# Report Quality Evaluation

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1. Report title: ***1991 U.S. Information Services Industry*** (WMAN4)

2. Please indicate your reason for reading this report:
   - ☐ Required reading
   - ☐ New product development
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   - ☐ Product planning
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3. Please indicate extent report used and overall usefulness:

| | Extent | | Usefulness (1=Low, 5=High) | | | | |
|---|---|---|---|---|---|---|---|
| | Read | Skimmed | 1 | 2 | 3 | 4 | 5 |
| Executive Overview | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Complete Report | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
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|---|---|---|---|---|---|
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| Confirm existing ideas | ☐ | ☐ | ☐ | ☐ | ☐ |
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6. Which topics in the report were the most useful? Why?_____

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_____

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**INPUT**

Erata letter - WMAN4

Dear Colleague:

Recently you purchased INPUT's annual report, U.S. Information Services Industry, 1991. We have found that an exhibt was published incorrectly. Enclosed is a replacement page to insert in your report. The error concerns Exhibit II-9.

We appologize for this error.

Sincerely,

Douglas H. Tayler
Vice President, Research

November 27, 1991

Dear Colleague:

Recently you purchased INPUT's annual report, U.S. Information Services Industry, 1991. We have found that an exhibit was published incorrectly. Enclosed is a replacement page to insert in your report. The error concerns Exhibit II-9.

We apologize for this error.

Sincerely,

Douglas H. Tayler

Douglas H. Tayler
Vice President, Research

Enclosure

EXHIBIT II-3

## Public Information Services Vendors—Revenue Growth versus U.S. Forecast (Percent)

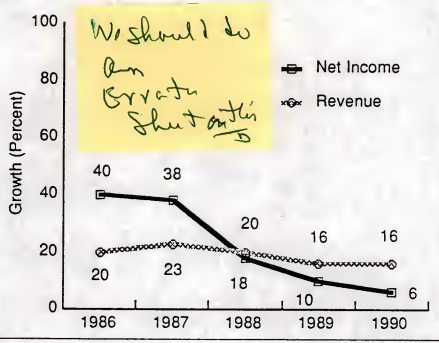
| Industry Sector | U.S. Forecast* 1989-1990 | Actual** Growth |
|---|---|---|
| Processing/Network Services Companies | 8 | 11 |
| Electronic Information Services Companies | 17 | 23 |
| Systems Software Products Companies | 13 | 25 |
| Applications Software Products Companies | 12 | 21 |
| VAR/Turnkey Systems Companies | 9 | 11 |
| Government Professional Services Companies | 5 | 10 |
| Commercial Professional Services Companies | 11 | 14 |
| Total Information Services Companies | 12 | 16 |

* All information services companies - forecasted growth of U.S. revenue

** Public U.S. information services companies - actual growth of worldwide revenue

EXHIBIT II-9

**Public Information Services Vendors—Revenue Growth versus U.S. Market Growth (Percent)**




B

## Driving Forces

There are a number of fundamental forces influencing the information services industry during the 1991-1992 timeframe that will have a measurable impact on the overall growth rate for the 1991-1996 five-year period. Each will impact the industry as a whole, as well as each of the eight delivery modes used by INPUT to analyze the industry and its key trends.

Exhibit II-10 identifies six primary driving forces impacting the U.S. information services industry. The impacts are multidimensional, fundamental, and long lasting.

EXHIBIT II-10

**U.S. Information Services Industry Primary Driving Forces, 1991-1996**

- The economy
- Globalization
- Influence of large vendors
- Outsourcing (buy versus make)
- Shifting technology foundation
- The changing buyer

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SEPTEMBER 1991

# 1991 U.S. INFORMATION SERVICES INDUSTRY

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***1991 U.S. Information Services Industry***



WMAN4 • 523 • 1991

# Abstract

INPUT's annual review of the U.S. Information Services Industry provides a concise look at the trends, issues and structure of this key element of the U.S. economy. Designed for the business executive or analyst who needs an understanding of the entire industry, the *U.S. 1991 Information Services Industry* report marks a major milestone—the industry has reached $100 billion in annual expenditures for services and software products.

This report highlights the impacts of the 1990 recession, provides an outlook for the recovery, and a preliminary forecast for 1991 through 1996. Each of the eight primary market sectors (processing services, systems integration, applications software products, etc.) are analyzed, leading vendors and their market share in each sector identified, and the underlying changes in the industries' driving forces discussed.

The year 1991 will be one of modest growth, when compared to most of the 1980s for this dynamic industry, yet information services continues to outgrow the economy by a factor of three. The question for the next five years is can the industry return to the 20% growth rates of the 1980s?

# Table of Contents

# Table of Contents (Continued)

# Table of Contents (Continued)

# Table of Contents (Continued)

# Exhibits

# Exhibits (Continued)

# Exhibits (Continued)

# Exhibits (Continued)

# Introduction

## A

## Purpose

This report, The *1991 U.S. Information Services Industry*, is INPUT's annual assessment of the U.S. information services industry. The report is designed for industry managers, financial analysts and business executives who need to understand the shape and direction of this key sector of the U.S. economy. INPUT has tracked the U.S. information services industry for over 15 years, providing analysis for those who need to gain a full understanding of the size, growth trends, and key issues of this growing, rapidly changing industry.

## B

## Scope

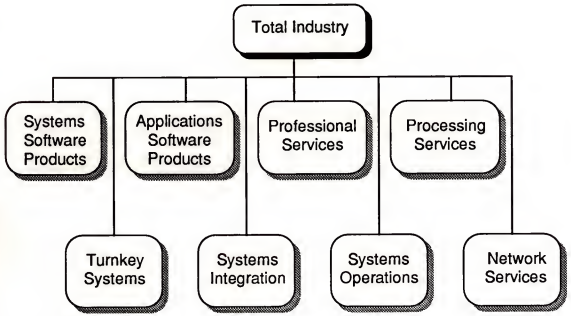
The report reviews and analyzes the information services marketplace for the industry as a whole and for each of the major segments. Included in this report are:

- Descriptions of the issues, trends, and events driving these markets
- Preliminary five-year forecasts for 1991-1996 of the markets and a description of the forces that drive or inhibit growth
- Discussions of leading vendors and their activities
- Summaries of the performance of public information services vendors

Exhibit I-1 delineates the information services industry that is tracked and analyzed by INPUT. There are eight major segments that INPUT classifies as delivery modes. Each year, INPUT reassesses the structure of the information services industry and, where changes warrant, revises the structure. No major changes were made for 1991.

EXHIBIT I-1

**Information Services Industry Structure**
**1991**




- The eight current delivery modes are listed below and defined in Appendix A. Each delivery mode or its submodes is addressed in a chapter of this report.

  - Applications Software Products
  - Systems Software Products
  - Turnkey Systems
  - Professional Services
  - Systems Integration
  - Systems Operations
  - Processing Services
  - Network Services

- The two software products delivery modes are addressed together in Chapter VIII.

- Systems operations was a new delivery mode in 1990. It consists of services offerings where the vendor provides contracted (greater than one year) management of data center operations. The contract may also include network management and applications support.

- Network Services includes two submodes—network applications and electronic information services. The vendors that provide network applications services are in general different from those providing electronic information services.

This report is organized as follows.

- Chapter II of this report provides an analysis of the entire U.S information services market.
- Chapters III through IX each address one of the delivery modes.
- Appendix A provides definitions used by INPUT in its assessment of the information services industry.

## C Methodology

As an independent market research company, INPUT conducts its own research, interviewing vendors and users on an ongoing basis. INPUT's clients include the leading providers of information services in the U.S. and Europe.

The market size and forecast data for each delivery mode are based on INPUT's analysis and include only U.S. revenues.

- The market size estimates are based on noncaptive revenue of industry vendors.
- The market forecasts are specified based on a compound average growth rate (CAGR) for the five years from 1991 to 1996. All forecasts included in this report are preliminary and may differ from the forecasts published in the final 1991 individual market reports listed in section D of this chapter.

Data on public companies were obtained from INPUT's *Vendor Financial Watch* (VFW), which tracks the annual performance of public information services companies.

- The public companies have been classified according to the mode of service from which they derive the largest proportion of their U.S. noncaptive information services revenue.
- Company data are obtained from annual reports, 10-K reports, and other published sources, supplemented by INPUT estimates when data are not yet available.
- Financial data in the VFW include each vendor's total worldwide revenue and net income, reported on a calendar-year basis. Comparisons on performance are provided for 1990 versus 1989.

D

## Related INPUT Reports

The following reports by INPUT provide more in-depth analysis of each of the major segments of the U.S. information services industry:

- *U.S. Processing Services Market, 1991-1996*
- *U.S. Professional Services Market, 1991-1996*
- *U.S. Network Services Market, 1991-1996*
- *U.S. Systems Integration Market, 1991-1996*
- *U.S. Systems Operations Market, 1991-1996*
- *U.S. Applications Solutions Market, 1991-1996*
- *U.S. Systems Software Products Market, 1991-1996*
- *The Electronic Data Interchange Market, 1991-1996*

INPUT also tracks the European information services industry and publishes a worldwide forecast of the information services market.

- *European Market Forecast & Analysis Summary, 1991-1996*
- *Applications Solutions Market (Europe), 1991-1996*
- *Systems Software Products Market (Europe), 1991-1996*
- *Processing Services Market (Europe), 1991-1996*
- *Professional Services Market (Europe), 1991-1996*
- *Worldwide Information Services Market, 1991-1996*

II

# U.S. Information Services Industry

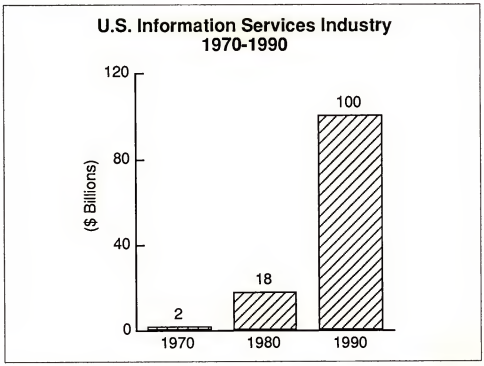
A

## 1990 Results

### 1. U.S. Information Services Industry

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

EXHIBIT II-1




During 1990 the industry grew just under a modest 12% from about $90 to $100 billion (Exhibit II-2). The distribution of the market at the end of 1990 is presented by delivery mode in Exhibit II-3 and by industry sector in Exhibit II-4.

EXHIBIT II-2

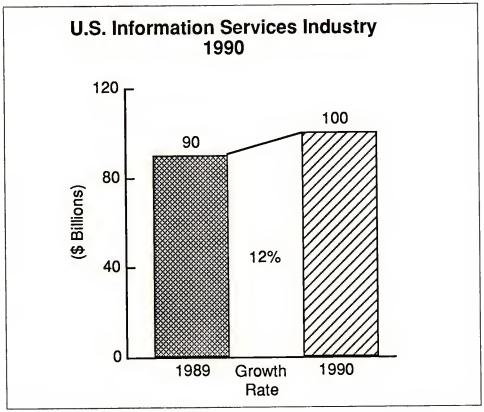



EXHIBIT II-3

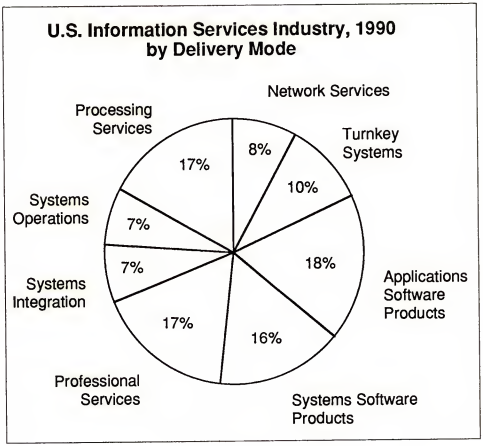


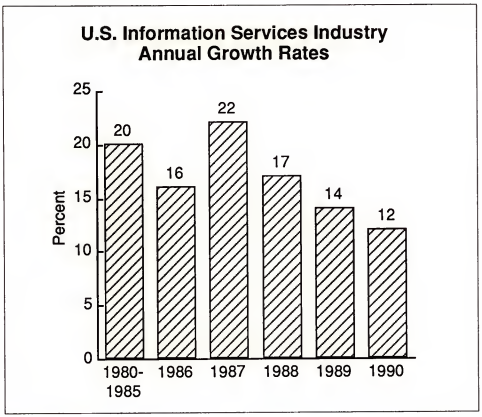
EXHIBIT II-4

## U.S. Information Services Industry, 1990 by Sector

| Market Sector | 1990 Market Share (Percent) |
|---|---|
| Industry Sectors | |
| Banking and Finance | 11 |
| Discrete Manufacturing | 11 |
| Federal Government | 8 |
| Process Manufacturing | 5 |
| State and Local Government | 4 |
| Medical | 4 |
| Insurance | 4 |
| Distribution | 4 |
| Business Services | 3 |
| Telecommunications | 3 |
| Transportation | 2 |
| Other Industry Sectors | 7 |
| Cross-Industry Sectors | |
| Accounting and Finance | 3 |
| Office Systems | 2 |
| Human Resources and Payroll | 2 |
| Planning and Analysis | 2 |
| Other Cross-Industry Sectors | 3 |
| Other Sectors | |
| Systems Software Products | 16 |
| Cross-Industry Data Bases | 3 |
| Other | 3 |
| Total | 100 |

As Exhibit II-5 indicates, 1990 reflects an intensification of a decline in annual growth rates that started in 1989. The average annual growth during the first eight years of the decade was over 19%.

EXHIBIT II-5




On a worldwide basis the industry continues to experience greater growth rates, close to 20%. Many U.S. vendors are also experiencing growth that exceeds that of the U.S. industry as a whole, due primarily to their international sales, and due to their focus on industry-specific 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 industry.
- The software products sectors are growing 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-6 summarizes 1990 results.

EXHIBIT II-6

**U.S. Information Services Industry**
**1990 Results Summary**

- Reached the $100 billion milestone
- Growth 2 to 3 times the economy continues
- Growth slowed in 1990 relative to 1989
- Economy causes confusion

Overall expenditures on applications software products was up only 12% in 1990 and is forecast to grow at a CAGR in the mid-teens over the next five years. This growth compares to a 23% CAGR for the previous five-year period.

Expenditure on turnkey systems was 9% higher in 1990 than in 1989 and will maintain a modest growth rate through 1996. Although turnkey systems once accounted for over half of total user expenditures for these two delivery modes, turnkey systems' share had declined to 37% by 1989. The two key reasons for turnkey systems' decline are decreasing hardware prices and the exit of turnkey vendors from the hardware business altogether as they become vendors of applications software only.

### 2. Public Information Services Companies

Public information services companies as a group maintained steady growth during the past five years. In 1990, revenues for the group overall grew 16% over the 1989 revenue level. This is the same growth rate as recorded in 1989, slightly below the growth rates of the previous three years, as shown in Exhibit II-7.

The most significant revenue growth in 1990 came from systems software, electronic information services, and applications software vendors. However, steady moderate growth was maintained by the government and commercial professional services and VAR/turnkey systems vendors.

Earnings, which have slowed consistently for the information services group as a whole during the past few years, grew only 6% for 1990, which is the fifth year in a row that net income growth has been less than the previous year.

Profitability for public information services vendors as a whole averaged 6.8% in 1990. In 1989, profitability averaged a somewhat higher 7%.

EXHIBIT II-7

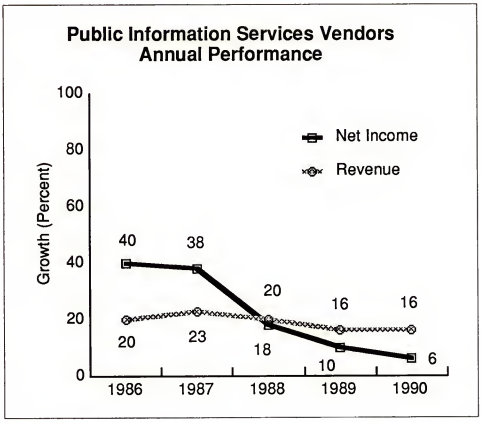



Exhibit II-8 provides a five-year history of the revenue and net income growth rates for each industry sector and for the industry as a whole.

Exhibit II-9 provides a comparison of the public company revenue growth and INPUT's most recent forecast of growth for each sector for all companies, both public and private in the U.S. information services industry. In general, the public companies' worldwide revenue growth rates are exceeding the projected growth for the U.S. information services industry.

EXHIBIT II-8

## Public Information Services Vendors Growth Rates (Percent)

| | | Revenue | Net Income |
|---|---|---|---|
| Processing/Network Services Companies | 1986 | 17 | 5 |
| | 1987 | 16 | 39 |
| | 1988 | 17 | 4 |
| | 1989 | 15 | 22 |
| | 1990 | 11 | -8 |
| Electronic Information Services Companies | 1986 | 42 | 2 |
| | 1987 | 32 | 45 |
| | 1988 | 30 | -9 |
| | 1989 | 21 | 99 |
| | 1990 | 23 | 1255 |
| Systems Software Products Companies | 1986 | 44 | 48 |
| | 1987 | 57 | 67 |
| | 1988 | 46 | 56 |
| | 1989 | 26 | 20 |
| | 1990 | 25 | 19 |
| Applications Software Products Companies | 1986 | 23 | 53 |
| | 1987 | 30 | -18 |
| | 1988 | 19 | 69 |
| | 1989 | 24 | 39 |
| | 1990 | 21 | -11 |
| VAR/Turnkey Systems Companies | 1986 | 10 | 376 |
| | 1987 | 16 | 44 |
| | 1988 | 11 | -29 |
| | 1989 | 5 | -72 |
| | 1990 | 11 | -26 |
| Government Professional Services Companies | 1986 | 16 | 38 |
| | 1987 | 16 | -4 |
| | 1988 | 10 | 37 |
| | 1989 | 9 | -31 |
| | 1990 | 10 | 36 |
| Commercial Professional Services Companies | 1986 | 20 | -36 |
| | 1987 | 14 | 244 |
| | 1988 | 16 | 62 |
| | 1989 | 13 | -31 |
| | 1990 | 14 | 109 |
| Total Information Services Companies | 1986 | 20 | 40 |
| | 1987 | 23 | 38 |
| | 1988 | 20 | 18 |
| | 1989 | 16 | 10 |
| | 1990 | 16 | 6 |

EXHIBIT II-9

**Public Information Services Vendors—Revenue Growth versus U.S. Market Growth (Percent)**

| Industry Sector | U.S. Market 1990* | Actual Growth** |
|---|---|---|
| Processing/Network Services Companies | 8 | 11 |
| Electronic Information Services Companies | 17 | 23 |
| Systems Software Products Companies | 13 | 25 |
| Applications Software Products Companies | 12 | 21 |
| VAR/Turnkey Systems Companies | 9 | 11 |
| Government Professional Services Companies | 5 | 10 |
| Commercial Professional Services Companies | 11 | 14 |
| Total Information Services Companies | 12 | 16 |

* All information services companies - growth of U.S. market
** Public information services companies - actual growth of worldwide revenue

## B

## Driving Forces

There are a number of fundamental forces influencing the information services industry during the 1991-1992 timeframe that will have a measurable impact on the overall growth rate for the 1991-1996 five-year period. Each will impact the industry as a whole, as well as each of the eight delivery modes used by INPUT to analyze the industry and its key trends.

Exhibit II-10 identifies six primary driving forces impacting the U.S. information services industry. The impacts are multidimensional, fundamental, and long lasting.

EXHIBIT II-10

**U.S. Information Services Industry Primary Driving Forces, 1991-1996**

- The economy
- Globalization
- Influence of large vendors
- Outsourcing (buy versus make)
- Shifting technology foundation
- The changing buyer

## 1. Economic Impacts

The economy, and the overall size of the information services industry, are significant factors 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—a lower inflation rate means slower growth.

- Real economic growth had been modest over the couple of years prior to the recession starting 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 lowers the software products investment based on current pricing practices. Quantities of software products sold increase, but revenue levels grow at more modest rates.

In 1990, a year with little to no real growth in the overall economy and inflationary growth of about 5%, the information services industry grew 12%.

- INPUT's 1990 and 1991 economic assumptions were for nominal GNP growth of 5.4% with real GNP growth at 1% or less.

- At this point in 1991, the third quarter, the economy remains in a no growth status with some improvement expected by late in the year. At the same time inflationary pressures are modest. This leads to the expectation of another modest growth year in 1991 and again in 1992. The expected 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 orientation to buy rather than make, in particular for larger systems requirements. Response time and impact in business operations are the key criteria. A vendor can often react much faster with newer thinking.

  - Interest in systems operations that permits organizations to redeploy capital investments and lower direct headcount is being reinforced.

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

- Negative impacts include:
  - Decision processes that are lengthened in a tight economy, causing deferral of major information systems projects
  - Tight information systems budgets that may favor the internal information systems staff over contracted professional services, may negatively impact 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.

- The European market is making progress towards a single market. The year 1992 is close by and many changes are apparent. 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 Science Corporation and Digital Equipment Corporation, and by the ever-expanding interest of Japanese vendors into the U.S. information services industry.

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

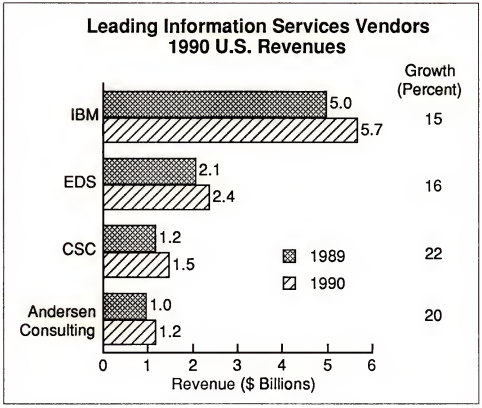
The primary negative impact from globalization is that it may make it harder for smaller vendors to grow and/or maintain independence.

**3. Influence of Large Vendors**

The role of the larger information services vendors has been increasing significantly over the past few years.

- The newer systems integration and systems operations sectors, while smaller than more traditional sectors such as professional services and processing services, are growing faster and are dominated by the leading vendors.
- A number of larger vendors are growing faster than the overall market. Exhibit II-11 lists four of the largest information services vendors that can be considered to be multi or full services vendors and their U.S. 1989 and 1990 information services revenues. They all increased information services revenues by at least 15%, greater than industry growth as a whole.

EXHIBIT II-11




- Certainly there are numerous smaller firms also growing faster than the market, but overall the dominance of the larger vendors is increasing.

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's investment in ASK Computer Systems are two more significant examples of large vendors seeking new channels and resources.

- Consolidation is also a factor. The 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. A third, Price Waterhouse, is also experiencing significant growth in its information technology-based business.

The increasing use of business consulting linked to professional services has provided a wedge for the large accounting and consulting firms, as well as some large information services firms, to use in gaining a greater share of the industry.

Over the next few years INPUT expects this trend to continue. The opportunity for the smaller more specialized software product or services vendors is not disappearing , but it is changing.

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

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

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

- Positive impacts include:

  - The larger vendors have the financial strength to help ensure that the risk element of systems management-type services is supported.

  - The larger vendors can ensure that financial resources are available to invest in new technologies, often through investment in smaller, 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 to grow.

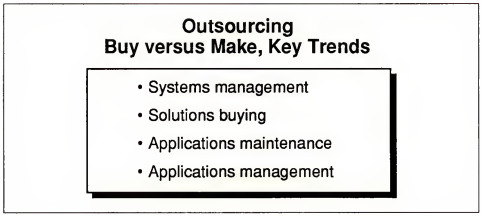
Larger vendors tend to move more slowly, which will hamper development and acceptance of new technology. This will give small vendors who seize a technology initiative an opportunity.

**4. Outsourcing (Buy versus Make)**

Since its inception, the information services industry (services plus software products) has tended to outperform the internal information services budget by continuously creating new products and services that permit the information systems function to outsource (buy versus make). This has always been an outsourcing industry. And while growth has slowed, there are a number of factors that will continue to permit growth that exceeds the economy, the computer hardware sector, and the internal information systems budget.

Key trends in outsourcing are listed in Exhibit II-12.

EXHIBIT II-12




### a. Systems Management

Outsourcing the management of information systems or at least significant elements of information systems continued to gain steam during 1990. Helped more than hindered by the recessionary economy, the inclination of general management of larger organizations to consider outsourcing continued to increase.

The ability to transfer much of the financial risk, and perhaps more importantly the technological risk to a specialist has numerous attractions to general management.

- The attraction that will become more and more important will be the ability to disconnect the information technology part of the "solution" from the business decision. General management wants results, an impact on the business, and does not want to listen to the pros and cons of a technology. The appeal of the vendor's offer to take on the risk either in a project (systems integration) or operations (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 then the buyer will bet on the company that can stand behind the risk (i.e., take the responsibility).

- Perhaps the primary positive impact is the ability for a corporation to gain access to a broad information technology at 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. There should be 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 applications solutions market.

- The fundamental decentralization of U.S. business management with the corresponding reduction of corporate staff is 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 applications solutions there is a hardware revolution to support the need. Client/server technology provides affordable high powered computing.

Finding a VAR that can provide a package plus customized system 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 the systems integrator and systems operations firm, the buyer is also seeking to gain more defined 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 contracted 24-hour support of existing application systems. The vendor provides a set level of services and interacts directly with the end user.

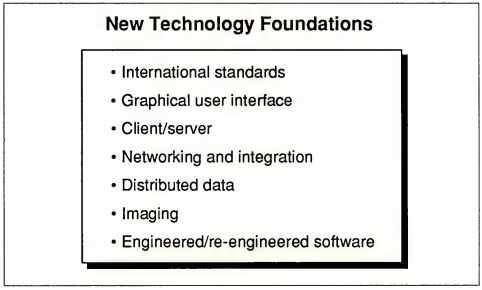
- Applications management is contracted management of development and maintenance of a set of applications. The vendor provides the software and all of the expertise and staff to ensure the application is successfully used over an extended period of time. Applications software products firms can become the 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 for the 1990s. A basic characteristic of much of this new technology is a shift in the underlying technological foundation. It isn't just new as has always been the case in this industry. Many of the elements of the technology are shifting to new foundations.

Exhibit II-13 lists the key elements of this shift in technology. Each is causing organizations to stop and rethink key elements of their information systems infrastructure strategy. This can slow the adoption in the short term and, over the longer term, create new vendor opportunities.

EXHIBIT II-13




All of these new technologies and foundations cause confusion in the industry and with the buyer. Confusion causes decisions to slow down, both by the buyer and by the vendor. 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 their strategies and change product development plans. New products become delayed and then require longer initial sales introductions.

- The user interface of the personal computer with its graphical pull-down menu and windowing form will be the only interface acceptable to users from now on. Text-based interfaces of the 1970s and 1980s will no longer be tolerated. Every major software products 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 early 1990s. Regardless of whether 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 system function and a shift to buying server-based applications products is underway. All of the impacts are not known. One, 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 alike. Today's networking products are permitting the distributed applications that have been discussed for years but were never possible.

- The way in which data are stored and turned into information has been fairly constant since the creation of the first hierarchical DBMS in the early 1970s. For almost 15 years the challenge was to build data bases, not consider building them with new types of components. The shift started with commercial use of relational DBMSs, but it is the distributed DBMS and perhaps more importantly image processing that will cause a major re-engineering of the data base architectures of larger organizations. Major new investment is required and out of necessity will come over time.

- 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 some major advances in programmer productivity accomplished.

The positive and negative impacts of the shift in the technological foundation include those below. Certainly, over the five-year period, the positives will greatly offset the negatives.

- Positive impacts from this shifting technology foundation include:

  - The availability of new types of solutions.

  - The role of the end user in information systems will continue to expand.

  - Opportunities for new as well as existing vendors are created.

  - Applications systems can be increasingly molded to the character of the organizations they support.

- 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 degree of technology shift now in process is creating a significant additional training and education requirement.
  - Slowed growth while the new technology is understood and 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 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.

## C 1991 Outlook

The recession that started in 1990, while mild, will continue throughout most of 1991. This, along with growth inhibitors, will keep the U.S. information services industry at a modest and reduced growth level until perhaps 1993. Exhibit II-14 presents INPUT's current projection for 1991, and Exhibit II-15 for the 1991 to 1996 five-year period.

- Growth in 1991 will be about 13% overall with greater than average growth for systems integration, systems operations, and network services. Processing services, professional services, and turnkey systems will be below the industry average; software products will grow about the average.

EXHIBIT II-14

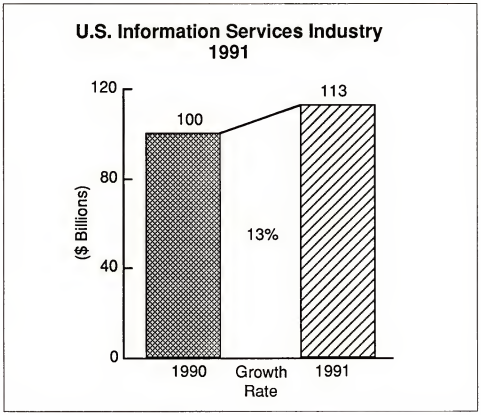
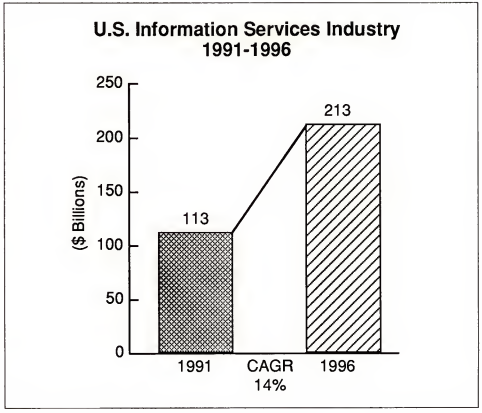
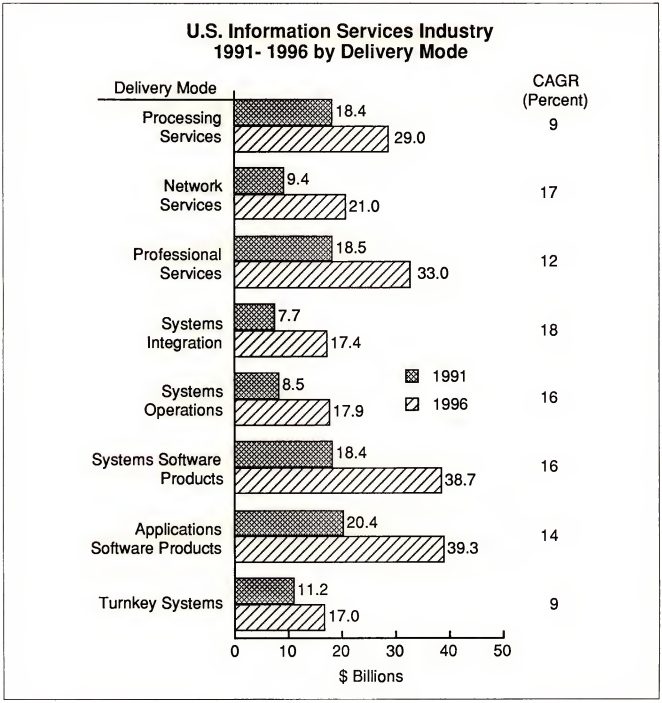



EXHIBIT II-15



- For the five-year period, the overall CAGR will be 14% with growth rates in 1995 and 1996, somewhat higher than this. More importantly, as Exhibit II-16 indicates, the growth rates (CAGRs) by delivery mode will continue to range from a low of 9% to a high of 18% (systems integration).

EXHIBIT II-16

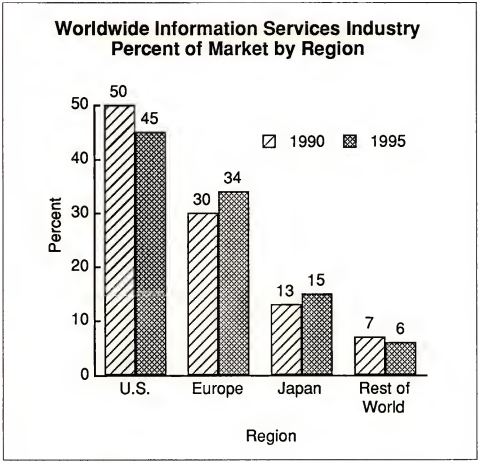


- By 1996, the two software products delivery modes will be the largest segments of the market and together will represent almost 37% of the market.

- The next largest segment will be professional services, which will pass processing services in size and reach $33 billion in 1996.

Exhibit II-17 provides a distribution of the worldwide information services market by region taken from INPUT's *Worldwide Information Services, 1990-1995* report.

EXHIBIT II-17




What is quite apparent is that the growth rates outside the U.S. are much greater than within the U.S. The 1990-1995 CAGR in Europe is now 19% compared to the U.S. CAGR of 14%. Given that some parts of Europe are also in a recession, it must be concluded that factors other than the economy have caused the slower growth in the U.S. These factors include:

- The size of the market.
- Higher levels of penetration in the U.S. In many markets the tendency to use professional services firms instead of internal resources to develop systems is still in the early stages of adoption. The use of applications software products remains less in all major markets outside the U.S.
- The shift towards contracting for long-term services (systems integration and systems operations), while fueling growth, seems to be slowing down investment decisions and negatively impacting growth.
- The breadth of new technology and the pressure to re-engineer existing systems and information networks is also slowing decisions in the U.S. market.
- The increased involvement of senior-level general management in information systems decisions is changing the character of those decisions.

## D Conclusions

The first year of the new decade, 1991 is exhibiting some significant points of change from the 1980s. All of them suggest more modest, but continued strong and stable growth for the information services industry.

- An economy that does not shift quickly helps management make longer term decisions, albeit at a slower pace. The recession was slow to come, relatively shallow, and the rebound will be slow.
- A market of $100 billion that is strongly impacted by the direction of the larger vendors should be expected to grow somewhat slower.
- The increasing tendency of larger organizations to turn to vendors for services that include real and significant elements of systems management and have a solutions orientation will lead to larger, longer term decisions—decisions that can take longer to make but which will have a lasting impact.
- Outsourcing offers new opportunities for information services vendors to attack the internal information systems budget, but the decisions and battles are larger and longer fought.
- Alliances will continue to be made and broken, consolidation will take place and the large vendors will get bigger; however, innovation will continue to come from the responsive, more modest vendor.

- The shift in the underlying technology foundation is for the better—more valuable and productive applications solutions will result. But it brings with it re-engineering, re-investment and re-training—this takes time and money. It will be another year before the momentum is fully behind client/server and distributed data base (cooperative processing). When it comes there is a major learning curve for vendors and users alike. This technology shift will be for the better, just as previous shifts have been, but time is required.

- The role of the general manager involved in the deployment of information technology continues to increase. In many instances, the general manager is a greater factor in major decision making than the information systems manager. Over time, this will have a positive impact on the size and growth of the information services industry—as long as the vendors provide satisfaction.

Overall the U.S. information services industry remains healthy. It enjoys growth rates well above those in the rest of the economy. Yet it has reached a level of maturity that portends more modest growth, as well as a restructuring. The first half of the 1990s will bring success to those vendors who manage with the long term in mind, and continue to cement long-term relationships with customers and business partners.

# Processing Services Market Analysis

## A

## Processing Services Market, 1990

Processing services continues to be one of the largest delivery modes in information services, ranking as a close second in revenues to application software products in 1990. Some of the leading vendors in information services offer processing services as one of their modes, if not their chief mode, of delivering services.

The business mix of processing services has changed markedly from the services offered during the 1960s and 1970s when problem solving, information analysis, access to specialized data bases and transaction processing were the motives for using these services.

- Most of the problem solving and information analysis has gone in-house to be run on workstations/PCs.
- Access to data bases and use of networks has become a separate service—network services.
- Systems operations (formerly described as facilities management) is now a separate and fast growing mode of service.
- Transaction processing, the provision of processing services on a specific application, is now the dominant processing service producing about 83% of revenues.
- Network capabilities have grown in importance in driving the use of transaction processing services. Many of the leading applications, including bank and brokerage functions and a percentage of credit card item processing, require network capabilities.

Other components of processing services, in addition to transaction processing, utility processing, and other processing, are continuing to grow.

- Utility processing services, which involve the use of vendor software and hardware to run user-developed applications, is growing at a slow rate since in-house workstations are increasingly used for this purpose.

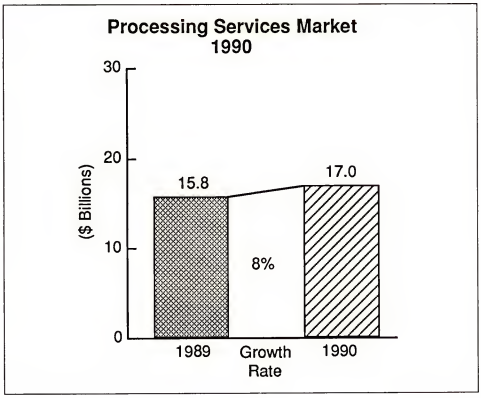
- Other processing services, which include data entry, pick up and delivery of work, special output such as microfilm, and disaster recovery, is growing more rapidly than transaction processing.

Increasing interest in disaster recovery has been driven by the fact that more companies are becoming dependent on their computer systems for ongoing operations.

Starting with last year's report, INPUT broke out systems operations from its two parent delivery modes: processing services and professional services. Therefore, the size of processing services as reported here, will be smaller than it appears in INPUT's reports in early 1989 and before.

Processing services activities (excluding systems operations) grew by 8% to $17 billion in 1990, as shown in Exhibit III-1. This is somewhat lower than the percent growth that had been forecast for this market in 1990—a primary factor in the slower growth was the economic downturn that reduced demand.

EXHIBIT III-1



B

## Processing Services Market, 1991 Outlook

### 1. Trends

The growth of processing services is due chiefly to the growth of transaction processing, which is its chief constituent. Transaction processing is driven by the interest of customers in having certain types of jobs run by a processing services vendor.

- Work that is selected for transaction processing may be run for less cost by a vendor or the vendor may help customers avoid the costs associated with supporting and keeping a particular application, like payroll, up to date in terms of tax rates and other requirements.

- Transaction processing also helps clients avoid operational complexity that does not have sufficient benefits compared to other processing work. Vendors that are specialists in payroll, credit card processing, bank, brokerage back office, and other work can provide inquiry and problem resolution functions that enhance the value of their services.

Once transaction processing services are initiated, they have tended to be used over an extended period of time with limited shifting between vendors. During the past few years, however, there have been more instances where work has shifted or moved to new modes of delivery. Vendors of payroll as well as banking processing services have also been more active recently in competing for each other's business.

The utility processing services submode, where clients use the processing power and other capabilities of a vendor, including software tools, to process their own work, is growing at a rate that is 60% less than transaction processing. This processing is much more likely to move in-house as the processing capabilities of workstation/PCs increase.

The other processing services submode, however, has been growing at a faster rate than transaction processing. Many of the services of this submode—such as pick up and delivery of data, data entry and specialized output including microfilm—are related to the volume of transaction processing work, but microfilm and disaster recovery can be sold separately from other processing services and help this submode to grow more rapidly.

Disaster recovery services is an area where significant growth is taking place due to the increasing importance of this service.

- Business is steadily becoming more dependent on information systems to keep operating.

- Business managers are more cognizant of the need for service to recover from disasters and are considering its use to cover more sites and functions within companies.

## 2. Issues

The driving and inhibiting forces in the processing services market are shown in Exhibits III-2 and III-3.

EXHIBIT III-2

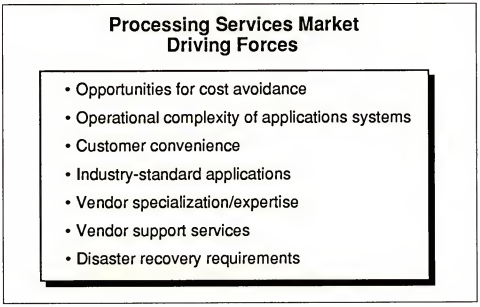
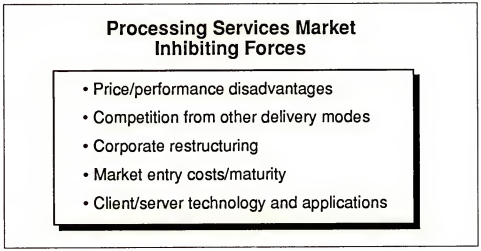



EXHIBIT III-3




The impetus for using a processing services vendor continues to be chiefly to avoid costs and/or operational complexity. Other reasons have become important to some extent, however:

- Vendors offer support services such as assisting with claims for unemployment insurance or reviewing changes in regulatory requirements for banking, finance or payroll applications.
- Vendors have immediate or near-term solutions to problems and are usually performing research on new requirements.

- Vendors offer services such as microfilm and disaster recovery together with their processing service.

Past reluctance to use outside vendors for important processing has decreased since a number of prominent corporations have utilized processing or even outsourcing contracts, such as Kodak and major banks have done.

The sight of a large corporation such as Kodak "giving up control" to IBM allays a major fear of management—the concern over dependence on an outside resource for part of their operation.

For the client that has already accepted this dependency by entering into a systems integration contract, the live operation of the new system provides a natural opportunity for the vendor to assume the operations management role—although this would normally be done under a systems operations contract rather than a processing services contract.

For smaller firms that have a straightforward application need, the processing services firm offers several key advantages: standard applications are immediately available from a firm with the industry knowledge and expertise to install, maintain and integrate them with the firm's other processing systems. In addition, the processing services vendor can implement a much more comprehensive disaster recovery capability than many firms can afford on their own.

All this comes at a price, however, and the biggest inhibitor to market growth is the perceived cost/performance disadvantage of processing services relative to an in-house operation. Alternative delivery modes (turnkey systems or applications software) that can take advantage of workstation/PC and client/server technology can appear to provide more cost-effective solutions, and also reduce the perceived lack of control which concerns many potential clients. All these factors tend to reduce user demand for processing services.

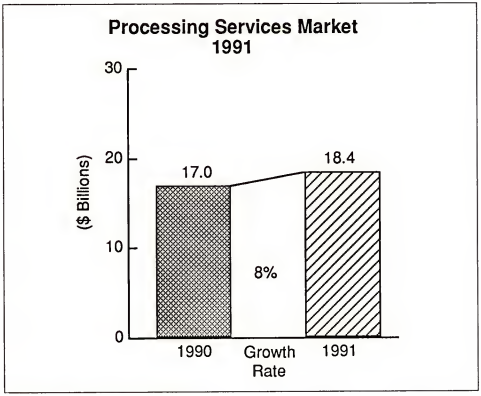
Corporate restructuring and consolidation can also threaten the market for processing services—mergers and acquisitions are increasing due to the thrift crisis and deregulation. Over the past several years, Systematics lost a sizeable volume of processing business in California due to acquisitions by Security Pacific and Wells Fargo. However, Resolution Trust Corporation, the government organization which acquires and manages failed thrifts, has awarded contracts to manage operations in bankrupt S&Ls that it took over to processing services vendors. Also, other bank processors, including First Financial Management and EDS, have found that merged financial institutions have turned to them for a means of consolidating and reducing the cost of processing. Restructuring creates both threats and opportunities for vendors.

The maturity of the processing market makes entry difficult and capital-intensive. New entrants need to make significant investments in software, equipment, and a service infrastructure just to get started. Although the market is large, the slow growth rate makes it necessary to offer processing together with other services and/or to offer multiple applications.

### 3. 1991 Forecast

Processing services will grow from $17 billion in revenues in 1990, to $18.4 billion in 1991, at a rate of 8%, the same growth rate as 1990. While economies of scale and the expertise and capabilities of vendors in certain cross-industry and industry areas such as banking will drive growth, the general economic climate and the increased use of the systems operations alternative will inhibit growth, keeping the processing services market at this modest rate into the 1990s.

EXHIBIT III-4

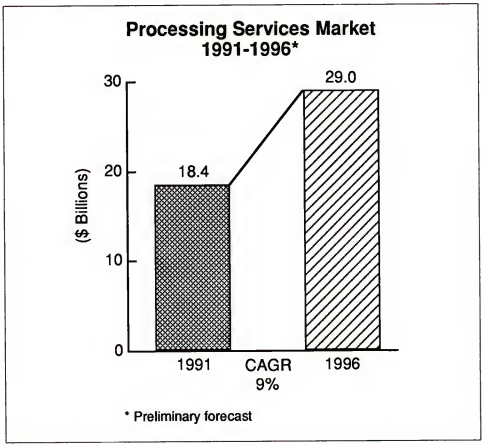



Between 1991 and 1996, revenues will expand at a CAGR of 9% and reach $29 billion in 1996.

- Throughout the next five-year period, processing services vendors will be countering the impacts of client/server technology, which along with application software products, offer cost-effective alternatives to many applications now processed outside on a transaction basis.

- In addition, INPUT predicts the systems operations market will be growing at about twice the rate of growth of processing services. This will cause more of the traditional processing services vendors to broaden their offerings to cover suites of applications or simply provide full data center operations services.

EXHIBIT III-5




## C

## Leading Processing Services Vendors

Processing services vendors employ offensive and defensive strategies to ensure their continued profitability, such as:

- Expansion into multiple delivery modes
- Growth through acquisition
- Rationalization through divestiture
- Exploitation of economies of scale

Exhibit III-6 lists leading processing services vendors that illustrate these trends. Systems operations revenues of vendors such as EDS are not included.

EXHIBIT III-6

## Leading Processing Services Vendors

| Selected Vendors | Market Share (Percent) |
|---|---|
| Automated Data Processing | 7 |
| American Express and FDR | 6 |
| First Financial Management | 4 |
| Control Data Corporation | 2 |
| National Data Corporation | 2 |
| EDS | 1 |
| Fiserv | 1 |
| Comdata | 1 |
| GTech | 1 |
| Paychex | 1 |

**1. First Financial Management Corp. (FFMC) 3 Corporate Sq., Bldg. 3, Suite 700, Atlanta, GA 30329; 404-321-0120**

One of the leading vendors in this delivery mode, First Financial Management, exhibits a number of characteristics of a successful processing services vendor. It possesses in-depth knowledge of a group of applications in its market area, banking; has a group of services that it offers to this market; does not rely fully upon processing services to gain revenue; and has acquired a group of companies that can add revenues and market capabilities.

The company provides a range of processing services, including financial institution processing, data imaging, micrographics, and merchant credit card authorization, processing and settlement. FFMC also operates a hybrid financial institution and a finance company. Services are currently provided to over 75,000 commercial customers and 450,000 consumers. FFMC believes its company is one of the largest providers of processing services to financial institutions in the U.S.

During the 1980s, FFMC completed about 30 acquisitions, representing annualized revenues of $670 million, and added 8,000 employees, 68,500 commercial customers and 450,000 consumer customers. FFMC has increased its information services operations and customer base from 170 customers served by 12 data centers in December 1982 to over 70,000 customers served by 84 data centers in 1990. Much of the expansion since early 1984 has been the result of the acquisition of 28 informa-

tion services businesses. In addition to processing services, First Financial Management offers systems operations and systems integration services.

The company also has diversified its market coverage to include insurance claims processing.

**2. Automatic Data Processing (ADP) One ADP Blvd., Roseland, NJ 07068; 201-994-500**

The leading vendor of processing services, ADP has a high level of knowledge, experience and work in cross-industry markets—in particular, payroll—and it has offered services in several industry markets including banking and wholesale distribution.

Although payroll and associated accounting functions still provide the bulk of its revenues, ADP now has significant operations in brokerage services, automobile dealer services, and claims services for automobile insurers and repairers. Processing to serve the banking market and some general financial needs has been discontinued. ADP has sold off a number of processing businesses it entered previously when they became too competitive or couldn't achieve earnings objectives.

In late 1989 and early 1990, for example, ADP sold its automated teller business to Electronic Data Systems (EDS) and its real estate service business to a private company. It also sold its banking and thrift processing service business to Welsh, Carson, Anderson & Stowe, and its Canadian brokerage quotation business to a private company. Its manufacturing services business was also sold to the division's management in a leveraged buy-out transaction.

In most of these cases, the market was so fragmented and ADP's position was so relatively small that ADP could not hope to establish a leading position. In addition, the outlook for thrift and banking processing services appeared threatened by deregulation and the thrift industry financial crisis.

By contrast, the U.S. market for brokerage quotation services is very large and the costs of entry are so high that it offers ADP an opportunity to be a dominant market factor. By taking over the development of Merrill Lynch's new quote system from the failed IBM/Merrill joint venture IMNET, ADP acquired a base of more than 10,000 terminals at one time and assured itself a commanding presence in this market.

As part of its strategy for controlling markets, ADP has also formed a number of marketing alliances with organizations which otherwise might be competitors. Payroll and accounting services are offered through banks and CPA firms to their clients, making it possible for banks and CPAs to provide a wider range of services at no incremental cost to themselves.

### 3. Electronic Data Systems (EDS) 7171 Forest Ln., Dallas, TX 75230; 214-661-6000

EDS as an organization is younger than ADP, and has focused more on vertical markets than ADP. It is closer to FFMC in developing a high level of expertise in an industry, but has moved from its original market, Blue Cross/Blue Shield support.

EDS' formal acquisitions seem to account for only a small amount of its growth over the last six years. However, in the 1984 merger of EDS and General Motors, EDS essentially acquired the GM data processing operations, nearly quadrupling its size in the process. And in 1988, EDS acquired MTech, a major bank processing organization owned by MCorp, a large Texas bank in financial difficulty. By 1990, the non-GM portion of EDS' business had grown to the point where it accounted for about half of total EDS revenues.

Although formal acquisitions (i.e., outright purchases of separate legal entities) have not been a major factor in EDS' growth, a significant portion of its growth has come from transactions which are very similar to an acquisition. In the systems operations business on which EDS built its reputation, the vendor essentially acquires the data processing operations of its client companies. These transactions typically involve EDS assuming responsibility for the client's staff and facilities, including hardware, premises, etc. Such transactions escape the financial reporting associated with outright purchases of separate corporations, but in many other respects are equivalent to a formal acquisition.

A strategy common to EDS, FFMC, and ADP is to develop and exploit significant economies of scale. They have developed processing centers (and megacenters in some situations) and nationwide data networks, allowing them to handle both processing and backup at a fraction of the cost that their individual clients would face. EDS*NET, the private digital network primarily dedicated to managing the telecommunications needs of EDS' 21 worldwide Information Processing Centers, already handles over 730 million transactions per month—nearly 17,000 per minute!

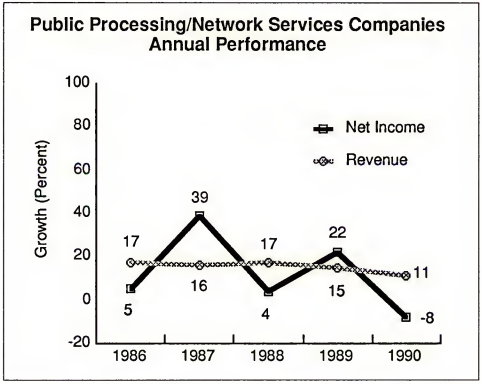
Scale also allows both EDS and ADP, as well as FFMC, to maintain leading-edge capabilities in rapidly changing environments—both technology and business related. For example, in areas such as banking and finance, rapidly evolving regulatory and competitive environments make it difficult for small institutions to maintain their own systems. By exploiting these scale economies, EDS is able to provide its clients with leading-edge systems capabilities at low risk and at a reasonable cost, allowing them to compete in specialized markets or niches without being concerned for the adequacy of their information systems. EDS has utilized these capabilities to acquire the processing business of over 20% of the nation's credit unions.

D

## Public Processing Services Companies' Performance

Revenue growth for the public processing/network services group, as shown in Exhibit III-7, slowed to 11% during 1990. For the period 1986 through 1989, revenue growth had remained relatively constant, ranging between 15% and 17% per year. The actual 11% growth rate was higher than the 8% expected growth rate for this sector.

EXHIBIT III-7




The growth in earnings for this group has fluctuated significantly during the past five years. Earnings declined 8% in 1990, but earnings grew 22% in 1989, 4% in 1988, 39% in 1987, and 5% in 1986. Certainly, the economic environment of 1990 had a negative impact on this sector.

Profitability for the processing/network services group is running slightly below average as compared to the information services industry as a whole. During 1990, the profit margin maintained by the group was 6.7%, close to the industry average of 6.8%.

It must be noted that several public processing/network services firms went private during 1990 and were omitted from this report. They include DST Systems, GTECH, and Worlco Data, which is no longer required to file quarterly with the SEC due to its small number of stockholders.

Companies acquired during 1990 and omitted from this report include Telecredit, which was acquired by Equifax, and Systematics, which was acquired by Alltel.

Exhibit III-8 lists the revenue and net income performance of the public processing/network services companies included in the 1990 report.

EXHIBIT III-8

## Public Processing/Network Services Companies Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ADP | 1,689.5 | 1,736.0 | 3 | 196.2 | 219.7 | 12 |
| COMDATA HOLDINGS | 159.0 | 189.8 | 19 | -11.7 | -40.8 [1] | -249 |
| COMP-U-CHECK | 7.7 | 7.3 | -5 | -1.9 | -0.4 | 79 |
| COMPUTER LANG. RES. | 126.1 | 119.4 | -5 | 0.7 | -4.5 [2] | -743 |
| COMPUTER SERVICES | 15.2 | 16.4 | 8 | 1.4 | 1.7 | 21 |
| CONCORD COMP. | 31.0 | 39.6 | 28 | 3.8 | 5.9 | 55 |
| CYCARE | 86.2 | 79.4 | -8 | 3.1 | -11.7 [3] | -477 |
| EQUIFAX INC. [4] | 1,001.6 | 1,078.8 | 8 | 63.5 | 63.9 | 1 |
| FIRST FIN. MGMT. | 666.7 | 925.1 | 39 | 56.8 | 72.9 | 28 |
| FISERV | 164.0 | 183.2 | 12 | 11.4 | 13.8 | 21 |
| M/A/R/C | 61.6 | 73.1 | 19 | 2.9 | 2.8 | -3 |
| NAT'L. DATA | 269.3 | 249.6 | -7 | 24.9 | -6.1 [5] | -124 |
| PAYCHEX | 110.3 | 128.8 | 17 | 9.6 | 8.9 | -7 |
| PAY-FONE | 5.9 | 5.3 | -10 | 0.0 | -0.3 | -1,605 |
| SANDATA | 11.9 | 11.9 | 0 | 0.2 | 0.5 | 150 |
| SAZTEC INT'L. | 19.8 | 20.8 | 5 | 1.2 | -0.8 | -167 |
| SEI | 149.1 | 171.9 | 15 | 12.1 | 12.1 | 0 |
| SHARED MEDICAL | 390.0 | 403.1 | 3 | 23.1 | 22.7 | -2 |
| SUNGARD DATA [6] | 201.1 | 262.1 | 30 | 17.1 | 20.5 | 20 |
| TOTAL SYS. SVCS. | 65.9 | 83.9 | 27 | 11.3 | 12.7 | 12 |
| WARNER COMPUTER SYS. | 31.1 | 46.8 | 50 | 1.1 | -0.2 | -118 |
| Total | 5,263.0 | 5,832.3 | 11 | 426.8 | 393.3 | -8 |

(1) Includes a $23 million charge for the prepayment of a non-compete agreement related to acquisitions made from American Express during 1989.

(2) Includes restructuring charges of $5.1 million associated with CLR's plan to accelerate the migration of its tax processing business from mainframes to a micro-based network environment.

(3) Includes pretax charges of $20.9 million for write-offs and provisions for restructuring related primarily to discontinued software product lines.

(4) Financials reflect the pooling-of-interests acquisition of Telecredit Inc. during 1990.

(5) Includes charges totalling $19.6 million, including a restructuring charge of $10.7 million, related to the closing of three voice centers.

(6) Financials reflect the pooling-of-interests acquisition of DYATRON during 1989.

# Network Services Market Analysis

## A

### Network Services Market, 1990

The two components of network services (electronic information services and network applications) were both affected by the economic downturn of the last few years. The decrease in volume in the equity markets led to a decrease in use of market-related electronic information services. Electronic information services include on-line data bases of financial and other information news, videotext, and services related to the delivery of information.

The expansion of network applications, the other component of network services, has been delayed by the recession. Some firms, however, have been stimulated to use EDI, one network application, since it can lead to cost savings and more operating efficiency.

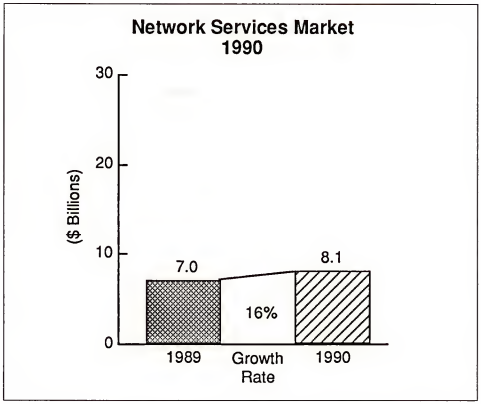
In addition to EDI (electronic data interchange), network applications include value-added networks and electronic mail. Network applications constitute about 25% of the network services market.

Although the potential for the use of network services continues to be significant, the expansion of these services has continued to lag due to economic problems and competitive technology.

- CD-ROMs have been used to meet some information needs in place of electronic information services.
- Facsimile transmission has been used to provide an alternative to EDI and electronic mail.

Despite delays or interruptions in use and competitive technology, network services grew at a rate of 16% in 1990 and reached a level of $8.1 billion, as shown in Exhibit IV-1. The growth rate was down from the 1989 rate of 21%, however.

EXHIBIT IV-1




B

## Network Services Market, 1991 Outlook

### 1. Trends

More types of electronic information will steadily become available to meet the needs of business and technical groups, research organizations, and individuals. This information will help in planning business activity; analyzing, developing and manufacturing products; and conducting research.

The need for timely data to meet global competitive situations will also stimulate continuing growth of the electronic information market.

As the use of electronic information increases in the U.S. and abroad, the use of CD-ROM for more static information will increase as well. Some users and vendors are discussing the use of software products that will determine when to access on-line data bases and when to access CD-ROM units.

The use of electronic mail and EDI will continue to grow as the ability to process messages across multiple networks spreads. EDI will also exhibit continuing growth due to the steady demand by large corporations that can use it to reduce costs and promote more efficiency in operations.

EDI has become the underlying technology and driving force to create a phenomenon called electronic commerce. Now the focus of major research by INPUT, electronic commerce deals with the electronification of the business interfaces by organizations, in particular those that make up a trading community. For example:

- The healthcare trading community includes hospitals, doctors, pharmaceutical companies, insurance carriers, numerous services suppliers, and transportation companies, among others. All of these entities exchange information as part of doing business.

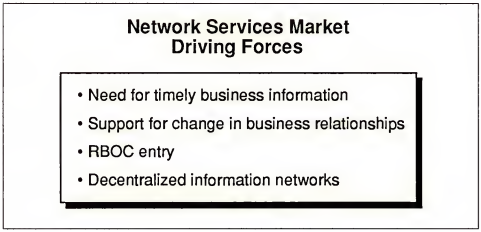
- As the exchanges become electronic, the nature of the relationships change and eventually the infrastructure of the industry changes. Distribution steps disappear, financial transactions are changed, and more.

Electronic commerce will eventually contribute significantly to the improvement of this and other trading communities and will be a strong factor in the growth of both network applications and electronic information service offerings throughout the 1990s.

### 2. Issues

Driving forces affecting the network services market, which are shown in Exhibit IV-2, are led by the need for timely business information.

EXHIBIT IV-2




- The largest and most significant need of this type is the need for information that is timely enough to aid in trading activities.

- Requirements for up-to-date information on parts, materials, processes, research, and many other items are also constantly increasing throughout business.

The entry of RBOCs into gateway services and the expansion of internetworking will drive the use of all network business by increasing the ability of more users to obtain services and to connect to more services and end points.

Expanding interconnection and the use of new network technology is also fueling the dramatic growth of voice mail. However, needs to improve support for marketing and service to clients must also be recognized as drivers for the use of voice mail.

Improvements in business functions is one of the most important drivers for network services. The business factors that drive the use of electronic information include needs for more timely and complete data that can be used on a global basis. EDI is also driven by business requirements to reduce costs and save time in ordering and payment processes.

The growing use of workstations/PCs by more business units and individual users and the decentralization of responsibilities to small business units continue to drive the use of electronic information services, electronic mail, electronic conferencing and VANs.

Inhibitors to the growth of network services, shown in Exhibit IV-3, include the use of technological alternatives such as CD-ROM to meet part of the needs for on-line information and facsimile transmission in a non-systematic manner in place of EDI and electronic mail.

EXHIBIT IV-3

**Network Services Market**
**Inhibiting Forces**

- Technological alternatives
- Data overload
- Regulatory environment
- Computer and data base literacy
- Questions about ISDN

Low levels of profitability that result from use of these alternatives as well as from competitive pricing is an important inhibitor. Lack of profitability and high entry costs discourage new competitors, although RBOCs may feel that they can overcome these obstacles.

An additional inhibitor is the national and international regulatory environment that must be addressed to offer network services.

- In the U.S. the entry of RBOCs into the marketplace has been one of the major regulatory considerations. RBOCs are finding means of entering the information services market to some extent, and their presence can be expected to grow.

- The international situation has become more complex due to common market planning.

There may be attempts to use European solutions that will reduce U.S. opportunities in 1991. American companies may find it necessary to seek foreign alliances to overcome this situation. However, the desire of European vendors to offer services in the U.S. should lead to reciprocal agreements.

Inhibitors to the growth of network services can also include the number and content of data sources available to potential users and their lack of experience with computers and on-line data bases.

- The number of available services may make it difficult for a potential user to identify or locate smaller or newer vendors of services that can meet their needs.

- Since the use of on-line data bases or other network services can be somewhat complex, potential users will need more than an exposure to PCs to utilize them.

Ideas on what ISDN may do can have an inhibiting impact on network services, as well, since some vendors have been trying to accommodate ISDN in their plans. ISDN services and benefits have not been fully defined in the market as yet, and may not be well defined for some time to come.

### 3. 1991 Forecast

Network services will rise above the $9 billion level in annual revenue in 1991 as shown in Exhibit IV-4. Its annual growth rate will increase slightly in 1991 to 17%, making it the delivery mode with the second-highest rate of growth.

Growth of network services will continue at a CAGR of 17% through 1996 as shown in Exhibit IV-5. Total revenue will reach $21 billion in 1996, making network services the fifth-largest delivery mode in information services, ranking ahead of turnkey systems, systems integration and systems operations.

EXHIBIT IV-4

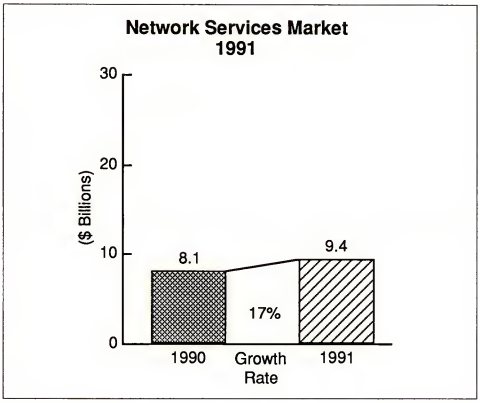
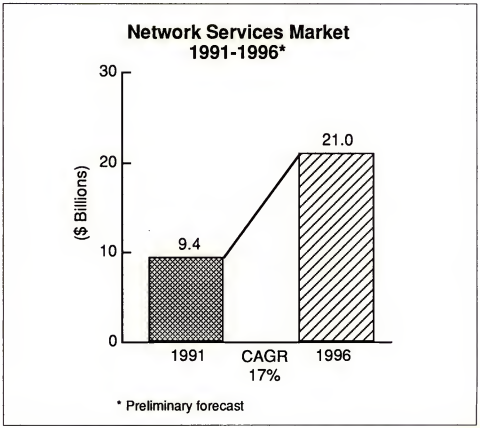



EXHIBIT IV-5



Growth will be driven by needs for timely information for global markets, increasing need for specific industrial information such as the specifications reflected by the CALS Program P-DES product description coding system, and greater acceptance of EDI and other network applications.

Larger firms will be favored in the growth of network services due to the investment and willingness to absorb low levels of profitability that will be required in the market. However, many smaller firms will provide products to support the growth of network services vendors and users.

## C

## Leading Network Services Vendors

Exhibit IV-6 lists leading network services vendors. Included are vendors serving both the electronic information and network application segments of the market. This list illustrates the diverse range of vendors that serve the network services marketplace.

EXHIBIT IV-6

**Leading Network Services Vendors**

| Vendor | Services Offered | | Market Share (Percent) |
|---|---|---|---|
| | EIS | Network Applications | |
| TRW | X | | 9 |
| Dow Jones | X | | 6 |
| Dun & Bradstreet | X | | 5 |
| Mead Data Central | X | | 5 |
| Equifax | X | | 5 |
| McGraw-Hill | X | | 4 |
| Reuters | X | | 4 |
| GEIS | | X | 3 |
| Quotron | X | | 3 |
| BT Tymnet | | X | 2 |
| Knight-Ridder (Dialog) | X | | 2 |
| Sprint | | X | 2 |
| MCI | | X | 1 |
| Compuserv | X | | 1 |
| IBM | | X | 1 |

**1. Equifax 1600 Peachtree Street, N.W., Alanta, GA 30309 404-885-8000**

Most of the major providers of electronic information such as Equifax have been in business for over two decades, even if some of the databases which they offer have been developed by more recent entrants into the information services business.

Large providers of electronic information such as Equifax also provide a substantial amount of information to their selected target industries. For the insurance, utility, retail, and banking and finance industries, and credit-related businesses that use its services, Equifax provides a variety of personal and other credit-related information.

Equifax has expanded its electronic information to include motor vehicle reports, claims information, mortgage loan data and other information related to its basic areas of interest. Providers of electronic information take advantage of economies of scale by expanding the amount of information they can make available.

Many providers of electronic information also make arrangements to deliver data through other services as Equifax has done with Lotus Development Corporation and CSC. Equifax has also expanded internationally in a similar fashion through other network services vendors and has broadened its total business by acquiring Telecredit, a check guarantee and credit card authorization service.

**2. CompuServe Inc. 5000 Arlington Centre Blvd., PO Box 20212 Columbus, OH 43220; 614-457-8600**

Originally founded to provide information services to the consumer market, CompuServe still focuses upon consumer-oriented services. It is now one of the largest providers of on-line services for microcomputer users with over 540,000 subscribers.

CompuServe's products and services include electronic information and network applications as well as remote computing and systems and applications software products. Electronic information includes business, research, demographics, news, and travel data. A total of over 1,400 subject areas is available. Economies of scale make it attractive for established providers of electronic information to add new subject areas.

Most providers of electronic information, particularly the largest ones, do not also offer network applications. However, CompuServe has electronic mail, interactive conferencing, home shopping, financial transaction, and travel planning services.

In a fashion similar to other providers of electronic information, CompuServe is also expanding service on a global basis.

**3. Sterling Software, Inc.—EDI Group 11050 White Rock Rd., Suite 100, Rancho Cordova, CA 95670-6095; 916-635-5535**

The EDI Group of Sterling offers EDI services and proprietary software products to a variety of industries. The EDI Group claims to host the largest user group meeting given by any EDI service provider.

One of the divisions of the EDI Group, ORDERNET, has relations with GTE, BT Tymnet, and industry associations to provide services to hospitals, druggists, and the grocery industry. Agreements are also in place with Kleinschmidt, GE Information Services, and Control Data. Arrangements and alliances with other companies to extend market contacts is common among network application vendors.

As is common with other providers of network applications, ORDERNET also provides access to a number of hardware platforms, software products to aid users, and communications services to enable users to make connections with trading partners. ORDERNET also provides services to convert electronic documents to hard copy and fax for delivery to trading partners when required.

The EDI market in particular is one that requires close contact and work with users. Sterling has responded to this with educational programs, user meetings, and multiple means of customizing and adapting products to user requirements. Electronic mail and other network applications can also require contact and hand shaking among users but not to the extent required by EDI. EDI holds promise of considerable savings in costs and operational work, however.

## D

## Public Network Services Company Performance

INPUT examines the public electronic information services vendors separately from the rest of the processing/network services group due to the difference in the market for these services. Many of the companies that provide network applications services are either also processing services companies or receive much of their revenue from other sources.

Growth for companies focusing on providing electronic information services has slowed since 1986, but remains above the industry average. Growth for 1990 was 23%, somewhat higher than the 17% forecasted for this sector in the U.S. See Exhibit II-3.

CUC International, the largest of the public electronic information services vendors, had 23% revenue growth in 1990.

Earnings growth has been more volatile for these vendors. For 1990, four of the six vendors in this group achieved earnings growth of over 100%.

Omitted from this report is Epsilon, which was acquired by American Express during 1990.

Exhibit IV-7 provides the five-year history of revenue and net income for this sector. Exhibit IV-8 lists the revenue and net income performance of the public electronic information services companies included in the 1990 report.

This chapter reports separately on the systems software and applications software products companies and then provides a comparison of the personal computer software products companies with all other software products companies.

EXHIBIT IV-7

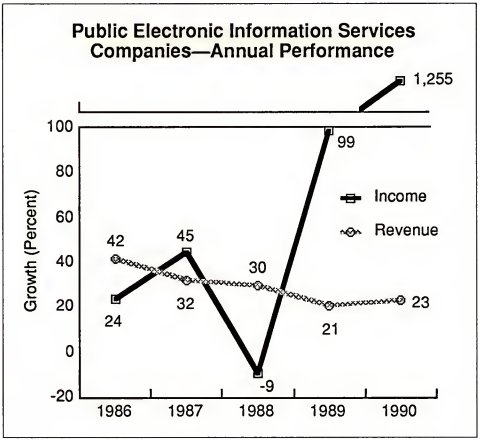


EXHIBIT IV-8

## Public Electronic Information Services Companies—Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ACXIOM | 84.9 | 99.5 | 17 | 5.7 | 4.7 | -18 |
| CUC INT'L. | 367.5 | 453.6 | 23 | 8.1 [1] | 17.5 | 116 |
| DATA TRANSMISSION | 14.2 | 18.0 | 27 | 0.5 | 1.4 | 180 |
| INFO. RESOURCES | 136.4 | 167.2 | 23 | -12.1 [2] | 4.5 | 369 |
| LCS INDUSTRIES | 33.4 | 42.5 | 27 | 0.2 | 0.4 | 100 |
| PC QUOTE | 9.1 | 10.0 | 10 | -0.4 | -1.4 | -250 |
| Total | 645.5 | 790.8 | 23 | 2.0 | 27.1 | 1255 |

(1) Includes $4.3 million in recapitalization costs.

(2) Includes restructuring costs of $5 million and a $10.7 million loss from discontinued operations, including three survey-related businesses.


# Professional Services Market Analysis

## A

## Professional Services Market, 1990

Recently, the professional services delivery mode has undergone significant changes. It has given rise to or supported the genesis and rapid growth of systems integration and systems operations.

- When professional services vendors gained the industry and technical knowledge to be responsible for complex systems projects, which involved multiple vendors or skill groups, they began to provide new services called systems integration. This new delivery mode was recognized by INPUT in 1987.

- Part of the systems operations market also arose from the professional services submode of facilities management services. The other part came from the facilities management submode of processing services. Both parts can depend on the professional services capabilities of vendors to successfully implement services.

Some long-term providers of professional services such as CSC, DEC and EDS, can now perform trade-offs and use their professional services capabilities to gain systems integration and systems operations business rather than to contract for shorter term professional services jobs.

A basic task that professional services vendors have provided, supplementing the internal information systems staff of organizations, has also been changing in the past five years.

- There has been a steadily increasing interest in obtaining technical skills to meet network data base integration and other technical needs. Analysts International, CTG, IBM (notably during the past year) and other vendors have addressed these needs.

- There is less interest in adding commonly available skills such as COBOL, except in the federal market where budget constraints have made it necessary to obtain COBOL programming skills to meet development targets.

In addition, a number of firms in other delivery modes have been providing professional services capabilities to take advantage of additional revenue opportunities and/or promote their major products.

- A wide array of software products firms, including American Software, Dun & Bradstreet Software, Microsoft and Lotus, provide professional services.

- Oracle has used professional services to increase penetration and use of its relational data base product.

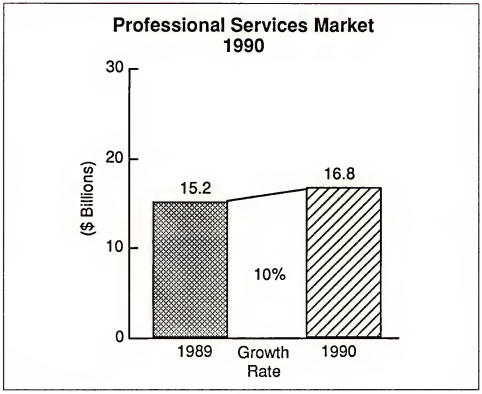
- Firms known for SI projects such as EDS, Andersen Consulting, and KPMG will bid for professional services jobs, particularly in companies where they have work under way.

- Most hardware vendors including IBM, DEC, HP, Prime, and Apple have strengthened their professional services capabilities in order to gain revenue as well as promote expanded use of their equipment.

In the immediate period, the greatest restriction on growth in professional services expenditures has been the modest recession in the U.S. Many firms began cutting back in mid 1990, cancelling contractor assignments in favor of internal staff development or just deferring projects. This trend has continued into 1991.

Despite the changing market situation and the economic climate for professional services, this sector did grow at a rate of 10% in 1990, to $16.8 billion as shown in Exhibit V-1.

EXHIBIT V-1




## B

## Professional Services Market, 1991 Outlook

### 1. Trends

A leading trend in the professional services market has been a decline in the high growth rate of the 1980s to a more moderate pace in the 1990s. This is partially due to the separation of systems integration, which has a higher rate of growth from professional services.

Among professional services products, consulting has been exhibiting a faster growth rate than system development and education and training, except in the federal market where there is a mandated shortage of development personnel and therefore a reliance on vendors. Consulting on the selection of projects and plans for the use of information technology to meet objectives is of increased value to organizations.

Another trend is for many vendors to develop expertise in certain industry areas and/or technical specialties rather than to address all the opportunities in their areas.

Larger professional services vendors, including public accounting firms, are having more impact on the professional services market.

- Several use large-scale demonstrations and advertisements to enhance their industry reputation.

- Some are willing to bid and use different scales for pricing jobs so that they can compete for smaller jobs when personnel are not occupied or jobs appear of strategic importance.

**2. Issues**

The dominant driving forces in the professional services market (listed in Exhibit V-2) have changed during the past two to three years and are now less related to filling gaps in IS staff than to meeting the key business objectives of clients. This is chiefly due to the impact of the economic downturn, although foreign competition and greater interest in results and solution-oriented projects have contributed to the current emphasis.

EXHIBIT V-2

**Professional Services Market Driving Forces**

- Need to improve earnings and service
- Need to obtain industry/application knowledge
- Increasing complexity of technology
- Need to obtain quality work
- Desire for more vendor responsibility

To a great extent, corporations want the aid of professional services and other vendors in activities to improve their earnings and services to customers.

- They are interested in vendors who understand their industries and applications, and who can formulate and execute steps to modify, upgrade, or integrate application software and other system components to achieve these goals.

- They recognize the need for aid with technological complexity, and are disposed to let solution-oriented vendors obtain whatever additional aid they require.

In some situations, organizations find they must seek aid to meet technical complexity, but these projects will not usually provide the revenue opportunities that solution-oriented projects will.

Exhibit V-3 identifies the key growth inhibitors for the professional services market.

EXHIBIT V-3

**Professional Services Market Inhibiting Forces**

- Current economic climate
- Systems integration
- Diverse buying points: decline of IS influence
- Pressure to offer higher value services
- Requirement for software product offerings

A long-term inhibitor is the replacement of professional services by systems integration services. To some extent this may be viewed as a classification issue, where the same service is performed (e.g., modifying an applications software package). However, it must be noted that a shift to systems integration requires the vendor to truly shift its underlying strategy and to be prepared to assume much greater risk relative to systems integration projects versus that typically assumed under a professional services assignment.

Related to the systems integration issue is the fact that buying points for information services within an organization are becoming more dispersed. Users or the IS organization, or a team of both may be involved in contract evaluation and vendor selection.

- Users may contact or be contacted by vendors and have IS involved in evaluations. As the buying point shifts more and more towards the user at a middle or senior management level, the decision criteria change, as do the buying requirements.

- This shift changes the selling process and will in general lengthen the selling cycle and increase the amount of the typical expenditure. The user buyer is interested in buying a solution not just a technology-based service.

As customer organizations become more decentralized and gain P & L responsibility, IS organization responsibilities become more fragmented.

In response to this situation, many professional services firms are under pressure to offer more services (consulting, fixed price contracts, systems integration, project management). Upgrading services in this manner may be inevitable for many professional services firms; but it may serve as an inhibitor to the growth of more traditional professional services firms because the firms' resources and focus are directed at developing

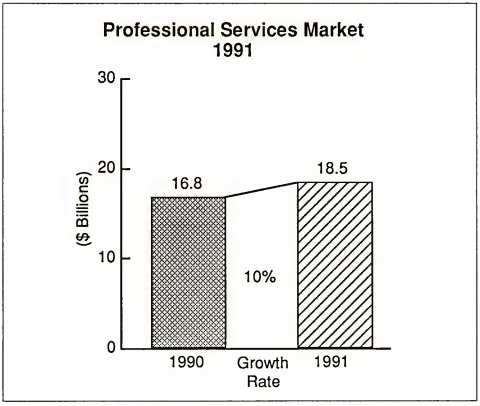
new capabilities such as project management. In addition, more time will have to be spent on staff training in general, which will make staff less available for contract assignments.

Combined with the pressure for more complete services is the desire to turn to a single vendor for all products and responsibility. For example, this requirement has driven some professional services firms to provide software products. Software products and professional services vendors are forming a growing number of alliances for this purpose. Some of these alliances may turn into partnerships or mergers.

### 3. 1991 Forecast

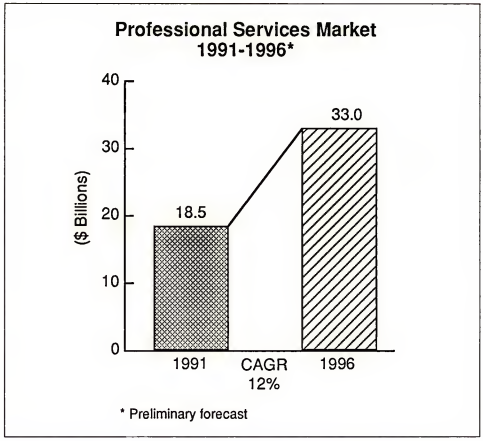
Professional services will surpass processing services in total revenue in 1991 and rank just behind applications software products as the second-largest delivery mode. Total revenues will increase at a 10% rate from 1990 to reach $18.5 billion in 1991, as shown in Exhibit V-4. INPUT believes that the 1990 recession is lingering and may impact 1992 budget plans this fall. The result is slower recovery for the professional services segment, which is the most sensitive to economic impacts.

EXHIBIT V-4




Growth in professional services will continue at a 12% CAGR between 1991 and 1996, as shown in Exhibit V-5, improving as the middle of the 1990s approaches. Total revenues will amount to over $33 billion by 1996 driven, in part, by a recovery cycle in business that will focus on earnings and service goals.

EXHIBIT V-5




These goals will favor the use of larger vendors experienced in the industries of their clients and prospects, as well as in information technology. Opportunities will also be available for smaller, aggressive firms that can take advantage of new technology and quickly develop a level of expertise that neither the larger firms nor the internal information systems group prefer to develop during the early stages of using a technology.

## C

## Leading Professional Services Vendors

Exhibit V-6 lists leading professional services vendors. Included are vendors serving both the commercial and governmental segments of the professional services market. This list represents a selection of the diverse professional services vendors that serve the information services marketplace.

EXHIBIT V-6

**Leading Professional Services Vendors**
**Commercial and Government**

| Vendor | Market Share (Percent) |
|---|---|
| CSC | 3 |
| IBM | 3 |
| EDS | 3 |
| Andersen Consulting | 2 |
| Computer Task Group | 1 |
| Control Data | 1 |
| Digital Equipment | 1 |
| Grumman Data Systems | 1 |
| Logicon | 1 |
| Unisys | 1 |
| Coopers & Lybrand | 1 |
| CGA | 1 |
| BDM | 1 |

The following profiles provide examples of how professional services vendors are addressing the challenges of this market sector.

**1. Computer Task Group (CTG) 800 Delaware Avenue, Buffalo NY 14209; 716-882-8000**

CTG, one of the largest vendors of professional services in the commercial marketplace, has positioned itself to take advantage of major trends in the professional services industry. In addition to a wide range of professional services capabilities, including consulting, system development, and education and training, CTG has developed strong systems integration offerings, including network integration capabilities.

CTG has significant expertise in certain vertical markets including discrete manufacturing and banking/financial—just as other leading vendors of professional services have, such as EDS and Andersen Consulting. CTG's industry knowledge and ability to staff and run major complex projects are several of the key reasons for IBM's investment in this vendor.

CTG also has demonstrated the ability to support small tasks and participate in projects with internal development teams as well as to support large-scale assignments for major corporations. The ability to be flexible in regard to assignments has been evident in the activities of larger professional services vendors, including several Big Six firms.

CTG has been active in promoting international business in addition to expanding its systems integration and systems operations (facilities management) work during the past year.

**2. American Management Systems, Inc. (AMS) 1777 North Kent St., Arlington, VA 22209; 703-841-6000**

AMS has diverted most of its professional services capability to systems integration work, where it can make use of its industry knowledge and tested applications software products. In a fashion similar to other vendors, AMS uses its industry expertise to obtain both systems integration and professional services assignments. Its areas of expertise include financial services institutions, federal government agencies, state and local governments, the energy industry, and telecommunications.

In the professional services area, AMS typically contracts for one phase of large contracts (design, development, or implementation) at a time.

To illustrate the interest by professional services firms in product diversification, AMS has expanded its services to cover software assessment and support of IBM's AD/Cycle application development strategy. AMS is also working with IBM to develop versions of its products that will conform to IBM's System Application Architecture, (SAA).

In addition to its professional services, software products, and systems integration business, AMS also offers systems operations services. During the past few years, AMS has also taken steps to expand into international markets.

**3. Computer Sciences Corporation (CSC) 2100 East Grand Avenue, El Segundo, CA 90245; 213-615-0311**

CSC is one of the oldest firms in the professional services marketplace. It has achieved prominence in the federal market and is now setting the objective of becoming one of the top two or three companies in the commercial markets for consulting, systems integration, and related professional services in the U.S. and overseas.

Just as many other professional services have done, CSC has developed areas of industry expertise. However, due to its length of time in the industry and its size, CSC has developed expertise particularly in two clustered areas: banking/finance/insurance and manufacturing/distribution. CSC also has notable experience in other industries.

As with other leading professional services vendors, CSC has expanded its products and services. It now offers systems integration, systems operation, and high-level consulting, as well as turnkey systems, and processing and professional services.

As part of its strategy for positioning itself to take a leading role in the commercial marketplace, CSC has expanded its consulting and implementation capabilities, established a branch-office structure, begun the transfer of technology gained in large federal system projects to its commercial organization, and earmarked funds for investment in acquisitions.

- CSC is increasing its efforts in the commercial market through acquisitions in the U.S. and Europe in both professional services and processing services.
- In addition to expanding its market share in commercial markets, CSC will work to maintain its dominant position in the U.S. federal marketplace.

## D

## Public Professional Services Company Performance

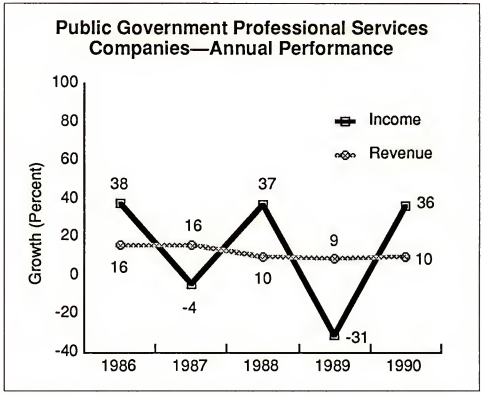
### 1. Public Government Professional Services Companies

Growth for the government professional services vendors has been moderate for most of the past five years. Revenues for these companies grew an average of 10% in 1990, compared to 9% in 1989, 10% in 1988, and 16% in 1987 (see Exhibit V-7). INPUT forecasted the overall 1990 growth for this sector at 5% in the U.S. Many of the public government sector professional services firms are experiencing their growth by expansion into the commercial sector.

Professional services for the government represents a very mature market targeted by several large vendors, the largest being Computer Sciences Corporation. In 1990, CSC generated revenues in excess of $1.6 billion, a growth of 16% for the year. Other large government professional services firms include Bolt Beranek & Newman (BBN) and Logicon.

Earnings for the group have fluctuated dramatically during the past several years. The group experienced a 36% increase in earnings during 1990, compared to a 31% decrease in earnings during 1989.

EXHIBIT V-7




Profitability for the government professional services vendors listed on Exhibit V-8 is well below the average for information services vendors overall. In 1990, the group earned 2.3% on revenues.

Changes in companies included in this sector are the following:

- American Management Systems was moved to the commercial professional services category this year.
- Sterling Software was moved to the systems software category.
- Telos was removed from the list because it was acquired by Contel.

### 2. Public Commercial Professional Services Companies

Growth for public commercial professional services vendors has leveled off during the past four years. Revenues increased 14% from 1989 to 1990, as indicated in Exhibit V-9.

EXHIBIT V-8

## Public Government Professional Services Companies Revenue and Net Income

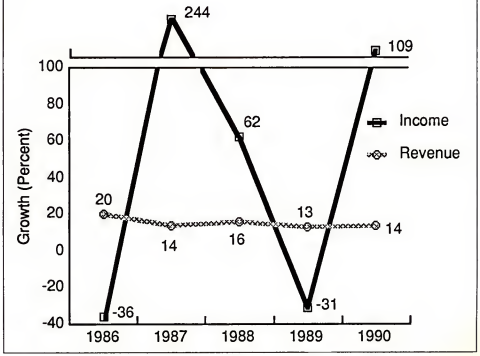
| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| BBN | 274.1 | 266.4 | -3 | -34.2 | -22.2 [1] | 35 |
| C.A.C.I. | 142.6 | 148.1 | 4 | 3.2 | 3.3 | 3 |
| COMPUTER DATA SYS. | 122.3 | 126.1 | 3 | 2.4 | 3.4 | 42 |
| COMPTEK RESEARCH | 47.4 | 51.0 | 8 | 1.2 | 1.4 | 17 |
| CSC | 1,442.8 | 1,679.3 | 16 | 58.4 | 68.0 | 16 |
| DYNAMICS RES. | 88.5 | 90.5 | 2 | 3.6 | 3.3 | -8 |
| INTERMETRICS | 46.7 | 52.4 | 12 | 2.0 | 1.8 | -10 |
| LOGICON | 254.2 | 257.3 | 1 | 8.6 | 8.6 | 0 |
| SOFTECH | 48.7 | 49.4 | 1 | 1.1 | -4.8 [2] | -536 |
| Total | 2,467.3 | 2,720.5 | 10 | 46.3 | 62.8 | 36 |

(1) Includes a $20.4 restructuring charge, of which $11.1 million is associated with the downsizing and refocusing of BBN Advanced Computers.

(2) Includes a $2.9 million one-time pretax charge for an excess office space lease and SofTech's investment in COMPASS.

EXHIBIT V-9

## Public Commercial Professional Services Companies—Annual Performance



The largest increases were achieved by Continuum and Brandon Systems. American Management Systems, now the largest of the public commercial professional services companies, grew 16% during 1990.

Earnings for this group have fluctuated over the past five years. Earnings rose 109% during 1990, after declining 31% during 1989 and growing 62% during 1988.

Profitability for the commercial professional services group, although lower than the industry average in 1990, was higher than for the government professional services group. Commercial professional services companies earned only 3.6% of revenues on average for the year, compared to 6.8% for the industry as a whole. The performance of each company is listed in Exhibit V-10.

EXHIBIT V-10

## Public Commercial Professional Services Companies Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| AMER. MGMT. SYS. | 225.3 | 261.9 | 16 | 6.2 | 12.0 | 94 |
| ANALYSTS INTL. | 98.9 | 114.2 | 15 | 5.4 | 6.2 | 15 |
| BRANDON SYSTEMS | 30.6 | 37.1 | 21 | 2.0 | 2.3 | 15 |
| COGNITIVE SYSTEMS | 3.4 | 3.4 | 0 | 0.1 | -0.6 | -700 |
| COMP. HORIZONS | 84.7 | 99.4 | 17 | -0.3 [1] | 3.3 | 1200 |
| COMP. TASK GROUP | 233.0 | 243.9 | 5 | -7.8 [2] | 7.2 | 192 |
| CONTINUUM | 75.1 | 97.1 | 29 | 3.1 | 8.1 | 161 |
| KEANE | 77.2 | 93.0 | 20 | 3.6 | 5.2 | 44 |
| SCIENTIFIC S/W | 20.8 | 19.8 | -5 | 0.5 | -9.2 [3] | -1940 |
| SYS. & COMP. TECH. | 44.5 | 51.1 | 15 | 3.4 | 1.1 | -68 |
| TECHNALYSIS | 20.7 | 20.5 | -1 | 2.0 | 2.2 | 10 |
| WORLD WIDE COMP. | 17.7 | 17.2 | -3 | 0.0 | 0.3 | * |
| Total | 931.9 | 1,058.6 | 14 | 18.2 | 38.1 | 109 |

(1) Includes restructuring charges of $3.3 million associated with a plan to reduce costs.

(2) Includes expenses of $17.4 million for certain restructuring and closing of businesses.

(3) Includes a one-time charge of $2.2 million associated with a change in the method of revenue recognition and $2.8 million in nonrecurring charges related to an office lease in London and provisions for anticipated losses for one client project.


# Systems Integration Market Analysis

## A

## Systems Integration Market, 1990

Systems integration (SI) is a vendor service that provides a complete solution to an information system, networking, or automation requirement through the custom selection and implementation of information systems 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 a buyer for the delivery of the specified system function, on schedule and at the contracted price.

It is critical to the success of the approach that there be a sharing or total transfer of responsibility (and risks) from the client organization to the vendor. In exchange for assuming risks of failure to deliver the desired solution on time and within budget, the integrator receives project management fees from the client.

Exhibit VI-1 shows the growth of the SI market from 1989 to 1990. In light of a weak economy and reports of delayed projects and reduced project value, the year-to-year increase would seem to suggest that the systems integration market outperformed all other markets by a substantial degree. However, viewing the figure by commercial and federal components results is a considerably different picture.

As shown in Exhibit VI-2, the commercial market grew 17%, compared to the previously forecasted 21%. The decline in growth rate was attributed primarily to the weakening economy and a general unwillingness by many corporate and information systems executives to commit to long-term development projects during this business climate.

EXHIBIT VI-1

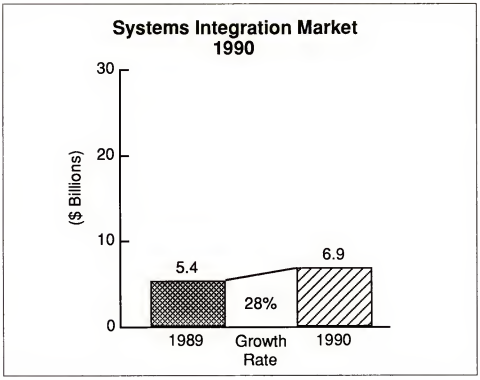
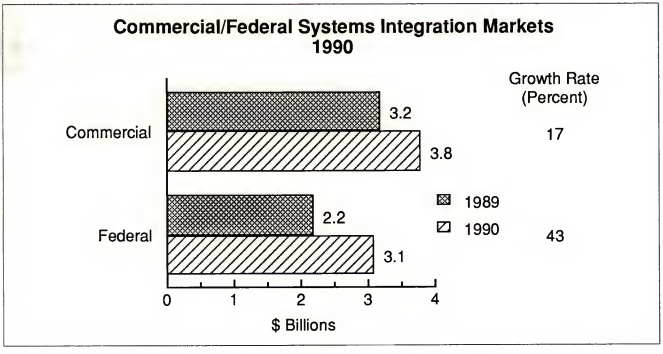



EXHIBIT VI-2



At the same time the commercial market growth rate declined, the federal market grew substantially. However, analysis of federal spending indicates that the growth resulted more from delayed spending from the previous year than from any major change in spending trends. The federal market growth rate is expected to return to a somewhat more normal growth rate in 1991.

## B

## Systems Integration Market, 1991 Outlook

### 1. Trends

Research into the SI market indicates a number of important trends. To a great extent, they reflect changes in the thinking of companies entering into systems integration projects. Key trends are shown in Exhibit VI-3.

EXHIBIT VI-3

**Key Systems Integration Industry Trends**

- Increased business process emphasis
- Short-term benefits expectation
- Reduced project size
- Reduced project length

Companies indicate they are placing increased emphasis on improving their business processes. Their interests are for systems (and SI projects) that result in operating efficiency. Whether the emphasis results from the demonstrated success of new systems in improving operations or from concern about organizational efficiency and effectiveness in driving new systems integration projects is unclear.

What is clear is that organizations recognize that systems integration provides opportunities far beyond just the implementation of new technology or (only) reducing the costs of specific operational activities. Systems integration provides significant opportunities to change the way an organization conducts business. Business processes are refined and improved, costs reduced, and creative solutions are incorporated more quickly and easily, all to the benefit of the organization's profitability.

Until recently, systems integration projects were generally considered to be exceptionally long and of high value. They still offer high value, and are longer and more complex than traditional systems development efforts, but many organizations are interested in obtaining benefits long before the end of a lengthy project. Users indicate that they prefer projects that result in improvements in operating performance within a year or two—not three to five years from now.

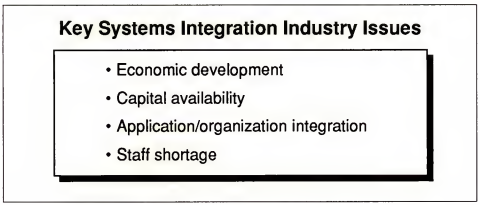
It is important to note that users are not actually reducing their (long-term) spending significantly. They are just defining projects in somewhat smaller pieces that will result in short-term benefits. The net effect is that there are more, somewhat smaller, shorter term projects.

Note that these trends pertain primarily to the commercial market. The federal market continues to focus on larger, longer term projects than does the commercial market. This is not expected to change.

### 2. Issues

There are numerous issues facing the systems integration industry. Exhibit VI-4 summarizes several key issues related to overall market development.

EXHIBIT VI-4




A key issue to both vendors and users of systems integration products and services is the rate of economic development. Few organizations fail to recognize that better systems would result in better operating performance, but many are reluctant to make investments in an economy that is so uncertain.

Among the effects of economic downturn and lethargy is the lack of capital available to make investments. INPUT noted numerous organizations that have systems integration projects approved, but are unable to initiate them due to lack of funding. The lack of capital is a significant contributor to management's focus on smaller projects that will result in shorter term benefits. Benefits from one project can, in some cases, fund a subsequent project.

Organizations increasingly view systems integration as a way of improving the operation of the business, but overcoming organizational inertia can represent a major stumbling block. Resistance to change is strong, particularly when one's position or authority may be threatened. Integrating systems with organizational changes is an exceptionally difficult process. Vendors that are highly technically oriented find this a difficult barrier to overcome.

Compounding the technical and organizational difficulties, vendors are increasingly faced with staffing shortages, particularly in two areas. At one end of the spectrum, vendors are unable to find sufficient numbers of individuals qualified in technologies such as electronic imaging, UNIX, client/server architecture, and others. At the other end of the spectrum, vendors are unable to find highly qualified project managers, particularly those that can deal successfully with organizational change dynamics.

There are a number of factors driving growth of the SI market. Because of the differences between the commercial and federal sectors, each is considered separately. Key driving forces are summarized in Exhibit VI-5.

EXHIBIT VI-5

**Systems Integration Market Driving Forces**

- Commercial market
  - Major rebuilding of infrastructure
  - Rising demand for connectivity
  - Growing user management trend
  - Global competitive pressure
  - Growing complexity of applications
- Federal market
  - Demand for productivity improvement
  - Shortage of technical staff
  - Shared implementation risks
  - Trends toward technology upgrades

Within the commercial sector, a need to rebuild the basic infrastructure pervades nearly all decisions. Systems integration is seen as one way to bring greater efficiency and operational effectiveness, but the necessity to make investments in basic facilities frequently takes higher priority. As a result, information systems managers are competing for dwindling pools of available funds.

Along with the need to rebuild basic facilities, there is a need to establish connectivity throughout the organization, both locally and globally. Nearly all organizations recognize that timely information must be available continually throughout the world. However, physical connectiv-

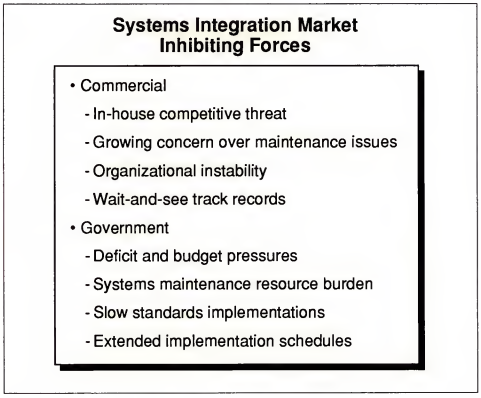
ity is easier to establish than logical connectivity. While physical connections can be made, systems need to be integrated to share information. Organizations increasingly recognize that they need assistance to successfully establish physical, logical, and organizational connectivity.

In the federal sector, concern about the ability to recruit and retain qualified information technology personnel continues. The level of difficulty makes contracting vendors for the design, development, integration and implementation of new systems more attractive.

Obsolescence of federal processing capacity, coupled with budget pressures, is creating an urgent need to upgrade hardware and applications. Federal SI projects are large and complex, frequently well beyond the limited technical capabilities and resources of agencies that seek to accomplish them. Government executives prefer to share the risks inherent in implementing new technology with a contractor.

Inhibitors to market growth, as shown in Exhibit VI-6, are also different for the federal and commercial markets.

EXHIBIT VI-6




In the federal sector, budget pressures can act as a spur to systems projects. They can also delay decisions to begin such a costly project. Reduced operating budgets may be largely earmarked for maintaining systems that are obsolete, leaving little for new programs. However, as evidenced by the significant shift in current spending (for systems integration), federal agencies will seek to divert funds, if possible, to initiate new projects.

There are numerous inhibitors to SI market growth in the commercial sector. A weak economy and lack of capital are major inhibitors to all spending, especially capital investments. Others are equally important.

In many organizations, corporate management views the in-house staff as qualified to address complex systems integration projects. Though some do have the skills to implement complex systems, many are overloaded with maintenance activities and/or lack the skills to integrate new technologies or implement advanced applications.

Also detracting from a decision to employ a systems integrator is concern about maintaining software programs developed by others. Although this may have been a problem in the past, improved software development and documentation products and procedures should alleviate much of the concern.

Not withstanding the current economic situation, the systems integration market will continue to grow in the 1990s. Though the motivations of decision makers will be different in the commercial and government sectors, the driving forces continue to exist.

- Technology upgrades are more and more necessary, particularly in the government sector where higher productivity must be attained in the face of budget cuts.

- Skilled staff continues to be difficult to find. Some evidence suggests that the pool of labor skilled in the latest technologies may even be dwindling.

- As users become more involved in decisions to acquire data processing resources, the reluctance to contract out for the development and operations of these services will decrease.

Vendors with demonstrated success in the design, development, and implementation of large, complex systems will be well positioned for success in the 1990s.

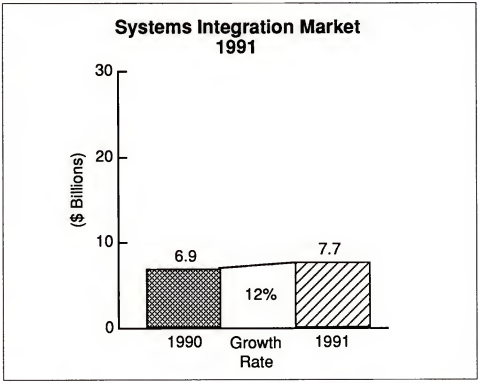
### 3. 1991 Forecast

Between 1990 and 1991, INPUT expects the SI market to grow at approximately 12%, from $6.9 billion to $7.7 billion (See Exhibit VI-7). The lower rate is attributable primarily to the overall state of the economy.

Organizations note that they will fund SI projects as soon as they see strong signs of economic recovery, but will have to wait until they are convinced that the economy has turned around.

The overall rate (12%) includes the commercial growth rate of 15% and the federal growth rate of 7%. The federal growth rate is significantly lower, reflecting a need to absorb the 1989 to 1990 growth before new investments can be made.

EXHIBIT VI-7

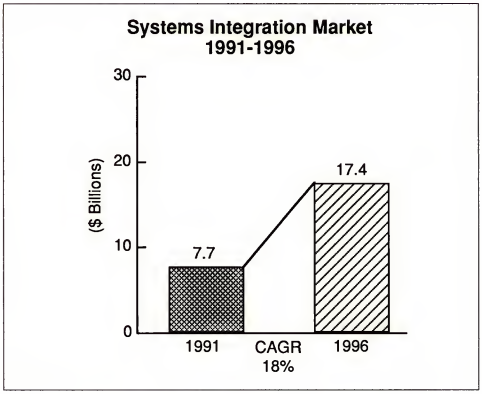



Between 1991 and 1996, the systems integration market is forecasted to grow at a CAGR of 18%, as shown in Exhibit VI-8. The overall rate reflects a CAGR of 19% for the commercial market and 16% for the federal market.

As noted above, the federal market experienced a significant increase in expenditure between 1989 and 1990. Because of this increase, the market is projected to be somewhat flat (7%) between 1990 and 1991 as agencies begin to initiate committed projects. The growth rate is expected to begin to increase in 1992, resulting in an overall, five-year growth rate of 16%.

In the commercial market, economic conditions will tend to hold down the growth rate for at least the next year. Beyond the next year, the actual growth rates will be highly dependent on the speed and extent of economic recovery. While some sectors will be higher, INPUT expects the commercial market growth rates to remain in the range of 12% to 14% for the next year, with growth rates increasing near the latter part of the five-year forecast.

EXHIBIT VI-8




## C

## Leading Systems Integration Vendors

Exhibit VI-9 identifies the major systems integrators participating in the commercial and federal SI markets.

EXHIBIT VI-9

**Leading Systems Integration Vendors**

| Vendor | Market Share (Percent) |
|---|---|
| IBM | 17 |
| Andersen Consulting | 10 |
| EDS | 9 |
| Digital Equipment | 8 |
| SAIC | 7 |
| Computer Sciences | 6 |
| Unisys | 5 |
| Martin Marietta | 5 |
| Boeing Computer Services | 3 |

The following profiles of successful systems integrators illustrate the characteristics of this delivery mode. Two vendors in the commercial market and one in the federal market have been selected.

**1. Andersen Consulting 69 West Washington Street, Chicago, IL 60602; 312-550-0069**

An independent, professional services organization, Andersen provides systems integration, systems operations, and professional services to numerous industries. Andersen also derives revenues from applications and system software.

Andersen Consulting's U.S. revenue for 1990 was $1.2 billion. Of the total revenue, 57% was derived from systems integration and 31% was derived from professional services. The remaining 11% was derived from systems operations and software products and services.

Andersen's primary strengths are at the high end of the life cycle process, which reduces its dependence on outside suppliers for the high-risk elements of most systems integration projects. Its strength in software development, project management, and packaged systems and applications software have contributed measurably to the firm's success. Andersen's more limited experience in service and repair and, to some extent, design integration are not critical to success in the business, particularly in the vertical markets where Andersen has focused.

Andersen's alliances and applications software offerings also add significantly to its overall capabilities. MAC-PAC (Integrated Manufacturing) and DSC Logistics (Distribution Control System) are good examples of the latter. Andersen's FOUNDATION development and implementation methodology is among the best known in the industry.

Among Andersen's key strengths is its heavy emphasis on training. Utilizing its internal training and development capabilities, Andersen invests significantly in ongoing efforts to ensure that all professional personnel understand and can consistently apply Andersen's processes and methodologies. Consistently trained personnel is one of Andersen's greatest assets.

Andersen Consulting's systems integration activities include the following:

- For the Department of Veterans Affairs, development of a supply management system. Contract valued at $5.8 million.
- Development of a human resources system for the Montana Human Resources Department. Contract valued at $15.5 million.

- For Boeing Corporation, development of a document management system. Contract valued at $7.5 million.

Andersen Consulting has an excellent reputation as a systems integrator. Strengths include its ability to manage the client's planning process, the resources to handle very large projects, and its focus on professional services. Its ongoing investments in key applications software products, and the continuing investment in staff development, will contribute to a continued leadership position in the market.

In addition to its expertise in project management and systems development, Andersen has leveraged its (former) association with Arthur Andersen to establish strong positions with senior management in client and prospective client companies. These relationships result in Andersen being able to "write" RFPs on which it then bids. The result is a very high success rate in winning contracts, and minimizing marketing and bid preparation costs.

**2. Electronic Data Systems Corporation (EDS) 7171 Forest Lane, Dallas, TX 75230; 214-661-6000**

Founded in 1962 by Ross Perot, EDS has evolved to being a leading provider of systems integration services in a broad set of markets, both in the federal and commercial sectors. EDS's primary activities are in the systems operations market, but it has increasingly leveraged its systems operations business into systems integration assignments. EDS currently provides systems operations, processing services, professional services, and systems integration services to nearly all vertical industries, as well as to the federal government.

EDS's 1990 noncaptive U.S. revenue was $2.4 billion. Of this revenue, approximately 26% was derived from systems integration; 41% was derived from systems operations. The remainder was derived primarily from a mix of processing services, network services, and professional services.

EDS has excellent technical consulting capabilities and has successfully leveraged its systems operations experience into systems integration. The company generally uses off-the-shelf hardware provided by other computer manufacturers. The systems integration organization indicates that it has some custom hardware capability, but would clearly prefer to use standard products. EDS' systems operations capability is augmented by its experience in managing one of the world's largest private networks.

EDS has a wide range of systems integration contracts, including the following:

- In partnership with DEC and IBM, EDS is developing an integrated CAD/CAE/CAM system for General Motors.
- Development of a fingerprinting identification system for Los Angeles County. The contract is valued at $9.6 million.
- Development of a system to handle parking violations for the city of Chicago. The contract is valued at $40 million.
- In partnership with Price Waterhouse, EDS is developing a real estate management system for the Resolution Trust Corporation.

EDS is expected to continue to use SI as an important ingredient for acquiring long-term systems operations contracts. In addition, EDS is expected to look increasingly at new vertical market opportunities.

**3. Science Applications International Corporation (SAIC)**
**10260 Campus Point Drive, San Diego, CA 92121; 619-546-5492**

Founded in 1969, Science Applications International Corporation (SAIC) offers diversified research and engineering services in the fields of national security, energy, and environment and health. SAIC is also involved in the custom assembly of specialized computer systems and in the manufacture of certain high-technology products.

Total 1990 revenues were slightly over $1 billion. Of the total, SAIC's revenues from information services were $600 million. SAIC earns an estimated 95% of its revenues from the U.S. government. Of the total information services revenue, approximately 80% is for systems integration.

SAIC started as a defense contractor and has continued to support the Defense Department in a wide variety of classified and unclassified projects. SAIC's commercial market work is primarily in the health care industry. However, the company has recently been pursuing opportunities in the broadcast industry, after a successful systems integration project for a Chicago television station.

SAIC's approach to the systems integration market has generally been to leverage specific projects that it can replicate in comparable organizations. Rather than treating SI in a global sense, SAIC is pursuing discrete SI opportunities in vertical industries in which it has demonstrated experience and qualifications. Using this as a base, it will then expand into other related industry sectors.

SAIC's services are provided primarily to the federal market—principally the Defense Department. Recent systems integration project awards include a patient care system for the Veterans Administration, valued at $52 million. In addition to this civilian contract, SAIC has a wide range of contracts currently active related to weapons systems testing and training.

INPUT expects that SAIC could be a significant beneficiary of the increase in technology spending by the Defense Department. SAIC has contributed to the success of many of the weapons systems used in the Iraqi war and should continue to be a contributor to the next generation of systems.


# Systems Operations Market Analysis

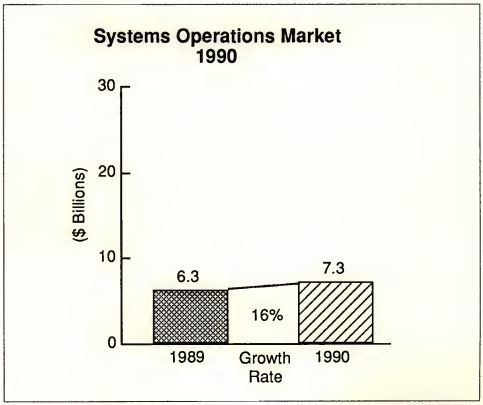
## A

### Systems Operations Market, 1990

The Systems operations market grew 16% to $7.3 billion in 1990, as shown in Exhibit VII-1.

Management of computer/communications operations by third parties continues to be a major information services industry trend in the 1990s. While some companies turn over their day-to-day processing operations to service companies, others are also turning over software development and maintenance to these service vendors.

EXHIBIT VII-1



For this reason the systems operations market is now considered to consist of two delivery submodes:

Platform systems operations—the vendor provides the processing requirements to meet the client's service needs, either at the client site or the vendor site. The equipment is generally owned by the vendor. The client retains responsibility for development and maintenance of applications software.

Applications systems operations—the vendor provides the processing facility and is also responsible for the development and maintenance of all or a significant part of the applications software for the client.

This market is developing faster than the overall information services market and is expected to outperform the market throughout the next five years.

## B

## Systems Operations Market, 1991 Outlook

### 1. Trends

As the market has evolved over the last few years, several significant trends have emerged that are expected to influence both the market growth and vendor strategies.

There is an increasing demand on the part of clients for vendors to enter into a partnership arrangement with the client. This may require taking an equity position in the client's information processing operations by acquiring the firm's existing hardware and/or assuming responsibility for the client's DP staff. This has led to longer term contracts in many cases.

The recent economic troubles faced by many firms have shifted the reason for outsourcing systems operations to a more cost savings-based rationale. Concerns about the ability to revert to internal management should the relationship fail, and worries about losing control, have dimmed in light of the significant cost savings promised by the vendors.

The vendors, for their part, have made significant capital investments to operate aggressively in this market, taking over the processing assets of the client in many cases and assimilating the staff of the client in other cases, as mentioned above. Their ability to control costs effectively and take full advantage of existing economies of scale will determine the health of this market in the coming years.

## 2. Issues

The question of information systems control remains a critical issue in any systems operations agreement. Can a client IS department retain control over its critical data when the processing of that data is the vendor's responsibility? Does that control erode even more if the development of application software operating on that data is also the vendor's responsibility?

Some client firms have determined that the risk is manageable when appropriate checks and balances are in place within the client's IS organization. Others have decided that the risk is indeed too high for their organization, and those firms have not chosen to outsource their operations.

A related concern is the loss of DP expertise in the client firm that chooses to outsource systems operations. During the life of the contract, critics say the company will lose expertise in processing technologies, since this function is being handed over to vendors. This makes it difficult, if not impossible, to reassume operational responsibility should the vendor fail to perform satisfactorily. Firms that have chosen to outsource have a response: Information technology is not a part of their core business and therefore it should be put in the hands of experts. The client's own IS resources can be best utilized in developing IS strategy and planning how best to use information systems more competitively.

Some skepticism still exists about whether the savings projected by the vendors can really be achieved, but early indications are that clients are indeed benefiting. The increase in the proportion of fixed-price contracts offers the buyer some level of protection against escalating costs also.

As illustrated in Exhibits VII-2 and VII-3 there are both driving forces acting on the market to expand it rapidly and inhibiting forces that could hinder the achievement of the projected growth. Prospects recognize that they must concentrate on their core business and leave technology-intensive support services, such as information systems, to experts. They are aware of the importance of these functions and often feel they can improve the delivery of these services by using vendors. Their own experience has been that it is becoming increasingly difficult to recruit and retain the skilled operating personnel necessary to maintain first quality IS operations. Once again the vendors provide a viable alternative.

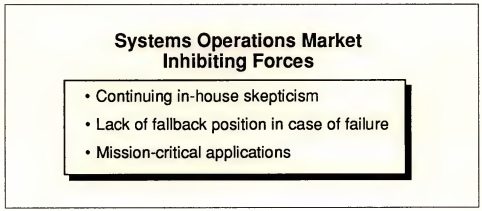
The lingering economic slowdown has also increased the pressure to control day-to-day operating costs and has tightened DP budgets to the point where money is no longer available for those upgrades required to fully take advantage of information technology as a competitive tool.

EXHIBIT VII-2


More prospects are looking to systems operations vendors as the solution. In the process of acquiring outside services for systems operations, many prospects are becoming aware of the improved backup and recovery capabilities a centralized facility can offer.

Tempering these positive forces are the continued skepticism on the part of many in-house staffs toward outsourcing in general. Though much of this attitude can be attributed to a desire to protect one's own turf, the real issue of control of the operations and the ability to recover if the partnership does not work are real concerns. When there are mission-critical applications involved, namely those judged vital to the success of the business, the soul searching is particularly intense. However, in some instances, it has been an incentive, rather than an inhibitor, to letting the experts do it.

EXHIBIT VII-3

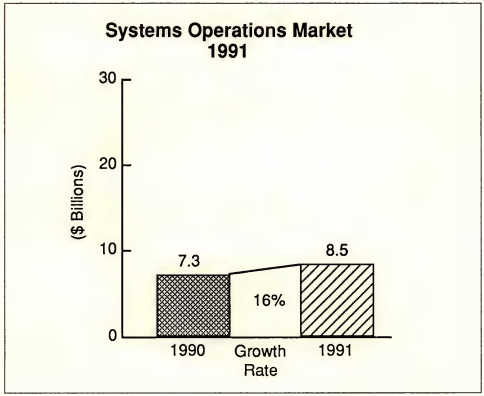


Which forces predominate in the marketplace will determine how rapidly the market will grow. INPUT will closely monitor emerging trends to rapidly respond to market changes and accurately project any change in market pattern.

### 3. 1991 Forecast

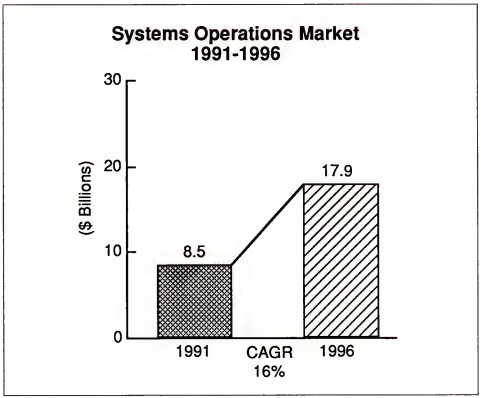
Exhibit VII-1 illustrates that the systems operations market reached $7.3 billion in 1990. Exhibit VII-4 shows that INPUT's preliminary analysis indicates the market will grow at the same rate of 16%, to generate $8.5 billion in revenue during 1991. This continued healthy growth rate reflects a continued pressure to control operating costs and an increasing acceptance of the outsourcing concept by more prospect firms.

EXHIBIT VII-4




INPUT projects that the long-term growth rate will be sustained at 16% over the 1991- 1996 period to yield 1996 revenue of $17.9 billion, as shown in Exhibit VII-5. This number could be significantly higher if more of the large, well-publicized contracts are demonstrated to be beneficial for the vendor and the client alike. Success stories will only serve to convince skeptics that the many advantages of outsourcing can be realized without undue risk to operational control and competitive effectiveness.

EXHIBIT VII-5




## C

## Leading Systems Operations Vendors

Exhibit VII-6 identifies the leading systems operations vendors in the United States with their estimated market share for 1990.

A market in which the leading vendor controls 14% of the revenue and five vendors combine to control 27% of the revenue is a healthy environment that still offers plenty of opportunity for new vendors. INPUT believes that prospects will strongly shape the market as they begin to relinquish control over their own operations and concentrate on their core business functions. The continuing incentive to reduce costs should also continue to make systems operations an attractive alternative. These prospects will select vendors with strong management skills who demonstrate they can successfully implement a long-term partnership in which both the client and the vendor are winners.

**1. Electronic Data Systems Corporation (EDS) 7171 Forest Lane, Dallas, TX 75230; 214-661-6000**

Electronic Data Systems Corporation, founded in 1962, is a leading information and communications services company providing information processing, consulting, systems management, systems integration, and communications services to the financial, insurance, commercial, and communications industries domestically and internationally. It also provides these services to state and federal government.

EXHIBIT VII-6

**Leading Systems Operations Vendors**

| Vendor | Market Share (Percent) |
|---|---|
| EDS | 14 |
| CSC | 6 |
| Systematics | 3 |
| Affiliated Computing Systems | 3 |
| IBM | 2 |

- EDS currently has more than 60,000 employees and more than 7,000 clients in all 50 states and 27 other countries worldwide.

The company currently operates 21 Information Processing Centers worldwide. The systems operations for many of its customers are conducted at these centers in a multiple-client environment. These IPCs are interlinked via network. The processing load can be shifted from one center to another as the need arises.

There are 122 other data centers operated and owned by EDS throughout the world that serve a single client.

EDS cannot split out of its customer base of 7,000 those for whom it is performing systems operations functions exclusively. The demographics of the customer base are as follows:

- 6,938 commercial clients
- 40 state and local government operations
- 12 federal government agencies

EDS is a supplier to a broad range of industries in the commercial market. EDS also provides systems operations services to federal, state and local government customers. Recent contract examples include the following:

- In August 1990, EDS won a five-year contract to provide life cycle management services of Standard Army Management Information Systems for the Army's Information Systems Software Center at Fort Belvoir (VA). Maximum life cycle value is approximately $116 million.

- In March 1990, EDS was awarded a seven-year, $45 million contract with the U.S. Small Business Administration (SBA) to operate the SBA's Washington data center, which supports 1,700 terminals at SBA offices around the country.

EDS offers financial institutions technology-based business solutions through systems integration, systems operations, and service bureau operations. Products and services include data processing, communications, information management, back office, bank card, and payment services. The company currently serves more than 6,000 banks, credit unions, and savings institutions worldwide.

EDS provides systems operations, processing services, and turnkey systems to commercial insurance companies and Blue Cross/Blue Shield organizations.

- During 1989, EDS processed over 391 million life, health, and casualty insurance claims.

- In March 1990, EDS and American International Healthcare, Inc. (AIH), a subsidiary of American International Group, announced plans to jointly develop and market managed-care information systems for the health insurance marketplace in the U.S. and abroad.

EDS also provides a range of systems operations and professional services to domestic and international clients. EDS was one of the world's first commercial systems operations specialists and has emerged as a major force in both government and commercial markets.

- Examples of recent domestic commercial contracts obtained by EDS include the following:

  - In August 1990, EDS was awarded a ten-year contract with the Permian Corporation to manage Permian's information technology in support of the energy company's oil and gas distribution operations.

  - In April 1990, EDS signed a ten-year contract with Westmoreland Coal Company to assume responsibility for all of Westmoreland's processing and communications operations.

The company has been active in the commercial systems operations arena for 28 years and in the federal government area for 23 years. In the early years the process was known either as facilities management or operations management, but it essentially represents the same set of activities that is now known as systems operations.

Approximately 54% of EDS' total 1990 revenue was derived from its parent company, GM, and 1% was derived from interest and other sources. The remaining 45% ($2.8 billion) of total revenue was derived from clients in various industries, including banking and finance, insurance, manufacturing, retail, distribution, transportation, and energy.

EDS has a strong, active alliance program for its systems operations business. EDS states that through a variety of partnership agreements, they are able to provide customers with greater value through enhanced technological and industry knowledge, resources, products and services. These strategic alliances enable EDS to draw on the strength and expertise of other companies and offer a wider range of service and product offerings to meet customer needs.

The company has in place more than 5,000 vendor contracts with support organizations. Typical of these partnerships are the following:

- ASK Computing, Banc One, and Norwest will do custom application design and development work for EDS clients in their respective fields of manufacturing control, banking and finance, and transportation.
- Earth Observation Satellite Company and Infocel provide their proprietary software to clients through EDS when these specialized products are required.
- Diebold is a provider of maintenance for ATM equipment for banking customers for which EDS does systems operations.

EDS expects to continue to grow significantly in the systems operations market both by expanding penetration in current markets and by entering new markets. In the latter case, the selection criteria to identify new markets will include the size of companies in that sector, the changes occurring in that sector, and how they will influence the receptivity of prospects to systems operations. In addition, the market sector will have to include enough viable prospects to make entry a profitable venture for the company.

EDS, the pioneer in facilities management, has broadened its services and is the clear leader in the commercial systems operations business. Its size, experience, and financial resources will continue to make it a very aggressive and capable competitor in this market.

Its broad vertical market focus and extensive early experience has recently been supplemented with an aggressive acquisition policy in which it has obtained not only major processing contracts, but also a cadre of expertise in such fields as title insurance and airline reservations systems.

**2. Andersen Consulting 69 West Washington Street, Chicago, IL 60602; 312-550-0069**

Andersen Consulting provides technology consulting services to clients in nearly every business and government sector. Andersen helps clients use information competitively in all phases of their management activity — strategic, operations, and financial. In September 1989 Andersen Consulting assumed the operations, activities, and personnel of the former Management Information Consulting practice of Arthur Andersen and Company, which provides accounting, audit, and tax services.

Andersen currently provides systems operations support to approximately 35 commercial customers worldwide, with an average contract value of $10 million. Currently, Andersen derives no systems operations revenues from federal clients. The low profit margins and highly competitive nature of federal systems operations business may be discouraging Andersen's pursuit. However, given the breadth of Andersen's other federal business, Andersen will likely begin providing systems operations to federal agencies.

Andersen has targeted the following vertical industries:

- Energy
- Manufacturing
- Financial Services
- Consumer Products
- State and Local Governments
- Health Care

Although Andersen has operated client data centers as an accommodation for a number of years, it has only been aggressively pursuing this market for two years.

In 1989, Andersen realized $30 million in systems operations revenue. However, it is growing this business very rapidly, currently realizing revenues at an annual rate of approximately $100 million. It considers its primary competitors to be:

- IBM
- EDS
- Regional firms

As might be expected, Andersen is leveraging its extensive experience in other areas to grow its systems operations business. Recently, Andersen captured a $10.2 million contract from the Jet Propulsion Laboratory to implement an integrated management and administration system. The system will become part of JPL's Management and Administrative Support System (MASS) Program.

On another project, Andersen will assist the Ontario Ministry of Consumer and Commercial Relations with a $7 million imaging system project. Andersen will act as the systems integrator in a multiyear effort to develop and operate an optical imaging system to capture the province's more than ten million vital statistical records.

Andersen has also formed a strategic outsourcing alliance with INFONET Services Corporation. The nonexclusive alliance enhances both firms' capabilities to offer communications, computing services, application support, and business operations expertise to meet specific customer needs. The alliance enables Andersen to offer INFONET's global communications network on a preferred basis, which will be very important to its systems operations capabilities.

Andersen expects to expand its systems operations business from both its existing client base as well as through new accounts. It has identified various selection criteria for pursuing new business:

- It is not cost effective for Andersen to pursue small systems operations opportunities. Therefore, it generally pursues only those contracts with a minimum revenue stream of $3 million per year.
- Andersen currently plans to stay with the equipment it already knows. Therefore, it usually limits itself to systems operations projects involving IBM, Amdahl, and/or DEC equipment.
- As previously indicated, Andersen is currently focusing on six vertical industries. Therefore, it pursues work in only those industries where it has the necessary expertise.
- Andersen also prefers to focus on technology-intensive industries and clients, since this is where it believes it can expect a competitive edge.
- Finally, it will focus on those opportunities where it can provide the highest value added, since these typically represent the most profitable projects.

Andersen currently has approximately 10 commercial clients in the U.S., approximately 20 commercial clients in North America, and approximately 35 commercial clients worldwide. As previously indicated, Andersen has no federal clients for systems operations services. The following are typical of Andersen's engagements:

- At the Greyhound Dial Corporation, Andersen manages and performs mainframe-based computer operations, systems software maintenance, and telecommunications.
- At MAXUS Energy Corporation, Andersen manages the entire data processing operation, providing computer operations and technical support, including systems programming and telecommunications support.
- At a large multinational manufacturing company, Andersen is operating the current systems while replacing the company's manufacturing, distribution, and financial systems.

Andersen estimates that the commercial systems operations business is growing 25% annually, while the federal business is growing at 15%. Andersen also believes that operating margins are increasing for commercial work, while remaining fairly flat for federal work. This explains Andersen's decision to focus on the commercial market for systems operations.

Andersen is investing to become a major player in this market. INPUT, therefore, expects it to grow faster than the overall market, and, subsequently, expand into other vertical industries. Essentially, any area in which it has consulting expertise will become a target of its systems operations efforts.

**3. Systematics, Inc. 4001 Rodney Tarham Rd., Little Rock, AR 72212; 501-220-5100**

Systems operations is a major line of business for Systematics. It operates as a subsidiary of ALLTEL Corporation, a provider of communications systems.

Systematics provides a full range of systems operation capabilities to its clients, as well as providing disaster recovery, education and training, and management consulting services. Occasionally Systematics supplements these capabilities with informal alliances, particularly in the areas of applications software, voice response systems, and equipment maintenance services.

The company has developed proprietary software for IBM systems that it provides as a part of the systems operations agreement to reduce the client's investment. It also has proven methods for both data center management and project management that it applies to the conversion and consolidation requirements of its systems operations contracts.

- Systems operations contracts are generally marketed to larger banks, those with deposits ranging from $250 million to $10 billion or more.
  - The computer hardware and data center staff are located in or near the bank.
  - Such contracts usually have a term of five years and include a 99-year nonexclusive license for the client to use the software for internal processing.
  - The company provides facilities management processing services from over 69 company-owned data centers.
- Three of the company's data centers are devoted to serving the 56 currently active remote services contracts.
- Remote services clients may elect to purchase a nonexclusive license to continue use of Systematics' software following the original term of the remote services contract.
- Because processing is done at remote locations that service several clients, it tends to be less customized.

Systematics has concentrated its marketing efforts in the financial sector. Within the financial sector, all of its 948 clients are in the banking and financial area, with service provided to clients that are commercial banks, savings and loan institutions, credit unions, and mortgage and finance companies.

- The majority of Systematics revenue is derived from commercial banks with deposits over $250 million.
  - Systematics began marketing its services internationally in 1987 and derived approximately 5% of its fiscal 1989 revenue from customers located in Europe, Asia, the Pacific, South America, and Canada. Systematics has clients in 17 non-U.S. countries. It has regional offices, handling sales and support in the U.K. and Singapore.

On November 30, 1990, Systematics announced that it had signed a letter of intent to acquire C-TEC Corporation's cellular telephone billing and information system. In addition, C-TEC will enter into a long-term outsourcing arrangement calling for Systematics to provide virtually all data processing services for C-TEC's telephone, cable television, and cellular operations. Under terms of the agreement, Systematics will pay C-TEC for the rights to its Virtuoso™ software, as well as a royalty on new licensing fees during a specified period.

On October 25, 1990, Systematics acquired Computer Dynamics, Inc. (CDI) of Little Rock, Arkansas. CDI operates a mortgage data processing center and provides the applications software to process more than 200,000 loans for 16 financial institutions in six states. The acquisition will allow Systematics to further leverage its loan processing capabilities and will create new growth opportunities. Systematics' software currently processes 2.7 million real estate loans on behalf of financial institutions nationwide.

On May 31, 1990, Systematics merged with Alltel Corporation, a communication company based in Hudson, Ohio, which services 1.1 million customers in 25 states. The prior major stockholder of Systematics, Stephens Group, Inc., agreed to the merger. The agreement strengthens both organizations, both of which are strong financial performers. Systematics, under the new arrangement, gains access to the capital it needs to acquire third-party processing vendors. Alltel, with the merger, expands its activities into the information processing services business, an area in which it can offer complementary communication skills and services.

The company's strategy is to expand in its chosen market, the banking and financial community, rather than to seek markets in other business sectors. Systematics management considers two criteria in its expansion plans:

- Whether they can add value to the application area
- Whether the profit margins are acceptable

Systematics currently derives approximately 85% of its revenue from its existing customer base and adds 15% from new accounts. Most of its new contracts are garnered through direct sales activity in the marketplace, with 20% of the contracts resulting from responses to bid solicitations by prospective clients.

Systematics has concentrated its efforts in the banking and financial sector, providing a broad-based product to institutions of all sizes. Over the past five years, its growth rate has been greater than 15% and it expects to continue growing at that rate in its selected market segment. Its growth strategy includes the acquisition of third-party processing in its market sector, a strategy which will be more achievable since its merger with Alltel has provided it with the necessary capital to expand by acquisition. It presents the prospect client with a conservative, well-managed company, with more than 20 years' experience—a model that generally appeals to decision makers in the banking and finance industry.

VIII

# Software Products Market Analysis

The software products market consists of two major categories: systems software and applications software products, defined as follows:

- Systems software products include systems control, operations management and applications development (including data base management systems and graphical user interfaces) tools.
- Applications software products include industry-specific (e.g. banking, manufacturing, insurance) and cross-industry (accounting, human resources, planning and analysis, etc.) software products.

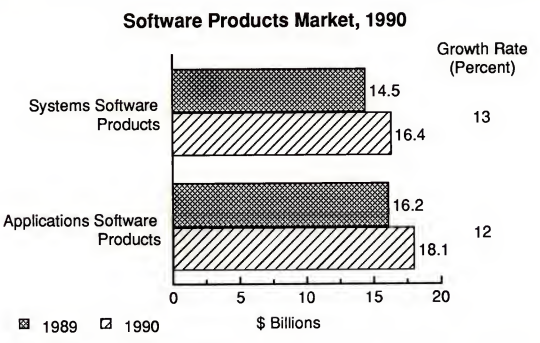
Together these segments represent a market of over $34 billion, or about one-third of the entire information systems and services industry in the United States. These two main categories each represent approximately half of the software products market.

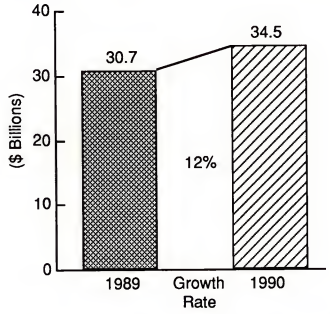
## A Software Products Market, 1990

In 1990, the systems software and applications software products segments grew at about the same rate—13% and 12%, respectively (Exhibit VIII-1).

During 1990, the fastest growing systems software product area was operations management tools, which encompass network administration and control products. In addition to pressures to improve processing efficiency, the trend towards multiplatform, multivendor networks and network integration has begun to fuel the growth of this product area.

EXHIBIT VIII-1




Growth in user expenditures for system control products, the largest product area or submode, was fueled by the introduction of new products including network integration products and products that support standards. Because hardware unit shipments are no longer experiencing the explosive growth of several years ago, hardware shipment rates are no longer a strong growth promoter.

Applications development tools—especially CASE tools—experienced strong growth in 1990 due to the ongoing need to improve software development productivity.

During 1990, the applications software products market felt few if any effects of a slowed economy. The fact that hardware sales were down was offset by pressure on profits at end-user organizations; expensive in-house development projects were put on hold, thus enhancing the possibility for additional external purchases of applications software products.

## B

## Software Products Market, 1991 Outlook

The total software products market is forecast to grow at a compound annual rate of 15% reaching $78 billion by 1996. Over the next few years, growth of the systems software products sector will exceed that for applications software products. Systems software and applications software products will continue to each represent about half of the total.

The next three sections of this chapter will separately describe systems and applications software products trends, issues, and forecasts.

### 1. Systems Software Products

#### a. Trends

The significant changes under way in systems software products are outlined below.

- As more applications are offloaded from the central computing facility, the need to monitor and manage software that has been distributed throughout a corporation expands. Vendors will continue to develop additional operations management products to manage computer systems and/or network resources such as performance monitors, job accounting systems, computer operations scheduling, disk management utilities, and capacity management. Effective ways of managing software distribution will also be required.

- LAN and LAN/WAN integration will be a key trend over the next several years. A market need exists for more robust LAN operating systems and development tools, network management, and data security features.

- Integration of LANs and networks will be an important catalyst for future implementations of client/server technology, distributed DBMSs and UNIX/open systems. Thus, activity will accelerate in these other areas, especially after 1993.

- The impact of standards—whether proprietary such as SAA and NAS, or industry wide such as SQL—continues to grow. Given the eventuality of standards, the cost of switching vendors will become lower. Vendors will therefore seek ways to differentiate through service, pricing, distribution, and/or expertise in a particular niche.

- The UNIX market is becoming established outside the engineering and research areas, but remains modest compared to the total market. Even so, all systems software vendors are continually evaluating the eventuality of providing UNIX products. INPUT research indicates that between 30% and 40% of the potential user base currently uses UNIX—either for commercial or engineering applications. The penetration rate is expected to be between 50% and 60% by 1995. Thus UNIX adoption is growing at a steady but moderate rate.

  UNIX implementation is a strategic decision rather than an isolated experiment. End users are willing to move away from their primary proprietary vendors for a UNIX solution that fits their needs. Thus competitive positioning will change as vendors grapple to maintain account control and take on new customers as well.

- Operating system competition at the desktop level is increasing—OS/2 versus MS-DOS versus the eventual Apple/IBM product.

- Object-oriented programming will gain momentum throughout the forecast period. Object-oriented programming greatly reduces the commands users must give to computers to perform tasks. It will allow programmers to create more sophisticated and easy-to-use software.

- A noticeable shift toward operations management and applications development tools that run on workstations and personal computers is under way; systems control products are more heavily entrenched on the mainframe because of the high mainframe-based operating systems licensing fees.

- The personal computer, through Macintosh and Microsoft Windows technology, has begun to change the human-computer interface. Menus and command languages are quickly becoming technologies of the past. The pressure from the user for yet another improvement in ease of use through graphical user interfaces will justify further purchases of both systems and applications software products.

**b. Issues**

Software has historically lagged behind hardware technology advances; hardware continues to grow in sophistication and decline in price simultaneously creating a host of issues for which systems software vendors must contend with.

- Although a trend towards standards and integration is under way, so too is a trend towards fragmentation of the systems software products arena. Many new products will be developed and in use during the next five years. An issue is how to balance the need for standards—and therefore more commodity-like features and functions—with a need for new innovative and differentiated products and technologies.

- Due to the trend towards standards/integration as well as the need for new products, technology sharing alliances will continue to be important in systems software products. Small companies with less capital are not the only ones that will form alliances, as the recent IBM/Apple joint venture attests. IBM and Apple plan to form a separate company to jointly develop a new operating system for their next generation of personal computers and workstations. The two firms will also design new computer chips, which will be manufactured by Motorola, and work jointly on multimedia technology.

- The competitive horizon will change as IBM flexes its muscles; IBM's goal is for 50% of revenues to be derived from software and services by the year 2000. The competitive horizon will also change as the myriad of smaller specialized vendors establish product niches. These smaller vendors, however, must prove themselves in the support arena if they are to become and remain viable.

- A key issue in systems software products is how best to support and educate the customer. Recent research conducted by INPUT revealed that reputation for support is now the single most important vendor selection criterion in the systems software products arena. Vendors will need to assist purchasers in keeping abreast of new technologies and products.

  - IBM's new Systems Services Division will comprise outsourcing, other facilities management services and disaster recovery support for customers who wish to turn over all or part of their IS management to IBM.

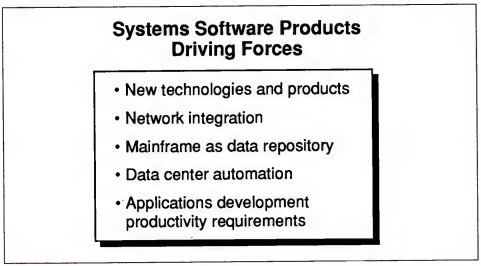
- Systems software and applications software products vendors must grapple with new pricing structures as mainframe offloading and downsizing continues. Their products will be running on more and smaller platforms, and customers will therefore expect lower overall pricing.

- As enterprisewide computing progresses, the selling environment is changing because there will be more buying points within a single customer site. Purchase decisions are becoming much more complex and time consuming, and new sales approaches will be necessary.

### c. Forecast

Given the above trends and issues, Exhibit VIII-2 outlines the key driving forces for systems software products.

EXHIBIT VIII-2




- New technologies/products and user demand for integrated solutions remain the leading factors in sustaining systems software market growth.

- The concept of the primary CPU—the mainframe—as the key corporate data repository will continue to gain acceptance. Along with this acceptance comes awareness of, and need for, more and better mainframe-based systems software products. Even with the increasing interest in client/server architectures and offloading the mainframe, IS managers are anticipating that a large amount of computing will still be done on the mainframe.

- Data center automation also continues to create new systems software product opportunities for numerous companies. In a recent INPUT survey, 53% of respondents cited data center automation as a current objective. This high percentage reflects the continuing concerns of IS managers to improve productivity and reduce costs of their data center operations and implies continued strong growth in the operations management category of systems software products.

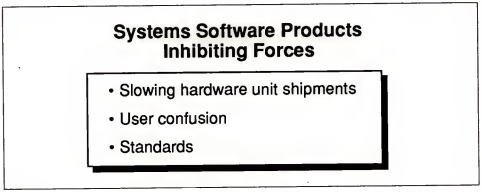
  - This area has become the primary focus of a number of fast-growth companies such as Systems Center, Goal Systems International, and Legent. Through alliances, acquisitions, and new development, these companies are building broad product lines and sustaining significant growth.

  - These software products are increasingly being migrated down to the PC and workstation level.

- Application development backlogs for traditional software products continue to escalate. And only limited progress is being made in applications development for client/server architectures because it is complicated, time consuming, and requires a high degree of coordination. A growing demand for products that improve efficiency of the development process—including data base management systems, CASE tools, and 4GLs—will continue to persist.

Even so, important growth inhibitors, shown in Exhibit VIII-3, will impact systems software products over the next five years.

EXHIBIT VIII-3




- Hardware sales will slow further in the short term. Since software needs hardware on which to run, the growth of the hardware installed base over a multiyear period has a direct impact on systems software product sales.

- Given the wealth of new technologies and products that are forthcoming, the rate of absorption of change is lagging far behind technological advances. The rate of growth of systems software products will depend heavily on vendors' ability to educate and support their customers.

- Overall and in the long term, standards will fuel the demand for new generations of systems software that conform to these standards. In the short term, however, the movement towards standards may have a negative impact as a systems software driver. Key standards are yet to be finalized, and users may postpone large systems software purchases in anticipation of products that adhere to standards.

Exhibit VIII-4 shows INPUT's current projection for growth in 1991 is 12%, which parallels 1990 performance.

Given the above trends, issues, and driving forces however, INPUT's systems software products forecast through 1996 is a more robust 16% CAGR, as presented in Exhibit VIII-5

EXHIBIT VIII-4

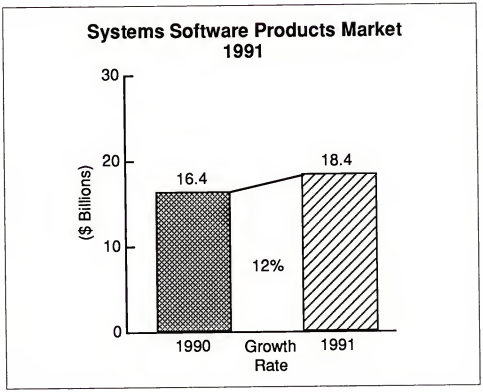
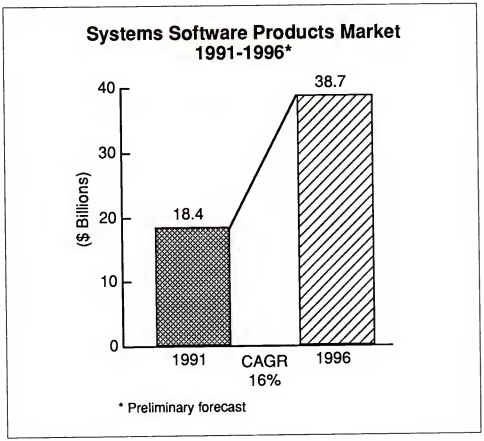



EXHIBIT VIII-5



## 2. Applications Software Products

### a. Trends

- Applications software products as a delivery mode is undergoing significant change as it responds to underlying shifts in technology.
  - The move to smaller hardware platforms and increasing interest in offloading the mainframe of non-mission-critical applications is creating a need for new kinds of applications software products that run on smaller platforms including client/server versions.
  - Greater emphasis is being placed on tieing platforms and existing products together in eventual enterprisewide environments. This is creating a demand for products that span multiple platforms from multiple vendors.
  - Applications software products that conform to UNIX and frameworks such as IBM's SAA and DEC's NAS will continue to become increasingly important as a means to integrate various applications running on various platforms and accessing distributed data bases.
- Service is becoming an increasingly important revenue generator for applications software products vendors. Microsoft's newly formed consulting group for users, Information Technology Integration Services, is an example of the importance vendors are beginning to attach to services.

  Equipment vendors must derive more of their revenue from software and services. Increasing competition in the applications software products arena will come from hardware vendors who are faced with the continuing decline in hardware margins. IBM has clearly made software and service a priority for the 1990s. Digital Equipment created a separate Software Products Group in 1990 and Sun Microsystems reorganized to create two software subsidiaries.
- Consolidation will continue due to the market's interest in interoperability, and smaller vendors will be hard-pressed to survive without forming strategic alliances. Transportable applications—those that run on different vendors' platforms and different sized platforms—will be preferred.
  - Borland's pending acquisition of Ashton-Tate is the most recent and major indication that consolidation is still underway in this industry. A key issue for this pair is the extent to which their product lines will interoperate with one another.

- Applications software products vendors will continue to garner a large portion of their revenues from international sales.
  - Borland's international revenues rose 361% in 1990.
  - Computer Associates' net income from foreign operations was 28% of its total net income for 1990.
  - Microsoft's international sales were 55% of total fiscal 1990 revenues.

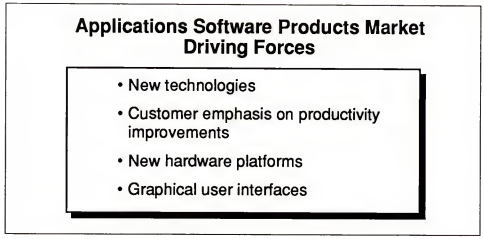
**b. Issues**

- Given the rash of technology changes under way, vendors will need to make decisions about what technologies—e.g., which hardware platforms, which proprietary standards and/or versions of UNIX—and whether to develop a client/server solution, to support.
- How to migrate over to new solutions will be a key issue during the forecast period. Vendors will need to provide a selection of migration strategies that will appeal to a broad customer base. These strategies must obviously include a well-thought-out pricing element.
- Emphasis in the marketplace is clearly on the solution rather than the technology. Vendors will need to beef up their solution selling abilities and respond to customers' specific requirements. Vendors with generalized products will seek out partners who can add verticalization or customization to their product offerings. Users will be considering the underlying technologies, including whether or not to incorporate client/server into their environments, and whether or not to implement UNIX.
- What level of specificity to build into the product and what amount of customization to provide is an issue for the 1990s. Cross-industry products have the advantage of appealing to a broader audience. With emphasis on specificity, however, need is increasing for customized solutions. Applications software products vendors will either have to provide more customized solutions or provide customization tools for their customers.

**c. Forecast**

Given the above trends and issues, several of the significant growth promoters for applications software products over the next five years are listed in Exhibit VIII-6.

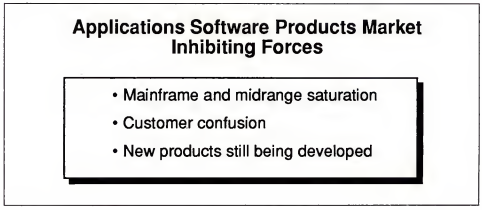
EXHIBIT VIII-6




- As described in the preceding section, new technologies will spawn new applications software products, which in turn will fuel user expenditures.
- A weak economy does not appear to have a negative impact on applications software products expenditures. The selective installation of new applications software products—including downsized solutions—is viewed as a means of minimizing corporate costs and improving productivity. Corporate restructuring through downsizing or acquisition also creates a need for new applications software products.
- New personal computers based on ever more powerful microprocessors creates an environment for more sophisticated and more user-friendly applications software products, including the incorporation of multimedia applications.
- The popularity of graphical user interfaces (GUI) expands the markets for various kinds of applications software products, making more products more accessible to more kinds of workers.

Growth inhibitors are listed in Exhibit VIII-7, below.

EXHIBIT VIII-7



- The declining growth rate in population for mainframes and midrange computers is restricting the market for traditional applications software products.
  - Some of this market is shifting to replacement in support of distributed processing environments or for newer (RDBMS and GUI) technology. The successful vendor must be using the latest application development tools.
  - The movement of application functions to the workstation is lowering the unit cost.
- As with systems software products, the speed with which underlying technology is changing makes for tough choices on what to use for a new application product. Furthermore, the market life of the product becomes shorter. The increased development cost that results may impact development of alternative products.
- New technology-based products to meet specific needs are still on the drawing boards. For example, only a few vendors—such as Ross Systems, Oracle, and Lawson Associates—have made major commitments to supply UNIX-based applications software products. A rash of client/server applications software products are being developed, but very few are yet available. PeopleSoft's PSHRMS human resources software is one of the first suites of client/server products.

Exhibit VIII-8 presents INPUT's projection for applications software products during 1991. The 13% growth is a percentage point above 1990 performance (12%). And as shown in Exhibit VIII-9, INPUT expects slightly increased growth for the 1991-1996 period with a 14% CAGR.

EXHIBIT VIII-8

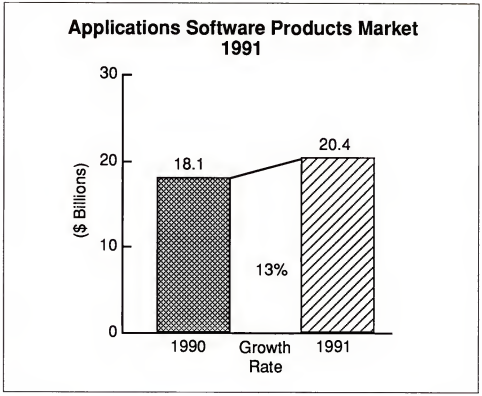
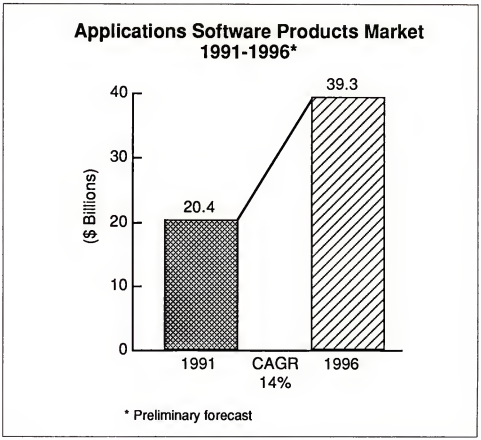



EXHIBIT VIII-9



C

## Leading Software Vendors

Exhibit VIII-10 lists the leading systems software products vendors and their 1990 market shares. Exhibit VIII-11 lists the leading applications software products vendors and their 1990 market shares. Of the thousands of companies with software product offerings, only a handful have a market share greater than 1%. The leader in both categories is IBM.

EXHIBIT VIII-10

**Leading Systems Software Products Vendors**

| Vendor | 1990 Market Share (Percent) |
|---|---|
| IBM | 18 |
| Digital Equipment | 3 |
| Microsoft | 3 |
| Computer Associates | 3 |
| Hewlett-Packard | 2 |
| Oracle | 2 |
| Novell | 2 |
| Unisys | 1 |

EXHIBIT VIII-11

**Leading Applications Software Products Vendors**

| Vendor | 1990 Market Share (Percent) |
|---|---|
| IBM | 4 |
| Dun & Bradstreet | 3 |
| Lotus Development Corp. | 2 |
| Microsoft | 2 |
| WordPerfect | 2 |
| Computer Associates | 1 |
| Groupe Bull | 1 |

The following profiles provide examples of how several vendors are addressing the challenges of the systems software and applications software products markets.

**1. Borland International, Inc. 1800 Green Hills Rd., Scotts Valley CA 95066; 408-438-8400**

Borland's soon-to-be consummated acquisition of Ashton-Tate, for over $400 million, has been met with skepticism by industry watchers who see Borland's first priority as gaining market share, not satisfying customers' interests. The acquisition may be a competitively defensive move against Microsoft, which has had a lock on personal computer software for quite some time. With the acquisition, Borland will have about a 75% share of the PC DBMS market.

The issue in this acquisition is what Borland will do with the two directly competing DBMS product lines—Borland's Paradox and Ashton-Tate's dBASE product.

Borland also has its sights on the corporate data base market and has plans to expand its product line to include minicomputer- and mainframe-based products.

Borland's three major product groups are data bases (Paradox DBMS), spreadsheets (Quattro Pro), and languages (Turbo C, Turbo Pascal, and Turbo Debugger and Tools programs). Borland, along with Lotus and Microsoft, is also a leader in the spreadsheet market.

Borland is a strong proponent of object-oriented programming, which allows the company to build software modules that are resuable across its product lines. IBM and Borland have formed an alliance in which Borland will develop specific object-oriented programming languages and development tools for OS/2 2.0.

Borland's fiscal 1990 revenues were $113.3 million, up 25% from 1989.

**2. Computer Associates International**

Computer Associates (CA) is one of the giants among independent software vendors, surpassed only this year by Microsoft. Fiscal 1990 revenues for CA were $1.3 billion.

Computer Associates has major product lines in both systems and applications software, and on all three platform levels (mainframe, midrange and workstation/PC). According to CA, an estimated 70% of revenues are derived from systems software products, down from 80% one year ago. Well over half of its products are targeted for the IBM mainframe computer. The company needs to bolster its product offerings for smaller platforms.

Growth has been fueled throughout the 1980s by acquisition—CA has acquired at least 20 companies. The two largest acquisitions were Applied Data Research in 1988 and Cullinet in 1989.

So far in the 1990s, however, CA has made only one relatively small acquisition—DBMS, Inc., a provider of DBMS tools for ACIDS. In an effort to bolster its PC-based product offerings, in early 1991 CA acquired Compete, a spreadsheet applications software product from ManageWare Inc. (San Francisco) that runs under Windows.

Now, with more marketplace emphasis on integration and scalability, CA must make sure all product lines will at some point work together. This is the main reason it introduced CA90s—its architectural framework—last year.

CA announced support of DEC's multivendor systems management platform, Polycenter. CA in recent months has announced several NAS-compliant DEC systems management products. These products will be part of CA's strategy for providing systems management across IBM and DEC systems.

CA is also developing Hewlett-Packard's HPUX systems management software, which eventually will be integrated with the DEC and IBM products.

**3. Dun & Bradstreet Software 3445 Peachtree Rd., Atlanta, GA 30326; 404-239-2000**

Dun & Bradstreet Software (DBS), a company of The Dun & Bradstreet Corporation, was formed in March 1990 by the merger of Management Science America (MSA) and McCormack & Dodge (M&D).

This company must also grapple with tieing together various product lines from merged companies. DBS' approach to its next generation of applications software products is to incrementally deliver client/server product lines for ease of migration for current customers. Components of the client/server strategy include relational SQL-based technology, graphical user interfaces—initially using Microsoft Windows 3.0—and groupware-enabled functionality. Its first products will be available in early 1992.

In addition, DBS will also continue to enhance its current product lines. Future plans also call for UNIX and SAA compliancy, object-oriented design, and a global offering for multinational corporations.

As it moves forward, DBS' challenge is explaining how it intends to merge its multiple product lines and how it will migrate its existing customers to its next-generation product.

DBS has been staffing up its Consulting Division; services revenues have grown 25% per year over the last two years and account for an estimated 20% of North America revenues.

**4. Legent Corporation 8615 Westwood Center Drive, Vienna, VA 22182; 703-734-9494**

Legent is an example of a company that has diversified away from strictly operations management products for IBM mainframes, to address heterogeneous environments managed from any IBM mainframe host. Now, in addition to software and services for IBM mainframe and network operations, its systems software technologies can manage other associated information platforms, including those of Digital Equipment Corp., Tandem, and MS-DOS and OS/2. Legent supports IBM's SystemView.

- Netspy is Legent's enterprise-wide performance monitoring system for IBM VTAM hosts down to LAN network servers.
- Legent has contracted Network Intelligence Inc. (Palo Alto) to add LAN management capabilities to its NetSpy network performance monitor which is Legent's top selling product.

Legent recently signed a joint development agreement with Software AG of North America to produce an interface between their change management software products. The interface will let Software AG's Predict Application control and Legent's Endevor/MVS products work together, giving users consistent management over applications built with Software AG's Natural fourth generation language.

To support its aggressive growth strategy through acquisitions, in December 1990, Legent acquired the assets of FlexLINK International Corp. whose MetaNetwork technology is a critical piece in Legent's strategy to extend its systems software solution across heterogeneous environments. Legent's fiscal 1990 (9/30) revenues totaled $170 million, an increase of 25% over 1989.

**5. Microsoft Corp. One Microsoft Way, Redmond, WA 98052 206-882-8080**

Microsoft's calendar 1990 worldwide revenues were $1.4 billion. Fifty-five percent of its revenues are from non-U.S. sources.

Microsoft's recent activities include:

- Microsoft shipped MS-DOS 5.0 in June.
- The company recently released version 3.0 of Excel for OS/2 Presentation Manager.

- Microsoft Windows 3.0 is now a year old. Close to 3 million copies have been shipped worldwide. Some 1,000 applications written by Microsoft and other developers now support Windows.

- Microsoft made two acquisitions in March 1991. These are Diorling, Kindersley Holdings Ltd. of London and Consumers Software Inc. of Vancouver.

- Microsoft is de-emphasizing involvement in OS/2 and has launched development of a new operating system for PCs based on its New Technology kernel.

- Microsoft is under FTC investigation with regard to its relationship to IBM and presumed monopoly of the PC operating system market.

- Microsoft Consulting Services, now one year old, provides consulting and applications development services, much of which is based on Windows 3.0. Custom, on-site education and training is also offered.

**6. Oracle Corp. 500 Oracle Parkway, Redwood Shores, CA 94065 415-506-7000**

Over the last several years Oracle's revenues have grown to such a degree that it is now in the big league of software vendors along with the likes of IBM, Microsoft, and Computer Associates, with revenues close to $1 billion. But this last year, Oracle's reputation suffered from aggressive sales tactics, product bugs, and unconventional accounting practices, not to mentioned a slowdown in demand for its flagship product—ORACLE RDBMS. It has recently received sorely needed funding from Nippon Steel in Japan.

During 1988 and 1989, Oracle expanded its offerings to include financial, manufacturing, and office automation applications software products and systems integration services. In February 1990 it introduced Oracle Personnel—originally developed and marketed in Europe—to the U.S. marketplace.

Oracle's differentiator is its multivendor and multiplatform capabilities and the degree of integration between Oracle FINANCIALS and its other applications software products. Oracle's products run on 27 different platforms. The use of Oracle's own CASE tools, and of course its use of its own ORACLE RDBMS, are also differentiators. Customers can do their own development around Oracle's products using Oracle CASE.

Oracle is striving hard to put its Applications Group on the map in the U.S. market. Oracle is one of the few large companies with a strong repertoire of UNIX applications software products, albeit of a limited breadth. Revenue from the Applications Group was $55 million, or 6% of fiscal 1990 revenues of $972 million; most of the $55 million was from accounting applications software products.

Forty-nine percent of Oracle's 1990 fiscal revenues were non-U.S., and this percentage is edging up.

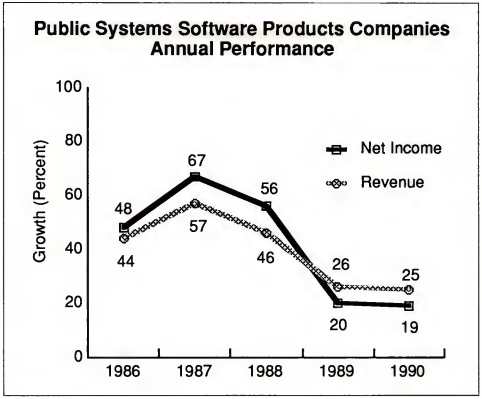
## D

## Public Software Products Company Performance

### 1. Public Systems Software Products Companies

Revenue growth for public systems software products vendors, as shown in Exhibit VIII-12, was 25% in 1990, compared to 26% in 1989, 46% in 1988, and 57% in 1987. The 25% growth was higher than the projected 14% overall growth rate for the systems software products sector.

EXHIBIT VIII-12




- Microsoft, now the largest of the public systems software products vendors, grew 55% during 1990.
- Computer Associates, previously the largest, grew 2% during 1990.
- KnowledgeWare had the most substantial growth for the group at 86%, followed by Borland at 83%.

Earnings growth for this group of vendors slowed to 19% during 1990. Vendors performing well above the group's average included Borland and Novell.

Profitability for this group of vendors for 1990 was 10.9%, well above the 6.8% average for the industry.

Significant changes in this sector include:

- The removal of Ingres Corporation because it was acquired by ASK Computer Systems, an applications software products vendor.

- The early 1991 merger of Index Technology and Sage Software to form Intersolv, Inc.

Exhibit VIII-13 lists the revenue and net income of the public systems software products companies included in the 1990 report.

**2. Public Applications Software Products Companies**

Applications software products vendors have grown steadily during the past few years. In 1990, as shown in Exhibit VIII-15, revenues for the group grew 21% over the previous year.

- The most significant growth (45%) was achieved by Cadence Design Systems, which acquired Gateway Design Automation Corporation in a pooling of interests transaction in December 1989, and Automated Systems, Inc. in July 1990.

- This year, Interleaf's results have been included in the applications software segment of this report. In late 1989, the company announced it was exiting the turnkey systems business and focusing on providing software and services.

During the past five years, growth in earnings has fluctuated continuously. In 1990, earnings declined 11%, compared to earnings growth of 39% for 1989. Results were negatively impacted by:

- Lotus Development, whose earnings dropped 192% due to a charge against earnings associated with the acquisition of Samna Corporation.

- Valid Logic, with $38 million in restructuring costs due to its decision to withdraw from the hardware distribution business.

Profitability for the applications software products group declined to 8% during 1990, but remained above the industry average of 6.8%.

Omitted from the group this year was Stockholder Systems, which was acquired by NYNEX during 1990.

EXHIBIT VIII-13

## Public Systems Software Products Companies
## Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ADOBE SYSTEMS | 121.4 | 168.7 | 39 | 33.7 | 40.1 | 19 |
| ALTAI | 5.6 | 7.3 | 30 | -0.1 | -0.4 | -300 |
| ASHTON-TATE | 265.3 | 230.5 | -13 | -28.6 | -18.1 | 37 |
| BGS SYSTEMS | 20.2 | 22.3 | 10 | 4.0 | 5.1 | 28 |
| BMC SOFTWARE | 82.0 | 125.0 | 52 | 17.9 | 27.8 | 55 |
| BOOLE & BABBAGE | 78.9 | 100.2 | 27 | 5.4 | 4.8 | -11 |
| BORLAND | 104.4 | 190.8 | 83 | 9.7 | 22.6 | 133 |
| COMPUTER ASSOC.[1] | 1,290.2 | 1,310.7 | 2 | 133.2 | 162.0 | 22 |
| GOAL SYSTEMS [2] | 86.4 | 117.0 | 35 | 10.5 | 10.3 | -2 |
| INDEX TECHNOL | 38.0 | 46.7 | 23 | 2.3 | -1.0 | -143 |
| INFODATA SYS | 12.0 | 12.2 | 2 | -0.8 | 0.2 | 125 |
| INFORMIX S/W | 145.0 | 146.1[3] | 1 | 6.4 | -46.4 [3] | -825 |
| INTELLICORP | 23.4 | 17.4 | -26 | 1.3 | -9.3 [4] | -815 |
| KNOWLEDGEWARE | 49.7 [5] | 92.3 | 86 | 8.7 | 11.7 | 34 |
| LEGENT | 142.8 [5] | 180.5 | 26 | 25.4 [5] | 34.7 | 37 |
| MICROSOFT | 952.8 | 1,477.8 | 55 | 210.5 | 355.6 | 69 |
| NOVELL | 429.1 | 526.3 | 23 | 52.6 | 109.7 | 109 |
| ON-LINE S/W | 85.0 | 95.4 | 12 | 3.3 | 3.8 | 15 |
| ORACLE [6] | 753.8 | 1,058.9 | 40 | 88.3 | 57.4 | -35 |
| PANSOPHIC [7] | 201.6 | 234.6 | 16 | 19.8 | -14.7 | -174 |
| PHOENIX TECH | 45.8 | 38.8 | -15 | -15.5 | -18.4 | -19 |
| RABBIT S/W | 5.5 | 8.5 | 55 | -12.8 | -3.3 | 74 |
| SAGE SOFTWARE | 23.9 | 30.9 | 29 | 2.3 | 4.2 | 83 |
| SPINNAKER S/W | 11.3 | 11.2 | -1 | -0.5 | -3.3 | -560 |
| STERLING S/W | 184.4 | 207.0 | 12 | 11.0 | 12.4 | 13 |
| SYMANTEC[8] | 64.9 | 95.3 | 47 | 7.9 | 6.7 | -15 |
| SYNERCOM TECH. | 16.2 | 12.6 | -22 | 1.1 | -0.9 | -182 |
| SYSTEMS CENTER[9] | 78.2 | 105.5 | 35 | 11.9 | -27.9[10] | -334 |
| VERDIX | 10.5 | 13.4 | 28 | 1.6 | 1.5 | -6 |
| Total | 5,328.3 | 6,683.9 | 25 | 610.5 | 726.9 | 19 |

(1) Results have been restated to reflect the pooling-of-interests acquisition of Cullinet in September 1989.

(2) Financials for 1989 have been restated to reflect the pooling-of-interests acquisitions of MVS Software and Essential Software during 1990.

(3) Results for 1990 have been restated to reflect Informix's recent voluntary adoption of a new, more conservative revenue recognition policy, restructuring costs of $6 million, and a net negative cumulative adjustment of $23.3 million for the effect of the change in policy on results from prior years.

(4) Includes a charge of $3.2 million from the cumulative effect of a change in the method of revenue recognition.

(5) Results for 1989 were restated to reflect the pooling-of-interests acquisition of BST, Inc. in November 1989.

(6) Results for certain quarters of calendar 1989 and 1990 have been restated to reflect a change in the method of revenue recognition and related sales expenses.

(7) Results for periods prior to April 1990 have been restated to reflect the disposal of the company's graphics business. Losses for 1990 reflect discontinued operations, (including a Brazilian subsidiary) and reorganization expenses.

(8) Results have been restated to reflect the pooling-of-interests acquisition of Peter Norton Computing.

(9) Results have been restated to reflect the pooling-of-interests acquisitions of Software Developments International and UNITECH Software Inc.

(10) Includes a one-time writedown of marketing rights (NET/MASTER) and restructuring expenses of $23.1 million.

Exhibit VIII-14 lists the revenue and net income of the public applications software products companies included in the 1990 report.

EXHIBIT VIII-14

**Public Applications Software Products Companies Annual Performance**

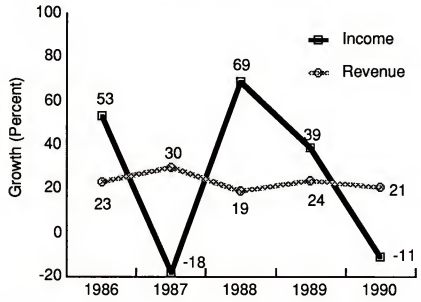


EXHIBIT VIII-15

## Public Applications Software Products Companies Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ALDUS | 98.6 [1] | 135.0 | 37 | 17.1 [1] | 23.8 | 39 |
| AMERICAN S/W | 86.3 | 99.8 | 16 | 17.2 | 17.6 | 2 |
| AUTODESK | 178.6 | 237.9 | 33 | 46.4 | 56.8 | 22 |
| CADENCE DESIGN [2] | 159.9 | 231.4 | 45 | 26.2 | 38.0 | 45 |
| COMSHARE | 94.6 | 115.9 | 23 | 6.3 | 6.4 | 2 |
| CONSILIUM | 25.1 | 33.0 | 31 | 4.2 | 4.9 | 17 |
| CYBERTEK | 24.0 | 28.6 | 19 | 1.8 | 3.3 | 83 |
| FDP | 14.7 | 16.8 | 14 | -0.1 | 0.5 | 600 |
| GENESEE | 1.7 | 1.9 | 12 | 0.2 [3] | 0.1 | -50 |
| HOGAN SYSTEMS | 44.3 [4] | 44.8 | 1 | 5.3 [4] | 0.1 | -98 |
| INFO SCIENCE | 13.8 | 12.0 | -13 | -0.4 | 0.0 | 100 |
| INTERLEAF | 114.8 | 84.1 | -27 | -15.6 | -2.1 | 87 |
| LOTUS DEVELOP | 556.0 | 684.5 | 23 | 68.0 [5] | 23.3 [6] | -66 |
| MACNEAL SCHWEND | 45.0 | 56.6 | 26 | 9.8 | 11.8 | 20 |
| POLICY MGMT | 265.6 | 346.1 | 30 | 26.8 | 37.2 | 39 |
| SILVAR-LISCO | 13.6 | 10.9 | -20 | -6.1 | 0.0 | 100 |
| SOFTWARE PUB | 110.4 | 153.5 | 39 | 18.8 | 20.6 | 10 |
| S/W SVC AMER. | 3.2 | 3.0 | -6 | -0.7 | -1.1 | -57 |
| STRUCTURAL DYNAM | 93.6 | 118.6 | 27 | 9.8 | 13.3 | 36 |
| SYSTEM SOFT ASSOC | 98.6 | 129.6 | 31 | 12.1 | 17.1 | 41 |
| TIMBERLINE S/W | 10.7 | 12.7 | 19 | 0.8 | 0.4 | -50 |
| VALID LOGIC | 173.9 | 158.5 | -9 | 10.0 | -44.1 [7] | -541 |
| WICAT SYSTEMS | 44.5 | 51.4 | 16 | 0.2 | 2.7 | 1,250 |
| WORDSTAR | 41.9 | 36.4 | -13 | -3.3 | -3.2 | 3 |
| Total | 2,313.4 | 2,803.0 | 21 | 254.8 | 227.4 | -11 |

(1) Restated to reflect the pooling-of-interests acquisition of Silicon Beach Software in February 1990.
(2) All amounts have been restated to reflect the pooling-of-interests acquisitions of Gateway Design Automation Corporation in December 1989 and Automated Systems, Inc. in July 1990.
(3) Includes a net gain of nearly $70,000 from the sale of a building.
(4) Results for 1989 were restated to reflect the sale of Hogan's BankVision product line.
(5) Includes a pretax gain of $6.8 million from the sale of Lotus Information Network Corporation, a provider of real-time stock market information using FM-sideband technology.
(6) Includes a one-time charge against earnings of $53 million associated with the acquisition of Samna Corporation in December 1990.
(7) Includes restructuring costs of $38.0 million associated with the company's decision to withdraw from the hardware distribution business.

### 3. Personal Computer versus Other Software Products Companies

Exhibit VIII-16 provides a summary comparison of the revenue and net income performance of two groups of public software products companies, personal computer software products companies and other software products companies. The companies included in the personal computer group include only those companies that receive the dominant share of their revenue from true personal computer software products.

EXHIBIT VIII-16

**Personal Computer versus Other Software Products Companies**

| | Revenue Change (Percent) | Net Income Change (Percent) |
|---|---|---|
| Personal computer companies | 33 | 52 |
| Other companies | 18 | -27 |

- For example, CASE product vendors such as Index Technology and KnowledgeWare were included in the "other" category since their products, while operating on a personal computer, are tied to the development of more traditional mainframe and minicomputer systems.

Exhibits VIII-17 and VIII-18 list public software products companies by personal computer and "other," respectively.

Performance, for revenue and net income, is substantially better for the personal computer companies than for all other companies.

- The performance of Microsoft and Novell are major factors in the excellent performance of personal computer software products companies.

- Ashton-Tate is the largest company in the personal computer software products category having a negative impact on this group's performance.

- A number of significant companies in the "other" category recorded lower growth rates in net income in 1990. Included are Systems Center, Informix, and Oracle.

- The largest company in the "other" category, Computer Associates, recorded a 22% increase in net income in 1990.

EXHIBIT VIII-17

## Public Personal Computer Software Products Companies Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ADOBE SYSTEMS | 121.4 | 168.7 | 39 | 33.7 | 40.1 | 19 |
| ALDUS | 98.6 | 135.0 | 37 | 17.1 | 23.8 | 39 |
| ASHTON-TATE | 265.3 | 230.5 | -13 | -28.6 | -18.1 | 37 |
| AUTODESK | 178.6 | 237.9 | 33 | 46.4 | 56.8 | 22 |
| BORLAND | 104.4 | 190.8 | 83 | 9.7 | 22.6 | 133 |
| LOTUS DEVELOP | 556.0 | 684.5 | 23 | 68.0 | 23.3 | -66 |
| MICROSOFT | 952.8 | 1,477.8 | 55 | 210.5 | 355.6 | 69 |
| NOVELL | 429.1 | 526.3 | 23 | 52.6 | 109.7 | 109 |
| PHOENIX TECH | 45.8 | 38.8 | -15 | -15.5 | -18.4 | -19 |
| RABBIT S/W | 5.5 | 8.5 | 55 | -12.8 | -3.3 | 74 |
| SOFTWARE PUB | 110.4 | 153.5 | 39 | 18.8 | 20.6 | 10 |
| SPINNAKER S/W | 11.3 | 11.2 | -1 | -0.5 | -3.3 | -560 |
| SYMANTEC | 64.9 | 95.3 | 47 | 7.9 | 6.7 | -15 |
| TIMBERLINE S/W | 10.7 | 12.7 | 19 | 0.8 | 0.4 | -50 |
| WICAT SYSTEMS | 44.5 | 51.4 | 16 | 0.2 | 2.7 | 1250 |
| WORDSTAR | 41.9 | 36.4 | -13 | -3.3 | -3.2 | 3 |
| Total | 3,041.2 | 4,059.3 | 33 | 405.0 | 616.0 | 52 |

EXHIBIT VIII-18

## Other Public Software Products Companies
## Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ALTAI | 5.6 | 7.3 | 30 | -0.1 | -0.4 | -300 |
| AMERICAN S/W | 86.3 | 99.8 | 16 | 17.2 | 17.6 | 2 |
| BGS SYSTEMS | 20.2 | 22.3 | 10 | 4.0 | 5.1 | 28 |
| BMC SOFTWARE | 82.0 | 125.0 | 52 | 17.9 | 27.8 | 55 |
| BOOLE & BABBAGE | 78.9 | 100.2 | 27 | 5.4 | 4.8 | -11 |
| CADENCE DESIGN | 159.9 | 231.4 | 45 | 26.2 | 38.0 | 45 |
| COMPUTER ASSOC. | 1,290.2 | 1,310.7 | 2 | 133.2 | 162.0 | 22 |
| COMSHARE | 94.6 | 115.9 | 23 | 6.3 | 6.4 | 2 |
| CONSILIUM | 25.1 | 33.0 | 31 | 4.2 | 4.9 | 17 |
| CYBERTEK | 24.0 | 28.6 | 19 | 1.8 | 3.3 | 83 |
| FDP | 14.7 | 16.8 | 14 | -0.1 | 0.5 | 600 |
| GENESEE | 1.7 | 1.9 | 12 | 0.2 | 0.1 | -50 |
| GOAL SYSTEMS | 86.4 | 117.0 | 35 | 10.5 | 10.3 | -2 |
| HOGAN SYSTEMS | 44.3 | 44.8 | 1 | 5.3 | 0.1 | -98 |
| INDEX TECHNOLOGY | 38.0 | 46.7 | 23 | 2.3 | -1.0 | -143 |
| INFODATA SYS. | 12.0 | 12.2 | 2 | -0.8 | 0.2 | 125 |
| INFORMIX S/W | 145.0 | 146.1 | 1 | 6.4 | -46.4 | -825 |
| INFO SCIENCE | 13.8 | 12.0 | -13 | -0.4 | 0.0 | 100 |
| INTELLICORP | 23.4 | 17.4 | -26 | 1.3 | -9.3 | -815 |
| INTERLEAF | 114.8 | 84.1 | -27 | -15.6 | -2.1 | 87 |
| KNOWLEDGEWARE | 49.7 | 92.3 | 86 | 8.7 | 11.7 | 34 |
| LEGENT | 142.8 | 180.5 | 26 | 25.4 | 34.7 | 37 |
| MACNEAL SCHWEND | 45.0 | 56.6 | 26 | 9.8 | 11.8 | 20 |
| ON-LINE S/W | 85.0 | 95.4 | 12 | 3.3 | 3.8 | 15 |
| ORACLE | 753.8 | 1,058.9 | 40 | 88.3 | 57.4 | -35 |
| PANSOPHIC | 201.6 | 234.6 | 16 | 19.8 | -14.7 | -174 |
| POLICY MGMT | 265.6 | 346.1 | 30 | 26.8 | 37.2 | 39 |
| SAGE SOFTWARE | 23.9 | 30.9 | 29 | 2.3 | 4.2 | 83 |
| SILVAR-LISCO | 13.6 | 10.9 | -20 | -6.1 | 0.0 | 100 |
| S/W SVC. AMER. | 3.2 | 3.0 | -6 | -0.7 | -1.1 | -57 |
| STERLING S/W | 184.4 | 207.0 | 12 | 11.0 | 12.4 | 13 |
| STRUCTURAL DYNAM | 93.6 | 118.6 | 27 | 9.8 | 13.3 | 36 |
| SYNERCOM TECH. | 16.2 | 12.6 | -22 | 1.1 | -0.9 | -182 |
| SYSTEMS CENTER | 78.2 | 105.5 | 35 | 11.9 | -27.9 | -334 |
| SYSTEM SOFT ASSOC. | 98.6 | 129.6 | 31 | 12.1 | 17.1 | 41 |
| VALID LOGIC | 173.9 | 158.5 | -9 | 10.0 | -44.1 | -541 |
| VERDIX | 10.5 | 13.4 | 28 | 1.6 | 1.5 | -6 |
| Total | 4,600.5 | 5,427.6 | 18 | 460.3 | 338.3 | -27 |


# Turnkey Systems Market Analysis

INPUT defines a turnkey system as an integration of equipment, systems software, packaged or custom applications software, and professional services into a offering that meets a specific set of user requirements. The professional services portion of the offering can include anything from traditional maintenance and support to customization and systems integration activities. The distinction between a turnkey system vendor and a VAR has become fuzzy, and the two terms are used interchangeably.

Hardware vendors 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 delivery mode.

## A Turnkey Systems Market, 1990

As indicated in Exhibit IX-1, the VAR/turnkey systems market grew by 9% in 1990.

This 9% growth compares to a 12% growth for the information services market as a whole. VAR/turnkey systems market growth is slower than the industry at large primarily due to its particular reaction to a weak economy and the continuing decline in hardware margins.

- VARs and turnkey vendors that sell predominantly to small companies—such as the many VARs that sell to business services firms—experienced the adverse effects of an economic downturn because smaller firms are the first to cut back on capital expenditures. The majority of VARs/turnkey vendors sell to small businesses.

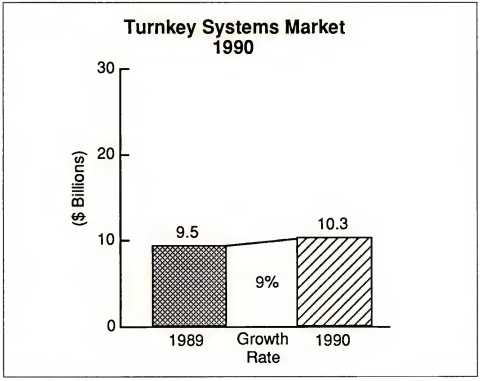
- In 1990, turnkey vendors that sold to manufacturing vertical markets felt the negative impacts of a weakened economy as capital expenditures were delayed. Because spending on turnkey systems by the

manufacturing sectors—principally CAD/CAM products and resource planning—accounts for a large percentage of total expenditures on turnkey systems (36%), whatever impacts the manufacturing sectors' health also affects turnkey systems vendors' health.

- Turnkey and VAR service contracts and support services, however, were not adversely affected by a weak economy. In fact, this portion of their business expanded as customers sought ways to leverage the products they already had.

- Declining hardware prices and profit margins are not new issues for turnkey systems vendors; they have been plagued with these issues since the introduction of the personal computer. As personal computers became more readily available at lower prices and through alternative distribution channels—including mail order, discount houses, and now, superstores—the advantages of turnkey solutions were eroded. Thus user expenditures on the hardware component of turnkey systems advanced slowly in 1990 and will continue to decline as a portion of overall turnkey systems expenditures.

EXHIBIT IX-1




This slow growth rate of the equipment portion of turnkey systems was a major growth inhibitor of this delivery mode for 1990. Hardware sales have become so price driven that many VARs simply cannot afford to compete.

B

Turnkey Systems Market, 1991 Outlook

## 1. Trends

The traditional VAR/turnkey system vendor develops its own applications software products for a single hardware vendor's platform. However, this delivery mode is in the throes of redefining its business. The changes underway are as follows:

- As UNIX and open systems gain momentum, turnkey vendors and VARs will be selling more third-party software rather than their own internally developed software. The reason for this is that it may be too costly and time consuming for many VARs to rely soley on rewriting their own software so that it willl run under UNIX and on multiple vendors' platforms. The smaller VARs especially do not have the technical expertise required to do these rewrites. Independent software vendors will be quick to oblige as they seek channels for their new software products.

- VARs are beginning to end their relationships with hardware manufacturers and are turning to distributors and affiliate relationships to capture the best possible prices on microcomputer hardware. Also as UNIX and open systems gain momentum, turnkey vendors and VARs will lessen their dependence upon, and allegiance to, a single vendor's hardware. Many turnkey vendors will opt to provide software that is multivendor and multiplatform.

- As lower-end PCs are increasingly routed through other third party channels, turnkey vendors and VARs will look to more sophisticated hardware, including client/server configurations, to bolster their sagging profits.

Hardware vendors are courting VARs to sell their new technologies. They are launching new programs not only to gain back their allegiance but also, importantly, to assist VARs in selling these new products. Hewlett-Packard, for example, has a new Enterprise Computing Solutions program to assist integrators and VARs in migrating mainframe customers to client/server computing schemes designed around its products and services. Many of the equipment vendors do not yet have the internal capability themselves to offer the network integration services and support needed to put together the enterprise-wide computing environment their customers need; alternative distribution channels will take on an increasingly important role for them.

- VARs and turnkey vendors will continue to provide more of the service content of their offerings as the demand for increasingly sophisticated software creates a need for service in the form of customization, training, and support.

- More systems integration and consulting work will also be part of the VAR/turnkey vendor's service offerings in response to the need to link disparate, enterprise-wide systems.

- It will become increasingly difficult to distinguish between VARs and network or systems integrators, which will cause channel confusion over the short term. Systems integration work is more of a project-by-project business that requires more flexible pricing and configuration terms compared to traditional VAR programs.

- As VARs/turnkey vendors respond to the shifting technology foundation, they are also faced with the question of whether to expand into additional vertical markets or take a more focused approach to their existing vertical sector markets. They must also evaluate on an ongoing basis whether to expand nationally, internationally, or stay local/regional in scope. They may also choose to form alliances with other VARs.

### 2. Issues

Given the above trends, some of the key issues VARs and turnkey vendors are grappling with are:

- VARs must decide whether to exit the hardware business and sell only software or to take on more sophisticated hardware. The declining profit margins on personal computers and erosion of minicomputer sales have prompted many VARs to return to their roots and concentrate heavily on applications software as their primary profit opportunity. Taking on more sophisticated hardware must be accompanied by new or rewritten applications software products.

- VARs must decide whether to port their own applications software products to multiple platforms or spend resources to provide more functionality for a single platform. They must decide whether and how to update their software to work with GUIs, client/server configurations, and UNIX—and what version(s) of UNIX.

- Given the shifting technology foundation, some VARs may opt to exit the turnkey business and sell service only. Many will elect to take on more of a systems integrator role.

### 3. 1991 Forecast

Given the above trends and issues, Exhibit IX-2 outlines the key driving forces or growth promoters for this delivery mode. In addition to new opportunities created by new hardware and software and renewed emphasis on third-party channels, the ever-increasing power of workstations and personal computers continues to broaden the market for turnkey

systems vendors and VARs. Also, emphasis will increasingly be on the provision of a solution—the VAR/turnkey vendor domain—rather than the provision of technology.

EXHIBIT IX-2

**Turnkey Systems Market Driving Forces**

- Shifting technology foundation creates new opportunities
- Hardware vendors emphasize third-party channels
- Downsizing fuels VAR/turnkey business
- Emphasis on solution selling

Even with these strong growth promoters a number of factors, listed in Exhibit IX-3, will inhibit growth.

EXHIBIT IX-3

**Turnkey Systems Market Inhibiting Forces**

- Weak economy
- Declining hardware margins
- Transitional issues
- New competition from LAN integrators, systems integrators, other third parties

INPUT expects the growth for this delivery mode to remain at 9% for 1991, reaching $11.2 billion by year end (Exhibit IX-4). INPUT also forecasts a 9% growth rate through 1996 (Exhibit IX-5) as VARs and turnkey vendors transit to new technologies.

EXHIBIT IX-4

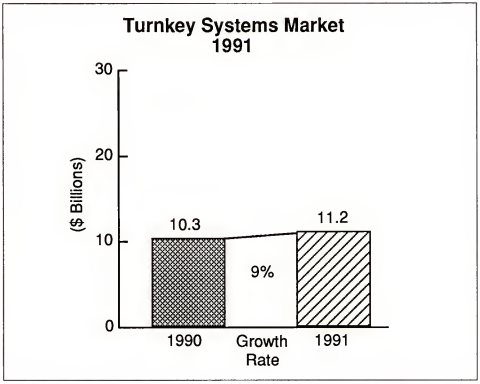
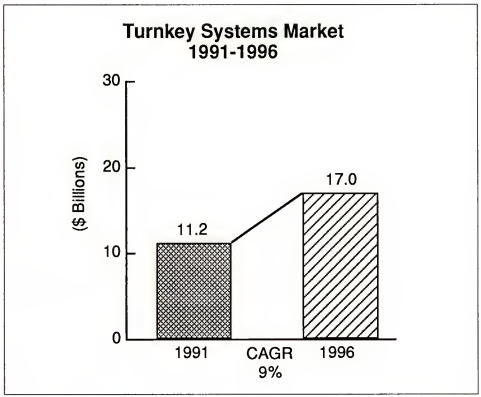



EXHIBIT IX-5



C

## Leading Turnkey Systems Vendors

The turnkey systems delivery mode consists of a large number of vendors (over 7,000), but only a modest number (perhaps 150) have annual revenues over $10 million. The vast majority have revenues under $2 million.

Exhibit IX-6 lists some of the leading turnkey vendors and their 1990 market shares. These companies have been in existence for many years and play strong roles in one or more vertical industry sectors.

EXHIBIT IX-6

**Leading Turnkey Systems Vendors**

| Vendor | 1990 Market Share (Percent) |
|---|---|
| Intergraph | 5 |
| Mentor Graphics | 2 |
| Reynolds & Reynolds | 2 |
| Schlumberger | 2 |
| Gerber Scientific | 1 |
| Triad Systems | 1 |

The following profiles provide examples of how several vendors are addressing the challenges of the VAR/turnkey systems market.

**1. Intergraph Corporation One Madison Industrial Park, Huntsville, AL 35807-4201; 205-730-2000**

Intergraph is a turnkey supplier of systems that support design, drafting, and analysis functions. Its four main markets are architectural and civil engineering, geographical and mapping information systems, mechanical design, and federal systems. Revenues for the fiscal year ending December 1990 increased 21% to $1,044.6 million. Net income decreased 21%.

Since 1984, Intergraph has based its turnkey systems on a proprietary CLIPPER RISC-based hardware platform that runs under Intergraph's UNIX operating system. Intergraph builds the chip for itself and a handful of customers. INPUT believes it will become increasingly difficult for Intergraph to sell these systems to a market that will increasingly favor open systems and standards.

All Intergraph software is compatible across all of its CLIPPER hardware platforms. Intergraph has a marketing alliance with Informix whereby

Intergraph sells Informix RDBMS products. Intergraph products are integrated and based on the Informix RDBMS. Intergraph also resells Oracle and ASK/Ingres RDBMS products.

In late 1990, Intergaph acquired Dazix/Cadnetix, Inc., a supplier of electronic design automtion software. This year Intergraph entered into an agreement with Sun Microsystems whereby Sun's SPARC systems will be resold with the DAZIX software. Intergraph may have to expand the role of Sun's platforms for its turnkey systems for long-term, broader appeal.

**2. Shared Medical Systems Corporation 51 Valley Stream Parkway, Malvern, PA 19355; 215-296-6300**

Shared Medical Systems (SMS) provides financial systems (billing, budgets, cost accounting), patient management systems, and clinical systems designed for a wide variety of medical departments. Thus, its systems serve both clinical and financial functions, in some cases operating in a mixed mode where clinical information is entered and used on local, distributed computer systems for direct needs and then uploaded to SMS processing centers for aggregation—especially to meet financial needs for accountability. SMS resells IBM and DEC hardware.

SMS is positioning itself to lead the industry in three key technologies for the 1990s. First, it is using the latest LAN communication technologies to integrate both existing departmental computer systems and newly installed systems. Second, SMS sees image processing, using optical disc technology, as very important, especially in changing the use of information systems by departments like radiology. Third, it is committed to RDBMS technology as the key to increasing the accessibility of informations systems.

**3. Triad Systems Corporation 3055 Triad Drive, Livermore, CA 94550; 415-949-0606**

Triad is a turnkey supplier to three vertical markets: automotive parts aftermarket, retail hardgoods dealers, and dental. Triad resells IBM and ATT/NCR hardware as well as its own proprietary hardware.

The company also provides automotive parts pricing and catalog updating data base electronic information services. It also provides lease financing to a substantial portion of its customers through its wholly owned subsidiary, TSC Leasing Corporation.

Fiscal 1990 revenues were $144.7 million, down from $148 million in 1989. Service revenues rose 5%, whereas revenues from its Automotive Division, Hardgoods Division and Dental Division all decreased. Its data base electronic information services revenue rose 29%. Revenues from system sales declined 23%.

The company's strategy is to increase its installed base through greater penetration of its three vertical markets.

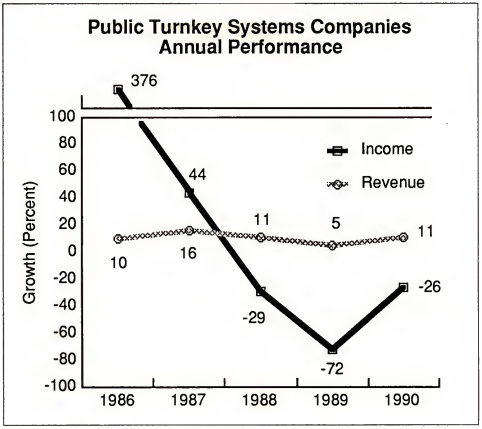
## D

### Public Turnkey Systems Company Performance

Revenue growth for VAR/turnkey systems vendors has been moderate to low during the past five years, as indicated by Exhibit IX-7.

Revenue grew 11% for these vendors in 1990, compared to 5% in 1989 and 11% in 1988. The most significant contributors to the growth in 1990 were C3, Terrano, Corporate Software, and ASK Computer Systems.

EXHIBIT IX-7




Earnings growth for the VAR/turnkey systems group has been somewhat volatile during the past five years. In 1990, earnings declined 26%, after falling 72% during 1989.

In 1990, profitability for the group ran below the average for information services vendors overall. The group earned 3.0% on the revenues it generated, compared to the industry average of 6.8%.

Note that Daisy Systems was removed from the list of public VAR/turnkey systems vendors because it was undergoing bankruptcy proceedings. Comptek Research was moved to the government professional services category.

EXHIBIT IX-8

## Public Turnkey Systems Companies
## Revenue and Net Income

| Company Name | Revenue | | | Net Income | | |
|---|---|---|---|---|---|---|
| | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) | 1989 ($ Million) | 1990 ($ Million) | Change (Percent) |
| ASA INT'L. | 23.8 | 18.7 | -21 | 0.5 | 0.3 | -40 |
| ASK COMP. SYS.[1] | 189.6 | 249.7 | 32 | 9.3 | 4.7 | -49 |
| AUTO-TROL TECH. | 76.9 | 77.2 | 0 | -4.4 | -2.1 | 52 |
| BARRISTER INFO. | 31.0 | 26.4 | -15 | -7.1[2] | -3.5 | 51 |
| C3 | 57.6 | 90.3 | 57 | -19.3[3] | -0.4[4] | 98 |
| CERNER | 56.7 | 51.3 | -10 | 3.6 | 1.6 | -56 |
| COMPUTER RESEARCH | 11.4 | 11.3 | -1 | -0.1 | -0.3 | -200 |
| COMPUTRAC | 13.4 | 10.6 | -21 | 1.8 | 0.1 | -94 |
| CORPORATE S/W | 135.5 | 197.0 | 45 | 3.2 | 3.6 | 13 |
| DELPHI INFO. SYSTEMS | 20.1 | 23.1 | 15 | -1.9 | 1.5 | 179 |
| FILENET | 83.1 | 102.9 | 24 | 3.0 | 3.8 | 27 |
| GERBER SCIENTIFIC | 306.1 | 279.8 | -9 | 33.2 | 15.1 | -55 |
| HBO | 203.6 | 201.5 | -1 | 15.5 | 7.1[5] | -54 |
| INTERGRAPH | 860.1 | 1,044.6 | 21 | 79.5[6] | 62.6 | -21 |
| IVERSON | 60.3 | 49.5 | -18 | 1.3 | -6.1 | -1,374 |
| REYNOLDS & REYNOLDS | 594.4[7] | 607.3 | 2 | 26.3 | 22.0 | -16 |
| TERRANO | 4.9 | 6.6 | 35 | 0.4 | 0.8 | 100 |
| TRIAD SYSTEMS | 148.9 | 143.7 | -3 | 2.7 | 3.4 | 26 |
| XYVISION | 35.0 | 29.1 | -17 | -17.1 | -18.1[8] | -6 |
| Total | 2,912.4 | 3,220.6 | 11 | 130.4 | 96.1 | -26 |

(1) Includes the results of Ingres Corporation from the date of its acquisition in 1990.
(2) Restated to include a $318,000 loss on the subleasing of excess office space.
(3) Includes interest expenses of over $12 million associated with loans used to finance the C3 acquisition by Knoll Capital Management L.P.
(4) Includes an extraordinary gain of $23.1 million resulting from a financial restructuring of the company during mid-1990.
(5) Includes a nonrecurring charge of $3.1 million related to the discontinuance of HBO's clinical equipment maintenance and refurbishment businesses.
(6) Includes $13.5 million in pretax gains on the sale of long-term investments.
(7) Restated to reflect a change in the method of accounting for majority-owned subsidiaries.
(8) Includes $6.9 million in restructuring charges and write-downs of assets to phase out the company's proprietary hardware manufacturing business.

# 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 A-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.

The changes made in INPUT definitions this year are as follows:

- *Systems Operations Submodes* - the submodes of systems operations have been redefined from processing services and professional services to platform systems operations and applications systems operations.
- *Business Services Industry* - the industry sectors of business services and personal services have been combined into a single business services sector.
- *Transportation Industry* - the information services expenditures relating to airline reservation systems have been returned to the transportation sector where they resided prior to 1990.

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:

- Processing of specific applications using vendor-provided systems (called *Processing Services*)
- A combination of hardware, packaged software and associated support services which will meet a specific application processing need (called *Turnkey Systems*)
- Packaged software products, either 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*)
- Bundled combinations of products and services where the vendor assumes total responsibility for the development of a custom solution to an information systems problem (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 associated with the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange, on-line data bases, on-line news and data feeds, etc. (called *Network Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is bundled as 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., EDI or VAN 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 eight delivery modes defined by INPUT, five are considered primary products or services:

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

The remaining three delivery modes represent combinations of these products and services, bundled together 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 users who purchase 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. Other**

*Outsourcing* is defined as the contracting of information systems functions to outside vendors. Outsourcing should be viewed as the opposite of *insourcing*: anything that information systems management has considered feasible to do internally (e.g., data center operations, applications development and maintenance, network management, training, etc.) is a potential candidate for outsourcing.

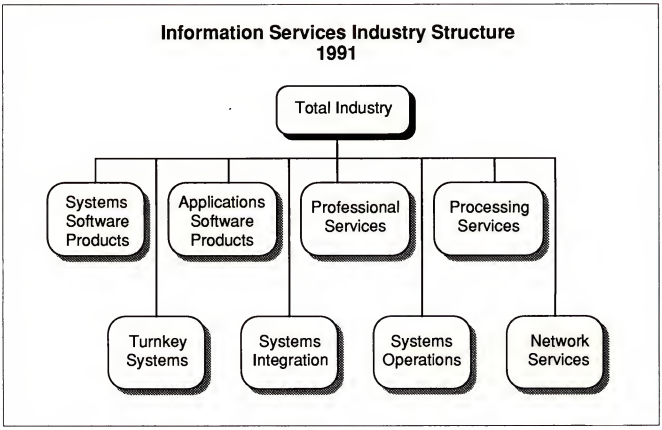
Information systems has always bought systems software, as it is infeasible for companies to develop it internally. However, all other delivery modes represent functions or products that information systems management could choose to perform or develop in-house. Viewed this way, outsourcing is the result of a make-or-buy decision, and the outsourcing market covers any product or service where the vendor must compete against the client firm's own internal resources. Therefore, the entire information services industry can be considered an outsourcing market.

## C

## Delivery Modes and Submodes

Exhibit 1 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.

EXHIBIT A-1




### 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 user 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 bundled in 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 counted as professional services, provided such fees are charged separately from the price of the software product itself.

### 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.

- *Systems Control Products* - Software programs that function during application program execution to manage computer system resources and control the execution of the application program. 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. Also included are system utilities (e.g., sorts) which are directly invoked by an applications program.

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 submodes.

- *Industry-Specific 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.

**2. Turnkey Systems**

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom application 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 support services provided. 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.

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

**3. Processing Services**

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

- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process transactions and update client data bases. Transactions may be entered in one of four modes:

- *Interactive* - Characterized by the interaction of the user with the system for data entry, transaction processing, problem solving and report preparation: the user is on-line to the programs/files stored on the vendor's system.

- *Remote Batch* - Where the user transmits batches of transaction data to the vendor's system, allowing the vendor to schedule job execution according to overall client priorities and resource requirements.

- *Distributed Services* - Where users maintain portions of an application data base and enter or process some transaction data at their own site, while also being connected through communications networks to the vendor's central systems for processing other parts of the application.

- *Carry-in Batch* - Where users physically deliver work to a processing services vendor.

- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and/or data bases, enabling clients to develop 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 was a new delivery mode introduced in the 1990 Market Analysis and Systems Operations programs. It was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1991 the submodes have been redefined as indicated below.

Systems operations involves the operation and management of all or a significant part of the user'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, often including telecommunications networks, without taking responsibility for the user's application systems.

- *Applications systems operations* - the vendor manages and operates the computer systems, often including telecommunications networks, and is also responsible for maintaining, or developing and maintaining, the user's application systems.

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).

The ownership of the equipment, which was the previous basis for the systems operations submodes, is no longer considered critical to the commercial market. Most of the market consists of systems operations relationships using vendor-owned hardware. What is now critical is the breadth of the vendor/client relationship as it expands beyond data center management to applications management.

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 user's information systems (equipment, networks, systems and/or application software), either at the client's site or the vendor's site. Systems operations can also be referred to as "resource management" or "facilities management."

**5. Systems Integration (SI)**

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation 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.

To be included in the information services market, systems integration projects must involve some application processing component. In addition, the majority of cost must be associated with information systems products and/or services.

- *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, 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 easily 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.

Systems integrators perform, or manage others who perform, most or all of the following functions:

- Program management, including subcontractor management
- Needs analysis
- Specification development
- Conceptual and detailed systems design and architecture
- System component selection, modification, integration and customization
- Custom software design and development
- Custom hardware design and development
- Systems implementation, including testing, conversion and post-implementation evaluation and tuning
- Life cycle support, including
  - System documentation and user training
  - Systems operations during development
  - Systems maintenance

**6. Professional Services**

This category includes three submodes: consulting, education and training, and software development.

- *Consulting:* Services include management consulting (related to information systems), 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:* Products and services related to information systems and services for the professional and end user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation.

- *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.

### 7. Network Services

Network services typically include a wide variety of network-based functions and operations. Their common thread is that most of these functions could not be performed without network involvement. Network services is divided into two submodes: *Electronic Information Services,* which involve selling information to the user, and *Network Applications,* which involve providing some form of enhanced transport service in support of a user's information processing needs.

#### 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 typically inquire into and extract information from the data bases. Although users may load extracted data into their own computer systems, the electronic information vendor provides no data processing or manipulation capability and the users cannot update the vendor's data bases.

The two kinds of electronic information services are:

- *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

- *News Services* - Unstructured, primarily textual information on people, companies, events, etc.

While electronic information services 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.

INPUT's market definition covers VAN services only, but includes the VAN revenues of all types of carriers. The following are examples of VAN services.

- *Electronic Data Interchange (EDI)* - Application-to-application exchange of standardized business documents between trade partners or facilitators. This exchange is commonly performed using VAN services. Specialized translation software is typically employed to convert data from organizations' internal file formats to EDI interchange standards. This software may be provided as part of the VAN service or may be resident on the organization's own computers.

- *Electronic Information Exchange (EIE)* - Also known as electronic mail (E-mail), EIE involves the transmission of messages across an electronic network managed by a services vendor, including facsimile transmission (FAX), voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

- *Other Network Services* - This segment contains videotex and pure network management services. Videotex is actually more a delivery mode than an application. Its prime focus is on the individual as a consumer or in business. These services provide interactive access to data bases and offer the inquirer the ability to send as well as receive information for such purposes as home shopping, home banking, travel reservations, and more.

  Network management services included here must involve the vendor's network and network management systems as well as people. People-only services are included in professional services that involve the management of networks as part of the broader task of managing a user's information processing functions are included in systems operations.