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U.S. PROFESSIONAL SERVICES MARKET

1990-1995

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Market Analysis Program (MAP)

U.S. Professional Services Market, 1990-1995

MAPFS • 506 • 1990

Abstract

This report analyzes the U.S. professional services market from 1990 through 1995. Data include user expenditure forecasts, vendor ranking, and merger-and-acquisition activity. Market growth estimates are also provided for 16 vertical sectors.

The professional services market is segmented into three sub-modes: consulting, software development and education and training. Each sub-mode is analyzed and forecasted.

This report presents the issues, trends and key events affecting the professional services market and identifies new and emerging strategies and opportunities. The report contains 98 pages and 56 exhibits.

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Exhibits

Exhibits (Continued)

Exhibits (Continued)

Introduction

Introduction

This report is part of a series of market analysis reports written each year by INPUT on the key sectors (delivery modes) of the U.S. Information Services Market. The delivery modes analyzed during 1990 are as follows:

1. Applications Software Products
2. Turnkey Systems
3. Processing Services
4. Systems Software Products
5. Network Services
6. Professional Services
7. Systems Integration
8. Systems Operations

The first six delivery modes are covered in reports included as part of INPUT's Market Analysis Program (MAP), a planning service for information services vendors. The other two delivery modes are covered in market analysis reports included in INPUT's systems integration and systems operations programs.

A

Purpose and Organization

1. Purpose

This report analyzes the professional services sector of the U.S. information services market. The report assesses trends and events within the U.S. economy, the U.S. information services market, and the professional services delivery mode to provide the reader with a comprehensive foundation for understanding this market sector and for anticipating future directions. The report also offers insights into the relation between the professional services and systems integration delivery modes.

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

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

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

2. Organization

This report is organized as follows.

- Chapter II - Executive Overview, summarizes of the research analysis, conclusions, and recommendations of the report.

- Chapter III - General Business Climate, provides an overview of the business climate within the U.S. information services market and the professional services delivery mode.

- Chapter IV - Market Forecast, provides a comprehensive look at the specific delivery mode and submodes, the five-year 1990-1995 forecasts, and an assessment of the forces driving this market sector. Where appropriate, the forecasts are presented by vertical and cross-industry markets.

- Chapter V - Issues and Trends, discusses the issues and trends that are most critical to this delivery mode for both the immediate and long term.

- Chapter VI - Competition, identifies the leading vendors and assesses the key competitive trends within this delivery mode. Profiles of vendors which exemplify the competitive trends are also provided.

- Chapter VII - Conclusions and Recommendations, provides conclusions and recommendations and identifies opportunities for the information services vendors active in or considering entering this delivery mode.

- Appendix A - Definitions, defines the terms used throughout INPUT's market analysis work.

- Appendix B - Forecast Data Base, summarizes the forecast for this market sector and reconciles the current forecast with the 1989-1994 forecast.

B

Scope and Methodology

1. Scope

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

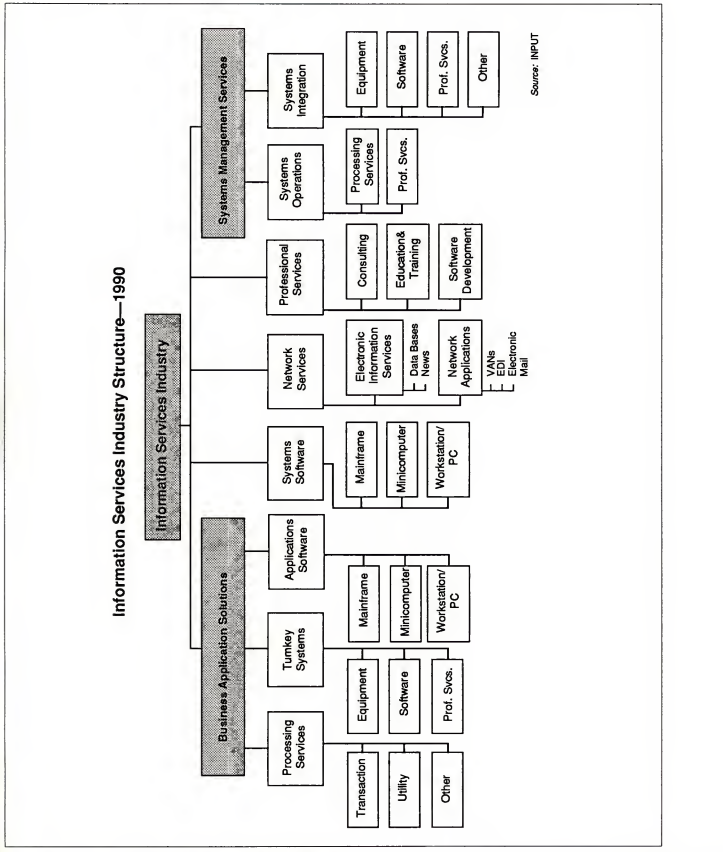
a. Information Services Industry Structure

Exhibit I-1 defines the structure of the information services industry as used by INPUT in its market analysis and forecasts. The market consists of eight delivery modes, each of which contains a number of submodes.

- INPUT develops a five-year forecast for each of the submodes listed.
- The following delivery modes are forecasted on a vertical industry and cross-industry basis—applications software products, turnkey systems, processing services, professional services, systems integration, and systems operations.
- The systems software products and network services delivery modes are forecasted for the U.S. market as a whole.

For a more complete discussion of INPUT's information services industry structure and terminology please refer to Appendix A, *Definitions*.

EXHIBIT I-1

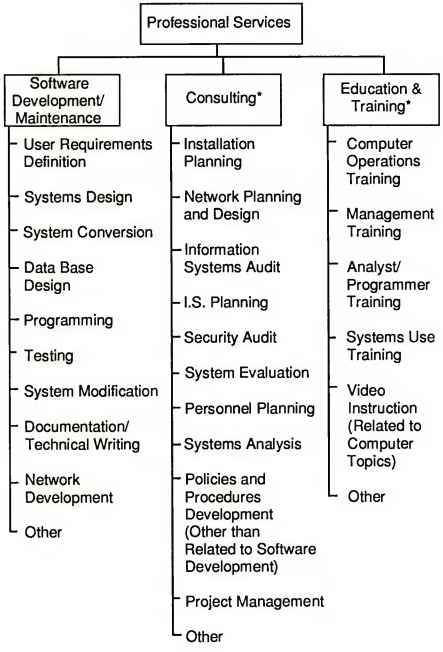


b. Delivery Mode Description

The structure of the professional services market, as shown in Exhibit I-2, is composed of consulting, software development and education and training sub-modes.

EXHIBIT I-2

Professional Services Market Structure



*Related to computer systems, topics, or issues

Professional services vendors market consulting, software development, and education and training services alone and in combinations. There are also vendors that only market selected functions, such as documentation or conversion services, or just one of the primary services, such as training.

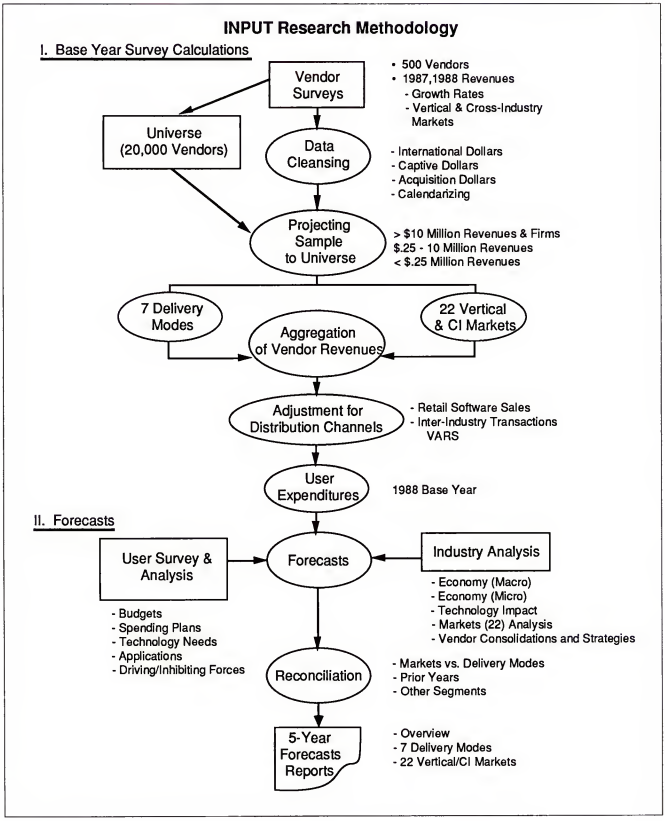
- Professional services may also be delivered as a component of the systems integration or turnkey systems delivery modes. The expenditure for these services are part of a larger expenditure and are not included as part of the professional services delivery mode. Such expenditures are included in the respective systems integration and turnkey systems delivery modes.

- Professional services sold in conjunction with processing services, network services, or software products are included in the definition of the professional services sector.

2. Methodology

INPUT's methodology for market analysis and forecasting is summarized in Exhibit I-3. As in past years, INPUT has continued the process of surveying information services vendors to determine their U.S. information services revenues, information systems organizations to determine their expenditures and outside services acquisition plans, and interviewing vendors a second time to understand their views of the market opportunities over the short and longer term.

EXHIBIT I-3



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

a. Base-Year Expenditure Calculations

- INPUT determines previous-year information services revenues for the eight delivery modes and 23 vertical and cross-industry sectors for hundreds of vendors. This is accomplished through interviews, use of public data, and INPUT estimates.
- The initial data is projected to represent the entire information services market.
- Adjustments are made to eliminate duplications due to distribution channel overlap and to assure captive information services expenditures are not included.
- The result is a base-year, 1989, user expenditure for each of the 23 vertical and cross-industry sectors and the 8 delivery modes.

b. Market Forecasts

- In the forecasting step, INPUT surveys information systems executives to determine their projected expenditure levels, both in aggregate and for each of the outside information services categories.
- In addition, a second set of vendor interviews is conducted later in the year to obtain an understanding of how key vendors view the market and its opportunities.
- The result is a five-year forecast for each of the 23 vertical and cross-industry sectors and the 8 delivery modes.

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

C

Economic Assumptions

Forecasts are presented in current dollars (i.e., 1995 market sizes are in 1995 dollars). In developing the five-year forecasts, INPUT has incorporated the following economic assumptions regarding the outlook for the U.S. economy as a whole.

The GNP and GNP Deflator growth rates used in INPUT's market projections for 1990 are from the CONSENSUS™ forecast, Blue Chip Economic Indicators of Sedona, Arizona. The Blue Chip CONSENSUS forecast is derived from a leading panel of economists representing leading financial, industrial, and research firms across the U.S. and has a 13-year track record of balanced and accurate projections.

Exhibit I-4 provides both the economic assumptions used by INPUT in the 1989-1994 market analysis reports and those being used for the 1990-1995 reports. The 1990-1995 assumptions compared to those used for 1989-1994 indicate:

- Significantly lower Real GNP growth for 1990 and 1991
- Stronger Real GNP growth for 1992 and beyond
- Inflation at somewhat lower levels using the 1990-1995 assumptions.

The resulting Nominal GNP growth used by INPUT is for much lower growth in 1990 (5.4% versus the projected 7.7% in the 1989 reports) and again in 1991 (5.4% versus 7.8%).

- In 1992 and beyond, the Nominal GNP growth rates are quite comparable.
- For the five-year period 1989-1994, the Nominal GNP averages 6.2% versus the previous 7.1%.

In summary, the economic assumptions used by INPUT reflect significantly reduced growth in the near term followed by modest steady growth through 1995.

It should be noted that the U.S. economic environment has worsened for the short term since this CONSENSUS forecast was published in October 1990. There are stronger signs of a recession in the first two to three quarters of 1991. The impact of a recession on the 1991 information services market is discussed in Chapters III and IV.

EXHIBIT I-4

GNP and Inflation Growth Rate Assumptions 1989-1995

1989 Report Assumptions

Overall Economy	1989E	1990E	1991E	1992E	1993E	1994E	1995E	CAGR 89-94 (%)	CAGR 90-95 (%)
Nominal GNP	7.6	7.7	7.8	7.0	6.5	6.5	6.5	7.1	--
GNP Deflator	4.8	5.2	5.5	5.0	4.5	4.5	4.5	4.9	--
Real GNP	2.8	2.5	2.3	2.0	2.0	2.0	2.0	2.2	--

1990 Assumptions (Preliminary Estimate)

Overall Economy	1989A	1990E	1991E	1992E	1993E	1994E	1995E	CAGR 89-94 (%)	CAGR 90-95 (%)
Nominal GNP	6.7	5.4	5.4	6.8	6.8	6.8	6.5	6.2	6.5
GNP Deflator	4.1	4.4	4.6	4.1	4.0	4.0	3.9	4.2	4.1
Real GNP	2.5	1.0	0.8	2.6	2.7	2.7	2.5	1.8	2.2

Note: 1989A based on final figures reported by U.S. Commerce Department

1990 onward from CONSENSUS™ economic forecast reported by Blue Chip Economic Indicators, Sedona, AZ (Vol 15, No 10, October 10, 1990)

D

Related Reports

Related reports of possible interest to the reader include:

1. U.S. Markets

- *U.S. Applications Solutions Market Analysis Report, 1990-1995*
- *U.S. Processing Services Market Analysis Report, 1990-1995*
- *U.S. Systems Software Products Market Analysis Report, 1990-1995*
- *U.S. Professional Services Market Analysis Report, 1990-1995*
- *U.S. Systems Integration Market Analysis Report, 1990-1995*
- *U.S. Systems Operations Market Analysis Report, 1990-1995*
- *U.S. Industry Sector Markets, 1990-1995* (16 reports on all major industry sectors, e.g., insurance)
- *U.S. Cross-Industry Sector Markets, 1990-1995* (7 reports on information services markets that serve all vertical industry sectors, e.g., accounting)

2. European Markets

- *The Western European Market for Computer Software and Services, 1990-1995*
- *Systems Software Products—Western Europe, 1990-1995*
- *Trends in Processing Services—Western Europe, 1990-1995*
- *Systems Integration Market Forecast—Western Europe, 1990-1995*
- *Systems Operations Market Forecast—Western Europe, 1990-1995*
- *Western European Network Services Markets, 1990-1995*

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

Executive Overview

Executive Overview

A

Key Trends and Issues

As indicated in Exhibit II-1, the current environment for professional services is marked by an increasing impact from the economic downturn. The trend may be short term, and it may be more pronounced in the Northeast, but it is having an effect on systems priorities with a number of users.

EXHIBIT II-1

Key Trends and Issues

- Trend: increasing impact of economic downturn
  - Shifting of systems priorities
  - Further pressure on technical skills
  - Mixed impact on vendors
- Issue: lack of qualified personnel
  - Acquiring technical skills
  - Developing technical skills
  - Retaining technical skills
- Issue: competitor dynamics
  - Systems integrators
  - Outsourcing vendors
  - Value-added resellers

Some systems work may be high priority because it is necessary to maintain older systems that are required to keep a company running. New systems must address the following to receive high priority:

- Improve competitiveness
- Generate significant cost savings
- Obtain payback in a relatively short time

Work that doesn't meet these conditions is being delayed or cut back or faces that possibility. This situation is having a mixed impact on vendors.

- Opportunities are available for those who have the technical skills required for systems with high priorities such as networked systems, relational data bases or image processing.

- Vendors with an absence of technical skills that have been relying primarily on traditional COBOL applications and short-term systems analysis work are experiencing cutbacks.

- Revenues may not be falling, but growth rates are down.

More vendors, including a number of small entrepreneurs, are competing for a shrinking volume of traditional contract programming work. For example, systems integrators involved in SI assignments may compete for additional contract-programming assignments to keep personnel busy.

The acquisition, development, and retention of technical skills is a major issue for professional service vendors, as noted in Exhibit II-1. These skills can help obtain work and provide the opportunity for building relationships with clients. In view of the demand for and short supply of some technical skills, vendors are taking the following steps:

- Vendors are using smaller, specialized vendors and entrepreneurs as subcontractors to meet needs for technical skills.

- Vendors are recruiting graduates from colleges that teach needed technical IS skills.

- Vendors are seeking assignments that can help further train individuals in technical skills.

- Vendors are tailoring rewards and recognition to retain employees with technical skills.

Another issue of concern to professional services vendors is the dynamics of competitors in the present economic situation.

- System integration vendors who face delays of contracts that are not critical for business plans may compete strongly for short term jobs as noted before.

- Major systems integration vendors contacted during this study pointed out that they use industry-specific knowledge to identify situations where they can achieve unanticipated revenues or cost savings for prospects.

- Systems integration vendors are finding that some prospects are running integration projects themselves and selecting professional services vendors to supply missing skills to reduce costs.

The present economic situation can lead prospects to consider moving the entire cost center of information systems out of house through the use of outsourcing. As a result, larger professional service and systems integrators are evaluating or entering the outsourcing business.

Other types of vendors are entering professional services work or are competing with vendors in the marketplace. Hardware vendors, from IBM to MAI Systems, are offering value-added professional services work. IBM and DEC have strengthened their ability to offer strategic consulting, which provides increased leverage to expand assignments. Software vendors are offering packages developed with 4GL and CASE tools that can reduce opportunities for professional services firms to modify applications.

B

Professional Services Market User Expenditures

As shown in Exhibit II-2, the professional services market will grow at a rate of 12% between 1990 and 1995 and will reach a revenue level over $30 billion.

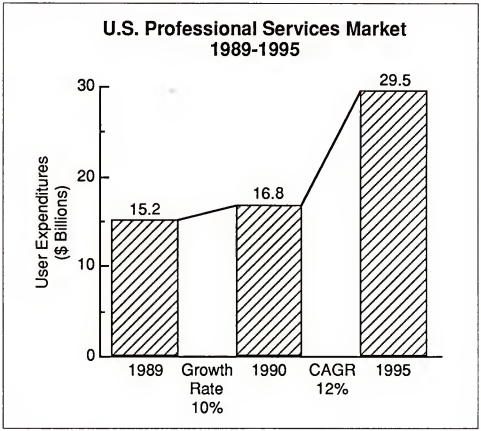
The growth rate of the professional services market has slowed during the past five years, but it is a sizable market. Some vertical industries with large revenues—such as process manufacturing, banking and finance, state and local government, and insurance—are growing more rapidly than the market as a whole.

- Revenues for banking and finance will grow at a rate of 14%, from $2.2 billion in 1990 to $4.3 billion in 1995.

- Revenues for process manufacturing and insurance will both grow at a rate of 14%, with revenues from process manufacturing growing from $2 billion in 1990 to $3.7 billion in 1995

- Revenues from insurance will grow from $1.4 billion in 1990 to $3.0 billion in 1995.

EXHIBIT II-2



The consulting services segment of professional services is also growing more rapidly than the market as a whole and is forecast to grow at a rate of 15% between 1990 and 1995, increasing from $3.8 billion to $7.6 billion. Software development and education and training will grow at 12%, slightly slower than the market as a whole.

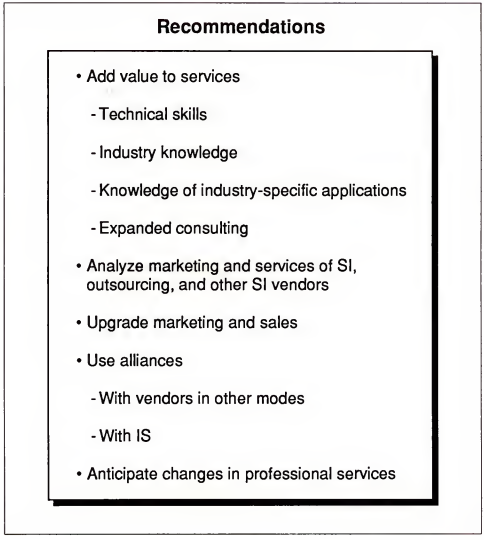
C

Market Recommendations

As indicated in Exhibit II-3, the recommendations that INPUT makes for the professional services market emphasize added values, the addition of consulting and technical skills, and expanding capabilities that can gain work in a soft economic period. Each professional services firm requires a set of skills that helps differentiate it and make it attractive to users.

Advanced technical skills in open systems, network use, data management, or image processing may be needed to support critical applications, and they are harder to replace with in-house skills when costs must be reduced. Vendors with these skills, industry-specific knowledge, or consulting capabilities in the use of technology or strategic planning will have more opportunities to talk to corporate management than vendors with traditional software development services. They have more opportunities for work and, particularly with consulting services, more opportunities to generate add-on assignments.

EXHIBIT II-3



Marketing and sales should emphasize value-added capabilities during sales calls, and in literature and correspondence even when assignments seem only to require traditional skills. Vendors should become identified as broad-based resources rather than as suppliers of traditional skills.

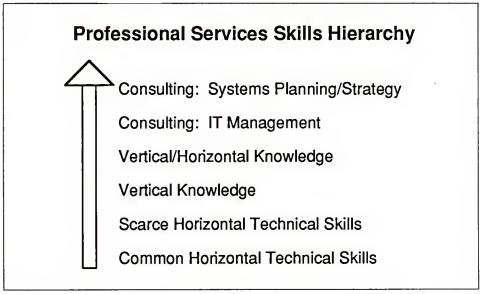
Vendors must also seek alliances to augment skills when necessary, and increase their range of sales possibilities. Vendors should also seek alliances or opportunities with information systems management that can help the internal information systems function be proactive when confronted with systems integration or outsourcing bids. Professional service firms can help IS act like an integrator and prepare alternatives.

Alliances and interaction with other vendors can also help a professional services vendor participate in or anticipate changes in the marketplace.

- Professional services firms are much less apt to develop all the software used in a system. They may utilize or modify the products of software vendors or work with hardware vendors to develop solutions. They may also be able to use their industry or application knowledge and/or their methodologies to help software, hardware, turnkey, other professional services, or even independent maintenance vendors reach a solution.

- Of course, professional services firms may find that they are starting to use the approach of a systems integrator when they coordinate the work of other vendors. Without analyzing the activities of various types of vendors and participating in projects with them, they may forego profitable opportunities. One method that a professional services vendor can use to assess its skills and capabilities, or the capabilities of possible allies, is to review them in relation to a set of advancing capabilities as illustrated in Exhibit II-4.

EXHIBIT II-4



General Business Climate

III

General Business Climate

In this chapter INPUT positions the market for professional services within the entire information services industry. The chapter first characterizes the general business climate, then the climate of the information services industry specifically. In the last section, it positions systems software products within the overall business climate for information services.

The reader will find this chapter quite similar to the corresponding Chapter III in the following market analysis reports:

- *U.S. Applications Solutions Market, 1990-1995*
- *U.S. Systems Software Products Market, 1990-1995*
- *U.S. Processing Services Market, 1990-1995*
- *U.S. Network Services Market, 1990-1995*

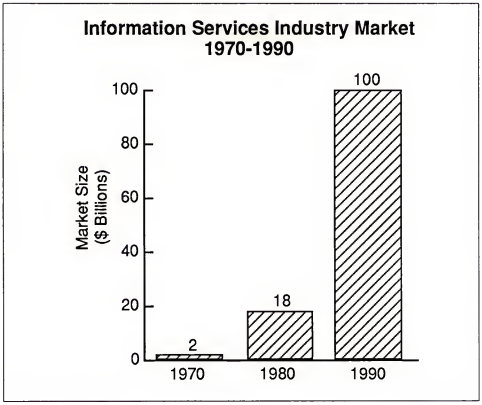
A General Economic Climate

1. A Look at the 1980s

As INPUT publishes its first set of forecasts for the 1990s, the general U.S. economy and the U.S. information services industry, particularly the professional services sector, face a new set of business conditions—different from those experienced since the early 1980s when the last downturn occurred. As shown in Exhibit III-1, in 1980 the U.S. information services market was less than 20% of its size 10 years later. Today that market represents approximately $100 billion in user expenditures each year.

The 1980s were marked by continuing strong growth following the formation of the information services industry in the late 1960s and early 1970s. Except for slowed growth during the downturn that started in 1982, the information services market grew at about 20% each year and routinely outperformed the economy as a whole.

EXHIBIT III-1



This overall growth has moderated in the past couple of years. The U.S. information services industry grew about 13% in 1990 as the impacts of the downturn were beginning to be felt. In terms of development, the industry is maturing: in some segments it has reached the top of the "S" curve. Thus, declining growth rates are to be expected, in particular as the market size continues to increase.

The decade ended with much lower growth rates in mainframe and minicomputer shipments and the first signs of maturity in personal computer and workstation sales. While all of the delivery modes included in INPUT's definition of the information services industry have growth rates above that of hardware, the trends for hardware certainly impact each delivery mode.

Therefore, the 1990s began with a maturing market for the products and services of information systems and services companies. Yet it remains a market that can and does outgrow the economy and continues to offer new business opportunities, in particular those that are solutions oriented.

2. Near-Term Impacts

As noted in Chapter I, the U.S. economy is in a recession. While expected to be modest, a recession will directly impact many sectors of the economy which in turn will impact expenditures for information services. Real growth in the overall U.S. economy will be very small in 1990 and could drop to zero in 1991.

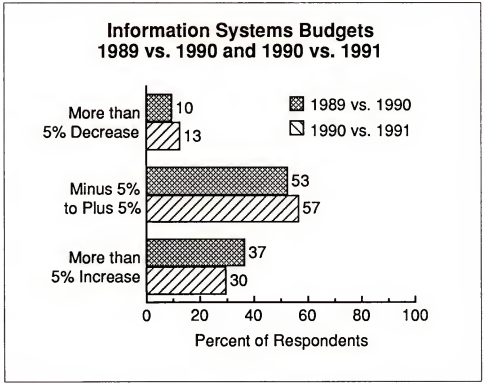
- For the past few years, the information systems budget has reflected tightening spending patterns with increases averaging less than 10% overall. Many organizations indicate essentially no change from year to year, and some organizations are undergoing year-to-year reductions of over 10%.

- During this period, growth in expenditures for information services has exceeded the overall growth in information systems budgets. The hardware and internal staff budgets have absorbed much of the impact of tighter budgets.

a. Information Systems User Impacts

Exhibit III-2 provides an assessment of information systems budget plans for 1989 through 1991. The research for this assessment was done in November, 1990.

EXHIBIT III-2



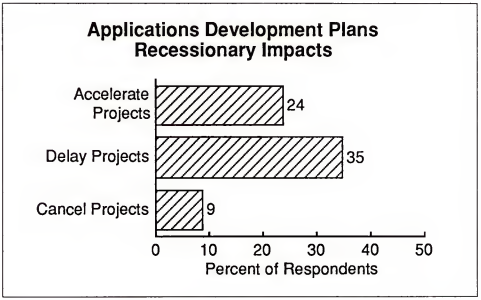
- The findings indicate that only about one in three information systems budgets grew by over 5% in 1990 over 1989 levels and the percentage planning to grow more than 5% in 1991 is even less, three out of ten.

- The research also found that drastic cuts are not planned, as might have been expected in a full recessionary environment.

Many respondents indicated that after a number of years of tightening budgets, 1991 would just be another year of the same. For most organizations, major strategic projects would not be measurably impacted given current general business projections.

Exhibit III-3 helps support that projection. INPUT found a number of organizations that would actually accelerate some projects in a recessionary economy and very few that would cancel projects.

EXHIBIT III-3



- Those projects identified for acceleration were typically of key value to business operations.

- Those projects identified for possible delay or cancellation were typically administrative and were often replacements for existing systems.

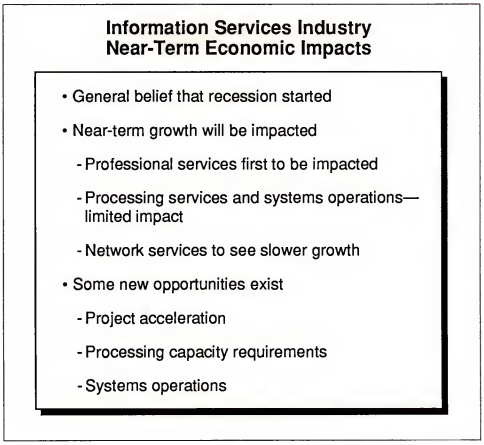
INPUT found that the current economy will impact information systems spending in the near term (through 1991 at least), but not to a significant degree. This will lead to slower growth rates in information services expenditures over the new 12 to 18 months, and it may in turn create pent-up demand for 1992 and beyond. The depth and length of the downturn will be a deciding factor in how much demand is delayed into 1992.

For a complete review of INPUT's recent research into the impacts of the current economy on information systems, see INPUT's report, *The 1990 to 1991 U.S. Economic Slowdown—Impacts on Information Systems Budgets and Spending*.

b. Information Services Vendor Impacts

INPUT found a cautious attitude among information services vendors assessing the impacts of the economic downturn on this business.

EXHIBIT III-4



- There was a general belief, in particular in the professional, processing, and network services firms, that a recession of some level had started as early as the third quarter. A number of vendors indicated that they were applying or considering internal budgetary constraints.

- Projections for near-term growth (1991) are more modest, reflecting 1990 experience.

  - Professional services will be the first to be impacted, with growth expectations dropping perhaps to 11%. Information systems will try to protect internal staff given the reductions experienced over the past few years.

- Processing services and systems operations tend to be long-term decisions. Levels of processing services are tied to client usage agreements and will not experience significant cutbacks. Also, an opportunity exists in the sale of incremental capacity to companies wishing to delay hardware expenditures.

- Network services has been a strong growth area with forecasted growth about 16% per year. Some slowing in growth is expected near term, but this sector will still outperform the information services market as a whole.

• The downturn offers opportunities to aggressive vendors. To find them, it is necessary to stay very close to the current clients and to know the secondary buyers within the prospect companies.

- Critical operational systems may be accelerated and may create opportunities for professional services and software products vendors. Buying a suitable application software solution may become favored over development of a custom solution.

- As noted above, the solution to capacity needs may be a processing services vendor instead of hardware purchases.

- Systems operation will become more attractive to a company looking for capital to invest in newer, more strategic application systems.

The next 12 to 18 months will be characterized by the unexpected—delayed decisions and unique opportunities. Solid growth is possible for the alert vendor.

3. The Mid-1990s

Beyond the 1990 to mid-1992 period, there is a general belief that the economy will return to modest growth like that of the late 1980s. Modest real growth rates combined with inflation and the ability for the information services industry to continue to outgrow the economy as a whole suggest that annual average growth rates in the low to mid teens will continue throughout 1990 to 1995.

Growth after 1992 will be stronger than prior to 1992. A true recession will generate some pent-up demand that could cause a real upturn in 1993 if the full economy returns to the growth rates experienced in the late 1980s.

B

Information Services Industry Issues and Climate

1. Overview

The information services industry ended the decade much different than it entered the decade. Exhibit III-5 lists some of the major differences and the related implications for the early 1990s.

EXHIBIT III-5

Information Services Industry, 1980 versus 1990

Difference	Implication
• Five times as big	• Slowing growth
• Many large vendors	• Consolidation and dominance
• Stronger vendors	• Greater reliance by user
• Willingness to outsource operations	• Processing services shifts to systems operations
• Greater variety of services	• Changing distribution channels
• Many small vendors	• Alliances to succeed
• More technological alternatives	• More services required to integrate

- Markets do not grow at 20% forever. On the average, information services did for the entire 1980 decade. Overall slower growth is predictable for the 1990s.
- In 1980 there was not an independent software supplier that had $100 million in revenues worldwide; in 1990 there are many and $1 billion in revenue has been achieved.
  - For some, growth is being fueled through mergers and acquisitions.
  - For others, diversification and a strong element of professional services is driving growth.
- The same can be said for professional services firms. Today, many exceed $100 million in revenue and serve a worldwide market.

- The leading information services vendors are much stronger than they were in the early 1980s. They are large, have financial strength, and have management that is prepared to take on long-term risks. The result is new market opportunities and a different perspective for the user.

- The end of the 1980s was marked by some significant shifts in the structure of the information services industry.

  - Systems integration emerged as a viable business in the commercial market in the mid-1980s, and systems operations (facilities management) has taken on new importance.

  - Larger vendors are changing the economy of scale in offering information services and, as result, a change in the fundamental channels of distribution. The user can now turn to a single vendor for a complete solution, and the vendors offering these services become customers (distributors) of the other information services vendors.

  - The concept of outsourcing has strengthened considerably recently and will be a trend for the 1990s.

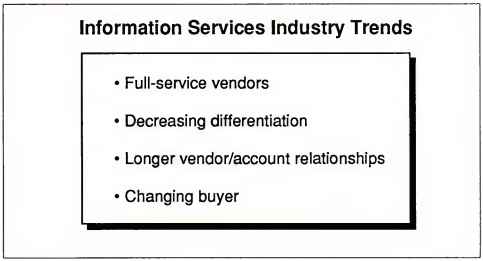
- Information services has been an industry where the initial cost of entry has been modest in many of the subsectors. Software product companies show up over night, professional services firms start with a few experts joining together, and most processing services firms start by large organizations selling surplus time. Although low cost of entry remains a characteristic, the cost of gaining market recognition and presence has changed. Success in the 1990s for the start up company will come through alliances with the larger firms, be they systems integrators, professional services, systems operations, or software product firms.

- Information systems' greatest challenge today, after maintaining current systems, is to choose from the breadth of information technology now available. The alternatives are great and the implications of some are significant. The result is often delayed decisions and implementation. Relational DBMS technology is about ten years old, and much of the implementation effort is still to be done. Object-oriented data base technology is already available. The result is greater professional services opportunities.

2. Information Services Trends

Exhibit III-6 identifies four fundamental trends that will impact the information services industry over the next five to ten years. The overall goal of account/client control will become paramount in the 1990s. It is the primary driving force behind these trends.

EXHIBIT III-6



- *Full services vendors will increase their dominance of the information services market.* They will achieve increased account control and become the channel of distribution for many of the specialized products firms. And they will do this to a significant degree through consolidation. A maturing market typically results in fewer and larger vendors who serve all aspects of the market.

- *Decreasing differentiation* - Professional services is now a factor in essentially each of the delivery modes, whether it is software products, systems operations, systems integration, or even processing and network services. That importance will continue to increase throughout the next five years. The end result will be decreasing differentiation of the leading vendors.

- *Longer vendor/account relationships* - The relationships formed in systems integration and systems operations agreements are multiyear in length and, once made, these become the vendors of choice for the next requirement.

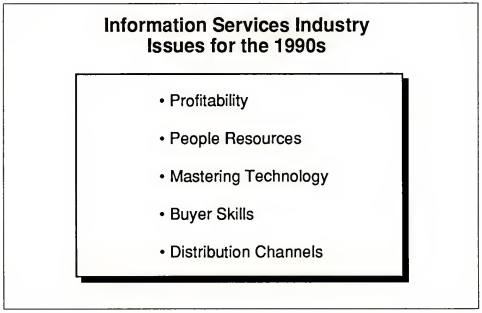
- *Changing buyer* - The buying decision is now commonly made by a partnership of information systems and an operating executive, certainly for major projects. The result is two buyers to be serviced and the opportunity for the vendor to build relationships in multiple parts of the client. This will also lead to increased client control and longer relationships.

In the 1990s, the major vendors have the opportunities to tie up major portions of the market for many years. This results in a number of new issues, but means there is an improved predictability of revenue.

3. Issues for the 1990s

The critical issues for information services vendors in the 1990s are summarized in Exhibit III-7. Many of these issues derive from the leading vendors' current emphasis on account control.

EXHIBIT III-7



- *Profitability* - The shift to long-term relationships with multiyear agreements and the assumption of risk by the vendor raises the exposure for the vendor. There are already some concerns about the impacts of commercial systems integration on the profitability of larger information services firms. And with the push to gain market share in the systems operations area, this concern could grow. Profitability over the next two years will be a key indicator of probable growth in the mid-1990s as the economy improves.

- *People Resources* - The increasing importance of professional services throughout the industry adds to the pressure on vendors to find and train qualified staff.

  - Many of these professionals are being acquired by hiring the staff of companies served under systems integration and systems operations agreements. Reorienting these people from internal to vendor perspectives will be a major test over the next few years.

  - The vendor staffing challenge will also be taxed by the training requirements of new technologies and the decline in college enrollment in computer science. The cost burden for training information systems professionals is shifting, to some degree, from the user to the vendor as greater use of outsourcing services develops.

- *Mastering Technology* - The developers of information technology continue to provide new technologies and products faster than they can be utilized. This is one of the forces behind the growth in the systems integration and professional services delivery modes.
  - The vendor takes on the task of learning the technology and bringing it into the client's environment, and perhaps even operating and maintaining it for some period.
  - Like the general training issues, this is a cost that cannot always be directly recovered by the vendor.
- *End User Skills* - The influence of senior/operating management in the buying decision will continue to increase into the 1990s. The information systems function will become an internal consultant and the skills of the end user will continue to increase more slowly.
- The vendor must become astute at assessing the skills of the buyer at all levels—the end user's skills, not the skills of the information systems function, will control success.
- *Distribution Channels* - The larger vendors are going to gain even more control of the user expenditure process, while smaller and specialized vendors serve as vendors to the larger vendors. The behavior of the larger vendors and their multiple, often overlapping strategic alliances may control the success of many of the smaller vendors.

C

Professional Services Business Issues and Trends

In this section we position the professional services sector against the economic and environmental conditions described above. This sets the stage for INPUT's 1990-1995 forecast for professional services presented in Chapter IV.

Two fundamental forces impact the professional services sector:

- First, the business environment that permits or inhibits an organization from addressing information systems requirements that are beyond the capacity of the internal information systems organization
- Second, the requirement to learn, adopt, and implement new information technologies. When the need exists there is always the alternative of turning to an organization that already has the needed specialized skills.

1. Business Environment

Throughout the 1980s the demand for new information systems has exceeded the internal capacity to develop and implement the needed

systems. It became very common for both general and information systems management to turn to professional services firms to augment the internal skills.

Occasional economic slowdowns also taught the information systems management that the external professional services resources could be more quickly deferred in times of budget restriction. To some degree, that is occurring in early 1991.

Over the past three years, INPUT has narrowed the definition of professional services by removing the more growth-oriented systems integration and systems operations segments. This narrower definition makes the professional services sector the most quickly impacted in times of economic slowdown. It should also make it the sector that reacts most quickly to improving market conditions.

2. Impact of New Information Technologies

Through the past decade, new information technology needs fueled a rapid growth of vendors who offered professional services to supplement the skills available within the business organization. By the late 1980s, the increasing complexity of applications, including the networks and data bases they required, made the critical skills to meet business systems needs much more important and often essential. The professional services firm can often better afford the initial training cost for a new technology because it will use the technology with a number of clients. The internal organization may only use it once.

Very few important or mission-critical applications can be achieved without the use of technically advanced skills. In today's economic environment, business is focusing on finding the necessary skills to accomplish major systems needs or turning to outside vendors that can take over and provide a total solution.

As Chapter IV shows, the professional services sector will follow the information services market in general. Growth will be acceptable, but somewhat lower than for the industry as a whole. Some firms will perform well, and others will have difficulty as the professional services market becomes more focused on specific types of services and vertical industries. Those that concentrate on learning and supporting the more successful new information technologies will fair well, both during the slowdown and the recovery that will follow.

Market Forecast

Market Forecast

A

Industry Structure

INPUT segments the information services industry into eight delivery modes serving 16 industry sectors and seven cross-industry sectors. The delivery modes are:

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

INPUT divides the professional services market into the three submodes listed below:

- Software development and maintenance
- Consulting
- Education and training

These segments, which were defined in Exhibit I-2, represent types of services offered in support of the information systems industry rather than generic services. For example, education and training includes services such as computer operations training, management training, and video instruction related to computer usage. In a like manner, consulting services are specific to the information systems needs of customers.

In prior years, the professional services delivery mode included a fourth segment called systems operations (or facilities management). In 1990, INPUT made systems operations a separate delivery mode, combining the systems operations (facilities management) segments from professional services and processing services.

B

Market Structure

Exhibit IV-1 presents the structure of the professional services market based on the category of service provider. The structure places professional services firms into one of three categories:

- Product-based
- Core service-based
- New service-based

Core service-based firms are the industry pioneers, some having offered professional services since the late 1950s. Although the public accounting firm Arthur Andersen & Company (now Andersen Consulting) has been a key player in professional services since the mid-1950s, the new service-based firms generally did not enter the professional services market until the 1960s or 1970s. Product-based firms, which sell primarily computer hardware or other products, entered the professional services market between 1965 and 1984. IBM, with its emphasis on customer service and support, helped build the market for professional services.

EXHIBIT IV-1

C

Professional Services Market

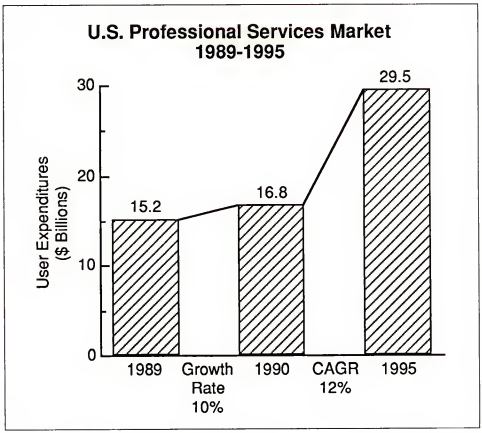
1. Market Overview

The professional services market continues to grow from a 1989 user expenditure level of $15.2 billion to a 1990 level of $16.8 billion, representing an annual growth rate of 10%. Over the five-year forecast period shown in Exhibit IV-2, professional services will grow at a 12% CAGR, reaching $29.5 billion in 1995.

INPUT's forecast for the 1990-1995 period is somewhat lower than its previous forecast of 14% for 1989 to 1994. INPUT had anticipated an increase of 14% during 1989 versus the 10% that resulted. The decrease in growth rate is due primarily to the following:

- The shifting or reclassification of professional services engagements to more complex systems integration projects
- The delay or cutback in systems development projects resulting from early impacts of the economic downturn and other negative business impacts in some industries
- The removal of the systems operations (facilities management) subsegment that, while only about 10% of professional services, was growing and will grow measurably faster than the three submodes that now make up professional services

EXHIBIT IV-2



The continued growth in professional services results from the pressure on users to implement and enhance applications systems that are critical in order to be competitive or reduce significant costs. These applications systems require experienced and skilled personnel, which may not be available inside the organization when needed: hence, the use of outside services. This is in line with the continuing thrust to outsource and the use of systems integration services.

Professional services vendors can provide the unique skills and experience necessary for problem solving. As a result of their independence, vendors can provide or support alternative solutions to industry-specific problems.

In addition to aiding with the analysis of business planning on systems and other strategic systems issues, professional services consulting helps users select from the myriad of applications software or turnkey systems available to satisfy the user's needs. Professional services firms attempt to make impartial recommendations in the selection process. By contrast, a consultant from a software products company that offers a certain type of software solution will try to promote that product.

When applications plans and needs become more complex, users hire professional services firms based on their experience in using sophisticate development skills or developing complex applications systems. Their ability to perform specialized, one-time services such as a particular application module or software conversion from one hardware platform to another represents substantial added value. The use of an outside service prevents hiring staff that is needed for only a limited time.

2. User Expenditures by Industry

In 1990, users will have spent about $16.7 billion for professional services, spread across 16 industry sectors. These expenditures, by industry, are shown in Exhibit IV-3.

In 1989, spending for professional services by the five leading industries accounted for 76% of total user expenditures. The top five industries are, in order:

- Discrete manufacturing
- State and local government
- Federal government
- Banking and finance
- Process manufacturing

Several factors contributed to the current spending levels in the key industries:

EXHIBIT IV-3

Professional Services User Expenditures by Industry, 1990-1995

Industry Sector	User Expenditures ($ Millions) 1990	1995	1990-1995 CAGR (Percent)
Discrete Manufacturing	4,163	7,572	13
Process Manufacturing	1,977	3,729	14
Transportation	213	395	13
Utilities	233	386	11
Telecommunications	950	1,927	15
Retail Distribution	207	328	10
Wholesale Distribution	327	509	9
Banking and Finance	2,044	3,381	11
Insurance	1,434	2,820	14
Medical	254	443	12
Education	76	139	13
Business Services	151	267	12
Consumer Services	133	192	8
Federal Government	2,136	2,629	4
State and Local Government	2,362	4,625	14
Miscellaneous Industries	104	185	12
Total	16,764	29,527	12

- Discrete manufacturers continue to spend heavily to automate production processes and materials management/distribution functions and improve order entry processes, with the heaviest expenditures for software development. Consulting expenditures and the use of systems integration grew in 1989 as well.

- State and local governments expanded network and computing capabilities and implemented new eligibility and emergency response applications as well as other accounting, revenue collection, and health and human services applications. Professional services firms were also hired to perform extensive software consulting to protect the investment in existing applications software. Since state and local governments must operate on a pay-as-you-go basis, these organizations are major users of systems operations contracts.

- The federal government has multibillion dollar contracts to replace second-generation computer systems in accounting and finance, logistics, and personnel. Systems integration, as well as professional services contracts were awarded to upgrade applications to achieve improved effectiveness. In addition, consulting expenditures increased as a result of developing plans to integrate network capabilities and new hardware and software products into existing systems.

- Consolidation as well as deregulation and internationalization in the banking and finance markets created sizeable opportunities for professional services firms offering software development and consulting. Steps to reduce operational costs have also led to ongoing use of professional services in the banking and finance industry. The challenges facing the industry are creating significant economic pressures, which resulted in much slower growth in 1990 (estimated at 5%) than in previous years.

- Process manufacturing, driven by the need to reduce costs, continued to re-automating its production processes. Process manufacturing companies are also modifying their information systems to yield more customer and marketing data. Information systems upgrades are necessitating extensive investments in skills upgrades for professional staff. Professional services expenditures in process manufacturing include software development, education and training, and consulting.

3. Expenditures by Functional Area

In 1989, users' professional services expenditures were concentrated in the following four functional areas:

- Manufacturing/business operations
- Accounting/administration (including order entry, customer services, office systems)

- Data processing/telecommunications
- Logistics/physical distribution

As shown in Exhibit IV-4, expenditures for professional services in manufacturing/operations and accounting/administration represent over 50% of the 1989 total.

EXHIBIT IV-4

Professional Services Expenditures by Functional Area, 1989

Functional Area	Expenditures ($ Billions)	Percent of Total
Manufacturing/ Business Operations	4.2	28
Accounting/ Administration/ Office Operations	3.5	23
Data Processing/ Telecommunications	2.4	16
Logistics/Distribution	2.0	13
Research and Development	1.4	9
Sales and Marketing	1.1	7
Human Resources	0.1	1
Other	0.5	3
Total	15.2	100

The manufacturing and operations area encompasses diverse professional services activities such as upgrading systems for computer-integrated manufacturing, airline reservations, railroad management, and hospital/ laboratory management.

Expenditures in accounting and administration are spurred by the relatively rapid implementation of electronic data interchange (EDI) services. INPUT segments EDI-related professional services into two categories, front-end and back-end.

- Front-end EDI professional services include the consulting and software modification necessary to implement EDI services. Back-end EDI professional services, chiefly software modification, result from the need to modify existing or to purchase and modify new accounting and finance software to utilize EDI capabilities fully.

4. Expenditures by Customer Size

Exhibit IV-5 divides 1989 user expenditures by the size of customer. Customer sizing information is derived from data published in *The U.S. Industrial Outlook* and *Sales and Marketing Management* magazine.

Large users control 53% of 1989 information systems expenditures for professional services. Midsize banks control a greater share for professional services than large banks. Midsize organizations represent relatively significant expenditures in the federal government, discrete manufacturing, and process manufacturing sectors.

Appendix A contains definitions of industry sectors.

EXHIBIT IV-5

U.S. Professional Services Expenditures by Organization Size, 1989

Industry Sector	1989 User Expenditures ($ Millions)			
	Small	Medium	Large	Total
Discrete Manufacturing	451	939	2,364	3,754
Process Manufacturing	229	587	933	1,749
Transportation	39	50	99	188
Utilities	35	78	108	221
Telecommunications	455	NA*	370	825
Retail Distribution	15	36	134	185
Wholesale Distribution	63	115	115	293
Banking and Finance	291	1,072	587	1,950
Insurance	254	444	570	1,268
Medical	27	76	126	229
Education	6	22	39	67
Business Services	11	23	101	135
Consumer Services	26	37	62	125
Federal Government	307	712	1,012	2,031
State and Local Government	164	327	1,583	2,074
Miscellaneous Industries	19	26	45	90
Total	2,392	4,544	8,248	15,184

*INPUT divides telecommunications into large (10 RBOCs, MCI, Sprint AT&T) and small (1,880 local telco carriers).

D

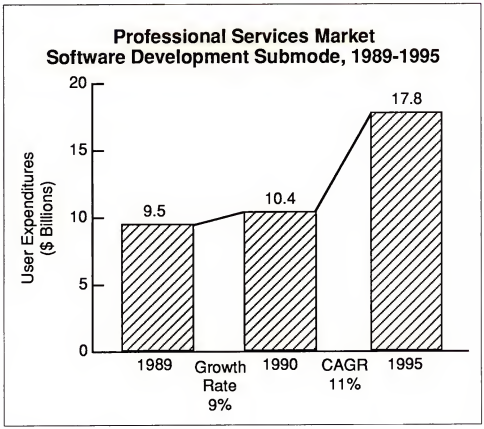
Forecast by Submode

1. Software Development Submode

User expenditures for software development in 1989 were nearly $9.5 billion, making this segment the largest of the three professional services submodes. It is expected to grow 9% in 1990 to $10.4 billion (see Exhibit IV-6). INPUT's definition of software development includes the following services:

- User requirements definition
- Systems design
- Data base design
- Programming
- Testing
- System modification and maintenance
- Documentation/technical writing
- System conversion
- Network development
- Other services

EXHIBIT IV-6



In general, software development is driven by new technologies in hardware and telecommunications, new generations of software products, and increasing purchases of information systems capabilities by organizations of all sizes. It is also driven heavily by the need to integrate networks, applications, and data bases.

Hardware vendors' introductions of new central processors mean more business for professional services firms. A recent round of product introductions (IBM's AS/400, RS6000 and ESA, Digital Equipment Corp.'s VAX 9000 mainframe, and new workstations from a number of vendors) have led to software conversion business as users add new applications or modify existing software.

Vendors that develop software products do not use the benefits of new technologies—such as higher density disk and tape storage drives, relational data base management software, 4GLs, optical disks, optical scanners, integrated voice/data products, and computer-assisted software engineering (CASE). However, there are now professional services vendors that support these technologies as well as convert existing user applications so that they use these technologies.

Small businesses converting from manual methods or timesharing to in-house microcomputers or minicomputers also require software development. There are vendors who support set-up and customization of newly purchased software for small users. Some will modify accounting and other PC packages to support vertical market needs.

Packaged software modification is becoming an important component of custom software development. Almost 25% of expenditures for mainframe software development activities can be classified as software modification. By listening to what their customers need, software product vendors have directly contributed to the boom in software development. Mainframe, minicomputer, and microcomputer software vendors now offer more functionality for a wider range of customers than ever.

The vertical sectors most heavily utilizing software development services include manufacturing, state and local government, banking and finance, and insurance. Within manufacturing, industrial automation and material handling applications generate significant software development opportunities.

More international business for U.S. manufacturing companies and services vendors means adding specific software features, such as handling exchange rates and different currency denominations for purchases and sales. The international aspect, though, provides significant opportunity for software development and consulting.

An additional driving force for software development is the so-called trend toward standards, particularly in network operations. Despite the promulgation of numerous sets of standards, no true standards exist. Hardware and software vendors embedded proprietary hooks in their products at levels requiring sophisticated knowledge. Custom software development expertise is needed to overcome the advantage of standard products.

Finally, large organizations, the primary users of software development, want to improve the return on their expenditures with professional services vendors and achieve higher levels of productivity. Specifically, sophisticated users want software developed faster with better control of costs.

2. Consulting Submode

The consulting segment had 1989 user expenditures of $3.4 billion and is expected to grow 12% in 1990, to $3.8 billion. This growth plus the forecast through 1995 is depicted in Exhibit IV-7. According to INPUT's definition, the consulting segment of professional services includes the following:

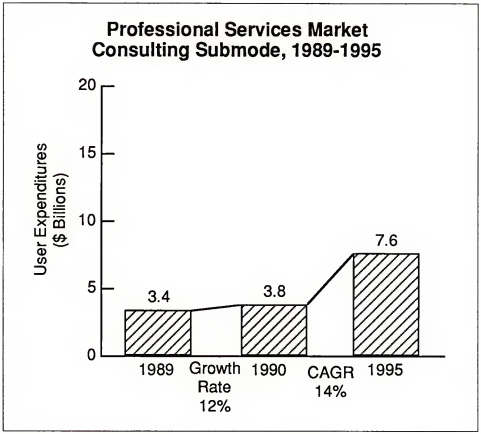
- Software installation planning
- Information systems audit
- Security auditing
- Personnel planning
- Policies and procedures development
- Network planning and design
- Information systems strategic planning
- Systems analysis
- Other

Strategic and other consulting revenue has grown as Big 6 accounting firms, CSC, IBM, DEC and others have increased their services in this area. In addition, Booz Allen and McKinsey have been emphasizing strategic consulting services which involve reviewing the impact of information systems on business planning as well as the impact on business operations.

In addition to noting continued strong demand for strategic consulting, INPUT has evaluated the use of consulting services by three categories:

- Processing and network services
- Software
- Information services (IS) management

EXHIBIT IV-7



Consulting in support of network management services is currently very profitable. The proliferation of LANs, WANs, micro-to-mainframe links, electronic data interchange (EDI), and ISDN has created strong demand for people knowledgeable in network management.

Software is a broader category, encompassing systems and applications software. The demand for systems software (and some applications software) consulting is driven partially by distributed processing, downsizing, and workstation technology. Consulting in the application software area also involves software maintenance. Users everywhere are searching for easier applications software maintenance. Through consulting services, users are better able to select and utilize existing application generation programs. While these programs do not solve all of a user's problems, they represent an immediate step in the right direction.

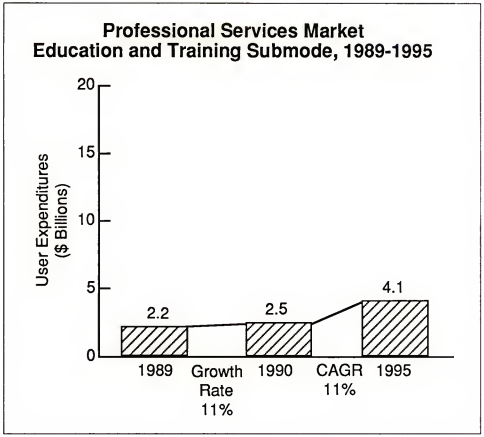
The new consulting services phrase, information systems change management, describes the process of moving the information systems process from a centralized, impersonal organization to one with more focus on computing end users. This new focus includes increased user support and training.

Vertical sectors with the greatest need for consulting services are manufacturing, transportation, and insurance.

3. Education and Training Submode

Education and training, at $2.2 billion or about 11% of total 1989 user expenditures, is the smallest segment in the professional services delivery mode. This number, illustrated in Exhibit IV-8, represents only external user expenditures for such services; monies spent for internal training are not reflected in the figures. The education and training submode will grow at a CAGR of 11%, reaching approximately $4.1 billion in 1995

EXHIBIT IV-8



The importance of education and training far exceeds its position based on user expenditures relative to consulting, software development, or systems operations. It is the foundation upon which information services vendors and large commercial, government, and services customers base their expertise.

As this segment matures, services are becoming increasingly specialized. Specifically, education and training covers the following types of services:

- Methodology and software engineering
- Systems software
- Hardware platforms
- Technology
- Information systems management

Education and training for systems software products covers UNIX and open systems as well as, IBM's CICS and DB2, and Digital's RDB data base management systems.

The introduction of new hardware platforms forces users and software developers to learn the technical ins and outs of these products. Digital Equipment's introduction several years ago of its MicroVAX line of workstations and IBM's recent introduction of the AS/400 midrange system automatically necessitated training and education for users and developers.

Information systems managers as well as non-IS managers need high-level information on emerging technologies, such as imaging systems, robotics, industrial automation, AI, LANs, telecommunications, data communications, and voice/data integration.

Information systems managers require exposure to new methodologies for running the IS department. Education and training is required in order to keep up with changes in project management and software development methodologies.

No longer are separate formal training classes offered to users and vendors. Now, employees from client companies can take classes formerly offered only to members of the vendor technical staff. INPUT market data reflects user expenditures for such classes.

E

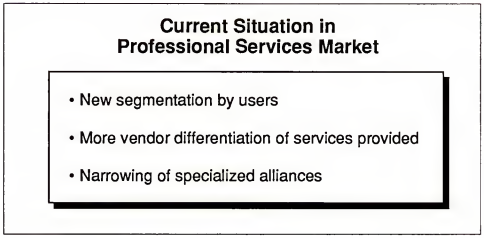
Current Market Situation

The recent maturation of the professional services market has led to the following trends:

- New market segmentation by users
- Differentiation of vendor services using proprietary products
- Narrowing of specialized alliances between hardware vendors and professional services firms

Exhibit IV-9 summarizes the current situation in the professional services market. Segmenting the market is one way to evaluate professional services activities. While the professional services market can be segmented on the basis of category of service provider and vendor capabilities, INPUT has identified three user-based market segments.

EXHIBIT IV-9



Firstly, user firms are segmenting the market based on the size of the professional services firm. The largest manufacturing, financial services, transportation, or utility organizations require the largest professional services firms. These firms' expertise, international experience, proprietary products, project management skills, and, most importantly, solid financial position ensure that they will receive at least a request for proposal (RFP) to bid on the project.

Secondly, users divide the professional services market into vendors with unique capabilities and those offering traditional services. Vendors have developed technical expertise in telecommunications and data management, proprietary software in computer-aided software engineering (CASE), and project management as the basis for differentiation and maintain this differentiation by not selling their products directly to users. Some vendors have also developed vertical industry software products which are not sold directly to customers, but are used to differentiate professional services.

Thirdly, a key characteristic of the professional services business is the flexible relationships between hardware vendors and vendors that primarily provide services. In this market segment, hardware vendors team with professional services vendors for one project, then compete vigorously with one another for a different project.

In the next two or three years, professional services vendors will form stronger alliances with specific hardware vendors. This new marketing approach will result from the increasing level of specialized knowledge required and from smaller services vendors' inability to make a substantial investment in training an internal staff on hardware and systems software products.

F

Professional Services Component of Systems Integration

Systems integration (SI) projects include the following major components:

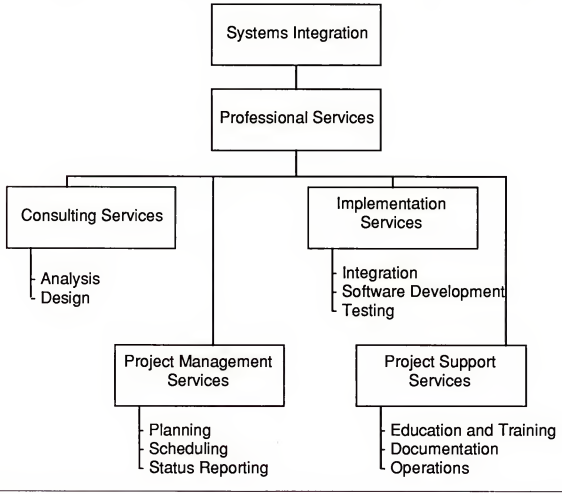
- Computer equipment
- Telecommunications equipment
- Packaged software
- Professional services

Exhibit IV-10 identifies four professional services activities associated with SI projects:

- Consulting
- Implementation
- Project management
- Project support

EXHIBIT IV-10

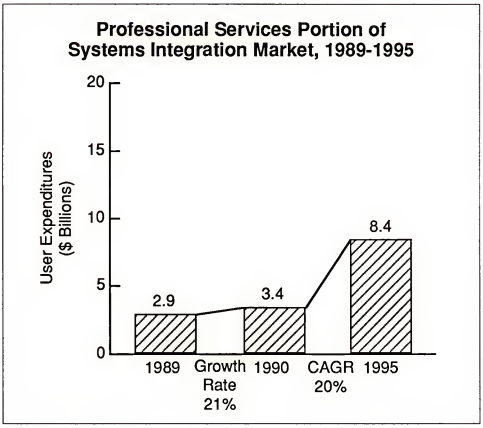
Professional Services Components of Systems Integration



Successful vendors will develop capabilities in all areas, either in-house or through alliances with third-party vendors.

Exhibit IV-11 indicates that expenditures for professional services in systems integration will grow at a 20% compound annual rate through 1995, reaching $8.4 billion. This represents about 27% of the professional services market. Systems integration and regular professional services will be nearly a $40 billion combined market in 1995, without including the customization of software products for turnkey systems, which also falls under professional services.

EXHIBIT IV-11



Reflecting the high value added, professional services is the largest and fastest-growing component of SI. Consulting services are frequently the precursor of most systems integration projects. Overall planning assistance, strategic consulting, feasibility studies, and cost/effectiveness trade-off studies guide the client to plan for the desired solution.

Fees paid to the integrator for planning, scheduling, and controlling the materials and human resources for the project represent another professional service. Project management (PM) also involves project monitoring and status reporting to the client and risk assumption by the vendor.

The development of new and customized software, the conversion of existing software, or the modification of commercial software packages are key professional services in SI. The level of these services varies by industry; however, the leading industries are, in order, as follows:

- Discrete manufacturing
- State and local government
- Banking and finance

Education and training of client staff on the operation of the system and the complete set of documentation for the project are also critical to the success of an SI project.

Some major projects require that the vendor operate and maintain the developed system for a specified time. This is vendor-staffed, on-site support of the system, or system operations. Under some contracts, maintenance is under warranty for a defined period, while under other contracts, operations and maintenance is a specifically negotiated arrangement marking the transition of the system from the "prime contractor" vendor to the client.

G

Overlap with Data from INPUT's Customer Service Program

INPUT's Customer Service Program tracks maintenance and support activities by computer systems manufacturers, software vendors, and independent maintenance vendors.

Faced with slowing growth rates in computer hardware maintenance revenues because of improving product reliability, increased competition, and increased pressure from users to reduce prices, many service organizations have identified professional services as an important growth market.

While specific activities may vary among different vendors' offerings in the professional services area, the basic concept defining professional services is that customer services-based professional services is any service performed for a fee that improves the performance of a computer system.

INPUT refines this definition to include only those services that are appropriately managed or performed by the service organization that affect the system's support requirements or ability to be serviced. Those activities include:

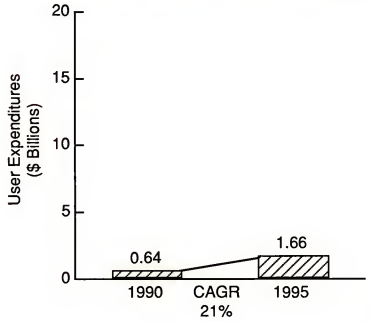
- Planning (environmental, site, and installation)
- Consulting (performance optimization, network planning and design, network implementation, or cabling)

- Training (on the maintenance of the system)
- Relocation and reinstallation
- Site management (also known as multivendor service coordination)

Exhibit IV-12 presents INPUT's forecast for customer services-related professional services. These relatively high growth rates are reasonable, given growing user demand for increased system reliability and availability and increasing user activity in these support areas.

EXHIBIT IV-12

Customer Services-Based Professional Services Market, 1990-1995



For example, IBM has announced three major professional services offerings.

- The first, Customized Operational Services (COS), is a series of site management and planning services that include the following:
  - Site readiness services
  - Contractor services
  - Installation management
  - Cabling
  - Data center evaluation and design consulting
  - Relocation planning and management services

In keeping with the customized nature of professional services, IBM prices COS on a case-by-case basis.

- A second major IBM professional service offering is its Technical Services Management (TSM) program, under which IBM provides multivendor support for users, either subcontracting the service or, at IBM's discretion, offering the third-party service itself.

- A third major offering by IBM is Telecommunications Services Network Support. This offering provides TSM-like multivendor support on a wide range of telecommunications and data communications products. Services range from network problem identification to fix verification from IBM's Network Support Center.

Digital Equipment Corporation has also announced two multivendor services:

- Enterprise-Wide Services is a comprehensive package of planning, program management, and integrated support services drawing from selected service alliances that Digital expects to sign with leading service vendors.

- Its Network Enterprise Management Program serves as a platform for existing network planning and support services, and adds new services resulting from alliances with leading telecommunications vendors.

Hewlett-Packard has also entered the world of multivendor service, introducing its Multivendor Support Operation and a Strategic Partners Program, which is designed to attract OEMs with little or no service presence.

Independent maintenance organizations also recognized the need to compete in the professional services market. CDC's organization introduced an operating system software maintenance planning and management service called Total Operating Performance Package (TOPP).

Issues and Trends

Issues and Trends

A

Introduction

Before discussing the professional services market and competitors, it is useful to identify and discuss key issues and trends in the information systems business.

Certain issues and trends discussed below are oriented to the overall IS market; others focus on the U.S. professional services market.

1. Major Issues in Information Systems

In response to sluggish sales, competitive business activity, or both, corporate management and information systems buyers are most concerned with steps that can improve the ability to market, sell, and support or improve the design, manufacture, and quality of products and services.

As shown in Exhibit V-1, the importance of sales and competition, particularly foreign competition, has given executives in certain user areas more influence in the determination of information system expenditures. These buyers are interested in improved order entry and customer service systems and in upgrades to manufacturing systems, according to user executives. As a result, new administrative, human resources systems, and other applications are being delayed at some companies.

Corporate management and influential buyers are interested in achieving results that address current situations, but they are sensitive to the economic climate and to the complexity of systems solutions that have created interesting challenges for informations services executives and vendors in the information services industry. These buyers are going to talk to information systems personnel or outside firms that understand their needs and have ideas about solutions. However these buyers and corporate executives are seeking cost-effective solutions that may require complex steps, such as the integration of data bases or networks or the development of distributed systems.

EXHIBIT V-1

Information Systems—Major Buyer Issues

- Sluggish sales
- Market penetration by competitors
- Sensitivity to the economic climate
- Complexity of systems solutions
- Allocation of IS expenditures
- Selection of information services
- Coordinating the use of technology
- Shortages of technical expertise

According to an information systems executive assigned to a user department at a large investment firm and a systems planning official at a manufacturing company, current economic uncertainty and the complexity of needed solutions will lead to phased solutions in many circumstances. Where a new or changed application can be implemented that will meet current needs within a short time, it will be done. Plans or guidelines that will facilitate future network or application and data base integration will be considered but will not be overriding factors.

The information systems executive assigned to the user department selected equipment, software packages, and network steps that a professional services firm and the corporate information systems group agreed would be compatible with the range of possibilities under consideration for longer range plans.

The professional services firm chosen to perform the consulting services was chosen for its expertise in systems planning. A separate professional services firm was chosen to implement the short-term solution based on its experience with the computing equipment and open systems platform being chosen. During the process of evaluating alternatives to meet the current sales problems, professional service firms, systems integrators, vendors offering outsourcing solutions, and application software vendors

called upon the company and offered ideas. The difficulty of evaluating information services alternatives and selecting vendors illustrated a major issue confronting information systems buyers, as indicated in Exhibit V-1. The IS executive noted that the information systems function has to be proactive, in these situations, a professional services firms must be selected that can help get the job done immediately. Otherwise, the user might choose to go to an SI or outsourcing vendor that would take care of all problems, short or long term.

Coordinating the use of technology is also a major problem to information system users, as illustrated by the above examples. A user at a major energy company noted that his division had just discovered that their open systems development of a new application was not compatible with open systems work in other divisions. Their internal developers did not have sufficient expertise with open systems to anticipate this problem.

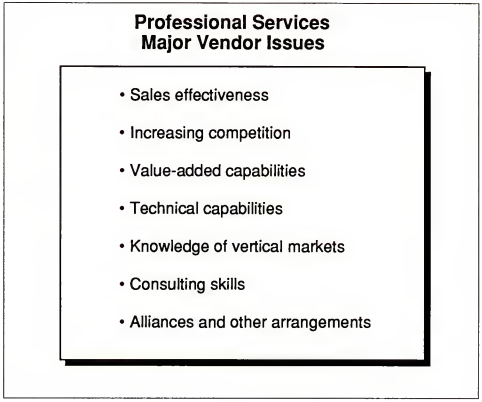
Shortages of expertise are reported by many companies in areas ranging from open systems to the use of relational data bases, CASE tools, or imaging techniques. A large systems group at the major energy firm referred to above has been constantly seeking expertise (real experience) in the use of certain network software as well as in the LU 6.2 interface. The need for and shortages of technical skills, in particular for newer technologies, is recognized by a number of professional services vendors, and many are now exploiting the capabilities of their staffs in seeking business.

2. Professional Services Vendor Issues

As indicated in Exhibit V-2, competition and the need to sell more effectively are primary vendor issues. Not only are there more professional services firms chasing a relatively constant client base, but there are additional types of firms competing for professional services business in a tighten market caused by economic conditions. Application and systems software firms have added professional services activities to help sell software and increase revenues when opportunities appear. Public accounting firms and systems integrators may compete for large and small system development jobs when they surface at existing clients. Even some vendors of computing equipment may bid for systems application jobs that may not use their equipment if the jobs are large enough and if they are in areas of vertical markets where the vendors are experienced.

In the face of this competition, professional services vendors are finding that they cannot rely solely on telemarketing and personal contact by sales representatives. Account representatives and literature have to portray the technical strengths and vertical market knowledge of the professional services firm. Account representatives and the staff of the firm may also have to be prepared to offer consulting services, which

EXHIBIT V-2



may be required to help conceptualize, plan, and justify development projects. Otherwise, the professional services or other vendor that can offer this consulting will be in an excellent position to win the job. Consulting services that can address business change or the operation of critical systems also provide means of working with higher levels of client management and gaining substantially more revenue.

As Exhibit V-2 indicates, the use of value-added capabilities is also a major vendor issue today. These capabilities may be necessary to win jobs such as assignments in networking or the implementation of a DB2 data base where the prospect may investigate credentials before awarding contracts for people or for projects. The capabilities may also enable the professional services vendor to participate in planning for the project or ensure that the vendor is less subject to cuts in work due to shortages or cutbacks in project funding. Information services vendors report that traditional professional services work is harder to obtain and is growing at a slower rate in today's market than services that involve value-added capabilities. Several vendors report that they are considering plans that would expand their abilities to offer expanded technical capabilities.

Alliances and arrangements with software products vendors (e.g., applications, data base, or CASE tools) or processing services vendors provide professional services vendors with additional offerings in their sales

activity. As a representative of one professional services firm said, "If you have the opportunity to meet buyers, you want to have enough services to offer so that you can walk away with some business." Of course, these alliances also enable professional services vendors to enhance their image as a value-added service.

B

Key Information Systems Trends for the 1990s

1. Computer Manufacturers' Role

Until the 1980s, computer hardware vendors relied greatly on the use of professional services to help sell hardware. These services, which helped to develop or modify applications to meet user needs, were a chief method of selling computing equipment as well as applications and system software products.

During the 1980s, the price, performance, and capability of application software became major factors in the sale of a computing system and information services. The decade was marked by the arrangements made between computer manufacturers and the developers of applications that helped to sell their hardware. The manufacturers helped to fund or provided resources to aid development, invested in software companies, and sold their products.

2. Information Systems Market Structure

Exhibits V-3 and V-4 depict INPUT's view of the changing information services market. This market in the 1980s, portrayed in Exhibit V-3, had software products at its center. Software products integrate the other four information services delivery modes.

More recently, users' needs are being fulfilled through the offering of integrated solutions often provided by a single vendor. As the 1990s unfold, the longer-term view, as shown in Exhibit V-4, is that the unifying force in the industry will become support services. When a customer buys computer systems or application software; processing, professional, or network services; or turnkey systems from one or more vendors, one vendor will act as the primary integrator through its support services infrastructure.

EXHIBIT V-3

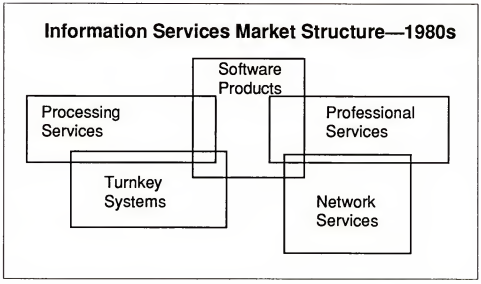
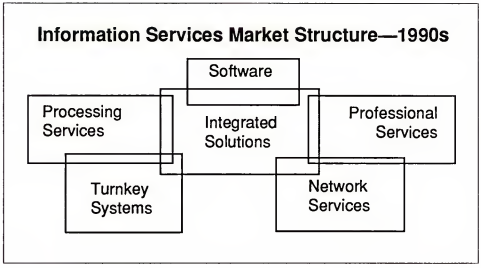


EXHIBIT V-4



3. Information Services Market Internationalization

Like the manufacturing and financial services markets, because of legal considerations and actions by vendors and buyers, the information services market is broadening its scope of products and services.

As indicated in Exhibit V-5, market barriers will soften in two key markets, Western Europe and North America. The 1992 agreement between the European Economic Community (EEC) member states will ease movement of goods, services, and capital across Europe. In North America, trade barriers between Canada, Mexico, and the U.S. are rapidly diminishing.

Customers buying information systems products and services are including some form of international capabilities in their specifications. These requirements include support for certain international communications protocols and distributed processing environments, and most importantly, post-sale service and support in Western Europe, the Far East, and potentially Eastern Europe.

EXHIBIT V-5

Internationalization of End Users

- Collapsing market barriers
  - Western Europe
  - North America
- Growing market interest/participation
  - Pacific Rim
- Internationalization of buyer requirements

C

Professional Services Market—Driving Forces

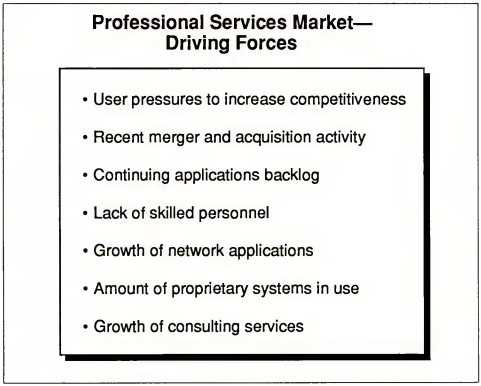
Increasing user and corporate attention to the need to increase competitiveness and continuing application backlogs result in ongoing demand for professional services, as indicated in Exhibit V-6. The creation or enlargement of user systems capabilities is not sufficient for improving competitiveness. Users note that they need multiple vendors to implement new order entry, customer service, and manufacturing systems. In addition to increased attention on these needs, there are backlogs of other application requests that represent at least one to two years of work, according to users.

A result of the record number of mergers and acquisitions during the last few years is a large volume of application integration or replacement work that will require significant technical expertise. Professional services vendors have begun to feel the impact of this increased demand.

The lack of skilled personnel to handle mergers, or other complex systems and technologies required by users, is a driver for the use of professional services firms. Account managers from several vendors state that the ability to offer certain technical skills is a door opener at many companies. However, these vendors also face the problem of locating and

holding on to skilled personnel. Because they work closely with vendors of hardware and software, they sometimes have more opportunity than users to anticipate needs for and obtain critical skills.

EXHIBIT V-6



Another advantage that professional services firms have in improving strength in specific technology areas—such as the implementation of communication networks—is that they can develop the business base to continue to train new personnel. This is particularly valuable in network assignments, as noted in Exhibit V-7.

Professional services work is also driven by the need to upgrade from one language, machine, data base, or network to another. The number of people and the expertise required will often be more than a user or company can provide. Attempts are being made to lessen this burden through the use of open systems. The eventual use of software engineering techniques to generate applications for a new environment also offers promise. For the near future, professional services firms will be needed to aid in the use of new approaches as well as with the great volume of proprietary software in use.

Professional services firms, from large (CSC) to small (Boston Systems Group), are finding increased need for consulting services. The consulting services being sold by professional services firms include systems planning assignments as well as work on the technological means of supporting new product plans. These assignments are another driver for professional services firms.

D

Professional Services Market—Growth Inhibitors

The professional services market can be affected by various inhibitors, including the current economic downturn, as indicated in Exhibit V-7.

The greatest near-term inhibitor is the economic downturn, which may cause users to delay projects and handle more development inside to save money. This inhibitor is currently having an impact on "plain vanilla" professional services firms that have people with standard skills, such as a knowledge of COBOL. Firms that have people with more critical skills, such as network and data base integration experience, are not suffering as many cutbacks.

EXHIBIT V-7

Professional Services Market—Growth Inhibitors

- Significant economic downturn
- Increased power of application development tools
- Lack of personnel with critical technical skills
- Movement of prospects to systems integration or outsourcing
- Slowing of information services industry

The use of more powerful software engineering tools could reduce the work of professional service vendors in the future. In the near term, these vendors are finding opportunity in the support of new software engineering tools and techniques. For some time, the evolution of this capability should provide opportunities for vendors. One energy company that has had success in using software engineering techniques to reduce the work of COBOL programmers notes that it has increased need for higher-level skills to support the use of tools, particularly in attempts to implement very complex new applications.

Vendors that cannot find ways to locate, hire, train, and retain individuals with critical skills will find their growth inhibited.

The movement of corporations away from the use of professional services toward the use of systems integration or outsourcing is an inhibitor and has reduced the growth of traditional professional services work.

Although systems integration is currently popular, it appears unlikely that the vast majority of corporations will choose it. Several information systems executives feel that internal IS groups could become more active as integrators in their companies, and they will go to professional services firms for the skills they lack.

E

Professional Services and Systems Integration

The relationship between professional services and systems integration is outlined in Exhibit V-8.

There is a professional services component to systems integration, but systems integration includes planning, managing, and implementing a solution on the equipment or facilities required for the solution. It also includes a significant systems management element where the systems integrator assumes overall responsibility for the entire project, including any subcontractors. The level of management responsibility is significantly less in almost all professional services engagements. The reader is referred to INPUT's report, *U.S. Systems Integration Market, 1990-1995*, for additional information.

EXHIBIT V-8

Differences between Professional Services and Systems Integration

Category	Professional Services	Systems Integration
Project Duration	Can be continuous	Limited
Project Management Responsibility	Usually customer	Prime contractor
Computer Equipment Selection	Customer	Prime contractor for customer
Services Provided	Often a single service (e.g., software development)	Usually multiservice, including hardware/ software integration
Pricing	Time and materials	Fixed-price
Item Purchased	Resources	A solution

Competition

Competition

A

Introduction

The leading vendors in the U.S. professional services market and various market segments are identified in this chapter. Professional services, defined as those information systems-related services performed for customers, include the following:

- Software development
- Consulting
- Education and training

These services may also be delivered with other capabilities as part of systems integration services. As the concept of systems integration became distinguishable in its focus on delivering solution services, as well as in its different growth rate and marketing methods, it became meaningful to treat SI as separate from professional services. One other component of professional services, facility management, has been reclassified as part of systems operation since it involves operational processes.

B

Market Leaders

The top vendors of professional services in the United States, listed in Exhibit V-1, include many companies devoted chiefly to other products and services, including manufacturers of computers and other products, public accountants, and a phone company subsidiary. Only six of the 20 top firms are devoted to professional services.

A number of the top firms in professional services, including CSC, Unisys, and KPMG, began to increase their emphasis of systems integration relative to professional services during 1989. This has changed the ranking of vendors in both professional services and SI categories.

Many of the top professional service vendors are suppliers to the federal government, including IBM, EDS, CSC, Black and Decker, BDM International, Logicon, and Unisys.

EXHIBIT VI-1

Largest U.S. Professional Services Vendors, 1989

Rank	Vendor	Professional Services Revenues ($ Millions)*
1	IBM	410
2	EDS	396
3	CSC	380
4	Andersen Consulting	287
5	Black & Decker	211
6	NYNEX	202
6	Logicon	202**
8	Unisys	200
9	CGA	196
10	Coopers & Lybrand	181
11	BDM International	170**
12	A.D. Little	165
12	Ernst & Young	165
14	Harris Corp.	150
15	Hewlett-Packard	146
15	CTG	137
16	NCR	130
17	Price Waterhouse	120
18	Grumman	117
19	Deloitte & Touche	114
20	Applied Learning	113
21	KPMG	106
22	Martin Marietta	104

*Does not include professional services sold as a component of systems integration.
**More specialized types of professional service work included.

This category of services firms has the greatest number of vendors among the top performers and is dominated by the Big 6 public accounting firms: Andersen Consulting (the business organization set up by the partners of Arthur Andersen in view of the size and growth of the non-accounting business), Ernst & Young, Coopers & Lybrand, Price Waterhouse, Deloitte & Touche, and KPMG Peat Marwick. Several of these public accounting firms perform systems integration work as well, notably Andersen Consulting and KPMG. Andersen Consulting has also moved aggressively into systems operations.

The trend toward expansion of SI services by leading vendors of professional services is illustrated in Exhibit VI-2, where the 1989 revenue is indicated for professional services and systems integration. Exhibit VI-3 ranks the top vendors in terms of their professional services and systems integration revenues.

- The top four vendors, IBM, EDS, Andersen, and CSC remain in dominant positions, however vendors such as Martin Marietta and Grumman ascend in rank and the overall order of vendors changes. DEC, a late entry to the professional services sector shows up as a leader in systems integration.

- In addition, these leading professional service firms are also turning attention to systems operation (outsourcing) to expand their revenues. EDS and Andersen Consulting are particularly active in these areas.

EXHIBIT VI-2

Leading Professional Services Vendors,1989 Professional Services and Systems Integration Revenues

Vendor	$ Millions	
	Professional Services Revenues	Systems Integration Revenues
IBM	410	930
EDS	396	545
CSC	380	400
Andersen Consulting	287	650
Black & Decker	211	194
NYNEX	202	100
Logicon	202	-
Unisys	200	399
CGA	196	22
Coopers & Lybrand	181	43
BDM International	170	32
Ernst & Young	165	42
A.D. Little	165	-
Harris Corp.	150	-
CTG	137	79
Grumman	117	220
Deloitte & Touche	114	29
Applied Learning	113	-
KPMG Peat Marwick	106	97
Martin Marietta	104	337
DEC	69	280

EXHIBIT VI-3

Ranking of Professional Services Vendors—Based on 1989 Revenues

Vendor	Rank Based on	
	Professional Services Revenues	Systems Integration Revenues
IBM	1	1
EDS	2	3
CSC	3	4
Andersen Consulting	4	2
Black & Decker	5	9
NYNEX	6	10
Logicon	7	NA
Unisys	8	5
CGA	9	17
Coopers & Lybrand	10	13
BDM International	11	15
Ernst & Young	12	14
A.D. Little	13	NA
Harris Group	14	NA
CTG	15	12
Grumman	16	8
Deloitte Touche	17	16
KPMG	18	11
Martin Marieta	19	6
DEC	NA	7

Professional services can be delivered with outsourcing, SI, turnkey (customizing), or even processing services. The volume of professional services business is larger than the market size for this mode as illustrated in Exhibit VI-4. By 1995, the total professional services work performed by SI and turnkey vendors may amount to over 26% of the professional services market. Professional services vendors should think of ways to compete for this business.

EXHIBIT VI-4

Professional Services Revenues from All Delivery Modes

Delivery Mode	1990		1995	
	$ Billions	Percent	$ Billions	Percent
Professional Services	16.8	77	29.5	74
Systems Integration	3.3	15	7.6	19
Turnkey Systems	1.7	8	2.7	7
Total	21.8	100	39.8	100

C

Segment Leaders

The next four exhibits present the leading vendors in each market segment.

1. Professional Services Submodes

a. Software Development

The leading vendors for 1989 in the software development segment, shown in Exhibit VI-5, include four computer systems manufacturers, three accounting firms, two subsidiaries of diversified manufacturing firms, and four vendors devoted chiefly to professional services. The 1989 top 20 software developers held a combined 1989 share of about 30% of the market.

EXHIBIT VI-5

Leading U.S. Professional Services Vendors
Software Development Submode, 1989

Rank	Vendor	Estimated Vendor Revenue ($ Millions)*
1	CSC	225
2	IBM	219
3	EDS	218
4	Andersen Consulting	183
4	NYNEX	183
6	CGA	163
7	Unisys	162
8	Ernst & Young	138
9	Logicon	138
10	BDM International	127
11	Coopers & Lybrand	123
12	CTG	110
12	Black & Decker	110
14	Hewlett-Packard	96
15	NCR	95
16	Telos	83

*Does not count revenues for work sold as components of systems integration services.

b. Consulting

In the consulting segment, vendors such as Booz, Allen & Hamilton, Arthur D. Little, and McKinsey join the leading vendors list. As shown in Exhibit VI-6, the top eight vendors hold a combined share of about 20% of the market.

EXHIBIT VI-6

Leading U.S. Professional Services Vendors Consulting Submode, 1989

Rank	Vendor	Estimated Vendor Revenue ($ Millions)*
1	IBM	109
2	EDS	106
3	CSC	101
4	McKinsey	95
5	A.D. Little	95
6	Booz, Allen & Hamilton	90
7	Black & Decker	70
8	Andersen Consulting	51

*Does not include consulting work sold as part of systems integration services.

c. Education and Training

As a specialized service, education and training attracts specialized vendors, as shown in Exhibit VI-7.

Professional services is not a uniform market; only CSC, IBM, EDS and Andersen are common to all three submodes covered in Exhibits VI-5, VI-6, and VI-7.

The vendor revenues that are shown in these exhibits do not reflect the total revenue of this work as noted before. The same activities are carried on in systems integration projects.

The rank of vendors by development revenues is somewhat similar to the order shown for professional services vendors in Exhibit VI-1, particularly for the top 10 vendors. The top vendors change somewhat when the sale of consulting services is examined. Firms that specialize more in consulting assignments, including Booz Allen, McKinsey, and A.D. Little, move into the top tier of consulting companies, as shown in VI-6. This business can be profitable and can lead to other information services work. IBM, CSC, DEC, and members of the Big 6 public accounting firms have all taken steps to increase revenue from consulting.

EXHIBIT VI-7

Leading U.S. Professional Services Vendors Education and Training Submode, 1989

Rank	Vendor	Estimated Vendor Revenue ($ Millions)*
1	Applied Learning	115
2	IBM	82
3	EDS	72
4	CSC	54
5	Andersen Consulting	53
6	Price Waterhouse	43
7	NCR	27

*Does not include education and training sold as part of systems integration services.

The education and training market does not exhibit the same appeal toward professional services vendors. In general, larger professional services firms have business in the market. However, there are firms specializing in this submode, and the leader in the submode is a specialist.

Just as many professional services firms entered the SI market when interest in SI service grew, professional services and SI firms have turned to outsourcing as systems operation has grown in revenue. Exhibit VI-8 shows vendors of professional services and SI services that are among the leaders in systems operation revenue.

EXHIBIT VI-8

Leading Systems Operations Vendors 1989

Vendor	Market Share (Percent)
EDS	16
CSC	5
Systematics	3
Affiliated Computing Services	3
Shared Medical Systems	2
SIAC	2
BCS	2

2. Federal Government Sector

As indicated in Exhibit VI-9, many of the leading professional services vendors receive a significant proportion or all of their professional services revenue from the federal government. Vendors largely dependent on that market include BDM International, Black & Decker, Martin Marietta, CDSI, and Centel Federal. However, there are major federal vendors, such as CSC and EDS that are also active in the non-federal market, as shown in Exhibit VI-10.

Except for a small number of vendors, however, the list of professional services vendors involved in federal government business is different from the list of non-federal business. It appears that vendors are faced with the choice of serving one of these markets or the other.

EXHIBIT VI-9

Leading Professional Services Vendors Federal Government Sector, 1989

Company	Revenue ($ Millions)
1. Computer Sciences Corporation	300.0
2. Unisys	120.0
3. Black and Decker	107.0
4. Martin Marietta	100.0
5. Grumman Data Systems	99.5
6. Computer Data Systems Inc.	99.1
7. Electronic Data Systems	99.0
8. Centel Federal Systems	87.0
9. IBM	65.5
10. Syscon	60.0
11. Mitre	48.5
12. BDM	47.4
13. Oracle	45.5
14. SAIC	42.3
15. Softech	35.0
16. Sterling Software	31.4
17. OAO Corporation	29.2
18. CBIS	25.5
19. Control Data Corporation	22.0
20. American Management Systems	21.0

EXHIBIT VI-10

Leading Professional Services Vendors
Non-Federal Government Sector, 1989

Rank	Vendor	Estimated Vendor Revenue ($ Millions)*
1	IBM	344
2	EDS	309
3	Andersen Consulting	264
4	NYNEX	202
5	CGA	196
6	Coopers & Lybrand	172
7	Ernst & Young	162
8	Hewlett-Packard	146
9	CTG	137
10	NCR	130
11	Price Waterhouse	114
11	Deloitte Touche	114

*Does not include professional services sold as part of systems integration work.

3. Public Professional Services Vendors

The list of the top five publicly traded firms that are leaders in the commercial and federal markets, as shown in Exhibit VI-11, emphasizes the differences between these markets. No firm is on both lists. Once a firm has become heavily involved in one market, it can be difficult to reach the same level of revenue in the other market, except by selling another mode of service such as SI or SO.

EXHIBIT VI-11

Leading Publicly Traded Firms
Federal Government Professional Services Market, 1989

Federal Government Professional Services Market, 1989	
Vendor	Rank
CSC	1
Unisys	2
Black & Decker	3
Harris Group	4
Martin Marieta	5
CDSI	6

Commercial Professional Services Market, 1989	
Vendor	Rank
IBM	1
NYNEX	2
CTG	3
NCR	4
Hewlett-Packard	5

4. Software Products Vendors

Exhibit VI-12 illustrates that very few software firms generate meaningful revenue from professional services. Oracle has been able to do so, and it has developed a systems integration business as well. This is chiefly because it has set up activities dedicated to generating this revenue. Very few turnkey firms generate much revenue from professional services. A software or turnkey firm that attempts to leverage professional service revenue from its major product is not likely to be as successful or to generate as much revenue as public accounting firms.

EXHIBIT VI-12

Leading Software Products Vendors in Professional Services, 1989

Rank	Vendor	Estimated Vendor Revenue ($ Millions)*
1	Oracle	70
2	CAI	45
3	Policy Management	48
4	Sterling	31
5	American Software	30
5	Compuware	30
7	Cadence	27

*Does not include professional services sold as part of systems integration services.

5. Public Accounting Firms

As shown in Exhibit VI-13 all of the major public accounting firms are very active in the professional services segment of the information services industry. Professional services opportunities and competitive pressures are key factors in the consolidation of the top public accounting firms that has taken place in the past two years. These firms are more used to selling services and addressing general problems.

EXHIBIT VI-13

Leading Public Accounting Firms in Professional Services, 1989

Rank	Vendor	Estimated Vendor Revenue ($ Millions)
1	Andersen Consulting	287
2	Coopers & Lybrand	181
3	Ernst & Young	165
4	Price Waterhouse	120
5	Deloitte & Touche	114
6	KPMG Peat Marwick	106

6. Computer Manufacturers

Computer manufacturers have typically used professional services to help sell equipment. It is not surprising to find that these manufacturers have healthy volumes of professional services work, as shown in Exhibit VI-14. The manufacturers develop or modify application software so that their hardware can solve user needs. They also sell or promote the sale of third-party application software as much or more than they use professional services to close sales in some cases. In addition, some manufacturers market turnkey systems, systems integration, or other services to promote sales so that the use of professional services is not as often the chief weapon in selling equipment as it was in the past.

EXHIBIT VI-14

Leading Computer Manufacturers in Professional Services 1989

Rank	Vendor
1	IBM
2	Unisys
3	NCR
4	Hewlett-Packard
5	DEC
6	Wang

7. Telecommunications Vendors

Telecommunication vendors such as NYNEX, AT&T, Ameritech, Bell Atlantic, Bell South, and Pacific Telesis constitute a group that can be identified in the professional services business. Their objective is to increase revenues in general, although several of these vendors see the services as a means of generating other types of business, including the sale of computing equipment, software, network development, and services.

D

Mergers and Acquisitions

Professional services vendors in general have tried to become more competitive through mergers, joint ventures and alliances, as shown in Exhibits VI-15 and VI-16. These moves enable vendors to fill in gaps in their services as well as to bring more products to a wider range of markets. It can leverage sales contacts and make a wider range of sales possible. Of course it can offer the opportunity to sell a set of linked services or solutions to prospects who are increasingly looking for this type of service.

EXHIBIT VI-15

Mergers and Acquisitions
Professional Services Firms

Firm	Acquired Firm
Andersen Consulting	- Courseware - Kestenbaum & Co.
CSC	- Inform Ltd. (U.K.) - CIG Intersys Group (Belgium) - Cleveland Consulting Associate (Cleveland, OH) - LPS, Inc. (Minneapolis, MN) - Inform, Ltd. (Weybridge, England) - Computer Partners (Boston, MA) - Index Group (Cambridge, MA) - CIG-Intersys Group (Belgium) - Seako, Inc.
CTG	- Scientific Integrated Systems Services - Maxima Computer Management Consultants Inc. - Shubrooks International, Ltd. (U.K.) - Quadra Systems, Inc. (San Antonio, TX) - United Software Consultants, Inc. (Chicago, IL)
NYNEX	- AGS Computers - Multiple Tech. (Detroit, MI) - Teco Technologies (Tampa, FL)
CBIS	- Auxton Computer Enterprises (Maitland, FL) - Vanguard Technologies International (Fairfax, VA)
Ernst & Young	- Network Strategies, Inc. (Fairfax, VA)
Coopers & Lybrand	- Computer Assistance (West Hartford, CT)

EXHIBIT VI-16

Joint Ventures, Alliances, and Investments Professional Services Firms

Firm	Type	Other Vendors	Notes (Products/Services)
IBM	Alliance	CTG	AD/Cycle
IBM	Alliance	CAP Gemini America	AD/Cycle
IBM	Alliance	G.E. Consulting	AD/Cycle
IBM	Alliance	Computer Power Group	AD/Cycle
IBM	Alliance	Andersen Consulting	Marketing
IBM	Alliance	Keane, Inc.	Marketing
IBM	Alliance	Planning Research Corp.	Marketing
IBM	Alliance	SAGE Federal Systems	Marketing
IBM	Investment	KnowledgeWare	CASE
IBM	Investment	Bachman Info. Systems	CASE
IBM	Investment	Index Technology	CASE
IBM	Joint Venture	Baxter-Travenol	Marketing
CTG	Joint Venture	A.T. Kearney	Prof. Services
Bell Atlantic	Joint Venture	American Mgmt. Systems	Network Services
Andersen Consulting	Alliance	DEC	Insurance Software
		MSA	Accounting Software
		McCormack & Dodge	Accounting Software
Coopers & Lybrand	Alliance	McCormack & Dodge	Accounting Software
		MSA	Accounting Software
Ernst & Young	Alliance	MSA	Accounting Software
		McCormack & Dodge	Accounting Software
		Integral Systems	Accounting; Human Resources Software
Price Waterhouse	Alliance	Qronos	Manufacturing Software
IBM	Investment	CTG	Max. 19.9% stake
IBM	Investment	American Mgmt. System	Max. 20% stake
IBM	Investment	Policy Mgmt. Systems	Current 20% stake
IBM	Investment	Baxter Healthcare Corp.	Partnership

E

Vendor Profiles

Six professional services vendors with different strategies in addressing the marketplace are profiled in this section. They include:

- American Management Systems, Inc.
- Analysts International Corp.
- Andersen Consulting
- Computer Horizons Corp.
- Computer Task Group, Inc.
- Keane, Inc.

Each profile contains information on company strategies, background and key products and services. Additional information can be found in INPUT's Vendor Analysis Program (VAP).

1. American Management Systems, Inc., 1777 North Kent St., Arlington, VA 22209 (703) 841-6000

Company Strategy

AMS leverages its strength in proprietary software for financial services, government, education, energy, and telecommunication companies together with strength in professional services and productivity tools to solve complex problems for large organizations. This has led the company from professional services to systems integration as its chief mode of service as well as to some systems operations. More work is also being performed for non-federal clients, including the joint operations with Bell Atlantic.

Company Background

American Management Systems, Inc. (AMS), founded in 1970, provides professional services, systems integration, and systems operation. Application software owned by the company is used in these contracts and is not sold separately. Revenues for 1989 of $225 million increased 6% over 1988 revenues. AMS is one of the vendors in which IBM has invested.

Key Products and Services

Proprietary software used in professional services and systems integration work includes credit management, letter of credit, collection, corporate account, and funds transfer systems for banking; accounting and financial systems for government and education; financial and information systems for energy companies; and billing, service management, and message processing systems for the telecommunications industry. AMS also has a repertoire of productivity tools and data management and other systems software available to aid professional services work.

2. Analysts International Corporation, 7615 Metro Boulevard, Minneapolis, MN 55435 (612) 835-2330

Company Strategy

The company provides professional services to a wide variety of industries. It has enhanced its ability to provide added value to clients by gaining high levels of technical capability in telecommunications, RISC architecture, open systems and software engineering through assignments and work in its research facility. Its revenues grow 20% from fiscal 1989 to 1990. The company has leveraged technical strength but has not augmented consulting activities or entered systems integration or outsourcing to expand revenues.

Company Background

Analysts International Corporation (AiC) was formed in 1966 as a publicly held corporation to provide professional services to a wide variety of industries. The company also offers three financial application software products. Fiscal 1990 revenue reached $107.8 million. Net income rose about 21%, from $5.0 million in fiscal 1989 to nearly $6.0 million in fiscal 1990. The company has over 1550 employees.

Key Products and Services

Over 98% of AiC's revenue is derived from professional services. The company has extensive experience in designing and implementing large and small-scale systems, including workstations for purposes such as:

- Funds transfer networks
- Software for processors and workstations in the manufacturing process
- Data base management and system operation
- EDI applications

Professional services include generation of specifications, design, programming, implementation, testing, documentation, training, and technical audits.

3. Andersen Consulting, Arthur Andersen & Co. , 69 West Washington Street, Chicago, IL 60602 (312) 580-0069

Company Strategy

Andersen emphasizes its knowledge of industries and the use of consulting services, particularly strategic consulting, as a means of selling

professional services, systems integration, and systems operation. Andersen has studied the performance of companies in the current economic downturn and targeted opportunities where it can use IS technology to gain new revenues or save costs. The company uses acquisitions and alliances to gain additional resources to address opportunities arising from its aggressive front-end use of consulting.

Company Background

- Andersen Consulting is a separate private firm of The Arthur Andersen Worldwide Organization and serves clients through 157 offices in 45 countries.

- In October 1988, Andersen Consulting was reorganized as a separate strategic business unit in order to create a clear, separate identity for the consulting practice. Estimated worldwide revenues for 1989 are $1.7 billion.

Key Products and Services

INPUT estimates approximately 65% of Andersen Consulting's 1989 revenue was derived from systems integration, 30% from professional services, 4% from application software products, and 1% from systems software products.

Andersen Consulting's areas of expertise include strategic consulting, systems integration and management and professional services. Systems integration and systems management services include total system solutions and assistance throughout the system's life cycle using proprietary methodology.

Marketing and delivery of services is leveraged through the use of impressive Operations, Advanced Technology, and Business Integration Centers.

4. Computer Horizons Corporation, 747 Third Avenue, New York, NY 10017 (212) 371-9600

Company Strategy

CHC is taking an aggressive strategy based on its size, range of capabilities, and ability to deliver quality solutions. Its senior representatives are emulating the approach of a Big 6 accounting firm and emphasizing CHC's ability to become partners to clients and take risks on critical assignments. In support of this strategy, CHC has strengthened technical capabilities, particularly in support of data base consolidation or change and project management skills for systems integration assignments. More emphasis on strategic consulting may also result from this strategy.

Company Background

Computer Horizons Corporation, incorporated in New York in 1969, provides custom software development, management consulting, and training and education professional services and systems integration services primarily to Fortune 500 firms in the commercial/industrial, communications, and financial services industries. Revenues were up 7% in 1989 to $84.7 million.

Key Products and Services

Approximately 90% of Computer Horizons' 1989 revenue was derived from its various professional services and 10% from systems integration activities. During 1989, Computer Horizons provided its services to 388 clients. A further breakdown of 1989 revenue follows:

Professional services	
• Software development	67%
• Network development	9%
• Consulting	9%
• Education and training	5%
	90%
Systems integration	10%
	100%

5. Computer Task Group, Inc., 800 Delaware Avenue, Buffalo, NY 14209 (716) 882-8000

Company Strategy

CTG's current strategy is to concentrate on commercial professional services, consulting services, systems integration, international opportunities, and its IBM relationship. Target markets include discrete and process manufacturing, banking and finance, insurance, and state and local government. CTG focuses on the delivery of needed technical capabilities and information technology consulting rather than the strategic consulting offered by members of the Big 6 and other professional services firms.

Company Background

Computer Task Group, Inc (CTG), founded in 1966, is one of the largest providers of computer-related consulting, systems integration, and professional services to the commercial market. CTG's 1989 revenue reached $233 million, a 7% increase over 1988 revenue of $218.7 million. During the second quarter of 1989, CTG closed four branches that were unprofitable and eliminated 65 overhead positions at a cost of over $1 million.

Key Products and Services

Approximately 87% ($203 million) of CTG's 1989 revenue was derived from its various professional services and 13% ($30 million) from commercial systems integration activities.

- The scope of work performed by CTG ranges from specific, minor tasks of short duration to large complex tasks. CTG offers consultants who are experienced in an industry application or technology, total project systems integration (often on a fixed-fee basis), and per diem services. Typically, CTG's professional staff augments and becomes part of the client's on-site software development team on a specific application or project.

- A majority of CTG's clients are large companies with multiple locations and substantial data processing operations. CTG currently has approximately 1,400 clients worldwide, including 85 of the Fortune 100 companies.

6. Keane, Inc., Ten City Square, Boston, MA 02129 (617) 241-9200

Company Strategy

In professional services, Keane emphasizes repeat business (95% of its work is repeat business) with clients who need aid with project management or development activities. In support of that work, Keane has developed strength in project management and technical skills. Keane has not leveraged project management and technical skills to gain systems integration work, however. Most assignments are performed on a time and materials basis. Company growth has recently been fueled by acquisitions.

Company Background

Keane, Inc., founded in 1965, provides software design, development, integration, and maintenance professional services for corporations, and application software products and systems operation services to hospitals.

Revenue for the three months ending March 31, 1990 reached $22.7 million, a 43% increase over $15.9 million for the same period in 1989. Net income for the period was over $1.1 million, a 36% increase over $827,000 for the same period a year ago.

Key Products and Services

Keane offers software design, development, integration, and maintenance services and adds value through expertise in project management (used in 47% of assignments) and telecommunication, and experience with a large variety of computing equipment.

VII

Conclusions and Recommendations

Conclusions and Recommendations

A

Opportunities in Professional Services

Professional services is a market with opportunities as well as dangers for vendors. One category of opportunities relates to the acquisition and exploration of skills that are needed to implement critical applications, as shown in Exhibit VII-1.

Many of the critical systems that are needed to meet competitive pressures or generate cost savings require new network capabilities and integration of applications and data bases. These include new or upgraded order entry and customer service systems that serve more products or broader geographical areas as well as manufacturing systems that are being imbedded further in production processes and require more intensive local or wide-area connections. They also include systems to merge the operations of consolidated business units or acquisitions.

EXHIBIT VII-1

Opportunities in Professional Services

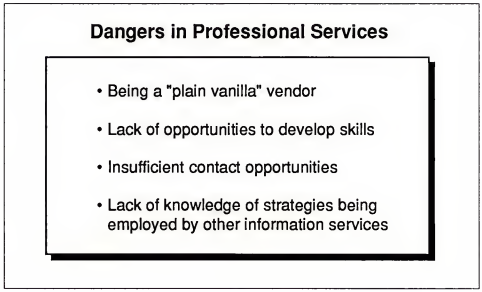
- Network integration
- Data base integration and distribution skills
- New technology and techniques
- Expanded consulting
- Diversification in other modes

Professional services vendors with high levels of skills in on-line transaction processing, networking, and data base software are being used or sought by major firms in energy, chemicals, manufacturing, and financial industries that were contacted in relation to this study. In addition, manufacturers, investment banks, and other firms have reported interest in professional services vendors' skills is using new workstations and supercomputers, including experience in open systems.

New technology and techniques are also being sought in many other areas, including the use of UNIX and UNIX-compatible data bases, image processing, and CASE techniques, according to users. Several users noted that professional services firms have helped them save significant amounts of development time through consulting, training, and the modification of software tools.

Users' need for technical skills provides a means of attracting the attention of prospects and gaining work. It also generates the possibility of obtaining additional work that requires commonly available skills such as COBOL programming, according to representatives of professional services vendors contacted during this study. These representatives pointed out that one of the dangers being faced today is being classified as only a traditional software development vendor, as indicated in Exhibit VII-2.

EXHIBIT VII-2



Being mostly involved in activities that preclude the acquisition of technical skills is a danger for vendors. A few years ago, it seemed favorable for a vendor to lock a high percentage of its staff into long-term jobs involving routine systems analysis and programming. Today, some of the firms that have done so do not have the skills available to maintain the same volume of work. Several vendors note that they now look for a mix of work that will include jobs that offer the opportunity to help employees test and advance their knowledge of skills.

Without technical skills, consulting activities and/or alliances, professional services firms may find that they are not making sufficient new contacts to provide themselves vigorous growth. Also, they may not be able to uncover opportunities for upgrading staff technical capabilities or learn about and react to new strategies of other information service vendors. Vendors may have new advancements in applications or network use that other professional service vendors can take advantage of and customize for their accounts.

Another opportunity that professional services vendors should consider is the expansion of consulting services. Strategic consulting services for management (business impact on systems and systems impact on business, systems strategy, strategic information systems planning, and the use of industry knowledge in systems activities), and consulting to IS management (systems implementation and network planning, audit, and technology impact assessment) have had a high margin in professional services assignments and have provided means of controlling accounts. Booz, Allen and McKinsey, which have specialized in consulting, have taken steps to obtain more professional services revenue as a result of performing consulting work. The Big 6 public accounting firms, in general, use consulting to obtain more professional services revenue.

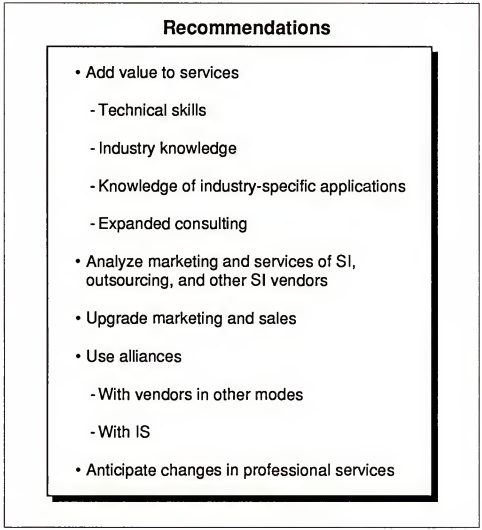
B

Recommendations

INPUT recommends that professional service vendors emphasize the acquisition of additional skills and analysis of market activities, as shown in Exhibit VIII-3. Assignments should be sought that can advance technical skills, as noted previously. INPUT also recommends training that can be tailored to an employee's free time to improve the skills. For larger vendors, which can recruit college graduates with interests and training in desirable areas, INPUT suggests that the programs of a variety of colleges be reviewed to uncover opportunities. Some institutions have acquired high levels of proficiency in network use, open systems, and other technical and application areas.

In addition to technical skills, professional services vendors should consider enhancing their consulting skills and vertical market knowledge. Consulting is the fastest growing component in this market and has the potential to generate software development work. Together with industry knowledge, it can help to generate systems integration contracts as well as other business.

EXHIBIT VII-3



Professional services vendors should become more acquainted with the systems integration and outsourcing modes, as indicated in Exhibit VII-3. There may be opportunities to offer these services in industries where vendors have experience. Being aware of the content of these services will also provide vendors with the opportunity of offering alternatives that involve use of their services. A vendor contacted during this study pointed out that he was able to aid an IS executive who had started to organize and manage a project internally rather than let a division use a systems integrator. In this economic climate, there will be an increasing number of instances where IS management will be receptive to working with professional services vendors to achieve such an objective. This type of action can demonstrate the value of internal IS to corporate management.

In an environment where technical skills, consulting, and industry knowledge have become more important, sales and marketing have to be upgraded and alliances have to be sought with internal IS as well as with other vendors. Sales and marketing have to be prepared to inform prospects of the levels of skills and knowledge their company offers. An account manager has to speak meaningfully about the strengths of his/her firm and use a consultative approach and not rely heavily on contact skills. The account manager also has to assess opportunities rapidly and know when his firm or an ally can address a problem.

Marketing and vendor management should also anticipate changes in professional services:

- Will some professional service vendors work closely with software product firms to help them meet problems with publicly available software rather than let SI firms solve problems with proprietary software or development?
- Will software developed in a 4GL or with CASE tools serve as a vehicle or template for letting users customize software to meet their needs, or will professional services vendors manage or assist users in employing these methods?
- Will solution-oriented work in which a user committee or executive acts like a systems integrator or general contractor and uses certain professional services vendors as subcontractors become attractive?
- Will professional service vendors partner with other vendors or investors to finance outsourcing?

Professional services marketing and management must recognize when the foregoing types of situations arise and take advantage of them.

Appendixes

Definition of Terms

A

Overall Definitions and Analytical Framework

Information Services - 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 (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 responsibility for the development of a custom solution to an information system 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, videotex, 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.

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

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.

- *Functional Application* markets, such as Human Resources, Accounting, etc. These are also called "Cross-Industry" markets.

- *Generic* markets, which are neither industry- nor application-specific, such as the market for systems software.

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

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 which have a different parent corporation than the user. It is these expenditures which constitute the information services market.

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 B describes the delivery modes and their structure in more detail.

Outsourcing is defined as the contracting of information systems (IS) functions to outside vendors. Outsourcing should be viewed as the opposite of *insourcing*: anything that IS 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.

IS 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 IS 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.

B

Industry Structure and Delivery Modes

1. Service Categories

The following exhibit presents the structure of the information services industry. Several of the delivery modes can be grouped into higher-level **Service Categories**, based on the kind of problem the user needs to solve. These categories are:

- **Business Application Solutions (BAS)** - prepackaged or standard solutions to common business applications. These applications can be either industry-specific (e.g., mortgage loan processing for a bank), cross-industry (e.g., payroll processing), or generic (e.g., utility timesharing). In general, BAS services involve minimal customization by the vendor, and allow the user to handle a specific business application without having to develop or acquire a custom system or system resources. The following delivery modes are included under BAS:

  - *Processing Services*
  - *Applications Software Products*
  - *Turnkey Systems*

- **Systems Management Services (SMS)** - services which assist users in developing systems or operating/managing the information systems function. Two key elements of SMS are the customization of the service to each individual user and/or project, and the potential for the vendor to assume significant responsibility for management of at least a portion of the user's information systems function. The following delivery modes are included under SMS:

  - *Systems Operations*
  - *Systems Integration*

Each of the remaining three delivery modes represents a separate service category:

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

Note: These service categories are a new concept introduced in the 1990 MAP Program. They are purely an aggregation of lower level delivery mode data. They do not change the underlying delivery modes or industry structure.

Information Services Industry Structure—1990

Source: INPUT

2. Software Products

There are many similarities between the applications and systems software delivery modes. 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 category of professional services. 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.

- **Systems Software Products**

  Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. These products include:

  - *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.

- **Applications Software Products**

  - *Industry-Specific Applications Software Products* - Software products that perform functions related to solving business or organizational needs unique to a specific vertical market and sold to that market

only. Examples include demand deposit accounting, MRPII, medical recordkeeping, 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. Applications include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

3. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom application software into a single system 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.

Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included 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 application 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 are divided into two categories.

- *Industry-Specific Systems* - systems that serve a specific function for a given industry sector, such as automobile dealer parts inventory, medical recordkeeping, or discrete manufacturing control systems.

- *Cross-Industry Systems* - systems that provide a specific function that is applicable to a wide range of industry sectors, such as financial planning systems, payroll systems, or personnel management systems.

4. Processing Services

This category includes transaction processing, utility processing, and other processing services.

- *Transaction Processing:* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at 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 vendor's system.

- *Other Processing Services*: Vendor provides services—usually at 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.

5. Systems Operations

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:

- *Professional Services:* The vendor provides personnel to operate client-supplied equipment. Prior to 1990, this was a submode of the Professional Services delivery mode.

- *Processing Services:* The vendor provides personnel, equipment and (optionally) facilities. Prior to 1990, this was a submode of the Processing Services delivery mode.

In the federal government market the processing services submode is called "COCO" (Contractor-Owned, Contractor-Operated), and the professional services mode is referred to as "GOCO" (Government-Owned, Contractor-Operated).

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."

There are two general levels of systems operations:

- *Platform/network operations* - where the vendor operates the computer system and/or network without taking responsibility for the applications
- *Application operations* - where the vendor takes responsibility for the complete system, including equipment, associated telecommunications networks, and applications software

Note: Systems Operations is a new delivery mode introduced in the 1990 MAP Program. It was created by taking the Systems Operations submode out of both Processing Services and Professional Services. No other change has been made to the delivery mode definitions, and the total forecast expenditures for these three delivery modes are identical to the total forecast expenditures of the two original modes before the breakout of Systems Operations.

6. Systems Integration (SI)

Systems integration is a business offering 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.

The systems integrator will 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
- Financing

7. Professional Services

This category includes 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 information systems, 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.

8. 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 major segments: *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.

- *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.

- *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.). Mean-

while, 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.

- *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 capability 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, or services that involve the management of networks as part of the broader task of managing a user's information processing functions are included in Systems Operations.

C

Vendor Revenue and User Expenditure Conversion

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

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

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

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

The following table summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to end-user expenditure (market size) figures for each delivery mode:

Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	1.00
Systems Integration	0.99
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95

D
Sector Definitions and Delivery Mode Reporting

1. Industry Sector Definitions (Vertical Markets)

INPUT has structured the information services market into 16 generic industry sectors, such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) Code system. The specific industries (and their SIC Codes) included under these generic industry sectors are detailed in the attached table.

EXHIBIT A-2

Industry Sector Definitions

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

EXHIBIT A-2 (Cont.)

Industry Sector Definitions

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

EXHIBIT A-2 (Cont.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business and Technical Services	65xx	Real estate
	73xx	Business services (except hotel reservation services in 7389)
	81xx	Legal services
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors
Personal/Consumer Services	4512x	Airline reservation services
	472x	Arrangement of passenger transportation (travel agencies)
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	88xx	Private households

2. Cross-Industry Sector Definitions (Horizontal Markets)

In addition to these vertical industry sectors, INPUT has also identified seven cross-industry or horizontal market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry. The seven cross-industry markets are:

- *Human Resource Systems*
- *Education and Training*
- *Office Systems*
- *Accounting Systems*
- *Engineering and Scientific Applications*
- *Planning and Analysis Systems*
- *Other Applications (including telemarketing, sales management and electronic publishing)*

3. Delivery Mode Reporting by Sector

The tables below show how market forecasts for individual delivery modes are related to specific market sectors.

Vertical Market Sectors Only

The following delivery modes are reported by industry sector (vertical market) only:

Delivery Mode	Applicable Submodes
• Network Services:	Network Applications
• Systems Operations:	All
• Systems Integration:	All
• Professional Services:	All

This reporting structure is intended to provide expenditures by industry sector. However, it is recognized that many of the services provided are not necessarily specific or unique to any of the individual sectors.

Vertical and Cross-Industry Market Sectors

The following delivery modes are reported by industry sector and cross-industry sector (vertical and horizontal markets):

Delivery Mode	Applicable Submodes
• Processing Services:	Transaction Processing
• Software	Applications
• Turnkey Systems	All

All of these delivery modes represent specific business application solutions.

Vertical and Generic Market Sectors

The following submode is reported both by industry sector (vertical market), and the generic market:

Delivery Mode	Applicable Submodes
• Network Services	Electronic Information Services

While some electronic information is industry-specific (e.g., farm crop reports), much of it is relevant to or may be used by any industry (e.g., data base services such as Dialog).

Generic Market Sector Only

The following delivery modes are so generic that they are not reported by industry or cross-industry sector (vertical or horizontal market):

Delivery Mode	Applicable Submodes
• Processing Services:	Utility Processing Other Processing
• Software	Systems (All)

Forecast Data Base

A

Forecast Data Base

Exhibit B-1 presents the detailed 1990-1995 forecast for the professional services market.

EXHIBIT B-1

Professional Services
User Expenditure Forecast by Market Sector
1989-1995

Market Sectors	1989 ($M)	Growth 89-90 (%)	1990 ($M)	1991 ($M)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	CAGR 90-95 (%)
Delivery Mode Total	15,184	10	16,764	18,465	20,494	22,976	25,989	29,527	12
Vertical-Industry Markets	15,184	10	16,764	18,465	20,494	22,976	25,989	29,527	12
Discrete Manufacturing	3,754	11	4,163	4,588	5,094	5,748	6,572	7,572	13
Process Manufacturing	1,749	13	1,977	2,196	2,462	2,785	3,206	3,729	14
Transportation	188	13	213	241	272	308	349	395	13
Utilities	221	5	233	254	281	312	347	386	11
Telecommunications	825	15	950	1,088	1,240	1,429	1,656	1,927	15
Retail Distribution	185	12	207	223	242	265	294	328	10
Wholesale Distribution	293	12	327	357	387	423	465	509	9
Banking and Finance	1,950	5	2,044	2,184	2,396	2,671	3,005	3,381	11
Insurance	1,268	13	1,434	1,618	1,842	2,118	2,444	2,820	14
Medical	229	11	254	282	315	351	394	443	12
Education	67	13	76	86	97	109	123	139	13
Business Services	135	12	151	169	189	212	238	267	12
Consumer Services	125	7	133	142	152	164	177	192	8
Federal Government	2,031	5	2,136	2,221	2,308	2,402	2,512	2,629	4
State and Local Government	2,074	14	2,362	2,700	3,088	3,532	4,041	4,625	14
Miscellaneous Industries	90	15	104	116	130	146	164	185	12

Numbers may not add due to rounding.

B

Forecast Reconciliation

Exhibit B-2 presents the forecast reconciliation for the professional services market.

INPUT redefined the professional services delivery mode in 1990 by removing the systems operations submode and placing it at the top (delivery mode) level in combination with the former systems operations submode from processing services. The reconciliation that is presented in Exhibit B-2 shows market numbers after this reassignment of systems operations revenue. The reconciliation is by vertical industry sector.

INPUT's final sizing of the 1989 market is $15.2 billion, or 5% less than the 1989 forecast. The reductions are primarily in the following industry sectors:

- Utilities - This reduction of $224 million is primarily due to the redefinition of projects in the energy management area to the systems integration delivery mode. These projects are large, multiyear projects and fully meet the definition of systems integration.
- Retail distribution - This reduction is a combination of realignment to systems integration and a true reduction in the growth of the market due to the impacts of the economic slowdown on the retail sector.
- Federal government - The reduction of $368 million is a direct result of a reduction in professional services activity by federal agencies.
- Miscellaneous Industries - The reduction is a result of the creation of the consumer services industry sector, which is new for 1990.

The differences for 1994 are a combination of the reassessment of the 1989 market size (5% smaller) and the lower growth rates (11% CAGR versus 14% CAGR). The result is that the professional services sector is projected to be 17% smaller in 1994 than INPUT projected one year ago.

EXHIBIT B-2

1990 MAP Data Base Reconciliation
Professional Services Market

Delivery Modes	1989 Market				1994 Market				89-94 CAGR per data 89 rpt (%)	89-94 CAGR per data 90 rpt (%)
	1989 Report (Fcst) ($M)	1990 Report (Actual) ($M)	Variance from 1989 Report ($M)	Variance from 1989 Report (%)	1989 Report (Fcst) ($M)	1990 Report (Fcst) ($M)	Variance from 1989 Report ($M)	Variance from 1989 Report (%)		
Total Professional Services Market	15,953	15,184	-769	-5	31,182	25,989	-5,193	-17	14	11
Discrete Manufacturing	3,754	3,754	0	0	7,755	6,572	-1,182	-15	16	12
Process Manufacturing	1,749	1,749	0	0	3,882	3,206	-676	-17	17	13
Transportation	185	188	3	2	347	349	3	1	13	13
Utilities	445	221	-224	-50	823	347	-476	-58	13	9
Telecommunications	800	825	25	3	1,688	1,656	-32	-2	16	15
Retail Distribution	213	185	-28	-13	428	294	-134	-31	15	10
Wholesale Distribution	313	293	-20	-6	578	465	-113	-19	13	10
Banking and Finance	2,015	1,950	-65	-3	4,829	3,005	-1,824	-38	19	9
Insurance	1,268	1,268	0	0	2,449	2,444	-5	0	14	14
Medical	229	229	0	0	398	394	-3	-1	12	11
Education	56	67	11	20	124	123	-1	-1	17	2
Business Services	135	135	0	0	237	238	1	0	12	12
Consumer Services	--	125	125	--	--	177	177	--	--	7
Federal Government	2,399	2,031	-368	-15	3,093	2,512	-581	-19	5	4
State and Local Government	2,074	2,074	0	0	3,992	4,041	48	1	14	14
Miscellaneous Industries	319	90	-229	-72	560	164	-396	-71	12	13