounding.

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