U.S. APPLICATIONS SOFTWARE PRODUCTS AND TURNKEY SYSTEM MARKETS

1992 - 1997

INPUT

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Market Analysis Program (MAP)

U.S. Applications Software Products and Turnkey System Markets, 1992-1997

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Abstract

This annual report provides an analysis and five-year forecast of the U.S. applications software products and turnkey systems markets for the period 1992-1997. Forecasts are provided by delivery submode and by platform for both software products and turnkey systems.

The five-year forecast, using a base year of 1991, covers 15 industry-specific and seven cross-industry sectors for each of the two market segments. The report discusses issues and trends and offers recommendations for vendors that wish to take advantage of the forces driving these markets.

The report contains 136 pages and 97 exhibits.

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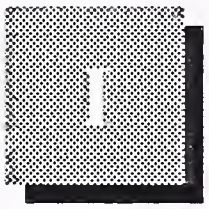


Introduction

This report is one of a series of market analysis reports prepared each year by INPUT for the key segments (delivery modes) of the U.S. information services industry. These delivery modes are:

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

The first seven delivery modes are covered in reports included as part of INPUT's Market Analysis Program (MAP), a planning service for information services vendors. The last 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 application solutions market, which comprises the applications software products and turnkey systems delivery modes of the U.S. information services industry.

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

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

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

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

EXHIBIT I-1

Market Reports Format

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

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

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

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

V. Vendor Issues and Trends
- An assessment of the delivery mode from the vendor point of view.

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

VII. Competitive Environment
- Discussion of the competitive environment for information services within this delivery mode with market share analysis and vendor profiles.

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

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

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

B
Scope and Methodology

1. Scope

This report addresses the U.S. information services industry for the application solutions market. It includes user expenditures that are noncaptive and generally available to vendors. Many large organizations have portions of their information services requirements satisfied by internal divisions. The resulting expenditure is not available for competitive 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, Definition of Terms.

a. Information Services Industry Structure

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

EXHIBIT I-2

Information Services Industry Structure—1992

- Systems Integration
  - Equipment
  - Software Products
  - Professional Services
  - Other
- Systems Operations
  - Platform Operations
  - Applications Operations
  - Desktop Services
  - Network Management
- Processing Services
  - Transaction
  - Utility
  - Other
- Network Services
  - Electronic Information Services
  - Network Applications
- Systems Software Products
  - Mainframe
  - Minicomputer
  - Workstation/ PC
- Applications Software Products
  - Mainframe
  - Minicomputer
  - Workstation/ PC
- Turnkey Systems
  - Equipment
  - Software Products
  - Professional Services
- Equipment Services
  - Equipment Maintenance
  - Environmental Services
- Professional Services
  - Consulting
  - Education & Training
  - Software Development/ Maintenance
  - Application Management/ Maintenance

Source: INPUT

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

- INPUT develops a five-year forecast for the delivery mode and each of the submodes.

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

The relationship between delivery mode forecasts and market sector forecasts is shown in Exhibit I-3. (Equipment Services will be added as a delivery mode to this chart next year.)

EXHIBIT I-3

Delivery Mode versus Market Sector Forecast Content

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

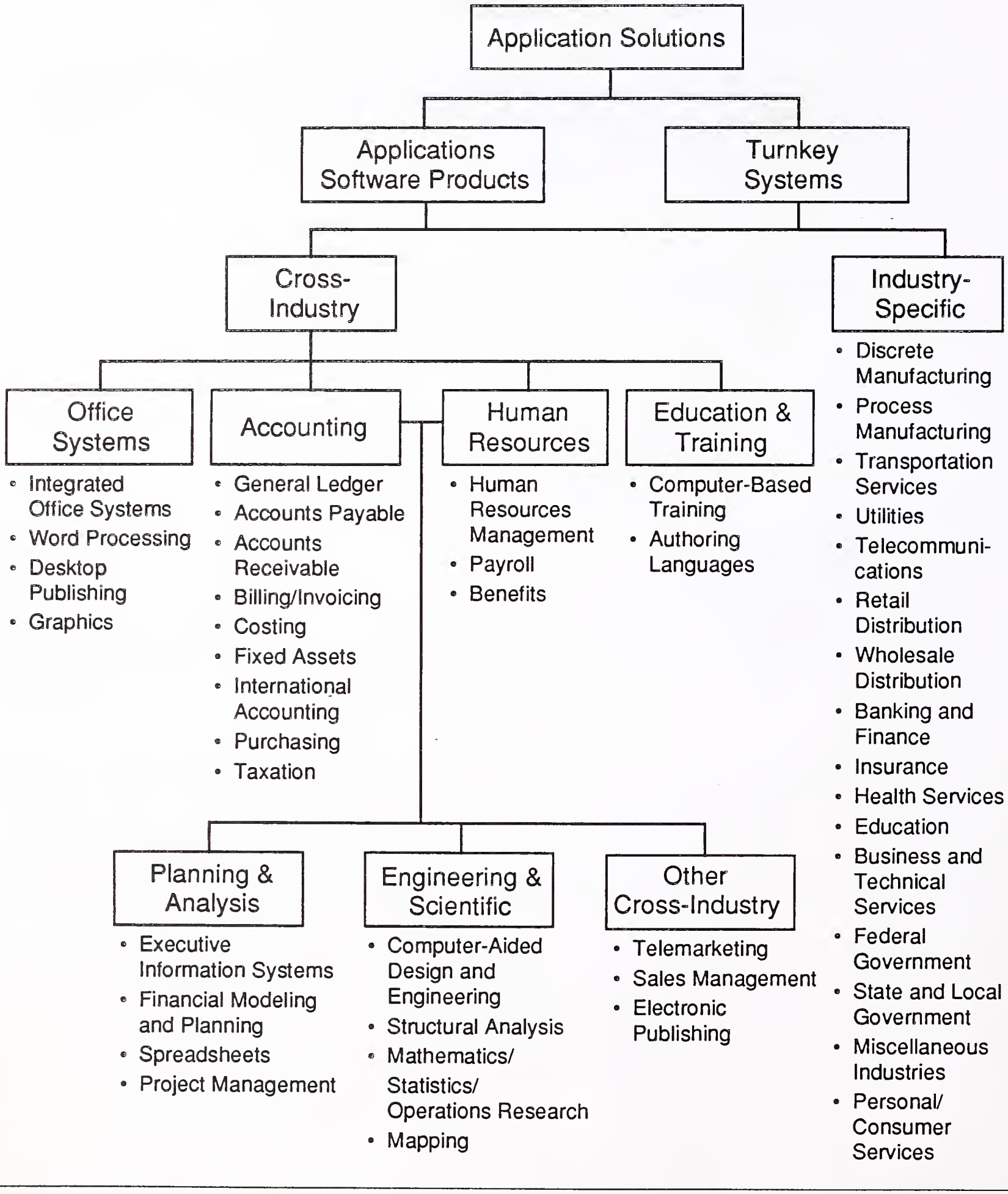
For a more complete discussion of INPUT's information services industry structure and market sector definitions, please refer to Appendix A, Definition of Terms.

b. Delivery Mode Description

As shown in Exhibit I-4, application solutions is composed of the applications software products and turnkey systems delivery modes. Each delivery mode is analyzed by the cross-industry and industry-specific markets to which they are sold.

EXHIBIT I-4

Application Solutions Market Structure, 1992



Application solutions are prepackaged or standard solutions to common business applications. These applications can be either industry-specific (e.g., a turnkey system for a law office) or cross-industry (e.g., human resources software). In general, application solutions 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. Exhibit I-4 is a diagram of the market structure for application solutions, including applications software products and turnkey systems.

Although application solutions include three delivery modes—applications software products, turnkey systems and processing services—only the first two are included in this report. INPUT has combined these two delivery modes into one report this year because of their similarities and the trend toward unbundling turnkey systems so that hardware, applications software and services are sold separately. In this report, the term application solutions refers to applications software products and turnkey systems. Processing services is the subject of a separate INPUT Market Analysis Program report.

i. Applications Software Products

Applications software is packaged software purchased for in-house computer systems.

- Industry-specific applications software products perform functions related to fulfilling business or organizational needs unique to a specific vertical market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, and automobile dealer parts inventory.

- Cross-industry applications software products 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.

User expenditure forecasts include lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the users' sites. Vendor-provided training or support in operation and use of the package, if bundled in the software pricing, is also included.

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.

User expenditures on applications software products purchased for resale by other delivery modes—namely, turnkey systems vendors and VARs (value-added resellers), and systems integrators—are excluded from applications software forecasts. However, where turnkey systems vendors have unbundled their products and sell applications software separately from the hardware, the applications software expenditures are included in applications software forecasts. Applications software products sold through other channels, however, such as through computer retailers, are included in the user expenditure forecasts.

ii. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software and packaged or custom applications software into a single system developed to meet a specific set of user requirements. The turnkey vendor adds value in software and support services, often providing the applications software and customizing services. Most CAD/CAM systems and many small business systems are turnkey systems.

Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

The distinction between a turnkey system vendor and a value-added reseller (VAR) has become fuzzy, and the two terms are used interchangeably. IBM invented the term "value-added reseller" in the mid-1980s when it introduced its first workstation. It wanted to emphasize the value-added aspect of this distribution channel rather than sell its workstations through original equipment manufacturers (OEMs) that do bring to mind added value in the sense of customization and services.

Turnkey systems vendors/VARs may also provide systems integration, acquiring software products as well as equipment from other vendors.

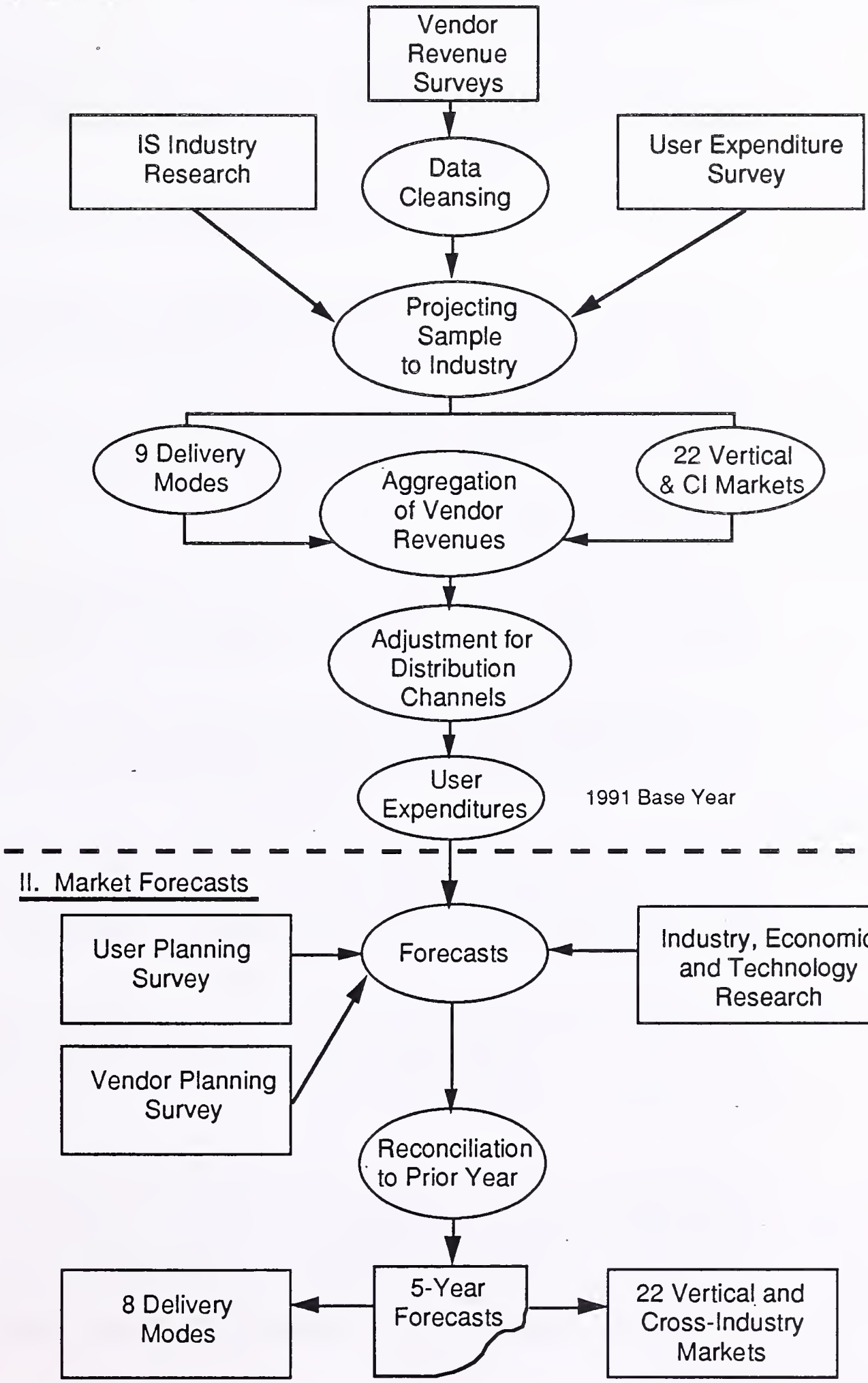
As with applications software products, turnkey systems are divided into two categories—industry-specific systems and cross-industry systems.

2. Methodology

INPUT's methodology for market analysis and forecasting is summarized in Exhibit I-5. As in past years, INPUT has continued to survey information services vendors to determine their U.S. information services revenues, and to query information systems organizations about expenditures and outside services acquisition plans.

EXHIBIT I-5

INPUT Research Methodology



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

a. Base-Year Expenditure Calculations

- INPUT determines previous-year information services revenues for the nine delivery modes and 22 industry and cross-industry sectors for hundreds of vendors. Estimates rely upon interviews, public data and INPUT's own estimates.

- The initial data are projected to represent the entire information services industry.

- Adjustments are made to eliminate duplications due to distribution channel overlap and to assure that captive information services expenditures are not included.

- The result is a base-year (1991) user expenditure for each of the 22 vertical and cross-industry sectors and the 9 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.

- The result is a five-year forecast for each of the 22 vertical and cross-industry sectors and the 9 delivery modes. The delivery mode and market sector forecasts are correlated according to the diagram in Exhibit I-3.

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

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

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

C
Economic Assumptions

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

D
Related Reports

Related reports of interest to the reader include:

1. U.S. Markets

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

2. European Markets

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

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

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Executive Overview

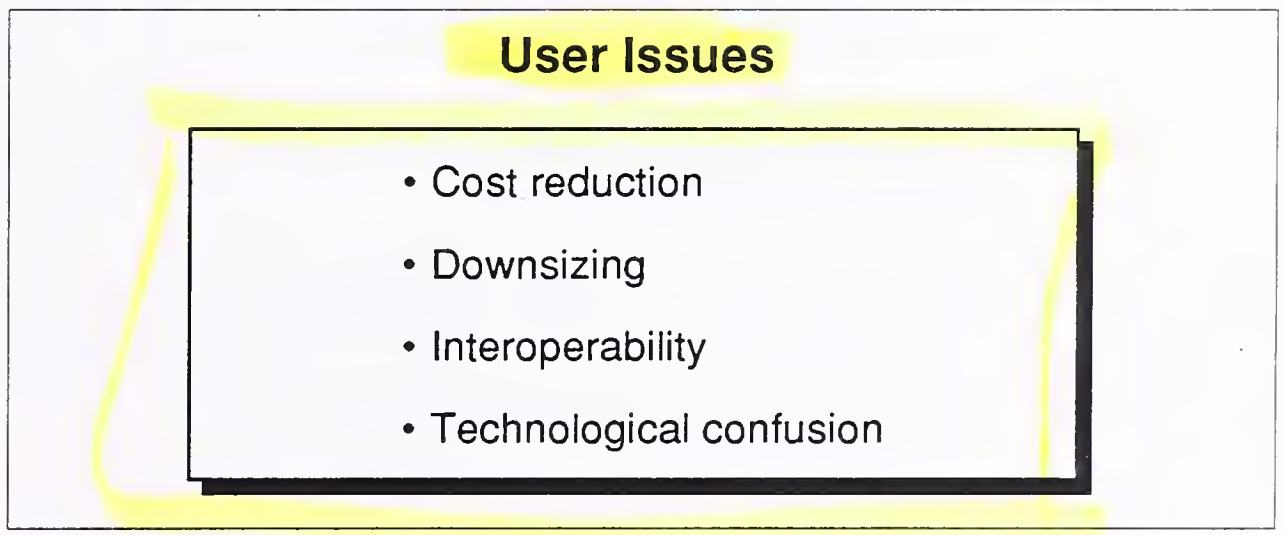
The application solutions market is defined by INPUT as two delivery modes: applications software products and turnkey systems.

In this Executive Overview, INPUT provides a summary of user issues and driving forces that will impact application solutions over the next five years. This chapter presents overall growth projections for applications software products and turnkey systems, and draws conclusions about this fast-moving portion of the information services industry.

A
User Issues

User issues are outlined in Exhibit II-1 and briefly described below.

EXHIBIT II-1



Cost Reduction: As a result of the slowdown in the economy, cost reduction has become a major concern to buyers of information systems. This was the issue mentioned most frequently by executives responding to INPUT's survey on application solutions. Many of the respondents indicated that IS expenditures have been constant in the past two years or have increased only slightly. The two industries that spend the most for application solutions—banking and finance and manufacturing—have been among the hardest hit by the recession.

Application solutions have been less affected by budget reductions than other delivery modes. Companies are looking at software as a way to increase productivity and perform sophisticated analysis to achieve a competitive advantage. Since they are seeking the lowest cost for these solutions, buyers are more interested in purchasing software separately, while shopping around for the best deal on hardware. Therefore, expenditures on applications software are expected to grow at a healthier rate than expenditures for turnkey systems.

Downsizing: While reliance on mainframe and midrange systems persists, users are embracing the concept of downsizing. The need to reduce costs and gain greater access to corporate data for individual users is driving this migration pattern. The great majority of executives INPUT interviewed for this report indicated that they are either currently using, planning or considering adoption of a client/server architecture.

Interoperability: As companies move toward implementing more applications on the PC LAN level and making data more accessible, the importance of integrating disparate systems is heightened. Companies wish to leverage their existing technology investments, yet often these systems were purchased by different user and/or IS organizations without regard to integration. Companies want to make sure that the decisions they make regarding their use of technology will facilitate the communication of those systems. Users are looking for solutions that can run on multiple platforms and are not vendor-specific.

Technological Confusion: There is still a great deal of confusion on the part of buyers regarding the rapid development of technology. Even within the IS organization, executives report that one of their greatest challenges is knowing how to balance investing in new technologies that will support the company's business goals against cost and selecting the "wrong" technology.

Internal applications development efforts persist in spite of the widescale availability of packaged applications software products. Although ready-made products are plentiful, users continue to indicate that much software is still not specific enough for their needs.

B
Driving Forces

INPUT has identified four driving forces supporting growth in the applications software products market. These are provided in Exhibit II-2 and discussed below. Four issues impacting the turnkey systems/VARs market are also described in Exhibit II-3 and discussed below.

EXHIBIT II-2

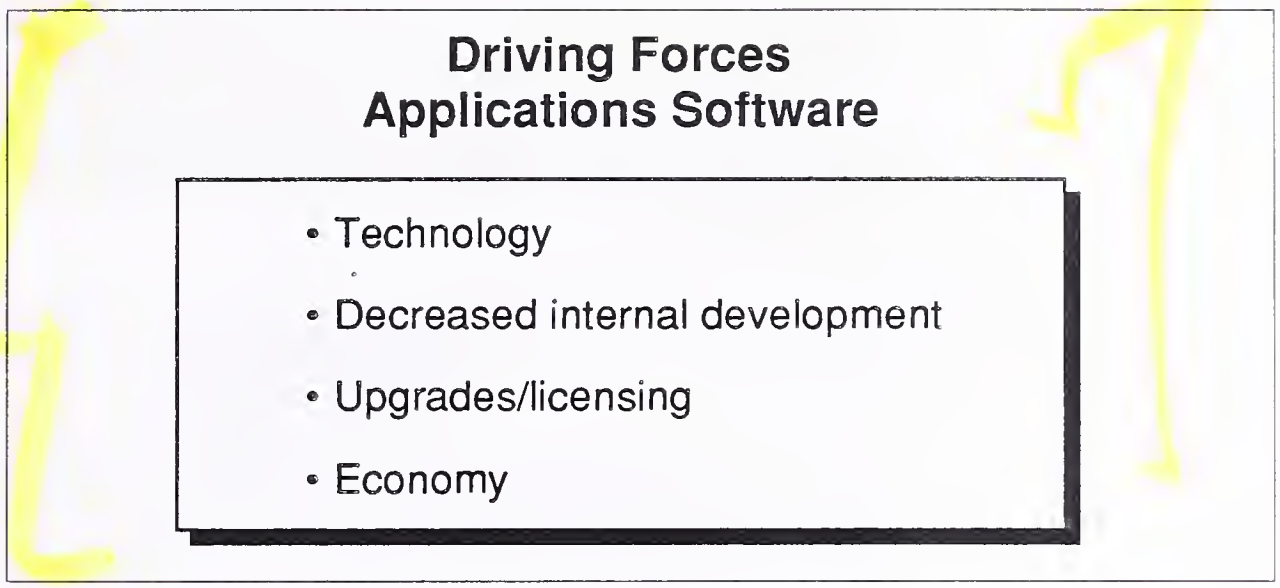
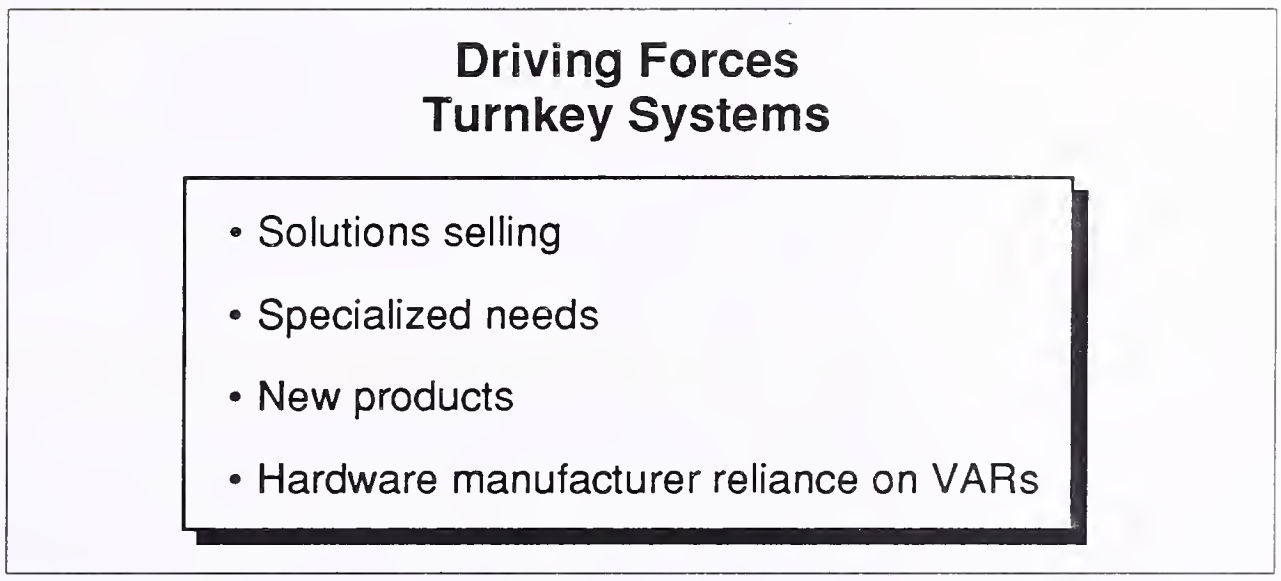


EXHIBIT II-3



Technology: The most significant factor driving applications software expenditures relates to the changing information systems model. As companies embrace downsizing, implement enterprise computing and make use of GUIs, the need for applications to support these technologies is critical. Applications that formerly were host-based will now be acquired or rewritten for the PC LAN or midrange system. Client/server applications are still in the development stage for many vendors. As new operating systems, such as Windows NT, are introduced the market for applications supporting them will increase.

A pent-up demand for new products and solutions will drive growth. Customers are asking for new solutions with better features and functionality.

Decreased Internal Development: Expenditures for applications software will also increase as companies become less and less able to develop systems in house. As IS budgets and staffing shrink, and users become more involved in purchases, packaged solutions will increasingly become more attractive.

Upgrades/Licensing: While the market for new application solutions is continuing to increase, an important source of revenue will continue to be upgrades and ongoing licensing and maintenance. As certain segments of the market mature, potential revenue from upgrades can be greater than for new products.

Economy: The state of the economy has led to budget reductions, but it has also resulted in the purchase of applications software to be used as a strategic tool to achieve competitive advantage.

Solutions Selling: The trend toward solutions selling should be advantageous to VARs and turnkey vendors. These providers are generally knowledgeable in an industry-specific or cross-industry sector.

Specialized Needs: Opportunities exist for VARs and turnkey vendors in addressing very specialized applications needs. They will continue to provide more service content to their offerings as the demand for increasingly sophisticated software creates a need for services in the form of customization, training and support. More systems integration and consulting work will also be part of VAR/turnkey vendors' service offerings in response to the need to link disparate, enterprise-wide systems.

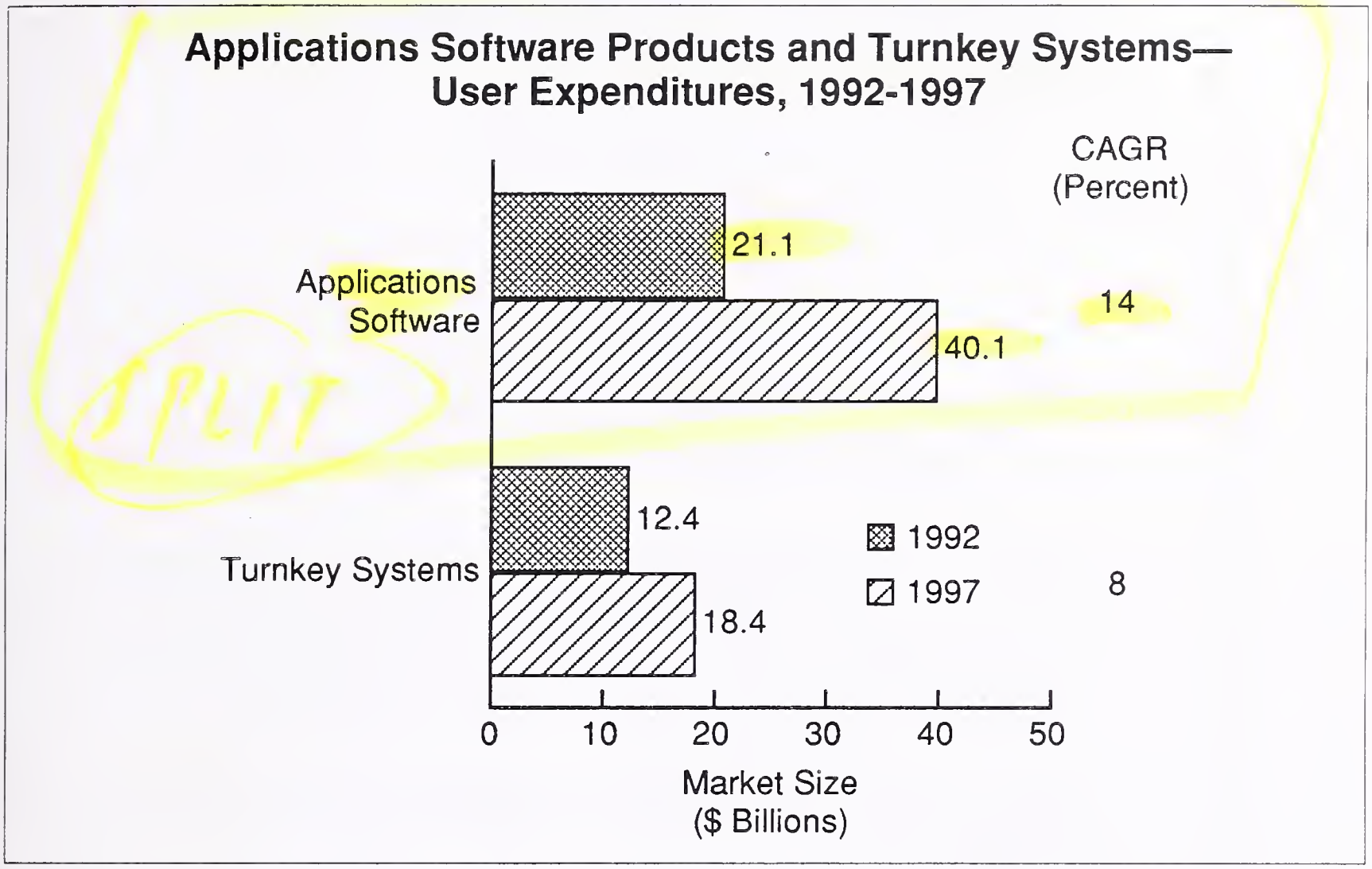
New Products: The proliferation of new technologies will result in an infusion of new applications software products to fuel the VAR channel. Both software and hardware vendors are launching aggressive VAR recruitment efforts. Faced with the complexities and time involved in engineering/re-engineering their own software products, turnkey vendors and VARs are likely to become more willing conduits for other vendors' applications software products rather than developing their own. They will add the necessary customization.

Hardware Manufacturers' Reliance on VARs: Hardware vendors are launching new programs not only to gain back the VARs' allegiance, but also—importantly—to assist VARs in selling their new products. For example, Hewlett-Packard's Enterprise Computing Solutions program assists VARs and integrators in migrating mainframe customers to client/server computing schemes designed around its products and services.

C
User Expenditures

User expenditures for applications software products are forecast to grow at 14% compounded annually over the next five years, reaching $40 billion by 1997, as shown in Exhibit II-4. The annual growth rate will gradually increase from 11% in 1992 to 14% by 1997 as new applications software products are introduced.

EXHIBIT II-4



In some segments, 1991 expenditures were less than projected due to the lingering effects of the recession. In most cases, as the recovery gains momentum, expenditures are expected to grow close to previously forecasted levels. Exceptions are generally in the more mature, cross-industry segments.

User expenditures on turnkey systems are somewhat lower. The turnkey systems/VAR market reached $11 billion in 1991 and is forecast to reach $18 billion by 1997. The CAGR will be 8% for the 1992-1997 period. With standardization underway for both software and hardware, turnkey vendors will no longer be able to capitalize on the added value of their proprietary systems. In addition, a weak economy, continuing declines in hardware margins, and competition from alternative channels such as systems integrators will keep growth of user expenditures on turnkey systems at a modest rate over the next five years.

In either casewhether for applications software products or a turnkey systemsales decisions are taking longer as users evaluate their options. Due to the plethora of new hardware platforms, operating systems, client/server versions and software frameworks available, user confusion will be an inhibiting factor.

Even so, customers are going ahead with selected applications software product and system purchases and are using the services of systems integrators to develop customized client/server and UNIX application solutions.

D
Vendor Competition

While the majority of software solutions vendors are small, with revenues of less than $1.5 million, in the past few years some industry giants have emerged. This has changed the market considerably. Market leaders such as Microsoft have the resources to make strategic acquisitions to strengthen their market position. They can allocate large budgets to advertising, conduct targeted marketing campaigns and offer competitive pricing packages.

Vendors are now offering an array of software as part of a product suites. Some of the popular applications are being bundled with hardware sales much like operating systems have been. For Microsoft, bundling its operating system and applications software along with hardware has the potential to increase sales exponentially at little or no sales cost.

The smaller vendors are left to fill niche markets. Yet they too must consider strategic alliances to be able to compete with some of the larger providers.

A list of leading applications software products vendors and turnkey systems vendors is provided in Exhibit II-5.

Lotus, Microsoft, WordPerfect and Borland vie for PC-based applications software product market share; Dun & Bradstreet and Computer Associates International provide mainframe-based software. D&B Software is transferring its entire series of product lines to a common client/server base.

The largest turnkey systems vendors play a strong role in one or more vertical sectors and have, for the most part, been in existence for many years. One example is Reynolds and Reynolds, which has long had a leading position in the automotive dealership market. Note that computer systems vendors that also sell software bundled with their general-purpose hardware are not considered turnkey systems vendors and are therefore not listed.

EXHIBIT II-5

Leading Vendors

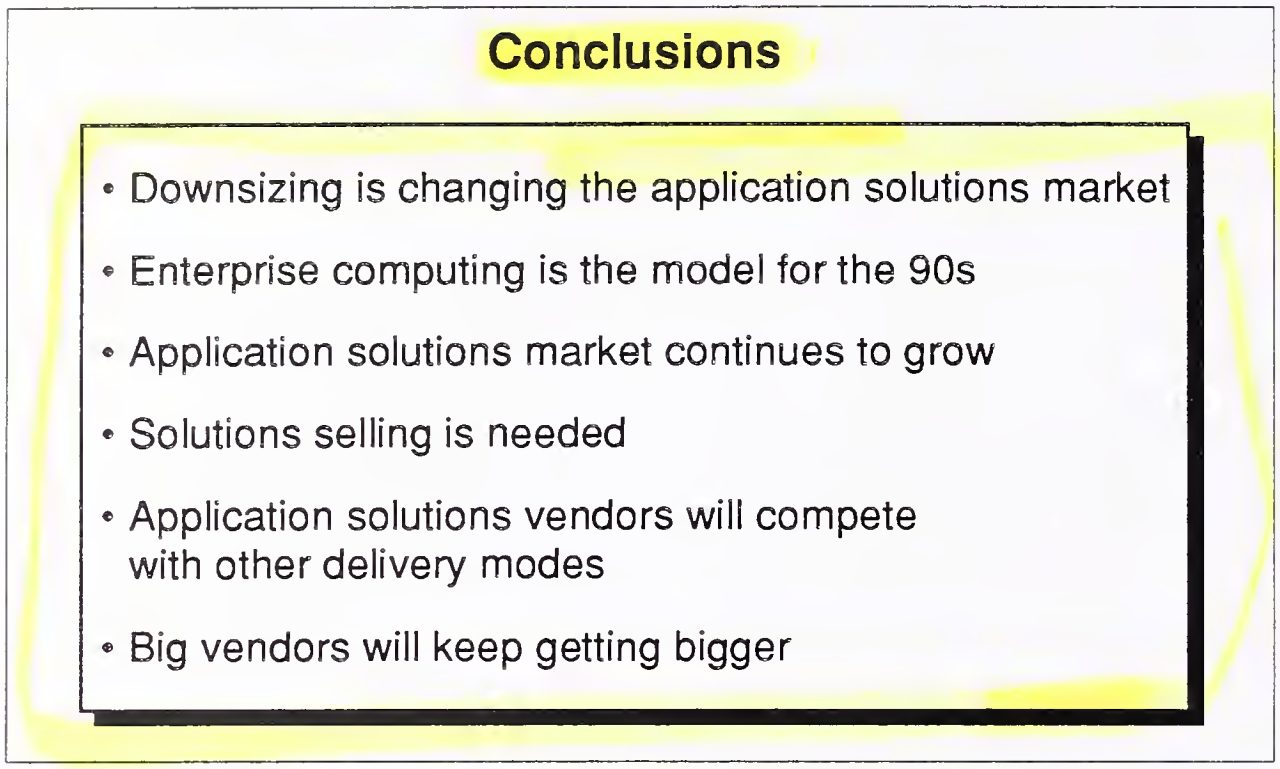
- Applications Software Products
  - Microsoft
  - Computer Associates International
  - Lotus
  - WordPerfect
  - Dun & Bradstreet
  - Borland International
- Turnkey Systems
  - Intergraph
  - Reynolds & Reynolds
  - Mentor Graphics
  - Schlumberger
  - ASK Computer Systems

As the market switches to workstations and client/server architectures, only the companies that successfully re-engineer their software or develop or purchase entirely new products in a timely manner will survive. Opportunities exist for new market entrants where large U.S. vendors and VARs may not be able to transition quickly.

E
Conclusions and Recommendations

Exhibit II-6 outlines INPUT's conclusions for vendors focused on providing application solutions.

EXHIBIT II-6



Downsizing Is Changing the Application Solutions Market: Functions that previously were handled in a host environment are now being distributed from the host to servers on LANs with the host serving as a data repository. Most of the executives INPUT spoke with expect to downsize key applications within the next five years.

Enterprise Computing Is the Model for the 90s: While the mainframe and midrange systems controlled mission-critical applications in the past, the PC was the domain of personal productivity and analysis tools. Today, the trend is toward downsizing host applications and making use of all three of these platforms, using the hardware that is most functional for a particular application. Platforms are linked through networks and data is integrated through the use of data base management systems.

Continued Growth in the Application Solutions Market: Downsizing and client/server architecture has created demand for new products that operate in those environments. The success of graphical user interfaces, in particular Windows, will contribute significantly to this growth. As the move toward open systems progresses and users demand interoperability, new software solutions will be required. Ongoing upgrades will also contribute to revenue growth.

In the turnkey systems area, new technology developments will provide opportunities for new product offerings.

Solutions Selling Is Necessary to Be Competitive: Application solutions purchasing will be increasingly influenced by the end user. The user will select the application solutions that best address business problems and will expect those solutions to work in the operating environment and

platform. In short, vendors will need to migrate from being product companies to becoming service companies.

Application Solutions Vendors Will Be Competing with Other Delivery Modes: As vendors move toward becoming more service oriented, it will become increasingly difficult to differentiate software companies from systems integrators and professional services companies. Turnkey systems vendors in particular will begin to look like software and service providers as they become less tied to specific hardware solutions.

The Market for Application Solutions Is Changing: As a result of these technology and buyer changes, the market is changing in the application solutions area. Features are constantly changing to be competitive, with ongoing updates needed.

Today's software solutions are sold to an ever growing number of users at low prices. Vendors need to expand their distribution channels to reach customers and more carefully target the segment they wish. Advertising is growing in importance as a way to market products.

Pricing structures are also undergoing dramatic changes as customers rebel against tiered pricing structures.

Vendors are becoming more creative in how they market—offering applications suites and bundling software with hardware.

Big Vendors Keep Getting Bigger: In an industry where small companies still are plentiful, the leaders are achieving dominance, which affects the ability of smaller vendors to compete. Growth has been achieved through acquisition and through expansion in the marketplace. Alliances and cross-marketing agreements are taking place to increase market penetration. This leaves the smaller companies to fill niche markets or align themselves with another, more dominant vendor with complementary products.

Recommendations are listed in Exhibit II-7.

EXHIBIT II-7

Recommendations

- Offer customer-oriented products
- Re-evaluate marketing/sales strategies
- Offer flexible and competitive pricing options
- Form strategic alliances
- Support standards as developed

Offer Customer-Oriented Products: End users are becoming the key customers. Those customers know what they want an application to accomplish, but they don't want to worry about the systems behind the application. Users will increasingly expect plug-and-play products along with templates for easy tailoring and modification. They will want products that are scalable to be used on multiple platforms. Products need to be easily maintained and reliable. Network capability and compatibility with object-oriented environments also will be important factors.

Re-evaluate Marketing Sales Strategies: To address the needs of the end user, the application solutions vendor needs to position itself as more than a product manufacturer, but as a service provider. Vertical markets that can benefit specifically from vendor products should be targeted specifically with industry-knowledgeable people hired to sell to that market.

Vendors should offer applications through packages, such as applications suites and bundling with hardware. This increases market penetration across the board and provides an incentive to the customer to maintain an ongoing vendor relationship.

Offer Flexible and Competitive Pricing Options: Buyers have already rebelled against traditional tiered pricing structures, and even market leaders like IBM and Computer Associates International have had to bow to the pressure.

Pricing is a complex issue today as new technologies and changes make old pricing structures inequitable. Vendors will need to continually re-evaluate their approach to pricing to be competitive and achieve adequate profit margins.

Form Strategic Alliances: Vendors must be able to sell to a variety of customers at a tactical as well as strategic level. In order to do this, a large vendor may need to form alliances with firms that have expertise it lacks.

Alliances are also particularly important for the success of the smaller niche vendors, which may lack the marketing abilities to go it alone.

As traditional applications markets mature, vendors will need to diversify their product offerings to meet needs for new products. Companies like Microsoft are using acquisition as a means to gain market strength in areas where they have not had a presence.

Support Standards as They Are Developed: In this fast changing industry, it has been difficult for true standards to be developed. While users and vendors alike have recognized and been moving toward standards and open systems, it has been a slow process complicated by the myriad of new product introductions that have taken place along the way.

Vendors need to be aware of unofficial standards as they develop and be ready to offer products that conform. For example, when Windows took the market by storm, application solutions providers had to provide Windows products to stay competitive.

It will be even more important for vendors to comply with industry standards as they are developed. Buyers are seeking solutions that will work on multiple platforms and operating systems. Product standardization will make it easier for buyers to make use of technology as a tool to support their business while being insulated from the technical aspects of computer systems.

In order to support a multivendor and multiplatform strategy, turnkey vendors must either diminish reliance on hardware or support a broad range of hardware platforms. Vendors are under more pressure to open up their systems. Customers may still want a turnkey solution, but don't want to feel limited to specific hardware.

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III

~~General Business Climate~~

This chapter provides INPUT's overview of the current business climate for the U.S. information services industry ~~and for the application solutions delivery mode.~~

A ~~Overview~~

Despite ~~concern~~ about the painfully slow growth rate in the U.S. economy in 1992, information services industry vendors report that the environment offers significant opportunities, together with challenges, as indicated in Exhibit III-1.

EXHIBIT III-1

Impact of the Economic Environment

Factor	Impact on the Information Services Industry
Low level of growth in U.S. economy	Increasing need for application systems that can improve revenues and restructure business
Slower growth rate for U.S. information services industry	Likelihood of slower growth rates for vendors who pursue business as usual
Annual increase in information services business of over $10 billion	Significant target for aggressive vendors
Foreign market opportunities and competition from foreign vendors in the U.S. economy	Need for information technology to increase product quality and customer services

Of note are:

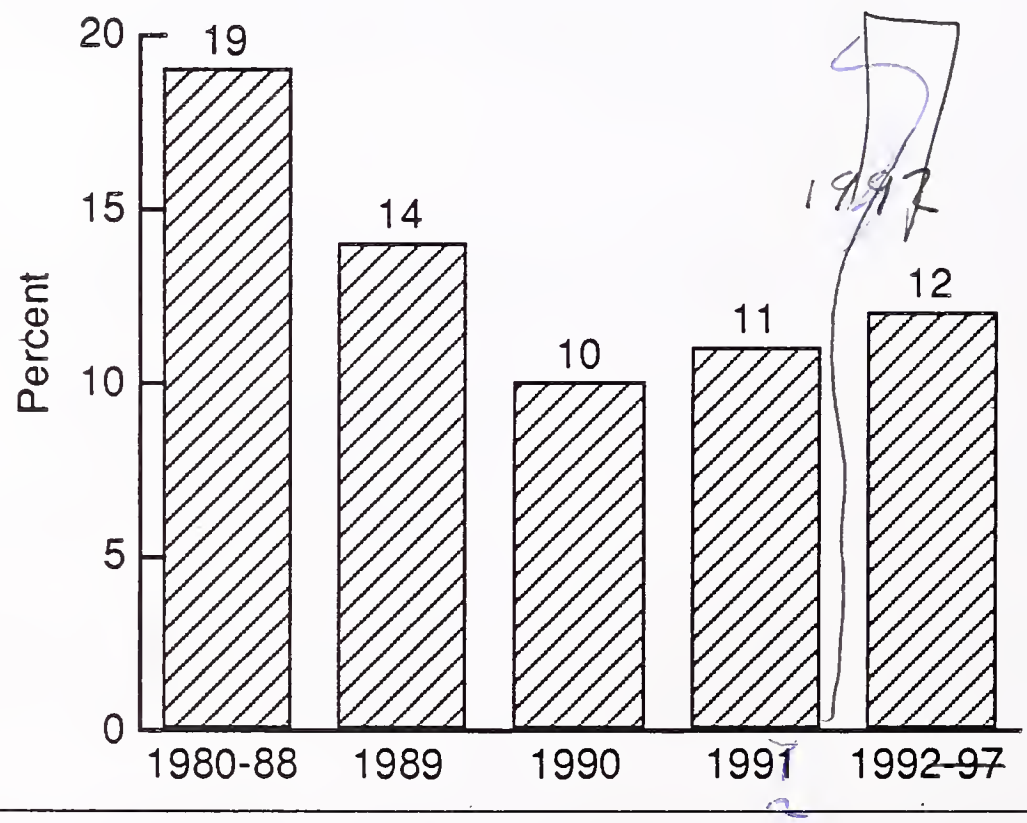
- The annual increase of business volume in the industry of over $10 billion, making information services one of the more attractive areas of opportunity in the economy.

- Demands imposed by the low level of economic growth have led to vendor projects that hope to increase revenues through improved geographical analysis of sales coverage, and improved service and product quality through the use of client/server systems that enable users to communicate between functions more effectively.

The U.S. information services industry is growing at a slower rate in the 1990s than it did in the 1980s, as shown in Exhibit III-2. Although the industry is rebounding slightly from the recession, it is not likely to return to the growth rates of the early 1980s. Vendors cannot rely on a favorable growth climate to help many of their product and service initiatives.

EXHIBIT III-2

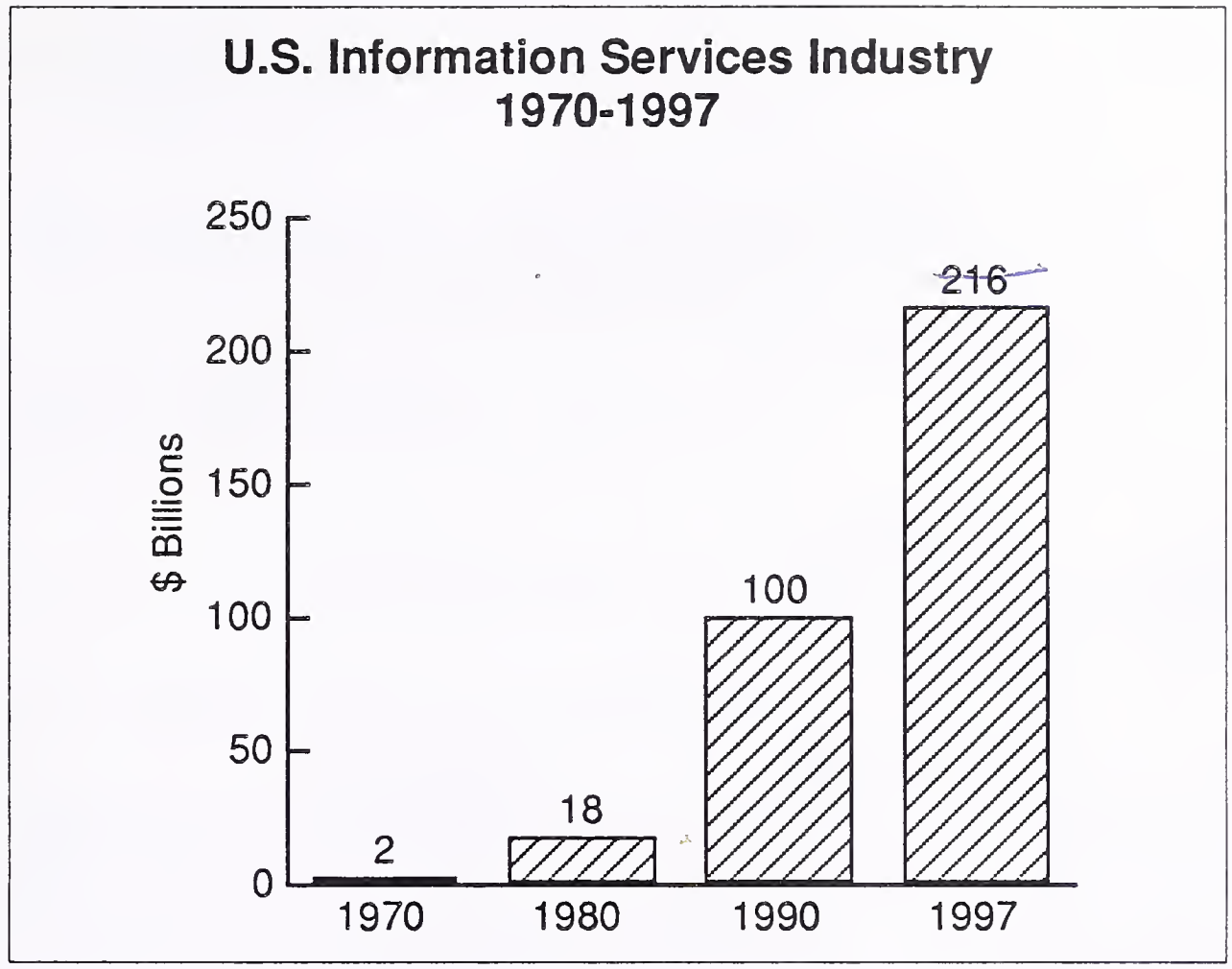
U.S. Information Services Industry Annual Growth Rates



The industry did reach a milestone during 1990, advancing beyond the $100 billion level.

- As Exhibit III-3 shows, the industry increased in size over five times during the 1980s and is 50 times larger than it was in 1970, when the industry represented $2 billion in user expenditures.

EXHIBIT III-3



- By 1997, the U.S. information services industry is expected to grow to over $200 billion, and the annual increase in absolute terms will be in the $20-25 billion range.

High rates of growth for the sale of software products and professional services provided the engine for growth during most of the last decade. As rates for increases in sales of these "delivery modes" declined, there were concerns about the continuing vigor of the information services industry; however:

- Growth of U.S. information services expenditures has been reinvigorated by the strong interest in outsourcing, restructuring, and downsizing business application systems, and by an increasing use of network services. In addition, there has been continuing growth in systems integration services.

- In effect, the information services industry has been shifting from sales of products and services for new application systems to sales that will upgrade, manage and outsource the use of information technology. This shift will continue to be driven by business needs to restructure in order to achieve greater effectiveness and productivity, as well as increased revenues.

On a worldwide basis, the industry continues to experience higher growth rates—close to 20%—and many U.S. vendors are experiencing growth overseas that exceeds that of the U.S. industry as a whole.

- This growth is primarily due to the relative stage of automation in many foreign markets, but the focus on specific industry markets in some countries is also a strong factor.

- Inflation rates and somewhat stronger economies have also helped to drive the global use of information services in the last few years, but these factors may have less of an impact at this time.

1991 Results for the U.S.

1991 results in the U.S. are analyzed below on a delivery mode basis:

- Although systems integration, systems operations and network services are not among the top three delivery modes in size, their rapid rates of growth (16% to 19% CAGR) are a major factor in maintaining and increasing the rate of growth in the industry as a whole.

- The software products sectors are maintaining a rate of growth slightly above the industry average (about 14% CAGR). As technological trends such as downsizing and client/server architecture are implemented, the demand for applications products is expected to remain steady.

- The industry averages are pulled down by the slower rates of growth in the large professional services and processing services sectors, as well as by the smaller turnkey systems sector (7% to 9% CAGR).

Overall, the 1991 performance of the U.S. information services industry is summarized in Exhibit III-4.

EXHIBIT III-4

U.S. Information Services Industry
1991 Results Summary

- Reached $110 billion in 1991
- Growth 2 to 3 times that of the economy continues
- Growth of 11% in 1991; forecast to return to 12% in 1993
- Extremely slow economic growth is complicating user plans

C

Market Forces

The set of market forces noted in Exhibit III-5 will continue to have an impact on the information services industry in the ~~19921993~~ timeframe and will also have a measurable effect on the overall growth rate for the ~~19921997 period~~. Each force will affect the industry as a whole, as well as each of the ~~nine~~ delivery mode sectors used by INPUT to analyze the industry and its key trends.

EXHIBIT III-5

U.S. Information Services Industry
Primary Driving Forces, 1992-1997

- Slower economic growth
- Globalization
- Growing influence of large vendors
- Outsourcing (buy versus make)
- Shift in technology
- The changing buyer

1. Slower Growth

The first of these forces, the interaction of the economy with the overall size of the industry, is a significant factor in user expenditure levels for information services.

- Since economic growth is slow and inflation remains low, there is less increase in industry sales due to price increases.
- Real economic growth, which had been modest over the few years prior to the recession that started in late 1990, will continue to be low during the forecast period. Consequently, low growth may continue to defer plans for the expanded use of information services in many industry sectors.
- The shift of information processing to smaller computers, which has been encouraged by the economy as well as by the current cost and level of technology, has lowered the software products investment, based on current pricing practices. Quantities of software products sold will increase, but revenue levels will grow at more modest rates unless

software products are sold together with professional or systems integration services where price might be increased in line with actual value.

1991 tended to follow the pattern of ~~1990~~. While there was little or no real growth in the overall economy and modest inflationary growth in the range of 5%, the information services industry grew at an annual rate of about 11%.

- While INPUT's 1990 and 1991 economic assumptions were for nominal GDP growth of 5.4%, real GDP growth was substantially less.

- At this point, the economy remains in a low level of growth, although a recovery—a slow-moving ~~or "sloth of a recovery" as *Business Week* has described~~ it—is underway. At the same time, inflationary pressures are modest. INPUT anticipates another year of modest growth in 1992, together with a slight rebound in information technology (IT) expenditures.

The slow upturn expected will have the following positive and negative impacts on the U.S. information services industry in the near term:

- Positive impacts:

  - There is increased motivation to buy rather than make, in particular for larger systems requirements. Response time and impact on business operations are the key criteria supporting use of outside services.

  - The interest in outsourcing, which permits organizations to redeploy capital investments and lower direct staffing levels, is being encouraged by slow economic conditions and the desire to lower costs.

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

- Possible negative impacts:

  - Continuing uncertainties in decision processes, although not as severe as in ~~1990 and 1991~~, will cause some delays or deferrals of major information systems projects.

  - With tight constraints on external information services expenditures at some companies, management may decide to burden the internal IS staff with applications maintenance, enhancement and development assignments rather than use contracted professional services vendors; this would have a negative effect on a major segment of the industry.

2. Globalization

The second major market force, which INPUT has stressed for the past three years, is globalization. During that time more markets have opened, vendors have expanded their international focus, and users have begun to expect global capabilities.

The primary positive impact of globalization is that it enables the larger vendors to balance their businesses in multiple markets, which are less affected by market downturns.

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

3. Large Vendors

The third market force is the influence of larger information services vendors, which has increased significantly over the past three years.

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

- A number of the larger vendors are growing faster than the overall market, and these vendors have more opportunity, based on their resources, to enter (or acquire vendors in) desirable foreign markets.

- There are also numerous smaller firms that are growing faster than the general market, but larger vendors have a disproportionate opportunity to obtain bigger jobs and continue to add large amounts of revenue to their bottom line each year.

The influence of larger vendors is also increasing in other ways. Starting with IBM, many large services vendors are making minority and majority investments in IT firms to gain influence on technology, access to software products for re-marketing, and market share.

The opportunity for the smaller, more specialized software product or services vendors is not disappearing, but it is changing in character.

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

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

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

- The larger vendors have the financial strength to mobilize resources for very large jobs.
- The size of the vendors can help to minimize the risk of losing large contracts.
- The larger vendors have financial resources available to invest in new technologies, often through investment in smaller and specialized firms.

Smaller technology firms may need to form alliances in order to gain the same advantages larger firms have, as discussed above, and survive. Larger firms, however, tend to move more slowly, which will hamper development and acceptance of new technology. This slowness will provide opportunity to small vendors that seize technology initiatives.

4. Outsourcing (Buy versus Make)

(SYSTEM OPERATIONS)

ANOTHER

~~The fourth~~ significant market force ~~to be reviewed~~ is outsourcing. The recession has encouraged more companies to consider outsourcing, and interest in it has grown from the outsourcing of the management of information systems (systems management) to other types of activity—such as solutions buying, applications maintenance and applications management, ~~as shown in Exhibit III-6.~~ (EXHIBIT III-6)

EXHIBIT III-6

Outsourcing Trends

- Systems management
- Solutions buying
- Applications maintenance
- Applications management

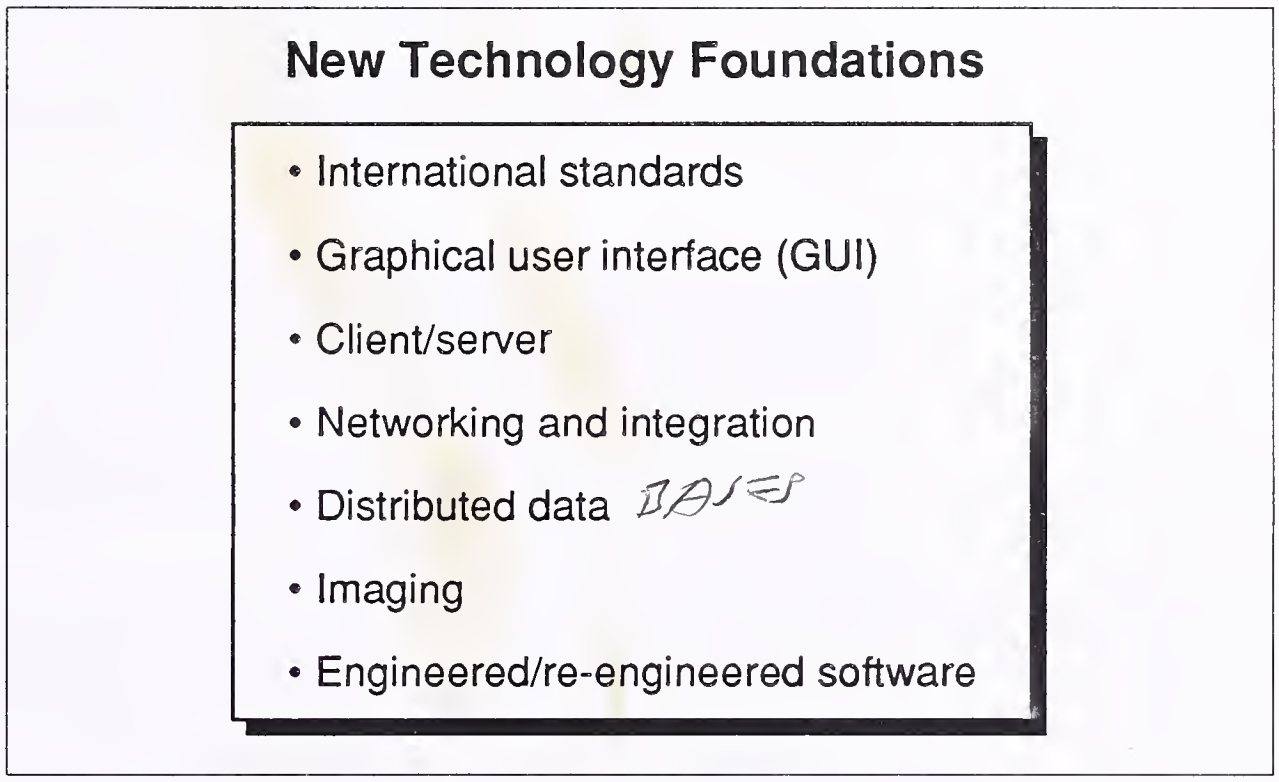
- Applications maintenance—the around-the-clock support of applications systems—and applications management—contractual arrangements to manage the development and support of application systems—are new means for utilizing support from professional services vendors that provides more defined relationships and pricing.

- "Solutions" buying is support for client/server technology where a vendor will provide software products and customization to satisfy the needs of a distributed environment.

5. Technological Shift

An additional market force is the shifting technology foundation (see Exhibit III-7). This influence is related to the developments that are adding complexity to or shifting the technological basis for the use of information systems ~~and~~ includes the following:

EXHIBIT III-7



- The international standards that must be considered when developing or buying software products in today's market.
- Graphical user interfaces, which are increasingly demanded by users of software products.
- Client/server architecture, ~~which is providing~~ the technology to meet ~~user needs. This~~ is the vehicle for downsizing application systems or portions of them for user environments.
- Networking and integration, which provide the means for distributing application systems as well as linking company functions.
- Distributed data, which are necessary for distributed user environments.
- Imaging, which is the inclusion of the entire source document in the information systems application.

- Engineered/re-engineered software products that will change the approach to the maintenance and enhancement of application systems.

These shifts will make it possible for solutions to be more tailored to user environments and company situations. They will also create a number of opportunities for vendors.

6. Changing Buyer

The final market force to consider is the changing nature of the buyer. The decision maker for the purchase of information services remained relatively constant until the late 1980s. It was the information systems executive and key staff (systems development and data center operations managers) who decided when to go outside and what company to contract with.

This role has changed significantly in the past few years and promises to change even more. As the information services vendor moves to provide a long-term service or a full solution, the executive (in user functional areas) is becoming the buyer. The results are significant:

- Technology becomes less important and the business or operational impact becomes more important.
- The impact of the information systems function becomes more consultative and less direct.
- The ability to try new ideas and approaches is increased.
- Time-to completion is controlled by the organization's ability to afford, not the constraints on the information systems group's ability to develop.

D
Summary

1991 and 1992 have been a period of significant changes from the 1980s. The changes suggest more modest rates of growth, but a sizable amount of growth in absolute terms. In addition, a number of opportunities and challenges could have a positive effect on vendors that opt to play a proactive role in the changes taking place. For example:

- A 1991 market of $110 billion that is growing at 12% over the next five years (CAGR) offers major opportunities.
- The increasing tendency of larger organizations to turn to vendors for services that include significant elements of systems management and have a solutions orientation will lead to larger, longer term decisions for vendor business.

- The shift in the underlying technology foundation will create more valuable and productive application solutions, but this shift will also necessitate re-engineering, reinvestment and retraining, and require time and money.

The role of the executive (in user functional areas) concerning the deployment of information technology continues to increase and will become more important in regard to vendor selection over the planning period.

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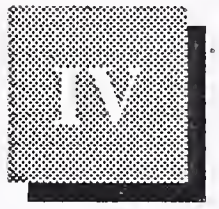


Information Systems Environment

A
Background

Information technology has evolved dramatically over the last several decades, as shown in Exhibit IV-1.

EXHIBIT IV-1

Computing History

	Hardware	Software	Applications
1960s	Mainframe	Internal Development / IBM Proprietary Systems	Corporate Systems
1970s	Mainframe and Minicomputer	Internal Development and Customized Packages / DEC, IBM, HP Systems	Corporate and Departmental
1980s–1992	PCs	Packaged Software / Variety of Systems	Personal Productivity

1990's

In the 1960s, computing was synonymous with large mainframe batch-oriented systems. In the 1970s, the minicomputer came into its own. This allowed many smaller companies, which did not require the capacity of a mainframe, to enter the computer world. Large companies began to make use of midrange systems for specialized or departmental applications. Terminal access to both minicomputers and mainframes supplemented batch processing for many applications. Data was stored in sequential files. The applications residing on these computers were those affecting the overall operation of the organization and included accounts payable, accounts receivable, payroll and order entry.

Systems were developed, purchased and managed by information systems organizations within companies. Large programming staffs were generally an important part of these organizations, as applications were frequently developed internally. These organizations typically produced a myriad of reports for managers to use.

When PCs became prevalent in the 1980s, the larger enterprise systems continued to play the same role. PCs tended to be used for personal productivity purposes—such as word processing, spreadsheets and project management. However, unlike their larger system counterparts, PCs were often purchased by the individuals or departments that made use of the PCs, sometimes bypassing IS organizations entirely. This led to a proliferation of various types of hardware and software within organizations, with little consideration of how these systems would interrelate. Over time, companies, through their IS organizations, tried to regain control over the unsupervised purchase of such systems through establishing standards for purchases. However, the power of the end user had already been established, and today the user continues to play an increasingly important role in purchases of computers and software.

In the 1960s, 1970s and even into the 1980s, hardware purchases drove the IS market. Vendors such as IBM, DEC and HP were riding high. Customers purchased proprietary systems from these vendors and relied on them for upgrades and support. Over time, however, purchasers began to realize that software is an area where real value is provided. Hardware has fast become a commodity with decreasing margins.

B

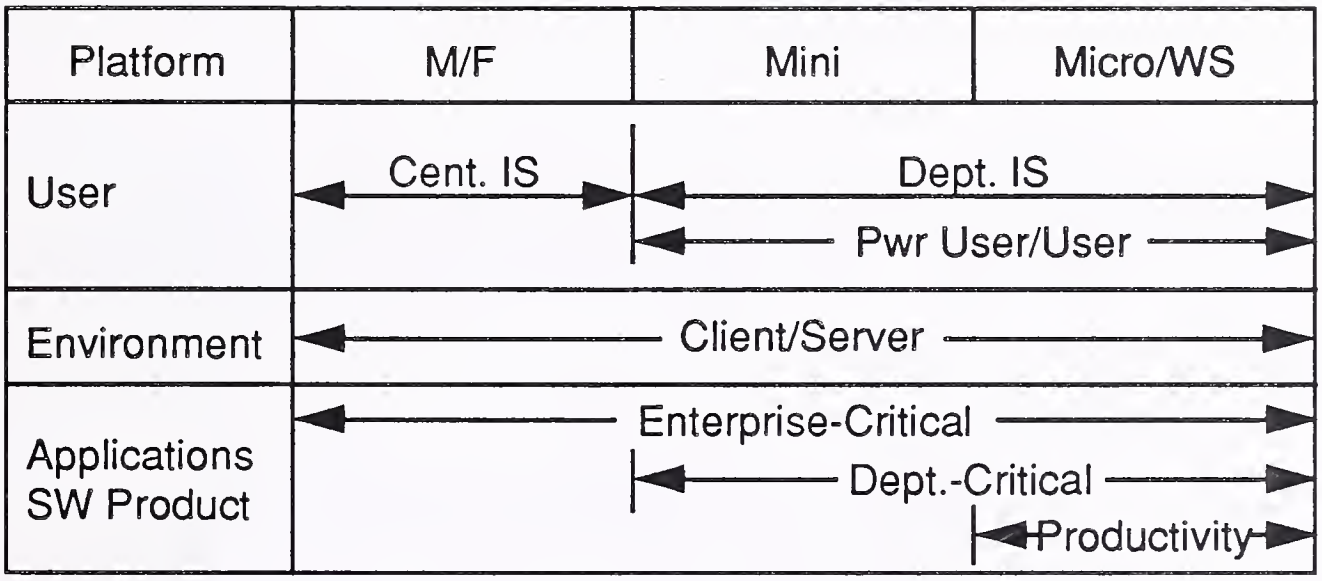
Information Systems Today

In the 1990s, the trend often discussed in trade journals and at conferences is enterprise computing. Other terms related to this trend include distributed and/or cooperative processing, along with client/server computing. Enterprise computing refers to the integration of mainframe, minicomputers and PC/workstations—and the networks that connect them—to handle the computing needs of an enterprise. This model strives to marry the

capability of PCs and larger systems together to efficiently handle business applications. As seen in Exhibit IV-2, this trend distributes processing responsibility beyond the IS organization to the department and individual users.

EXHIBIT IV-2

IS Model for the '90s



Enterprise computing requires the integration of various platforms and systems through networking. It involves software residing not only on a variety of platforms, but with several operating systems.

Although enterprise computing may be highly discussed among "industry experts," INPUT wanted to find out what is actually going on within companies that are purchasing application solutions today. Have they embraced the enterprise computing model, and if so, how far along are they in implementing it? What does this mean in terms of their purchase of application solutions? Who is making the decisions about application solutions within companies?

To find out the answers to these, and a variety of other questions, INPUT spoke with IS decision makers at 30 companies, representing a variety of industries. Also, to better understand the issues from a vendor perspective, INPUT interviewed 20 vendors of packaged applications software and turnkey systems. This chapter presents INPUT's findings regarding the interviews with these companies. Supplemental research information is included where appropriate.

1. Computing Platform

Interestingly enough, despite all the hype about downsizing and client/server architecture, the companies INPUT spoke with are still heavily

reliant on large-scale systems. As seen in Exhibit IV-3, 64% of the respondents described their primary computing environment as mainframe or minicomputer based. Only 13% of the respondents reported "Local-area or wide-area networks supporting minicomputers/PCs" as their primary computing environment. However, an additional 23% reported their environments to be mainframe, minicomputer and LAN-PC/workstation based. These companies tended to be large businesses that have acquired a mix of systems throughout their organizations, with no single platform dominating.

EXHIBIT IV-3

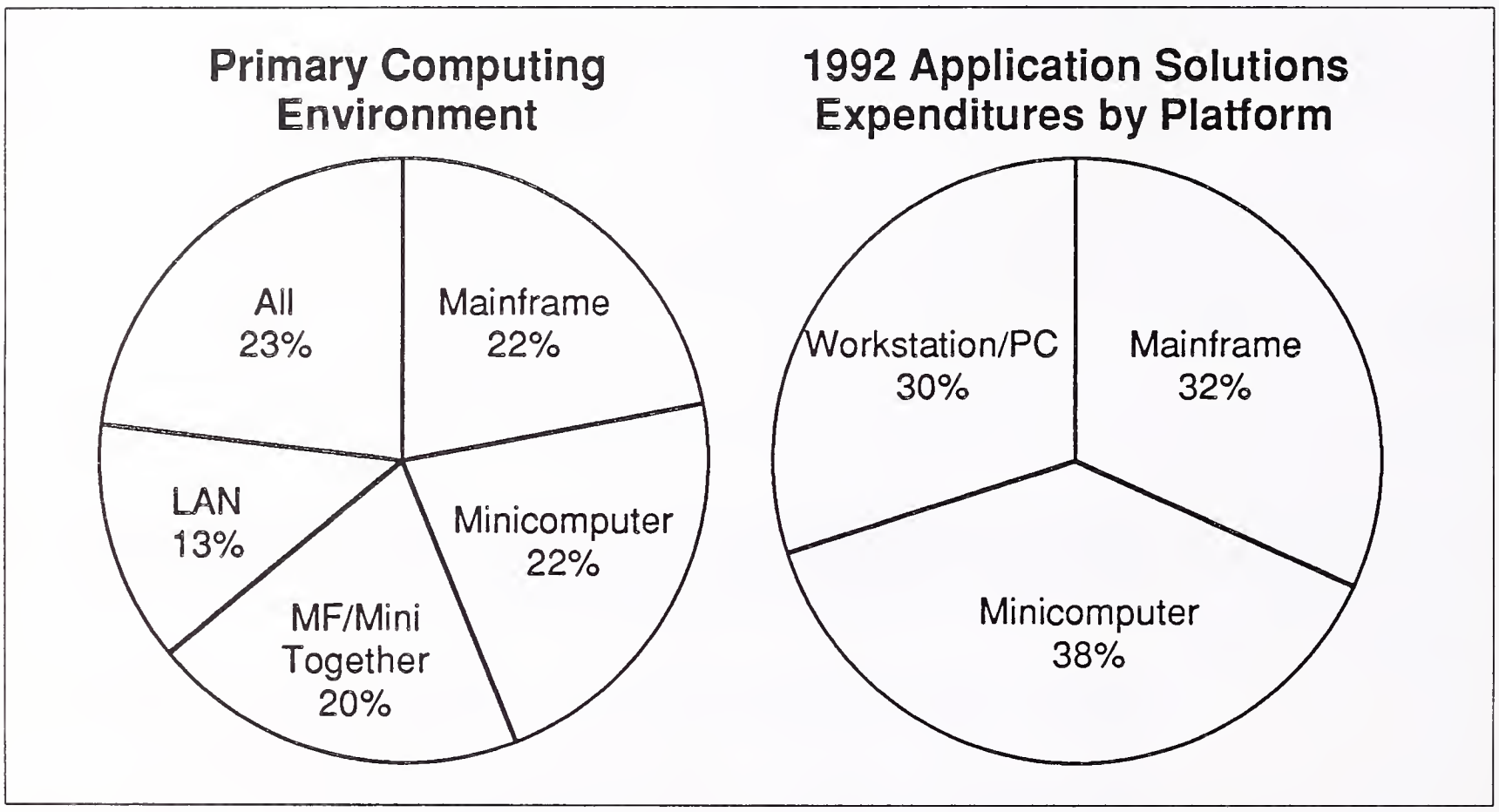
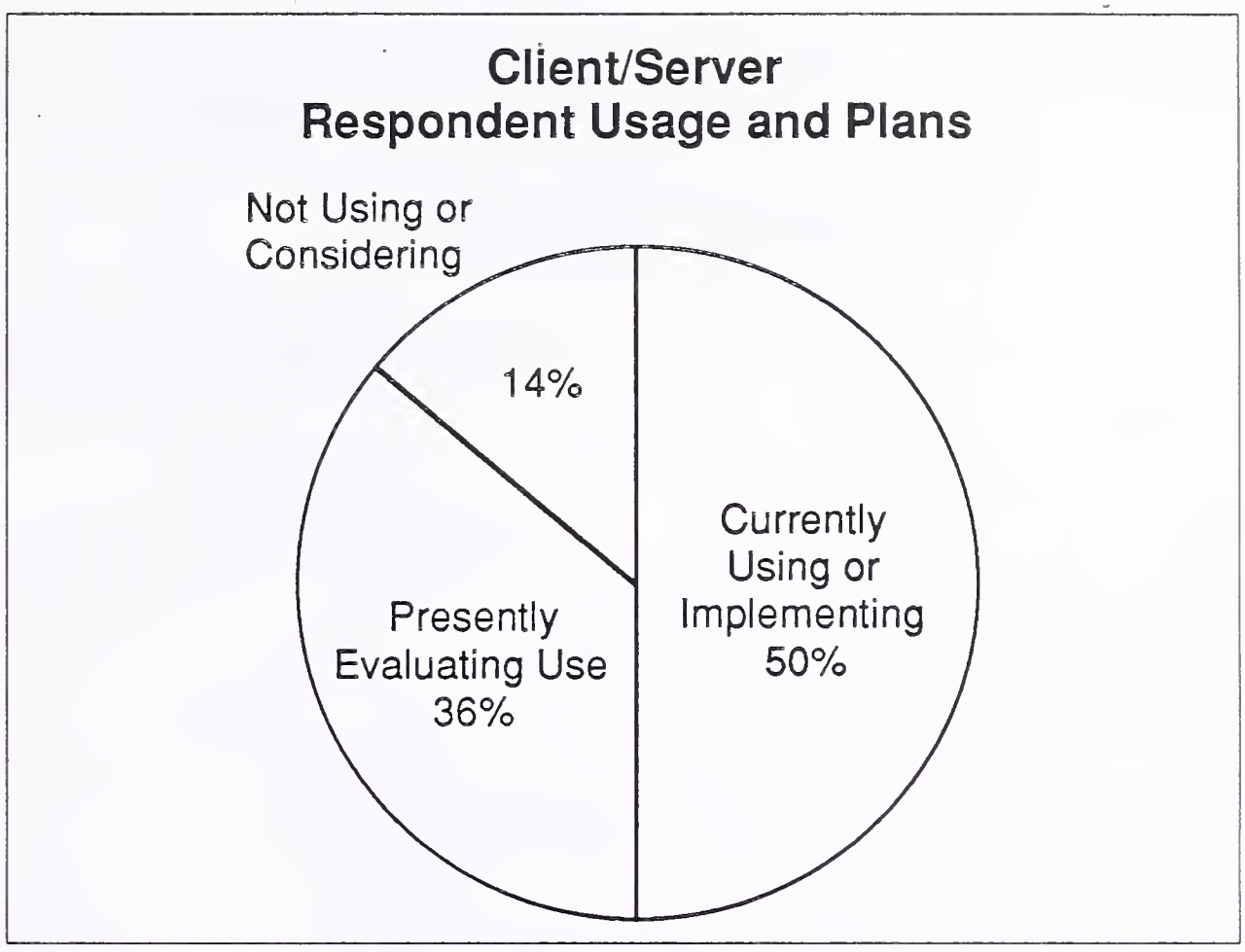


Exhibit IV-3 also looks at expenditures for application solutions by platform. Spending was split generally evenly among the three platforms, with minicomputer solutions representing the highest average expenditures (38%) and workstation/PC application solutions being the lowest, at an average of 30%. These percentages are averages across all responses. It should be noted that certain companies had expenditures that were more heavily weighted toward one of the three platforms.

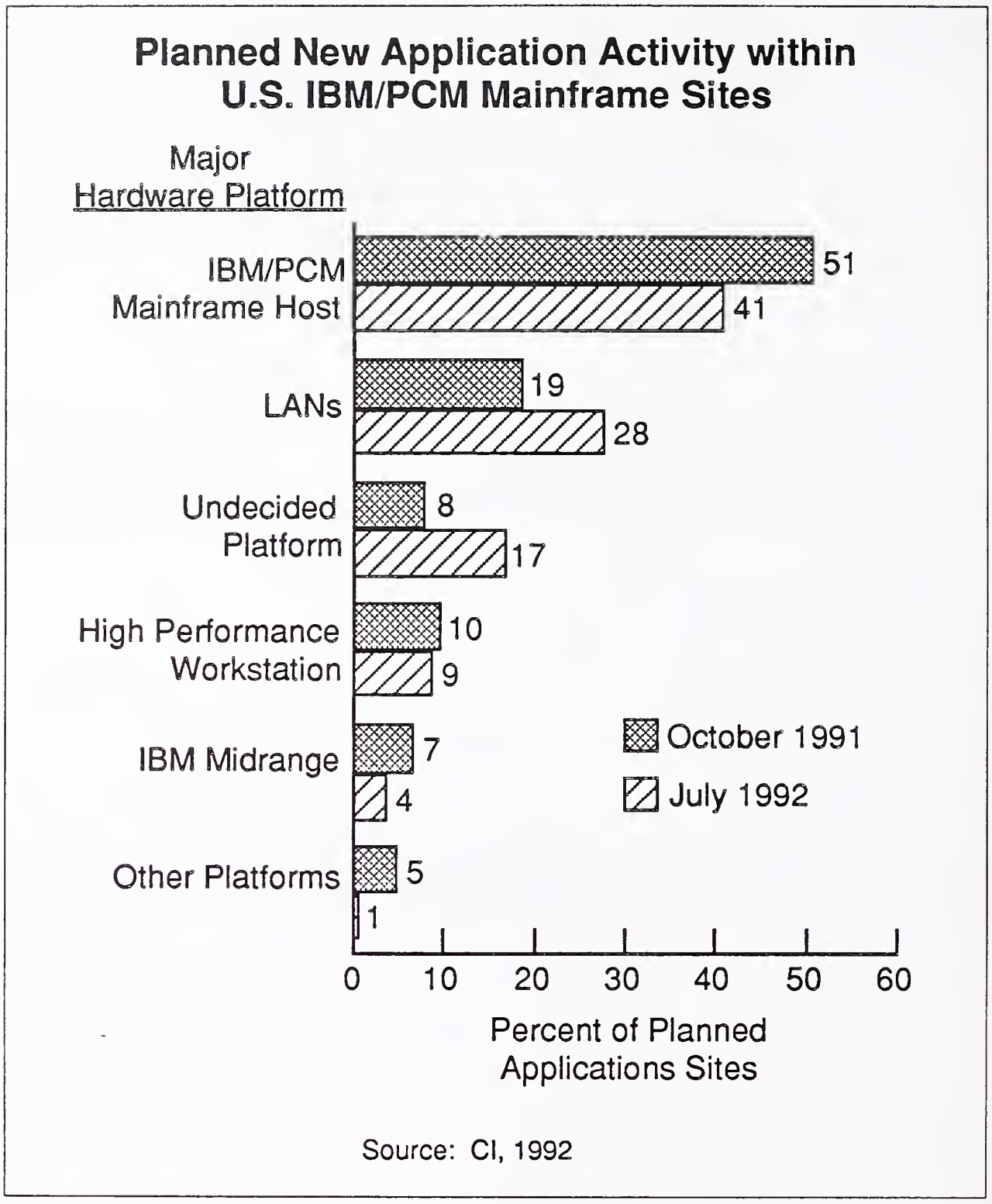
The findings indicate that many of these companies still rely on mainframes and minicomputers. However, what about the future? When asked if these expenditures were expected to change, 43% indicated that they expect to increase expenditures at the PC/workstation level. As shown in Exhibit IV-4, 86% of the respondents are either currently using, planning or considering client/server solutions.

EXHIBIT IV-4



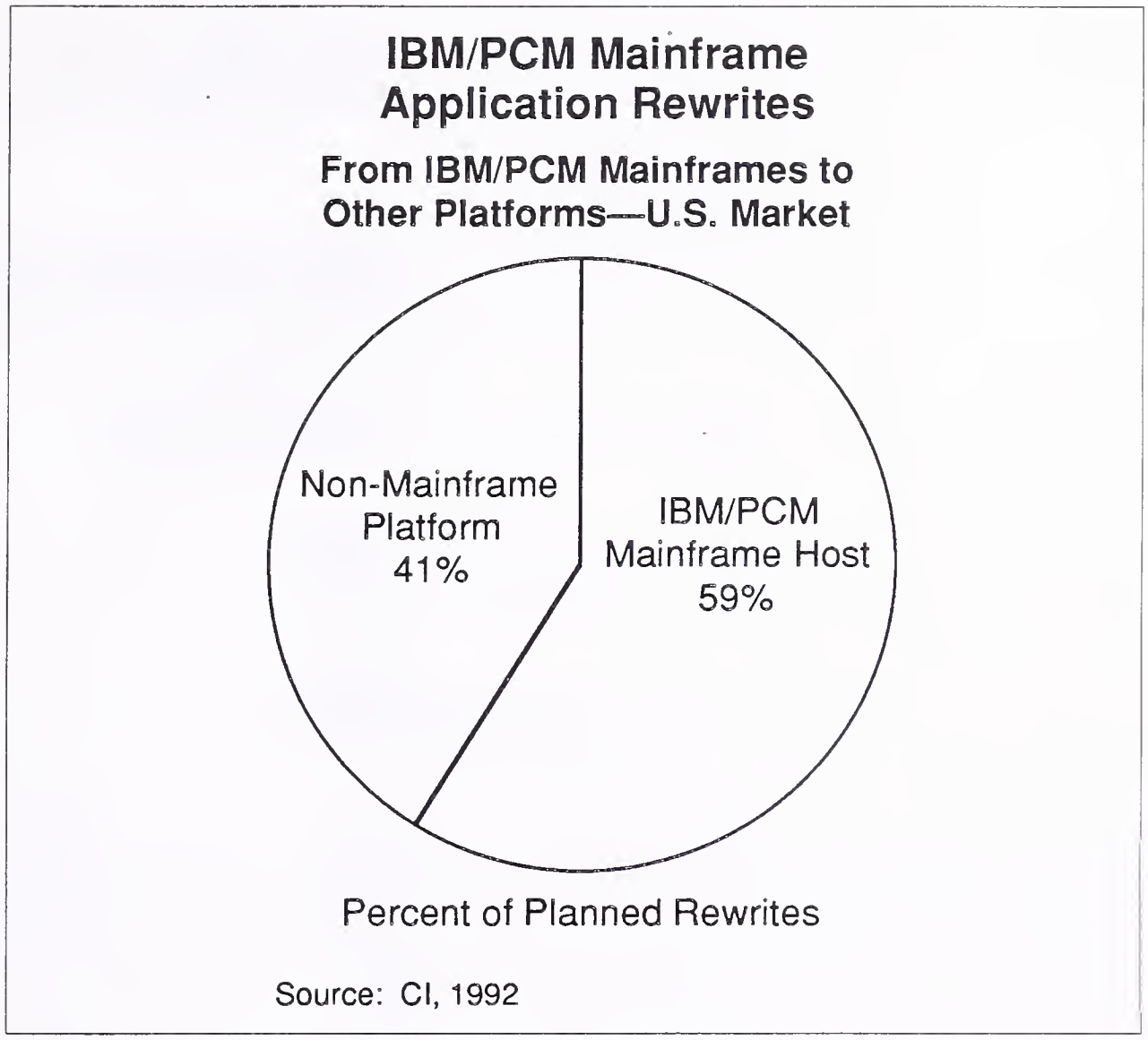
Analysis performed by Computer Intelligence (CI) supports these findings. Exhibit IV-5 shows planned new application activity within U.S. sites that make use of IBM/PCM mainframes. While in 1991, 51% of the planned new applications were for the mainframe host, in 1992 this percentage was reduced to 41%. CI reports that this is a marked reduction from the 70% of the software budget spent for mainframe packages in 1987. Planned applications on LANs increased in 1992 to 28% from 19% in 1991. Also note the marked increase, from 8% to 17%, in the number of sites that were undecided about the platform for future applications. This seems to indicate that users are considering changes from their present course.

EXHIBIT IV-5



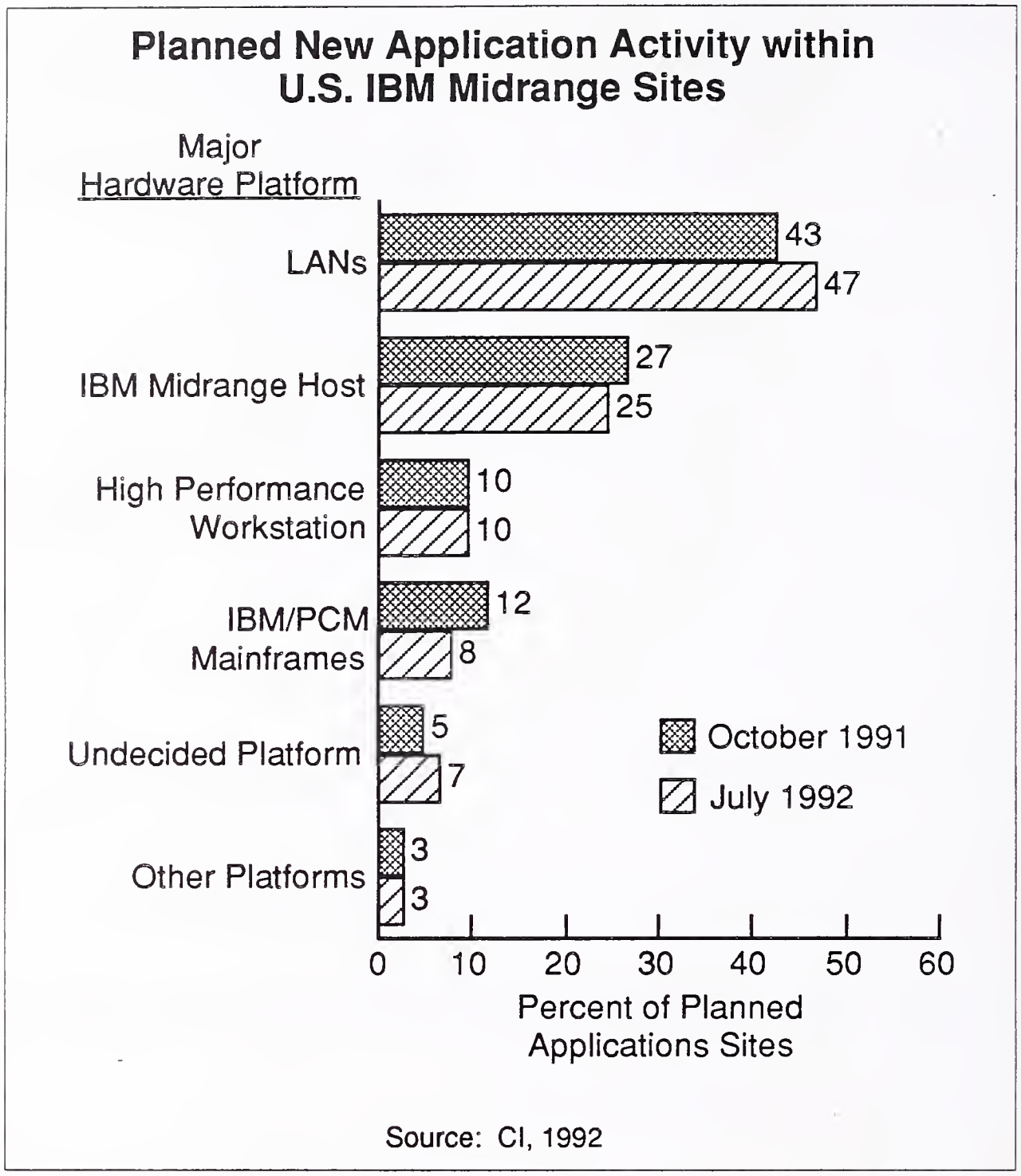
Perhaps even more significantly, in looking at rewrites, CI found that among those companies that were planning to rewrite mainframe applications software, 41% was being rewritten to another platform, as shown in Exhibit IV-6.

EXHIBIT IV-6



In looking at U.S. midrange sites, CI found that LAN application activity increased from 43% in 1991 to 47% in 1992, as seen in Exhibit IV-7.

EXHIBIT IV-7

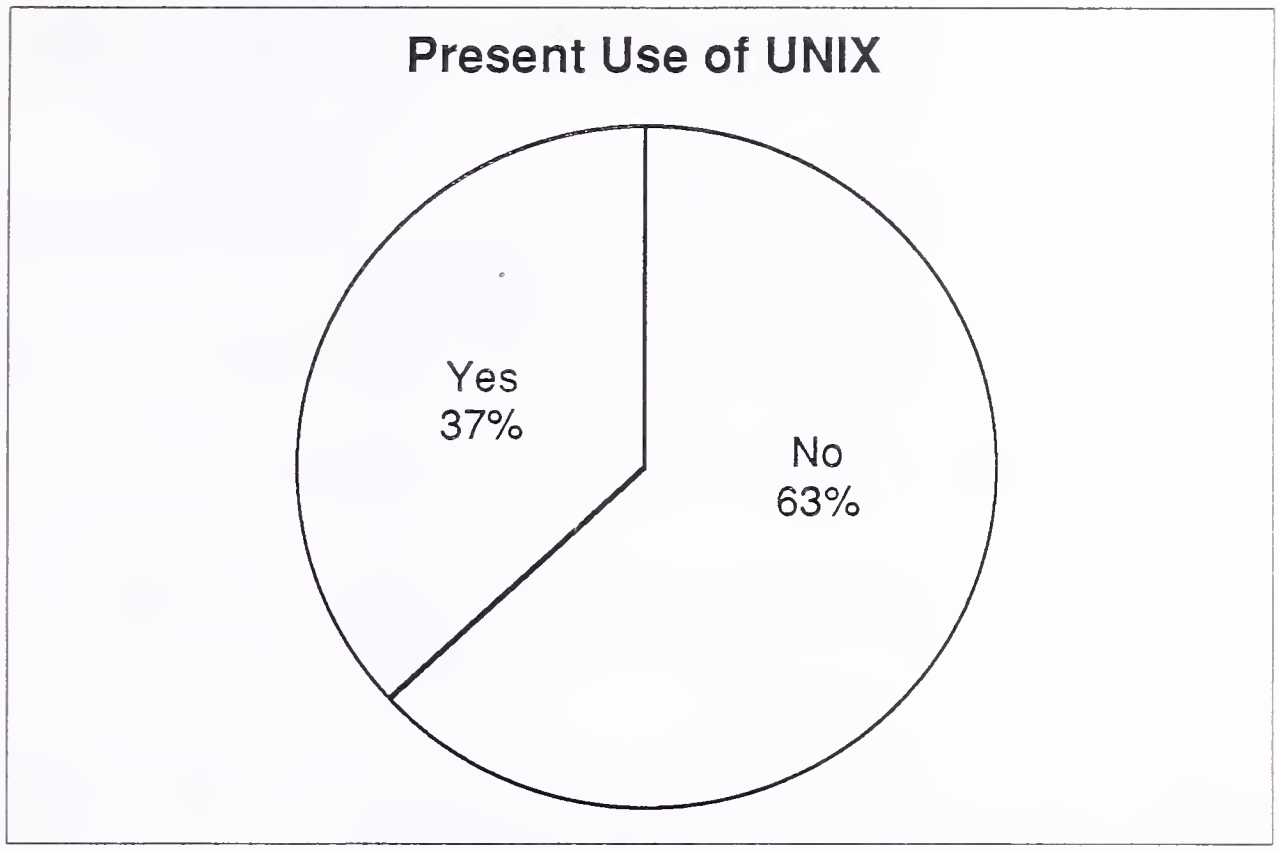


The results of CI's analysis, along with INPUT's research, show that mainframes and minicomputers continue to play an important role. However, the trend is clearly moving toward more development of applications at the PC/workstation level. This translates into potential opportunities for software solutions vendors, particularly at the PC level. Many companies are anticipating significant changes in their computing architecture in the next five years. As companies downsize to smaller systems and evaluate client/server, demand for software solutions will increase.

2. UNIX

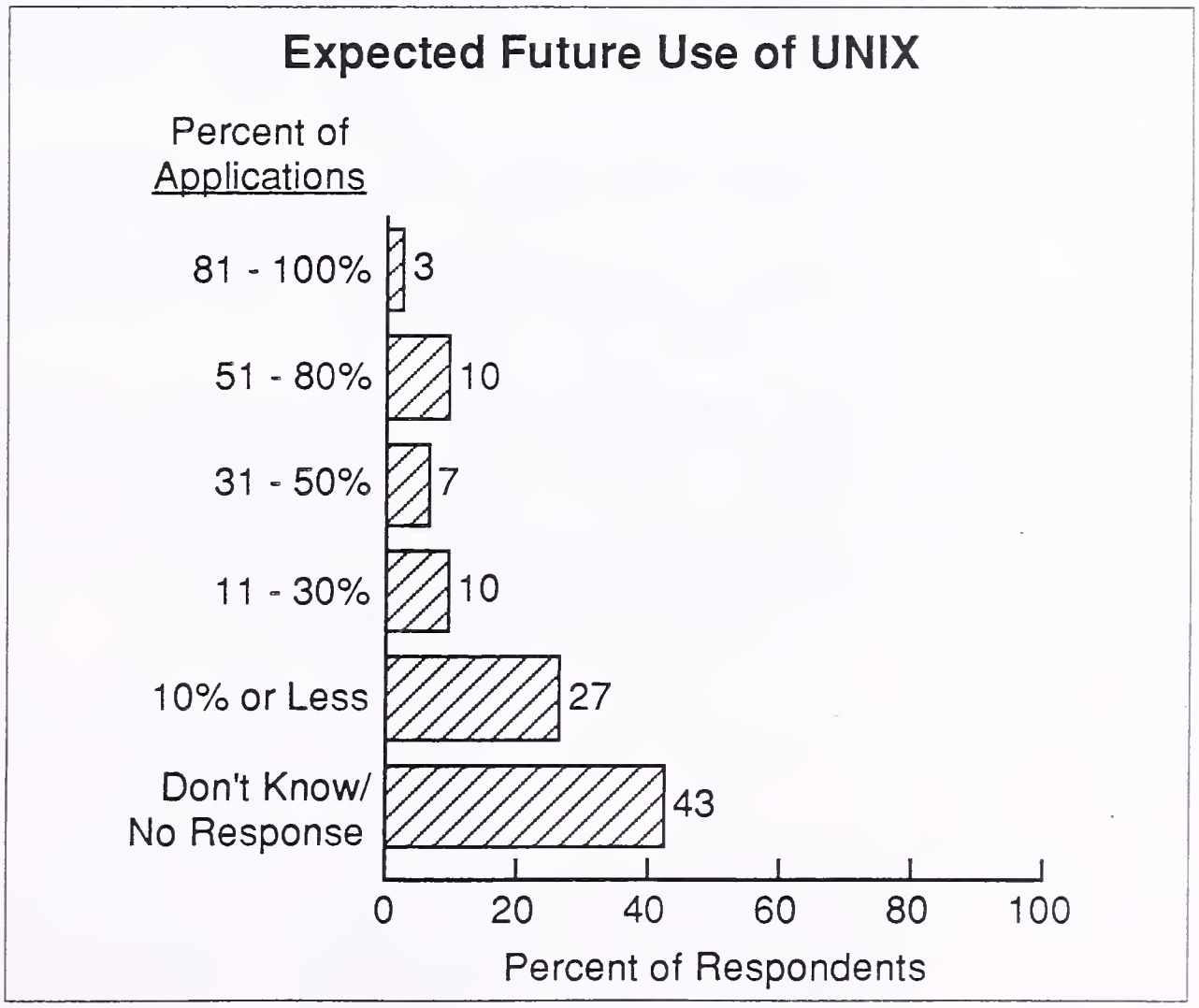
Where does UNIX fit in with this environment? As shown in Exhibit IV-8, the majority of respondents (63%) to INPUT's survey indicated that they do not use UNIX products.

EXHIBIT IV-8



In addition, when asked about expected future use of UNIX, most respondents were unsure about potential use. Of those that did provide estimates, 37% of respondents anticipate 30% or less of their systems usage will be on UNIX, as shown in Exhibit IV-9.

EXHIBIT IV-9



CI's research shows that 27% of the IBM mainframe sites and almost half of the VAX sites reported that they were planning UNIX purchases this year.

The Department of Commerce indicates in *Industrial Outlook* that UNIX's "complexity and size will keep it out of the mainstream market."

While UNIX offers important advantages related to portability, its command set is complex, putting it at a distinct disadvantage at a time when users have come to expect computers to be easy to use. No major breakthroughs have yet occurred in the development of GUIs for UNIX.

It is expected that UNIX will continue to play a role in specialized applications handled by the more sophisticated user.

3. Budgets

Given the recent economic slowdown in the U.S., INPUT wanted to find out how IS budgets, and specifically application solutions expenditures, were being affected. Exhibit IV-10 illustrates the average budget changes between 1991 and 1992 for those companies responding. Some companies declined to provide budgetary information.

For 1992, 35% of those responding reported no change in their IS budget as compared with 1991. An average increase of 1.5% was found among those that did report changes in 1992. While a 1.5% increase represents the average, individual companies reported increases from 1991 as high as 20% and decreases by as much as 15%.

For application solutions, 47% of respondents reported no change in expenditures for applications software and 50% reported no change for turnkey systems. Of those reporting changes, a 15% average increase was reported for applications software. An average increase of 1% was reported for turnkey systems in 1992.

These findings show that for many companies, 1992 was a year when budgets were flat for IS organizations, affecting expenditures for software solutions. For those companies that did have budgetary changes, applications software was a category that realized increased spending, while turnkey systems had minimal increases.

EXHIBIT IV-10

1992 Expenditures

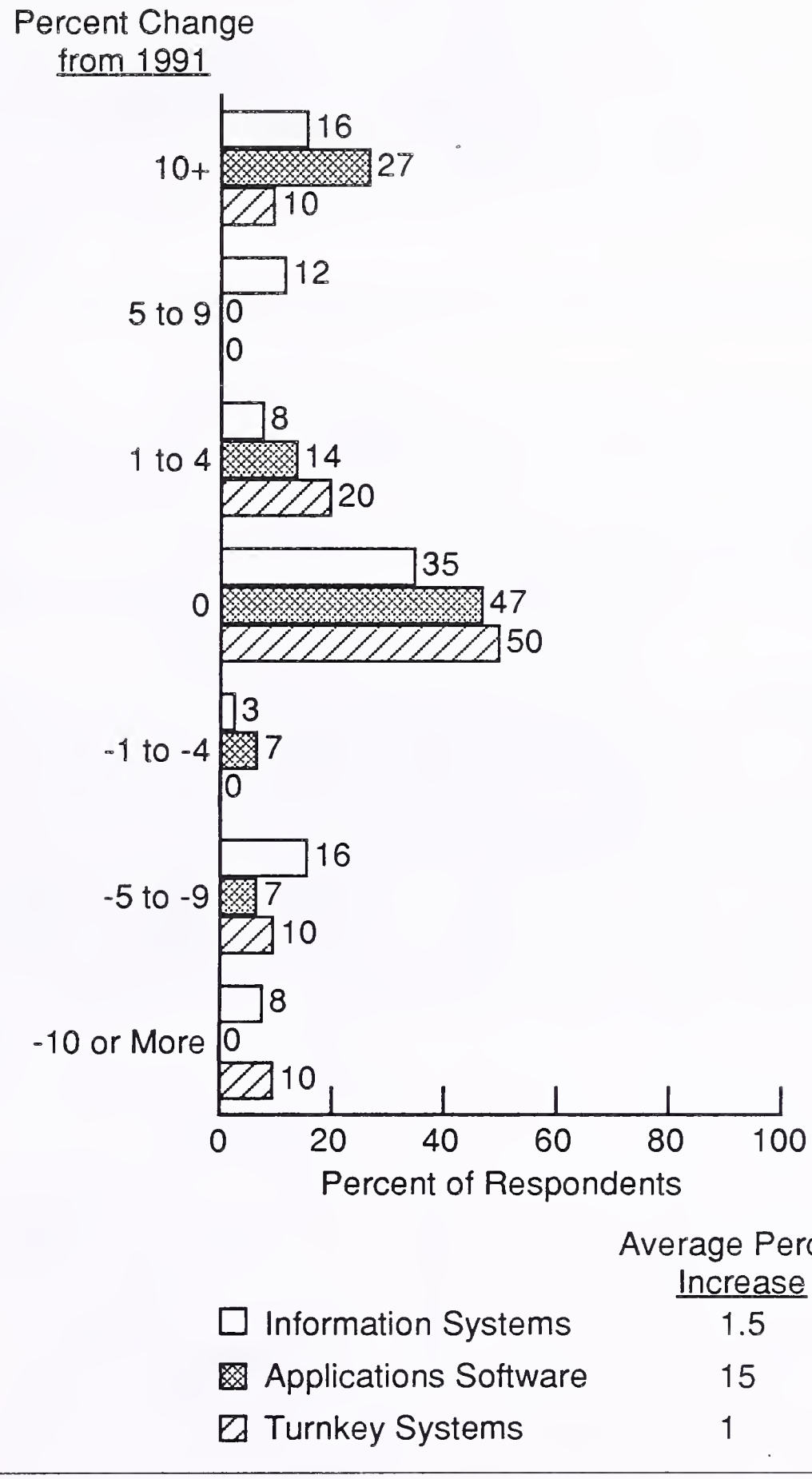


Exhibit IV-11 shows that, among respondents, an average of 26% of the IS budget was for packaged applications software.

EXHIBIT IV-11

1992 IS Budget
Applications-Related Expenditures, 1992*

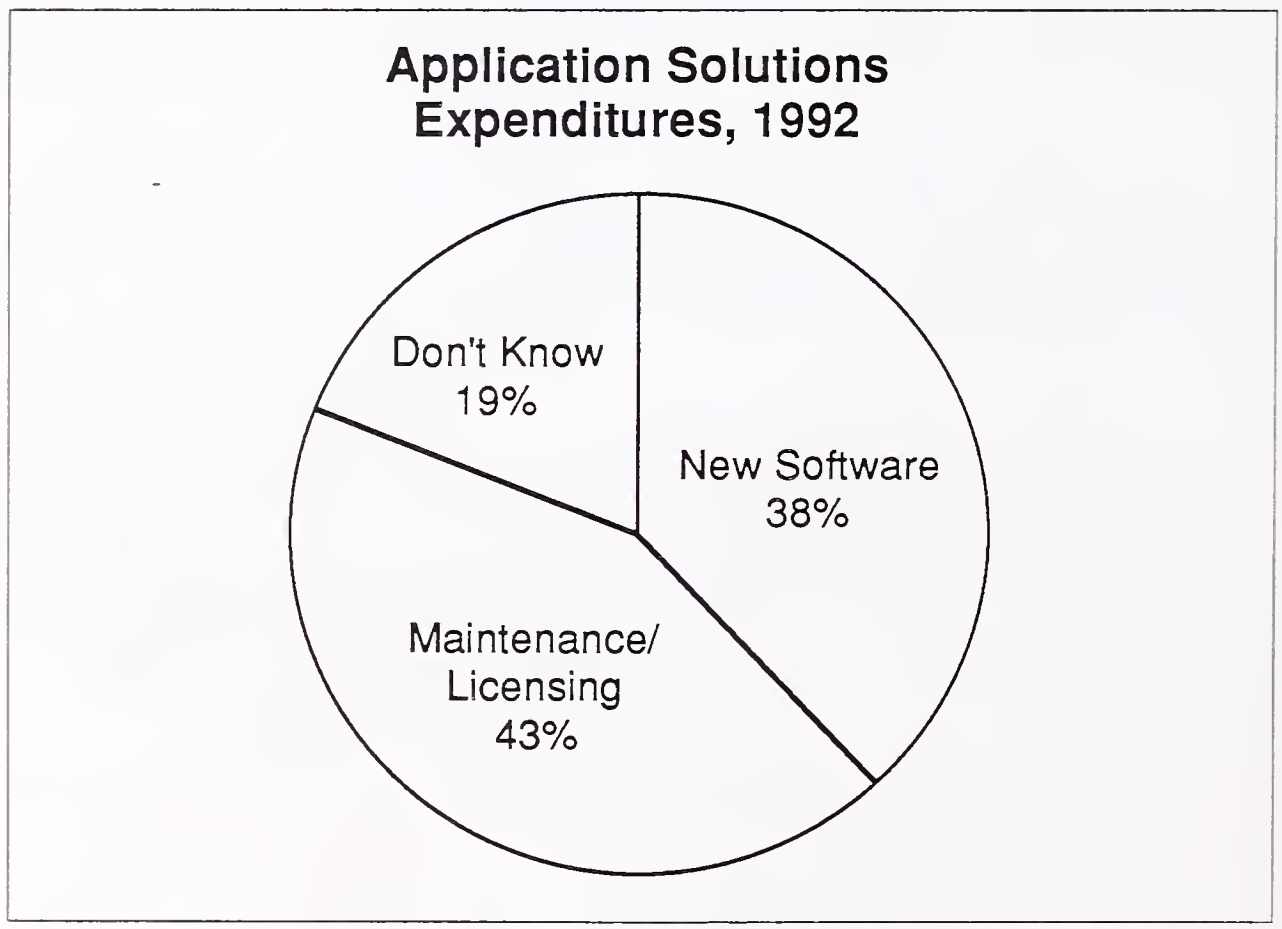
	Percent of IS Budget
Packaged Software	26
Turnkey Systems	14

*Note: Not all respondents make use of both.

Of companies purchasing turnkey systems, 14% of the IS budget, on average, was spent for those systems.

In comparing expenditures for new software versus maintenance and licensing of existing software, responses showed slightly more expenditures for the latter category, as shown in Exhibit IV-12.

EXHIBIT IV-12



While INPUT's 1991 report showed 61% of expenditures for new software, responses this year show a more modest 38%. This illustrates the maturing of some segments of the software market, with many companies having selected software solutions to address certain needs. The revenue potential for upgrades, however, is expected to be significant. An article published earlier this year in *Computer Letter* quoted a spokesman from Corporate Software, a large reseller, as saying that while there is 1 new customer for every 10 repeat customers, the price ratio of new software to upgrades is 3 to 1.

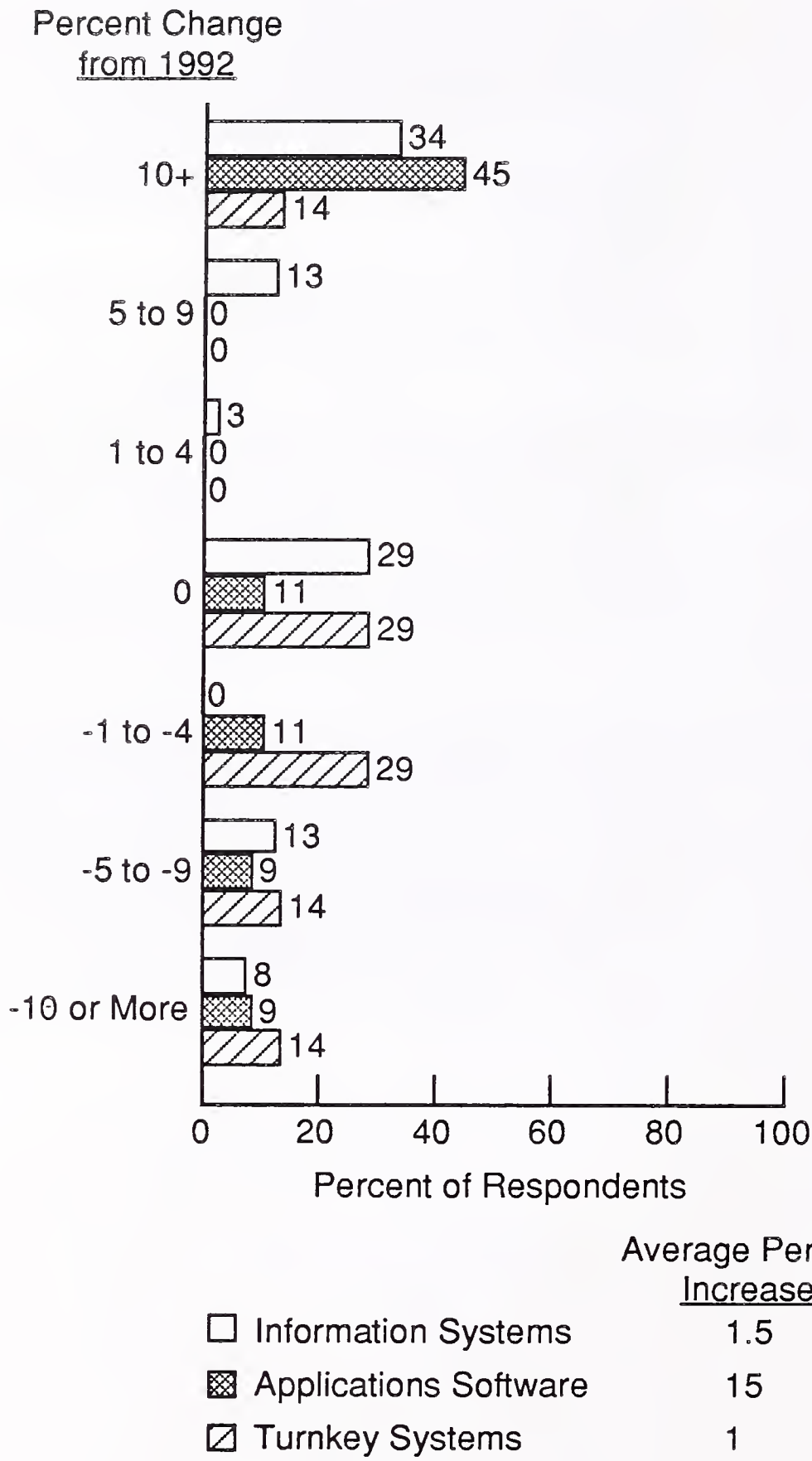
In 1993, expectations are somewhat more optimistic for spending in general, as shown in Exhibit IV-13.

While nearly a third of those responding to this question projected no changes in the IS budget in 1993, the average increase projected is 4%. This average represents responses ranging from -15% to +50%. For applications software, an average increase of 8% is anticipated among those expecting budget changes, with responses ranging from -20% to +40%. In the turnkey systems area, an average decrease of 1% is expected, with responses ranging from -20% to +10%.

Clearly the recession has had an effect on IS expenditures, particularly in certain segments, such as banking/finance and manufacturing. Many companies report 1992 and 1993 budgets as flat as compared with 1991, while still others have indicated budget cuts. Turnkey systems expenditures seem to have followed the overall budgeting trend. However, expenditures on application solutions seem to be holding their own despite the economic times. In fact, respondents indicated the selective installation of new applications software products—including downsized solutions—is viewed as a means of minimizing corporate costs and improving productivity.

EXHIBIT IV-13

1993 Projected Budget



When respondents were asked who is responsible for decision making in purchasing application solutions, 70% responded that it was a joint decision between IS organizations and users, as shown in Exhibit IV-14.

EXHIBIT IV-14

Application Solutions Decision Makers

IS	26%
User	4%
Joint Decision	70%

An additional 26% of respondents indicated that IS was responsible for such decisions, with the remaining percentage of decisions made by users. Also, as shown in Exhibit IV-15, demand from end users was mentioned most frequently by respondents as having a positive effect on application solutions expenditures, which indicates a cooperative effort between IS and user departments in making decisions about application solutions purchases.

EXHIBIT-15

Issues Affecting Application Solutions Spending

Issue	Percent of Responses*
Positively	
User Demand	53
Cost of Technology	50
Changing Hardware	33
Changing Applications	33
Negatively	
Business Climate of Industry	30
Business Climate of Organization	26
Recession	26

*Multiple responses allowed.

Respondents also generally consider the cost of technology, along with changing hardware and applications, as having a positive effect on purchases, while the recent business climate has had the most negative effect.

4. Applications

To delve deeper into understanding application solutions purchases, INPUT asked respondents about the type of applications being purchased. Findings varied considerably from last year's research. While INPUT's 1991 report showed that cross-industry applications accounted for nearly two-thirds of applications software expenditures, interviews this year indicate a more even split between industry-specific and cross-industry applications, as seen in Exhibit IV-16.

EXHIBIT IV-16

Application Solutions Expenditures for 1992

	Percent	
	Applications Software	Turnkey
Cross-Industry	47	26
Industry-Specific	53	51

It should be noted that these percentages are averages. In some cases, nearly 100% of expenditures were for cross-industry software, and in other cases up to 90% were for industry-specific software. Some fluctuation in expenditures between cross-industry and industry-specific software is expected as companies priorities change from year to year according to need and projects planned.

In the turnkey systems area, the split between cross-industry and industry-specific was considerably less even. Cross-industry turnkey system expenditures averaged 26%, with industry-specific spending averaging 51%. The remaining 23% represents respondents who did not know how software expenditures broke out. To today's buyers, the advantage of turnkey systems relates to the value added by packaging hardware and software that can address specific business problems. This packaging is less advantageous in the more generic, cross-industry areas.

Accounting software led the list of cross-industry application purchases, with 26% of respondents reporting expenditures for this software, as seen in Exhibit-17.

EXHIBIT IV-17

Cross-Industry Applications

Industry	Percent of Respondents Using Packaged Software
Accounting	26
Office Systems	22
Planning/Analysis	20
Human Resources	16
Education/Training	16
Engineering/Scientific	14

Office systems and planning/analysis programs were also among the most popular.

Industry-specific applications run the gamut from manufacturing process control in the manufacturing environment to record handling in the medical community and order entry/process applications in the retail and banking worlds.

While cross-industry software has the advantage of wide market appeal, industry-specific software is a key area of potential growth. As internal budgets shrink and software geared to the needs of vertical markets emerge, buyers predict that an increasingly larger part of their purchasing dollars will go toward industry-specific software.

Turnkey systems has had its strength in the industry-specific area, where it has tailored hardware/software products to address unique needs. Generally speaking, turnkey systems—encompassing a total solution of software, hardware and service—are purchased for the fundamental purpose of running a business. The applications are, foremost, industry-specific production-level applications. For example, a law office will purchase a complete industry-specific accounting package that includes professional services billing, client disbursements and client cost-tracking systems, which will be the mainstay of its business. A cross-industry human resources package will be a secondary consideration, the purchase decision typically being made after the turnkey solution has already been procured.

As industry-specific software becomes available, the turnkey market is expected to be limited to certain, very specialized needs.

5. Applications Development

Among survey respondents, dollars budgeted for applications development, either in-house or through third parties, averaged 20% of IS dollars. Exhibit IV-18 shows a sampling of current projects under development in the companies surveyed.

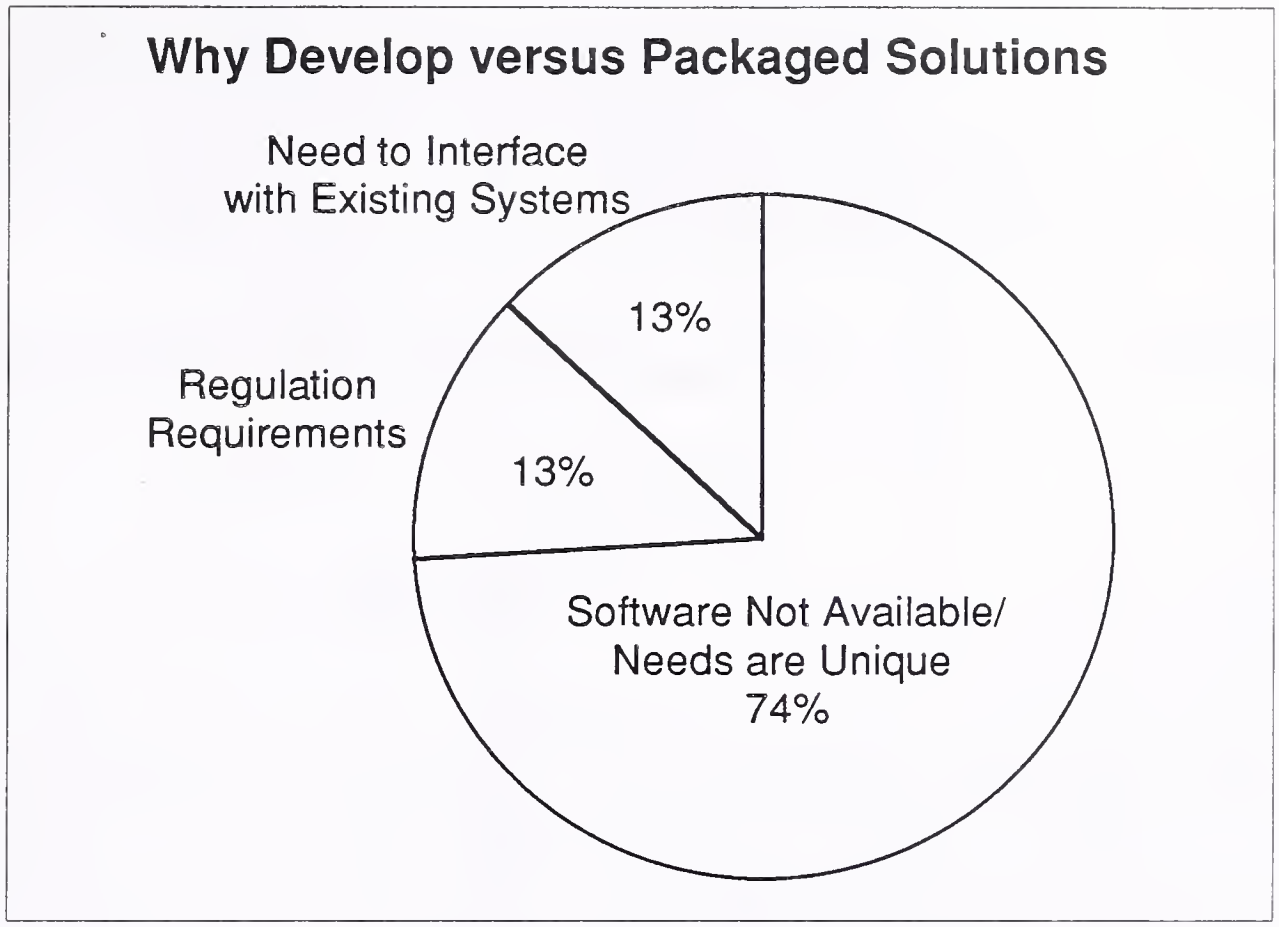
EXHIBIT IV-18

Planned Applications Development Projects

- Electronic imaging
- Procurement
- Distribution of product information
- Membership program
- Inventory cost reclamation
- Medical records
- Insurance claims processing

When asked why these projects were being developed instead of purchased, 74% indicated that the software was not available or their needs were too unique to be met by packaged software. As seen in Exhibit IV-19, regulatory factors and the need to interface with existing systems were the other reasons behind the decision to develop rather than purchase.

EXHIBIT IV-19



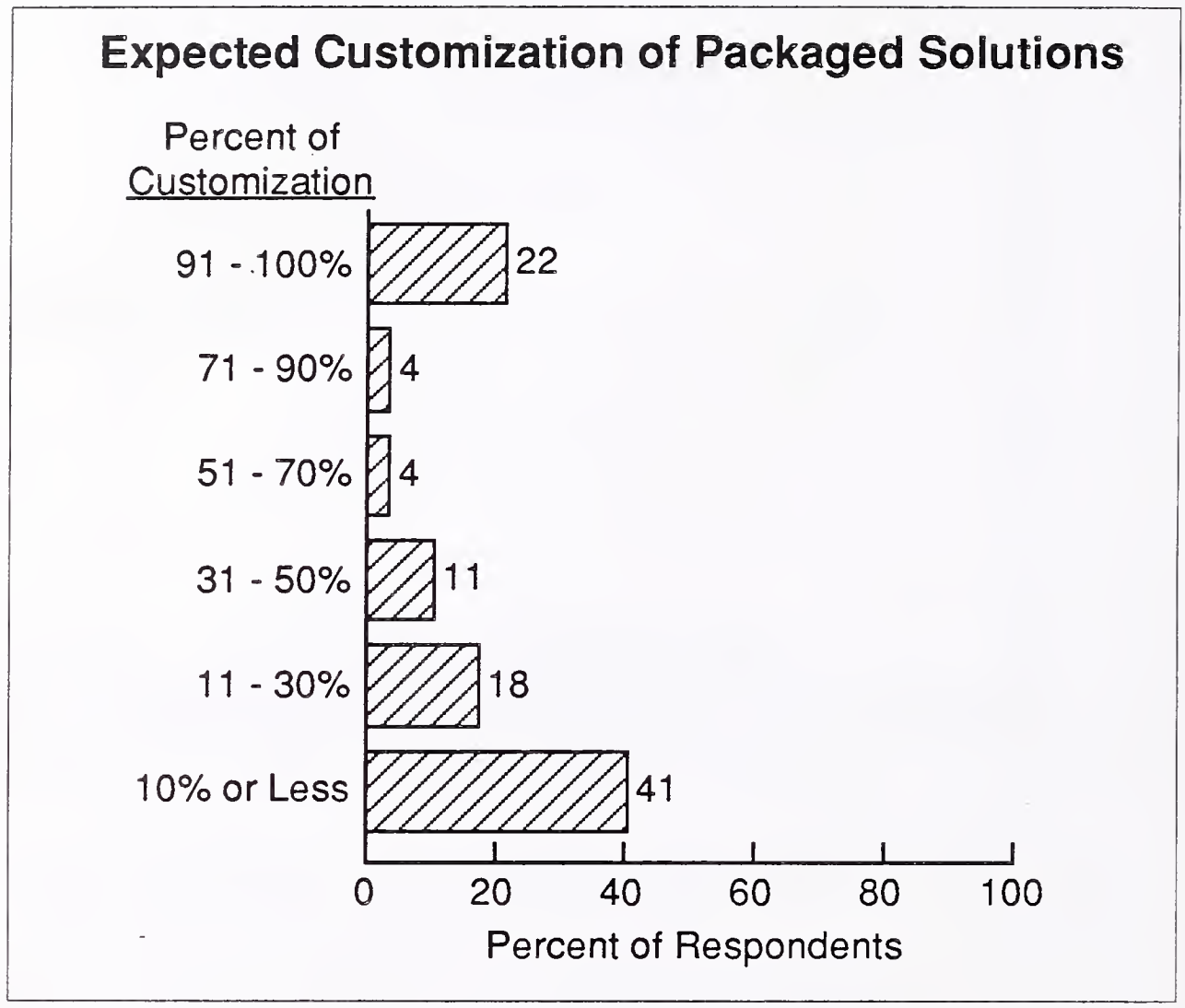
It's interesting to consider these findings in comparison with the responses of software vendors regarding competition. The vendors that INPUT spoke with discounted the significance of in-house development and cited their main competition as other vendors. Some went so far as to say that users are not doing very much applications development.

Both user and vendor responses seem to indicate that what can be provided as packaged software is already being provided and vendors must compete for an already established market. A question should be raised, however, regarding expenditures for software development. As companies downsize and internal resources become scarce, some applications previously developed in-house will have to be handled by third parties. Applications software companies can compete for this piece of the market by finding a way for packaged solutions to meet specific user needs. Through customization and a service-oriented approach to sales and marketing, software companies can compete with professional services and systems integration professionals for this type of business. Although many companies consider their needs unique, packaged software with customization capability could become a more attractive option as resources shrink.

Despite concerns about unique requirements, when respondents were asked if they expect to purchase more applications software within the next five years as an alternative to development, 63% said yes. Clearly, there are some opportunities for growth beyond the existing market, and applications software providers need to consider applications developers

as competition, in addition to other software vendors. This may mean changing the perception that the buyer has of the software vendor's role. The users that INPUT spoke with don't seem to consider the software vendor as an option to address unique requirements. In fact, more than 70% of respondents reported that they expect to customize less than 50% of software purchases, as seen in Exhibit IV-20

EXHIBIT IV-20



Of those companies that do any customization of packaged software purchases, 80% plan to do the customization in-house. An additional 16% of respondents planned to use professional services vendors and software vendors, as shown in Exhibit IV-21.

EXHIBIT IV-21

Expected Source of Customization

Source	Percent of Respondents
In-house	80
Software Vendor	8
Professional Services Firm	8
Don't Know/No Response	4

The picture that emerges is one of the software vendor being perceived by the user as a provider of standard software solutions. When unique needs are to be met, the company looks most to its internal staff to address application customization and/or development. Yet these same companies see the handwriting on the wall with staff reductions and fully expect to purchase more packaged software in the future. Software providers can maximize their potential revenue by offering solutions to meet specific needs and promoting themselves as solutions providers that can customize standard software to meet unique requirements.

6. Top IS Issues

There were a number of business and technology issues cited by respondents as driving IS and application solutions decision making, as seen in Exhibit IV-22.

EXHIBIT IV-22

Top IS Issues
(As Reported by Survey Respondents)

- Reducing costs
- Responding to organizational changes
- Networking
- Interoperability
- Open systems
- Adapting to rapidly changing technology

Reducing costs and improving overall productivity were mentioned most frequently by the respondents. Many of these companies are under pressure from their management to reduce staff levels and other expenditures due to the lingering effects of the economy. Application solutions, while an expense, can also serve to reduce costs in other areas to support increased productivity goals.

With the extensive merger and acquisition activity that has occurred in recent years, organizational changes have become a major consideration for IS organizations. Consolidation of disparate systems that have been acquired piecemeal from different organizations presents a significant challenge.

The technology goals of LANs/networking, interoperability, open systems and distributed data bases are interrelated. All enable users to access and share data and/or applications software products and resources more easily. Companies are looking for solutions that help them to leverage their existing systems while obtaining solutions that address their business problems. Solutions that can reside on a variety of platforms and can be integrated with complementary systems will present an attractive option to these companies.

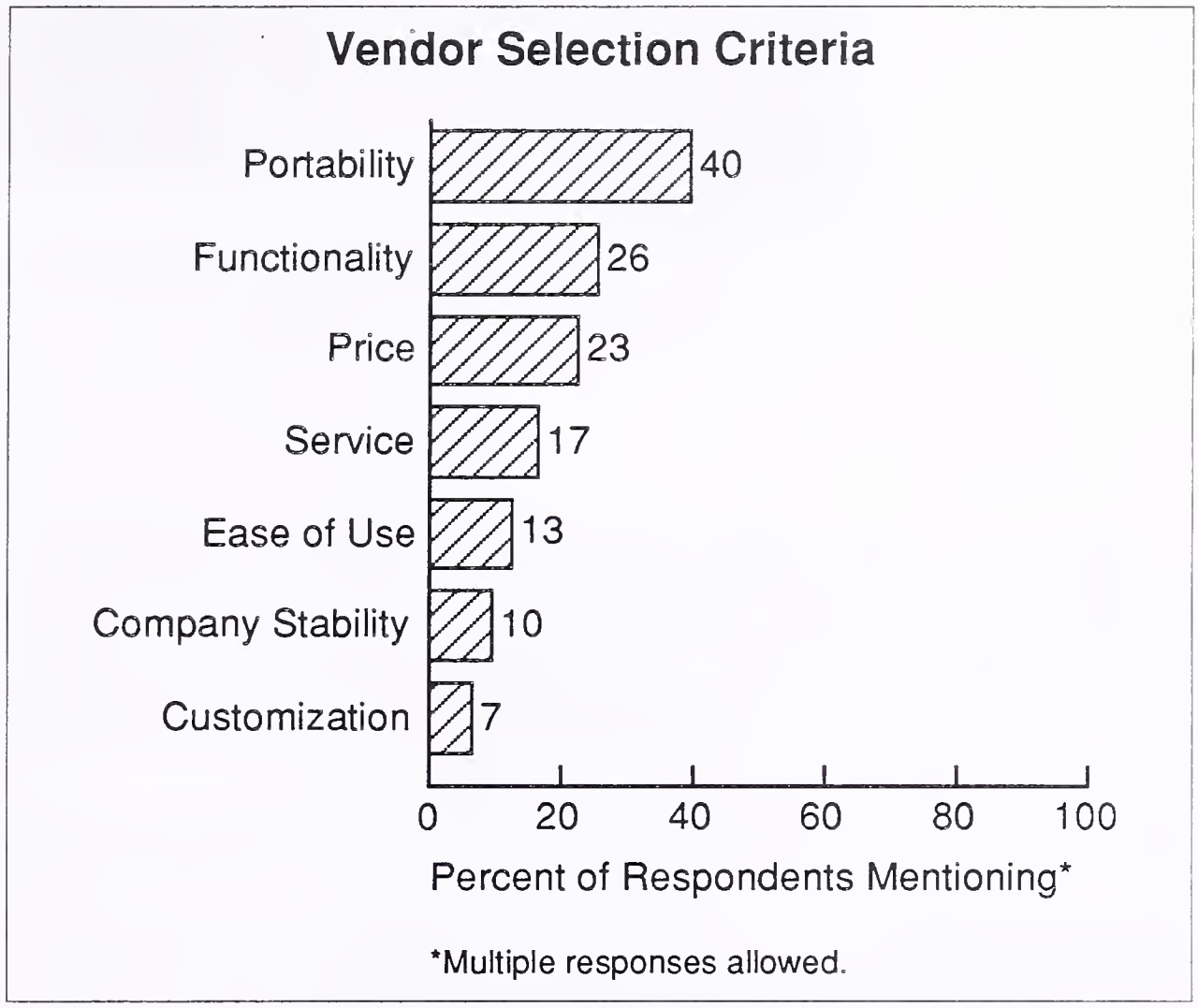
Respondents also discussed the difficulties associated with decision making in a world of changing technologies. Companies are anxious to gain benefit from new capabilities, but must constantly evaluate potential purchases as compared with cost and with concern for what technologies and other alternatives might become available in the future.

7. Vendor Selection

A variety of vendors were mentioned by respondents as being used most frequently. Most often, the vendors mentioned were those offering industry-specific products. As shown in Exhibit IV-23, one of the top concerns of buyers in selecting vendor products is the portability and flexibility of the solution.

Buyers want to integrate solutions with existing systems and are looking for products that are compatible with these systems. Functionality was another major concern mentioned by buyers in selecting vendor solutions, followed by price and service considerations.

EXHIBIT IV-23



C

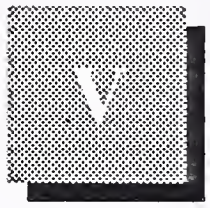
Research Summary

While companies are still heavily reliant on their mainframe and midrange platforms to conduct business, significant change is expected within the next five years as companies downsize and embrace client/server architecture. This will translate into growth for application solutions at the PC/workstation and networking levels.

A weak economy, while affecting IS expenditures on the whole and turnkey systems, does not appear to be dampening expenditures for applications software; in fact, it may promote expenditures as users look to applications software products as a way to reduce costs and improve productivity within their corporations. However, purchases of applications software products are being closely scrutinized; products that obviously improve productivity will be purchased and other "nice to have but not necessary" products will suffer. Growth is expected in industry-specific applications.

Applications development efforts persist in spite of vendors' efforts to make their products easier to customize. A dilemma for vendors is deciding what it will take to get users to purchase rather than develop; if they

make their products more specific, the potential market size is limited. Vendors are responding to this challenge by not only adding customization and flexibility to their products, but by providing services in support of users' development efforts. It appears that the latter will provide the most immediate returns.



Trends and Issues

This chapter discusses the ways in which current trends in the use of information technology are affecting the applications software products and turnkey systems delivery modes, along with related issues. Section A focuses on trends, Section B discusses the issues, and Section C summarizes the impacts of these trends and issues.

A
Information Technology Trends

Exhibit V-1 shows the major trends that will have a significant effect on the decisions companies make regarding application solutions.

EXHIBIT V-1

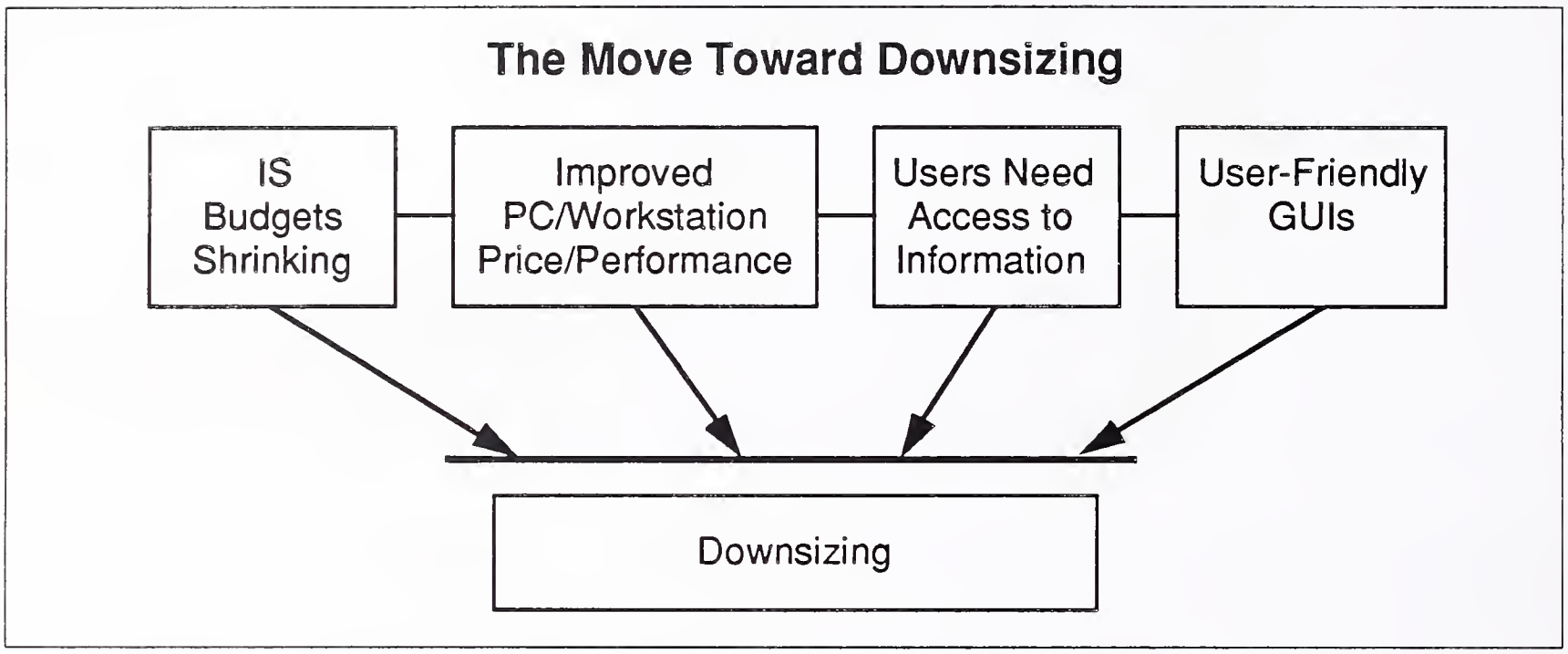
Technology Trends

- Downsizing/distributed processing
- Client/server architecture
- Networking/interoperability
- GUI
- More user involvement

1. Downsizing/Distributed Processing

Several factors are driving companies today toward downsizing, as shown in Exhibit V-2.

EXHIBIT V-2



In today's economic climate, companies are under increasing pressure to reduce costs. IS organizations are feeling these pressures acutely. In fact, cost reduction was the concern mentioned most frequently by the IS managers INPUT interviewed. Companies are finding that they can reduce costs significantly by off-loading applications onto smaller, less costly platforms. The availability of packaged software allows companies to reduce programming staff.

At the same time, users are becoming more sophisticated in the use of PCs and are requiring greater access to data on corporate systems for analysis and decision support. Many companies view this on-line access to up-to-date information as critical to performing the analysis needed to stay competitive.

The price/performance of PCs and workstations is continually improving. In addition, graphical user interfaces such as Windows are making it possible for users who traditionally have been "computer illiterate" to use PC/workstations to do their jobs more effectively.

These factors are all driving the move toward downsizing, where applications are being moved off the large mainframes onto smaller, more easily accessible PCs and minicomputers. A total of 43% of the respondents to INPUT's research indicated that they expected to downsize and/or move to a more distributed processing environment within the next five years.

Downsizing focuses heavily on LAN technology with PCs, high-powered workstations and minicomputers used as servers. Data processing centers are reduced and consolidated as processing power moves closer to the user. The host may serve merely as a data repository.

A key question arising regarding this trend is, "what applications are being downsized?" To gain a better understanding of how users are approaching downsizing, INPUT spoke with 52 executives earlier this year about their plans. Forty percent identified a total of 44 applications that were either scheduled or being considered for downsizing. Exhibit V-3 indicates the types of applications involved. Not surprisingly, cross-industry applications were the most likely candidates for downsizing. Accounting and administration applications lead the list.

EXHIBIT V-3

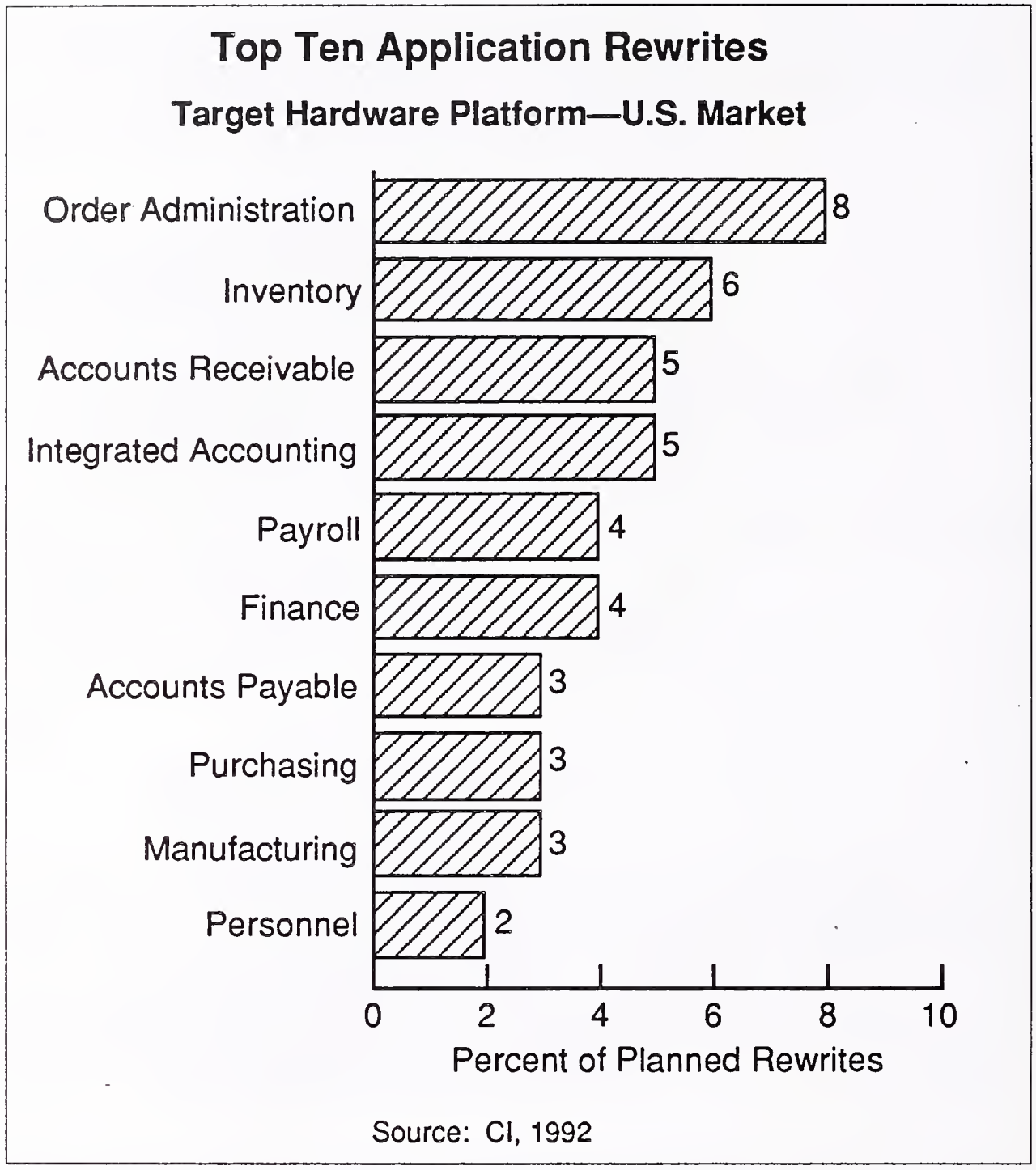
Applications Being Downsized*

	Percent of Respondents
Accounting/Administration	37
Production Processes	27
Image Processing	7
Knowledge-Based Systems	2

*Based on survey of 52 IS executives.

CI recently looked at what applications were being rewritten from mainframes to other platforms. Exhibit IV-4 shows that order administration and inventory management were the top applications being rewritten.

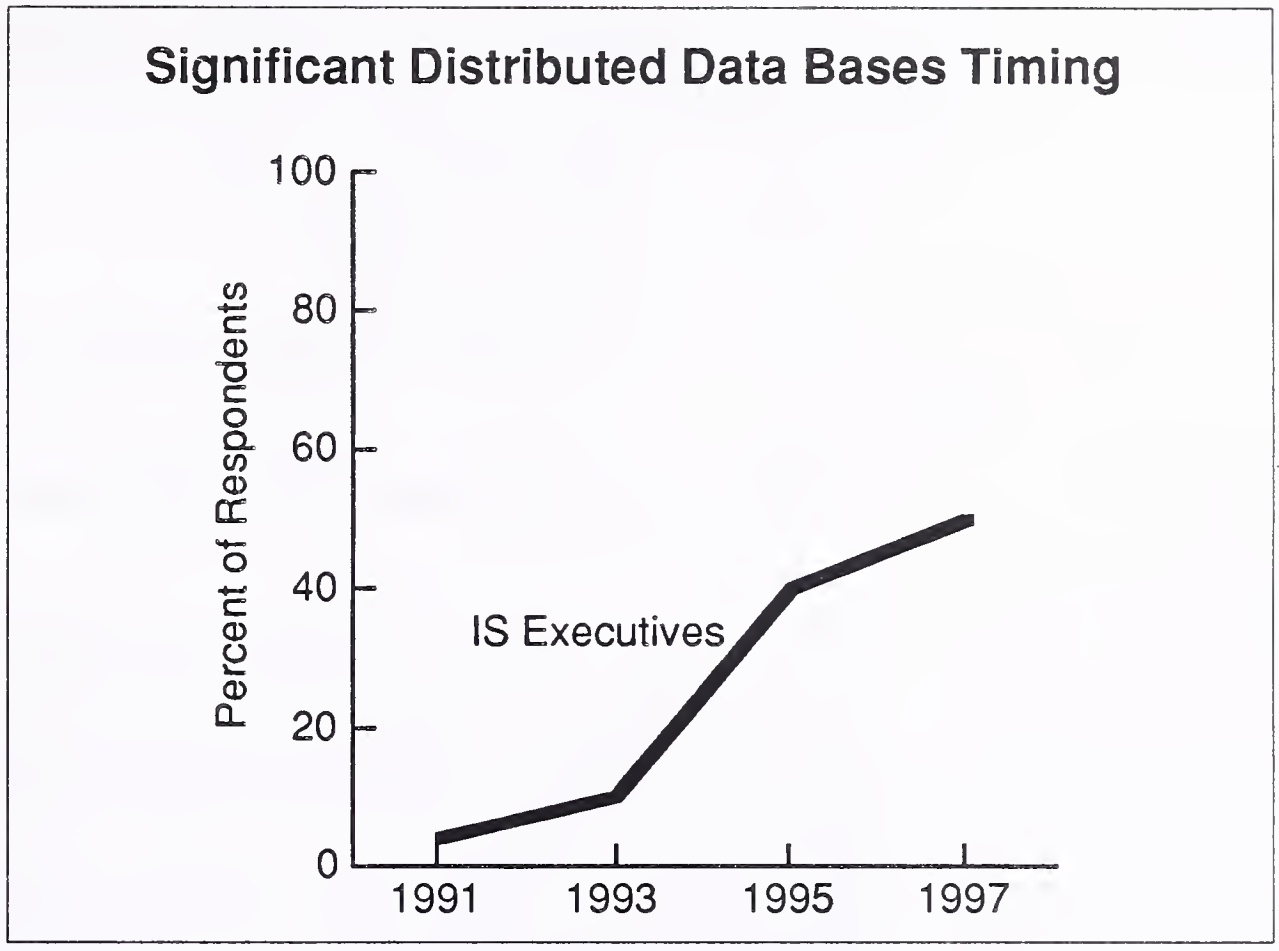
EXHIBIT V-4



Note that these applications fall into the category of "mission critical," which many have argued will have to remain in the mainframe environment.

When asked about their expected timing for distributed processing, 40% of the 50 executives INPUT interviewed indicated that most of the distribution of significant data bases would be completed by 1995, while 50% to 60% said that it would probably be 1997 before this was accomplished, as shown in Exhibit V-5.

EXHIBIT V-5



2. Migration to Client/Server Architecture

The term *client/server* has often been used interchangeably with downsizing. Like many concepts in their relative early stages, there has been much confusion regarding what the client/server is all about. This confusion is not unlike varying definitions of other generalized IT concepts—such as open systems, downsizing and re-engineering. Vendors use the term in a self-serving way to refer to their existing and planned products. Users reflect what vendors tell them, plus offer their own unique interpretation of what client/server means.

Client/server is a loosely defined concept that refers to an architecture that divides application logic and processing across multiple computer equipment platforms for the purposes of improving performance, increasing accessibility, reducing costs and leveraging IT investments. INPUT produced a report earlier this year addressing this trend and its place in the information technology environment. A large number of IS vendors are putting emphasis on developing products and services to address the growing interest in the client/server market. Exhibit V-6 defines key components of client/server architecture.

EXHIBIT V-6

Client/Server Architecture Components

- Applications software
- Systems software
- Relational data base management systems
- Computer/networking equipment

The client/server trend emphasizes a single consistent architecture across platforms. Much of the client/server software being used today is being developed internally. Software products for the client/server environment are just beginning to be offered. A sales strategy for the new client/server products is to position them as multiplatform and multivendor. This involves the use of relational data base management systems and the distribution of data among various hardware platforms. Users are purchasing relational products from companies such as Oracle, Informix and Sybase.

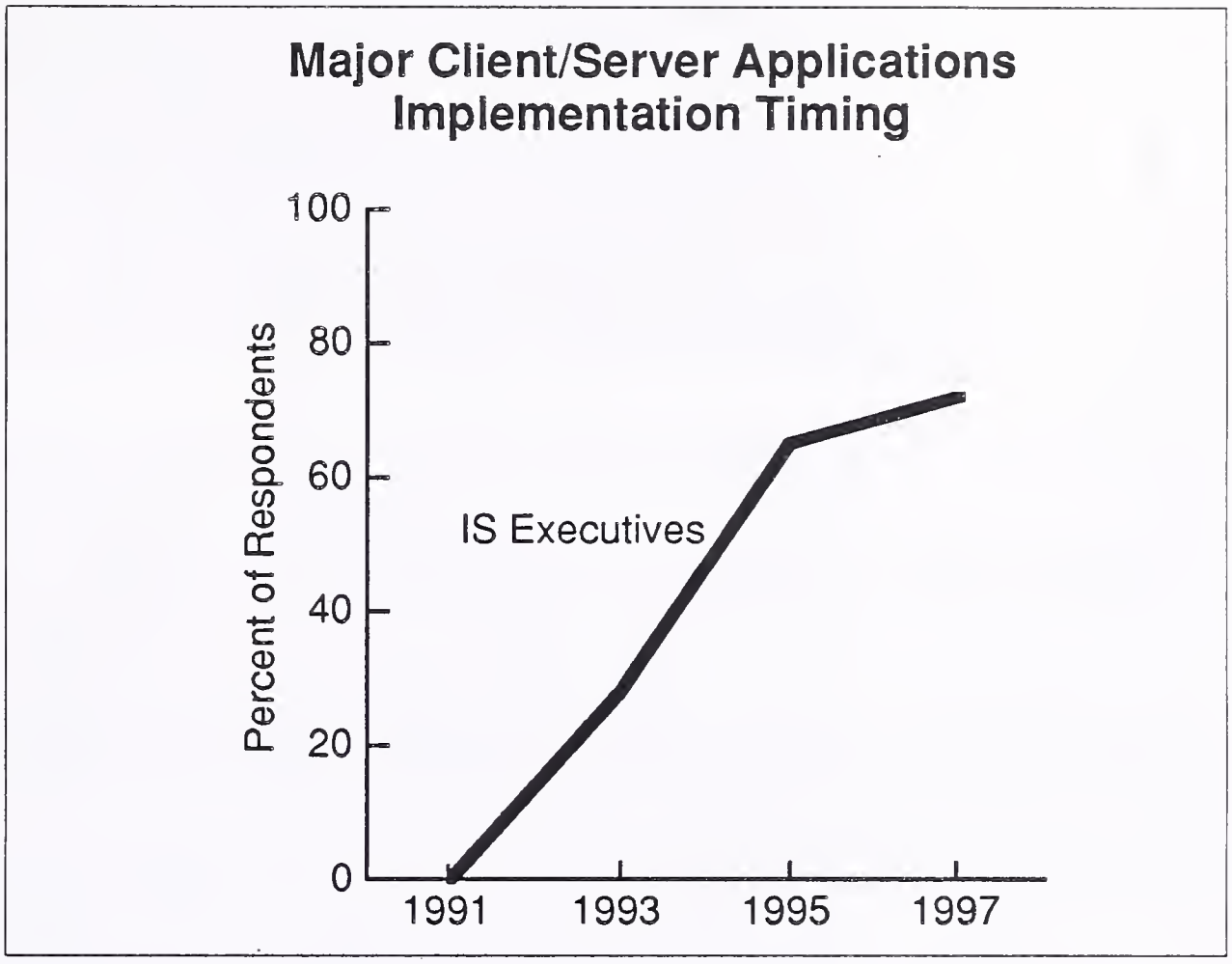
The fact that the same version can run on any platform—from a workstation, to a LAN, to a mainframe—is a selling point when migrating customers to a client/server product because it makes the migration easier. The user sees the same screens, is subject to the same edits, observes the same security, views the same reports, etc. as before. Given the need to work with multivendor hardware, client/server solutions must be software based.

Application developers are focusing much of their efforts on enabling their applications for client/server computing. While many of the current development efforts may not strictly fit the definition of cooperative, shared processing, efforts are clearly underway to continually move toward a more distributed computing environment.

As shown in Chapter IV and Exhibit IV-4, 50% of the respondents to INPUT's application solutions research indicated that usage of client/server architecture was either existing or currently being implemented. Another 36% of user respondents indicated that they were considering client/server solutions.

Of the other group of 52 IS executives interviewed earlier this year, 60% indicated that in their organizations, major client/server-based applications would be implemented by 1995, as shown in Exhibit V-7.

EXHIBIT V-7



An additional 10% of IS executives expect that key applications would be implemented user client/server architecture by 1997.

3. Increasing Importance of Networking/Interoperability

The implementation of client/server architecture and distributed processing relies on networking products and services to support communication between various devices. While client/server solutions are not possible without distributed DBMSs, LAN and network integration are prerequisites for broad usage of distributed DBMSs.

Companies find themselves in the position today of trying to integrate a variety of platforms and vendor products that were acquired piecemeal over the years. While IS controlled the mainframe environment, departmental decisions were often made independently, affecting minicomputer and PC selections. In many cases, individual users had the go-ahead to make PC/workstation and related software decisions. Now these organizations want to leverage their existing investments while implementing a unified architecture for computing. Products and services that enhance integration of multivendor, multiplatform computing solutions will experience strong growth over the next several years.

Many of the companies that INPUT interviewed for this study reported that interoperability and open systems are key areas where they are seeking solutions today.

4. Market Acceptance of Graphical User Interfaces

Graphical user interfaces (GUIs) have had a dramatic effect on the PC/ workstation market. These ICON-based interfaces, which make use of logical pull-down windows, have brought the general masses into the computer age. *PC Week* reported in June 1992 that applications based on GUIs captured over 35% of the market in 1991. A Datamation survey earlier in the year found that 37% of respondents were planning to invest in GUI software in 1992.

GUIs, along with products like X-Windows, Presentation Manager, Motif and SCO Open Desktop, are having a significant impact on the application solutions market. A GUI increases the productivity of a user through standardization because menu bars and dialogue boxes are similar across a number of applications. Therefore, a user does not have to learn the idiosyncrasies of each application, but can begin using them immediately. GUIs will promote the use of application solutions by the general user base and allow for use of more applications per user.

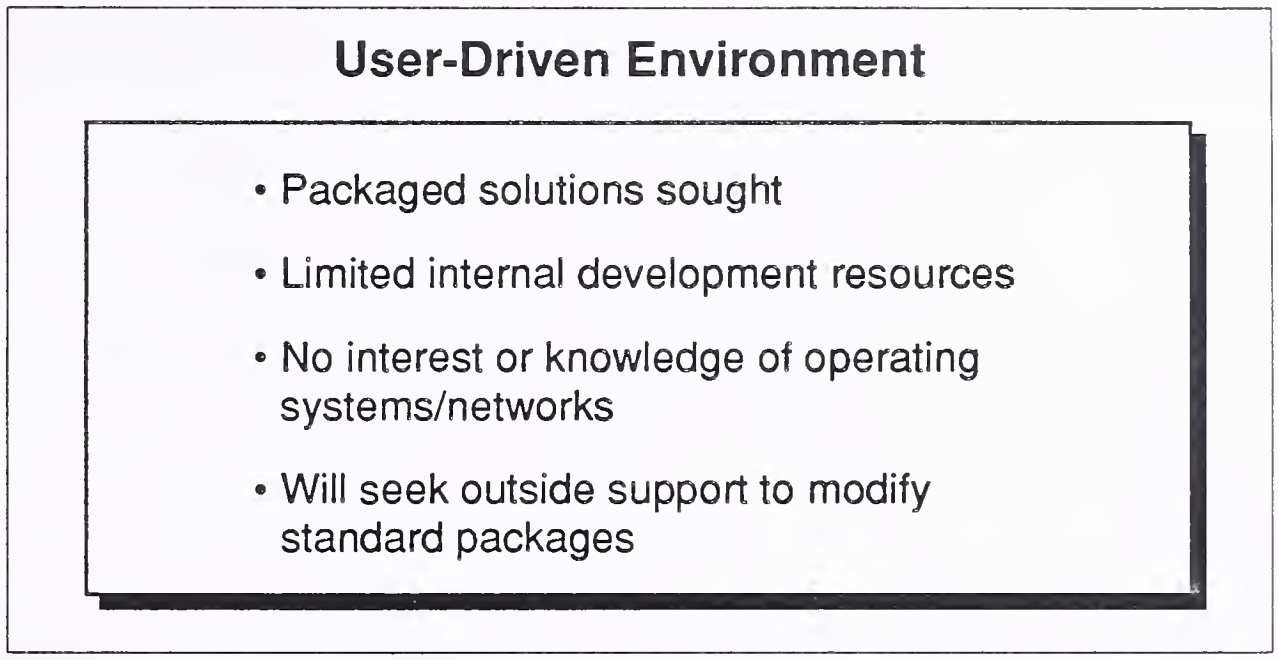
Apple led the charge in this area with its easy-to-use Macintosh. However, Microsoft Windows has achieved phenomenal market penetration since its introduction in 1990 and is expected to have a significant impact on the application solutions market. Over 9 million copies of Windows have been sold and the Department of Commerce projects Microsoft's Windows revenues in 1993 to be about $700 million. A survey reported by *Software Magazine* in April 1992 reported that Windows was found at 69% of respondent sites and was expected to be in 84% by year's end.

This has created a huge demand for application solutions that run in the Windows environment. *Software Magazine* reported in its review of the top 100 independent software vendors (ISVs) in June 1992 that Windows products were supported at 65 of the top 100 ISV companies. Another 22 companies reported plans to add Windows applications this year. Market leaders that have been slow to adapt their products to Windows have seen an erosion of their market position as new entrants with Windows products get a leg up in the market. For example, Lotus and Software Publishing were losing market share in 1991 due in part to slow migration to Windows.

5. More User Involvement

Two questions arise in analyzing these trends: who's driving these changes and who will be buying the software to support these solutions? The answer to both questions is the end user. Exhibit V-8 describes what this emphasis on the end user means to applications software.

EXHIBIT V-8



The typical end user is not a techie wanting to learn about technology for its own sake. Today's users are focused on using computing technology as a tool, much like paper and pencil, to address business issues. Business people, for the most part, are no more interested in the bits and bytes of computing than they are in the mechanics of manufacturing the paper they use.

As IS organizations become smaller, there will be limited resources to develop in-house solutions. Since the user does not have the skills or the interest to develop applications, off-the-shelf solutions will become increasingly in demand. Users don't want to worry about data base management, operating systems, network management or application integrity. What they will generally do is seek help to modify standard software products if packages do not meet specific needs. This need for customization can bode well for turnkey vendors and VARs that bundle additional support with software solutions.

Traditional software products will lose acceptance in this new world if they don't allow for easy modification through scalable options, templates and hooks. This applies not only to PCs but also to minicomputers and mainframes.

Key attributes that the buyer is looking for are described in Exhibit V-9.

EXHIBIT V-9

Key Vendor Attributes

Users seek products that:

- Run on multiple platforms
- Make use of a network
- Are reliable
- Are upgradeable
- Are easily maintained

Although user involvement is increasing, many applications are still within the domain of IS. The stumbling block for the vendor here are some long-held beliefs that many applications, particularly those that are industry-specific, must be developed in-house. Even with the increasing development backlogs, lack of programmers, and the trend toward out-sourcing, many companies still spend more on internal development than on purchases of applications software products. Vendors must entice these buyers to consider packaged solutions. One approach by vendors has been to not only provide product flexibility and customization tools, but also services in support of users' unique requirements. Vendors are also increasing their distribution through third parties, such as VARs, that can provide industry specificity and are eager to customize.

B

Vendor Issues

As a result of recent trends, applications software vendors need to address a number of new issues in several areas. These are shown in Exhibit V-10 and are discussed below.

EXHIBIT V-10

Vendor Issues

- Changing market
- Pricing
- Marketing issues
- Alliances
- Open systems

1. Changing Market

Downsizing and the increased involvement of users in purchasing decisions are dramatically changing the application solutions market, as shown in Exhibit V-11.

EXHIBIT V-11

Applications Software Product Vendors

Attributes	Old	New
Features	Fixed	Constantly adding
Updates	Infrequent	Frequent
Sales	Field	Direct/indirect
Cost of sales	Labor bias	Advertising bias
Price	$10,000+	$100+
Customers	100s	100,000s

In the old mainframe/IS shop environment, software features tended to be relatively fixed until the next release. In today's world, technology and customer needs change quickly. To be competitive, solutions must be flexible enough to allow features to be constantly added. Frequent updates are a fact of life.

When sales were primarily focused on IS, applications software vendors traditionally relied on a field sales force. Software sales were for high-ticket items sold to a relatively limited number of buyers. Today, instead of the hundreds of buyers of host software, products are sold to tens of

thousands of users with the average price tag being hundreds of dollars rather than thousands of dollars. Clearly, this has resulted in a need to change the way applications software is marketed.

The sales strategy should use a variety of channels, including direct and indirect sales, to be cost effective and reach a broader prospect base. Sales costs have traditionally been labor-intensive, relying on representatives approaching prospects one-by-one. Today, more dollars are being spent on advertising and promotion, as evidenced by Microsoft's product announcement using a $2 million Broadway extravaganza.

2. Pricing

Tiered pricing has been the mainstay of IS software purchasing. The theory behind it is simple: the larger the system is, the more value is gained from it, and software prices increase accordingly with hardware size. Advances in workstation/PC capacity in recent years, along with the proliferation of LANs, have forced application solutions providers to rethink pricing strategies, as shown in Exhibit V-12.

EXHIBIT V-12

Pricing Strategies

Pricing	Description	Vendors Using
Tiered Pricing	Linked to size of Hardware	IBM CA International
User-Based Pricing	Linked to value for user	DEC Microsoft Lotus Others
Designated User	Each user assigned software package	
Concurrent	Limited to maximum number of users at one time	
Metered	Charged by usage	Proginet
Special Deals	Corporate discounts Site Licenses	Microsoft Borland Others

As users link their PCs onto LANs, users expect price breaks, as compared with software on individual PCs. Vendors offer six-pack products for LAN usage; however, in many cases users complain that the savings are insignificant and not enough copies of documentation are provided.

As companies downsize and consolidate data centers, they are demanding changes from tiered pricing. Some users have been deterred from consolidating applications onto large systems because tiered pricing makes costs prohibitive. Still other companies complain that they are unwilling to pay the high costs for applications that are not widely used but, due to system upgrades, happen to reside on a mainframe. As costs for hardware go down, users are increasingly unwilling to spend a disproportionate amount on software.

This has led to user-based pricing schemes. One approach is referred to as "designated user", where software purchases/licensing is based on the number of users and each package is designated to a specific user. Another user-based pricing scheme is the concurrent license, where the number of those that can use the software at any one time is limited, but it does not require specific users to be designated. Both DEC and IBM are beginning to adjust their pricing strategies in response to user demand; however, IBM is still primarily focused on size of hardware.

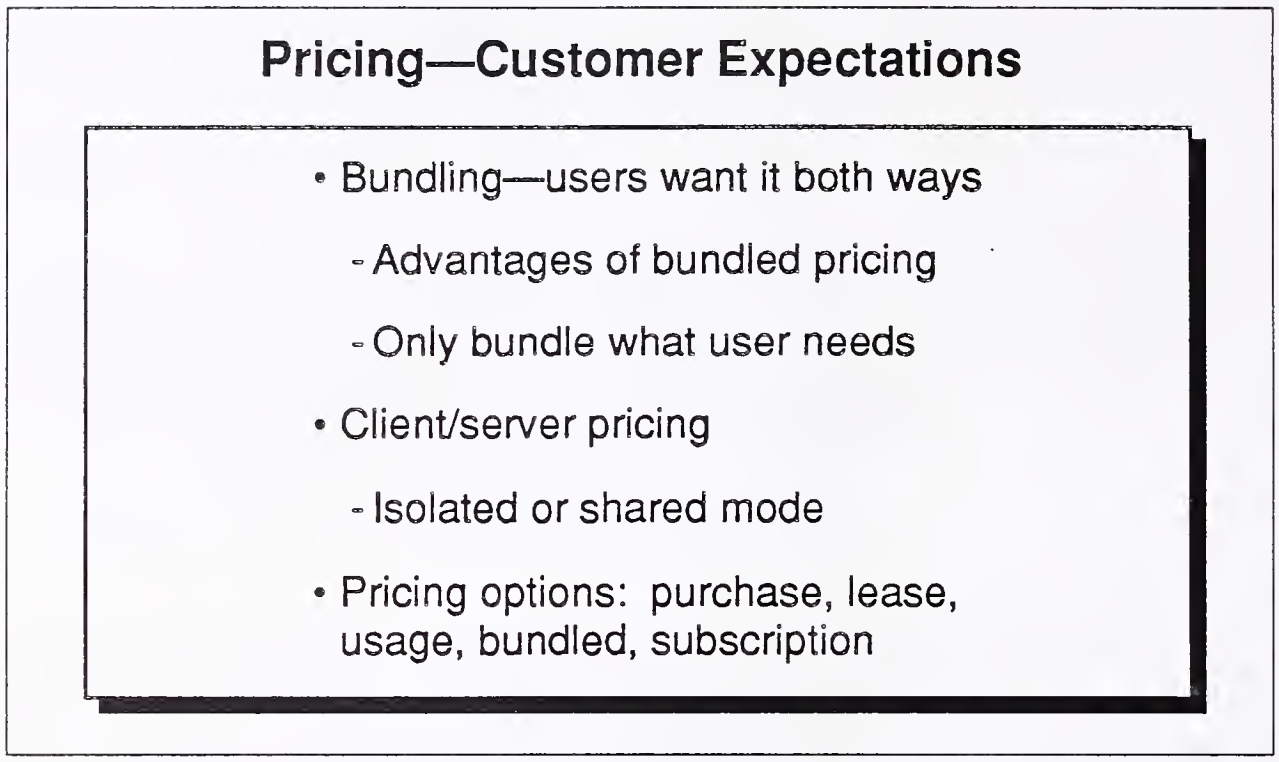
Vendors are entering into various creative licensing agreements with large corporate customers. Borland made an arrangement with Price Waterhouse to provide a license for up to 25,000 users for four of its products. The arrangement allows unlimited copying within some specified reporting boundaries. In a similar but more comprehensive deal, Andersen negotiated with Microsoft to provide licenses for three applications for as many as 65,000 users. Microsoft makes use of its extended licensing agreement to give large corporate customers significant discounts.

Computer Associates International (CA) has developed an enterprise license program that allows the customer to use the program on any computer. Rather than basing fees on size of machine, the fee is based on total number of MIPS used by the enterprise. CA also provides credit for the amount of time an application has been on a smaller system and applies that toward the migration of software onto a larger system.

Another approach is usage-based pricing where the user is charged only when the software is being used. This creates complexities related to monitoring usage that can be difficult to implement. Proginet Corp announced its Software Meter utility earlier this year, which monitors how often mainframe software is used.

With the trends toward downsizing, client/server architecture and shared networks, pricing issues have become more complex. Client expectations are changing, as shown in Exhibit V-13.

EXHIBIT V-13



Users want options for pricing to meet various needs. They want the advantages of bundled prices but want to have the bundling include only those specific applications needed by the user. A client/server pricing model will need to be provided. Pricing packages need to include a variety of options that are purchase, lease and usage sensitive. Flexibility and responsiveness to user needs will be the keys to successful pricing strategies.

3. Marketing Issues

Given the large number of potential buyers for software, which is continually coming down in price, marketing is becoming more challenging. Vendors must look beyond direct field staff to sell their products to the mass market. They need to rely on a variety of channels—including direct mail, advertising and third-party channels. The large, established vendors clearly have an advantage here, since they have the deep pockets to support such approaches.

Software Suites: Vendors that offer a variety of products are leveraging their success in one area to gain overall market dominance through the packaging of software suites. As seen in Exhibit V-14, two major vendors have developed such ways of offering their products.

EXHIBIT V-14

Software Suites

- Microsoft Office
  - Word
  - Excel
  - Power Point
  - MS: Mail
- Lotus Smart Suite
  - Lotus 1-2-3
  - Ami Pro 2.0
  - Freelance Graphics
  - CC: Mail
  - Adobe Type Manager
  - Windows Tutorial

While not all vendors have the option of providing a suite of products, some are forming comarketing agreements with providers of complementary products. For example, WordPerfect and Borland recently announced a cross-marketing agreement to give users price advantages on each other's products.

Software Bundling: Given the competitive software marketplace, vendors are developing a variety of arrangements to increase market penetration. One approach is arranging with OEM vendors to bundle in software as part of the hardware purchase. Many PC manufacturers today ship Lotus's Smart Suite or MS Office with DOS and Windows. These deals can result in software being offered for under $100 while a customer would have to pay over $200 through a dealer. While this approach is beneficial, increasing market penetration, there is some concern that such pricing schemes could eventually drive prices down. Less that 10% of PCs today include bundled software; however, this is a trend that is likely to increase.

Alliances: While the number of mergers and acquisitions has gone down in 1992, the number of alliances continues to rise. Companies are entering into anything from comarketing agreements to joint development efforts.

Vendors are realizing that they can't be all things to all people. For them to keep pace with new technology, they have to link up with others that may be focused in those areas. Certain segments of the market are becoming more mature and vendors of those products need to diversify in order to grow.

Even giants like IBM and Apple have joined forces to develop products that leverage their own strengths, as part of their Taligent project. Microsoft is now including applications software from third-party suppliers to better position its operating systems in targeted vertical markets.

4. Open Systems

Users are looking for software to address their business needs and want those solutions to be available regardless of hardware used. As companies move toward increased use of EDI and other forms of electronic communication, the solutions that will succeed will be those that are platform independent. While the move to an open systems environment has not yet been accomplished, software providers need to focus their development efforts on functioning in the open environment of the future.

C

Impact of Trends and Issues

Exhibit V-15 highlights some of the key areas affected by the trends and issues discussed.

EXHIBIT V-15

Impact of Issues/Trends

- Continued growth on applications solutions
- Software vendor as service provider
- Customization needs
- Need to expand channels of distribution

1. Continued Growth in Application Solutions Market

Downsizing and client/server developments will result in the continuation of double-digit growth for application solutions. Particularly at the PC level, buyers will seek products to address their changing applications needs. Significant revenue can be gained not only from new applications but also from upgrades, maintenance and continued licensing of existing systems.

2. Software Solutions Vendor as Service Provider

The software vendor should strive for ways to isolate the buyer from the technology. As discussed, the end users do not want to have to worry about the idiosyncrasies of operating systems not do they want to make use of programming tools. As users become more involved in IS decision making, they will look to the vendor more and more to address issues that they have neither the time nor the inclination to handle themselves. This changes the role of the software vendor significantly. The vendor will change from being a product company to a service company. This change in emphasis means that vendors must strive to understand user needs and put together solutions for which the packaged software is only a part. Customization capabilities and support will become increasingly important. As such, the lines between systems integrator, consultant and software provider can become blurred.

User demands for service will continue to increase in response to incorporating new products into existing environments and the need to link disparate, enterprise-wide systems. Lower margins on hardware and eventually software will require vendors to take on more and more income from professional services.

Likewise, turnkey vendors and VARs will need to rely more heavily on service content, as well as the added value of their software product offerings, as the demand for increasingly sophisticated software creates a need for customization, training and support.

Every VAR will find larger percentages of their revenues coming from service and software and less from the hardware business. Given the shifting technology foundations, some VARs will opt to exit the turnkey business and sell service only. Many VARs will elect to take more of a systems integrator role.

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

3. Customization Needs

Chapter IV discussed the migration from the traditional IS mainframe environment to enterprise systems. In the mainframe-dominated world, companies developed much of their own software solutions. When PCs came along, shrink-wrapped software came into its own. Today, many companies still believe certain applications can only be developed in-house, while at the same time the demand for packaged software is increasing. Although many of the companies interviewed for this report still allocate sizeable funding for applications development, the majority

believe that they will be purchasing more packaged software as an alternative within the next five years. Many stated that cost reductions make maintaining a large in-house programming staff unrealistic.

A discernible shift toward more tailoring of applications software products by software vendors and third-party service providers, as well as by the customer, is occurring. The ease with which a product can be tailored and the increased availability of tools with which to do this tailoring are compelling selling points. Vendors want to eliminate, as much as possible, the need for hard-coded modifications.

4. Need to Target Channels of Distribution

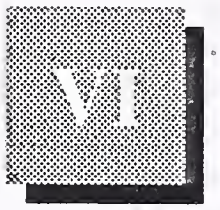
As applications software products and systems vendors introduce new products, and as the cost of direct sales continues to increase, vendors will need to evaluate alternative distribution channels. Exhibit V-16 demonstrates trends in distribution.

EXHIBIT V-16

Distribution—Channels

	Trend	Platform(s)
Direct sales	More	PC
Indirect sales	More	PC, all
Telemarketing	More	PC
Field sales	Less	Mainframe, minicomputer

Of particular importance will be approaches such as telemarketing, targeted direct mail promotions and increased advertising, along with distribution through traditional dealer channels. The potential number of buyers continues to increase, and the expanding small office/home office market will lead to exponential growth in the number of buyers. Competition for dealer shelf space and dealer representation will be greater in the future. Vendors need to expand options for distribution as well as target carefully those approaches likely to result in the greatest yield.



Market Forecast

A
Market Overview

1. Growth Perspective

Despite the slowdown in the U.S. economy through 1991, the application solutions sector has enjoyed continued growth. In fact, the Department of Commerce reported that in 1991, packaged software grew faster than most other segments in the economy as a whole. Of the entire packaged software market, application solutions is the biggest segment.

Montgomery Securities stated in February 1992, that "software and services will be the strongest growth segment of the computer industry, fueled by Windows applications and outsourcing."

According to *Software Magazine's* 1991 review of the top 100 software companies, these market leaders collectively enjoyed growth of over 22% in 1991. Microsoft's 1991 growth alone was 58%, with fiscal 1992 growth estimated to be near 50%. The ASK Companies achieved 63% growth in 1991.

These growth rates are impressive considering the slowdown in hardware sales and the pressure on IS organizations to maintain or reduce costs. Applications software appears to be one area where companies continue to make investments despite pressures to cut back. Many companies view expenditures in this category as a means to increase productivity and thus contribute to reducing costs. Also, companies are increasingly reliant on software to conduct their business and perform analysis needed to maintain their competitive position in the market.

Despite continued growth in application solutions as a whole, in markets such as banking and finance the recession, along with extensive consolidation activity, has resulted in cutbacks across-the-board, affecting applications software along with other IS expenditures. In these categories, growth rates have been reduced as compared with 1991's projections.

In the turnkey systems market, the picture is somewhat different. Buyers are reluctant to be tied to a specific hardware product for an individual application solution. Customers are looking to leverage existing hardware investments and choose solutions that can be integrated on these platforms. Even the turnkey systems vendors themselves are beginning to cut the ties with specific hardware vendors and offer their capabilities on a variety of platforms. However, the turnkey provider does offer something that is becoming increasingly important in the market today—the solutions sell. Turnkey vendors package hardware, software and professional services to meet a specific need. As companies begin to increasingly purchase rather than develop industry-specific solutions, turnkey packages will continue to have a place in responding to these requirements.

Growth will continue for the next five years, fueled by upgrade potential in mature segments, new technologies causing demand for compatible software, and the movement away from in-house development. Consumer and small business software also represents a potentially growing market.

2. Forecasts

Actual 1991 expenditures for applications software products as a whole were $18.9 billion compared to the forecasted $19.8 billion, a reduction of 5%, as shown in Exhibit VI-1.

EXHIBIT VI-1

Application Solutions
1991 Actuals versus Forecast

1991 Actuals and Forecast	1991 Forecast ($ Billions)	1991 Actuals ($ Billions)
• Applications Software	19.8	18.9
- Mainframe	5.3	5.8
- Minicomputer	5.7	5.4
- Workstation/PC	8.8	8.6
• Turnkey Systems	11.5	11.4
- Equipment	5.3	5.3
- Software	4.3	4.2
- Professional Services	1.9	1.8

1991 and 1992 Forecast	1991-1996 CAGR (Percent)	1992-1997 CAGR (Percent)
• Applications Software	14	14
- Mainframe	6	7
- Minicomputer	10	9
- Workstation/PC	20	19
• Turnkey Systems	9	8
- Equipment	6	6
- Software	10	9
- Professional Services	13	12

For several vertical industries and cross-industry markets, expenditures were as projected. The markets where actual expenditures were different from what was projected in the 1991 report are shown in Exhibit VI-2.

EXHIBIT VI-2

1991 Actuals versus Forecast
Applications Software

Sectors	1991 Forecast ($ Millions)	1991 Actuals ($ Millions)
Vertical Sectors		
Transportation	390	387
Utilities	202	201
Telecommunications	378	344
Retail	272	270
Banking/Finance	2,270	2,040
Insurance	852	826
Federal Government	520	680
State/Local Government	143	165
Cross-Industry Sectors		
Education/Training	242	201
Office Systems	2,250	2,400
Planning/Analysis	2,375	1,620
Sales/Marketing	486	335

Banking and telecommunications were the two industries where actuals were considerably less than projected, varying from the forecast by 10% and 9% respectively. In both cases, these reductions were a result of the delay in the economic recovery. Growth is expected to follow previously forecasted patterns for these segments, with compound annual growth rate (CAGR) for banking of 10% and for telecommunications of 20%, as shown in Exhibit VI-3.

EXHIBIT VI-3

CAGR 1991 Report versus 1992 Report Applications Software

Sectors	Projected CAGR 1991-1996 (Percent)	Projected CAGR 1992-1997 (Percent)
Vertical Sectors		
Banking	9	10
Telecommunications	20	20
Federal Government	20	11
State/Local Government	15	13
Cross-Industry Sectors		
Education/Training	18	9
Office Systems	15	15
Planning/Analysis	15	17
Sales/Marketing	14	12

Conversely, in the federal government and state/local government sectors, expenditures were higher than projected in last year's report, by 30% for the federal government and 15% for state and local government. This increase was due to some significant systems that were purchased in 1991. Unlike banking and telecommunications, however, the CAGR for these sectors is expected to be less for 1992-1997 as compared with projections for 1991-1996. Cutbacks in defense spending and state/local fiscal difficulties are significant factors.

In the cross-industry area, 1991 expenditures were less than projected in several categories, as seen in Exhibit VI-2. For education and training, the reductions cited in 1991 are not just related to the recession but have been reprojected at a CAGR half of what was projected last year, as seen in Exhibit VI-3. While continued growth is expected for these products, particularly at the PC level, previously forecasted projections were overstated.

For office systems and planning and analysis, CAGR projections stayed about the same as the previous forecast. The CAGR for sales and marketing was reduced by 2%.

With regard to turnkey systems, 1991 actuals were 1% lower than forecasted despite significant changes in certain categories. As seen in Exhibit VI-4, the biggest negative change was in telecommunications, with actuals 9% less than projected. For telecommunications, the CAGR for 1992-1997 is expected to be the same as projected for the 1991-1996 period.

EXHIBIT VI-4

1991 Actuals versus Forecast
Turnkey Systems

Sectors	1991 Forecast ($ Millions)	1991 Actuals ($ Millions)
Vertical Sectors		
Process Manufacturing	568	558
Transportation	275	277
Utilities	93	94
Telecommunications	519	472
Banking/Finance	1,000	965
Insurance	311	301
Federal Government	612	900
State/Local Government	167	175
Cross-Industry Sectors		
Education/Training	182	110
Office Systems	66	116
Planning/Analysis	50	0
Sales/Marketing	471	275

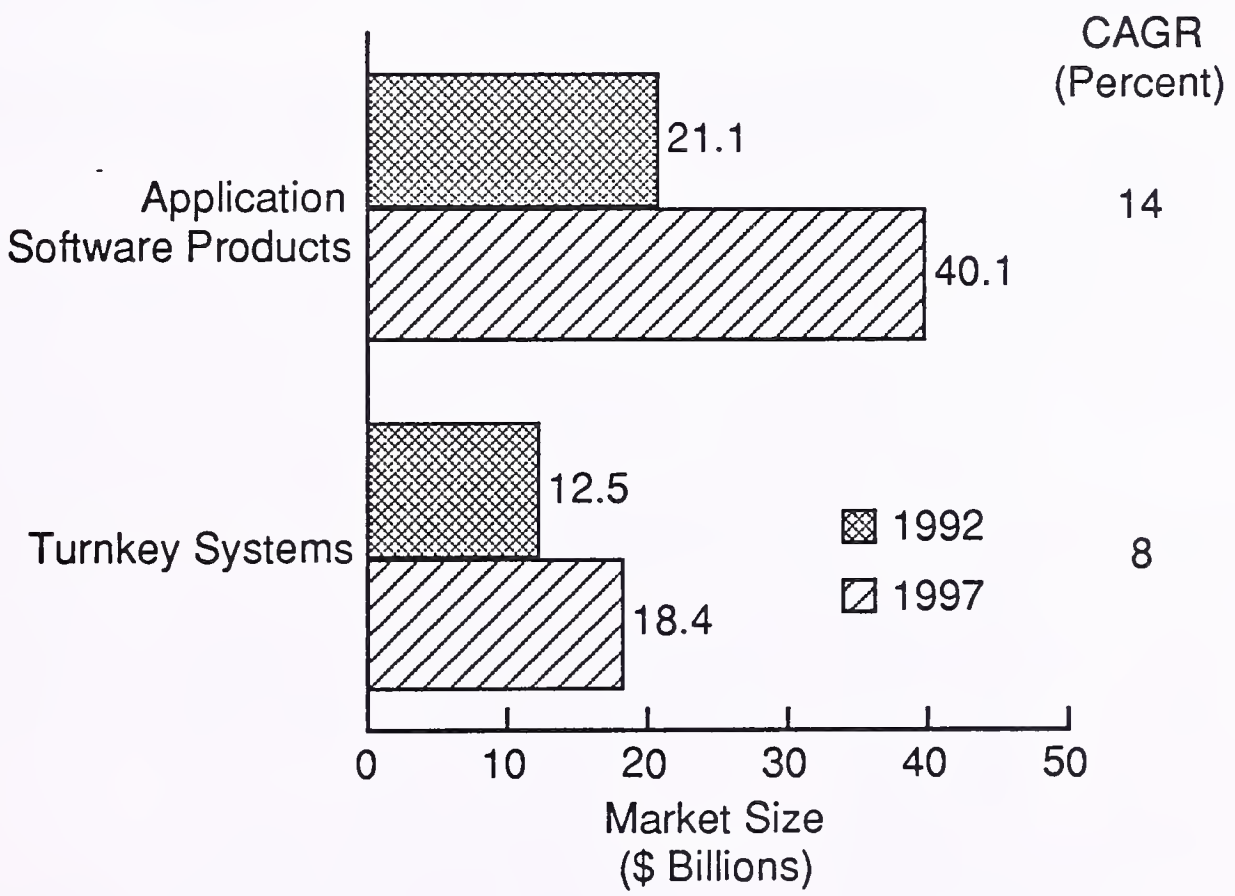
On the positive side, federal government expenditures were significantly greater than projected (+47%) due to a large desktop project.

On the cross-industry side, education and training expenditures have been adjusted down by 40%. This adjustment has been done with the recognition that the majority of turnkey systems for this purpose are sold into the government sector. Office systems projections were adjusted upward by 76%. Growth of expenditures for mainframe- and minicomputer-based applications software products is due almost exclusively to price increases. Increased expenditures at the PC level result from technology developments related to downsizing, availability of GUIs, RDBMS and executive information systems. The continuing decrease in prices for workstations also promotes growth at this level.

INPUT's 1992 forecast growth rate for applications software products and turnkey systems for the period 1992-1997 remains the same as that forecast for the period 1991-1996. Over the next five years, user expenditures for applications software products is forecast to grow at a CAGR of 14%, reaching $40.1 billion by 1997, as shown in Exhibit VI-5.

EXHIBIT VI-5

Applications Software Products and Turnkey Systems
User Expenditures, 1992-1997



The annual growth rate will gradually increase from 11% in 1992 to 16% by 1997, as new applications software products are introduced and the economic recovery gains strength.

The turnkey systems market is forecast to reach $18.4 billion by 1997. The CAGR for turnkey systems will be 8% for the 1992-1997 period.

B

Applications Software Products

1. Driving Forces

Several significant growth promoters for applications software products over the next five years are listed in Exhibit VI-6.

EXHIBIT VI-6

Applications Software Products
Driving Forces

- Technology developments
- Decreasing in-house developments
- Upgrades/ongoing licensing
- Economy

Technology Developments: The most significant factor driving applications software purchases relates to constant technology changes and developments. As companies downsize, moving toward distributed processing, their applications needs will change. Applications that formerly were host-based will be acquired or rewritten for PC/LANs and or midrange systems. The market for client/server products is just beginning to open up. As discussed in Chapter IV, 86% of the IS managers with whom INPUT spoke indicated that they were either currently implementing or considering client/server solutions. Most of the vendors that INPUT interviewed are moving toward the client/server environment, but in reality few client/server products exist today. As products become available and buyers implement plans, the potential market for new products is significant.

Like client/servers, graphical user interfaces are still in relative infancy. Microsoft's introduction of Windows NT has the capability of revolutionizing the operating system environment and enticing buyers to make use

of computer systems for increasingly more applications. Traditional software is being rewritten to be compatible with GUIs as customers move toward this user friendly environment.

The move toward open systems is strong and steady. Users want software to be available on multiple platforms and expect easy portability between systems. Change means new software development opportunities for vendors.

New personal computers and workstations based on more powerful microprocessors create an environment for more sophisticated and more user-friendly applications software products, including multimedia applications. Systems software products—such as operations management products that support the commercial UNIX environment and network management tools—will likewise create new opportunities for application solutions.

Decreased In-house Development: Chapter IV discussed the perspective of the IS managers INPUT interviewed regarding ongoing internal development of applications. Many user respondents indicated that their needs were unique in certain applications areas, making it necessary for them to develop solutions rather than purchase packaged software. Still other respondents indicated that new applications needed to be compatible with existing, in-house developed software, once again requiring them to choose the development route. However, 63% of these same respondents, reported that they expect to be doing less in-house development and purchasing more packaged solutions within the next five years.

With budget tightening, it is becoming more difficult for companies to maintain expensive in-house programming staff. This difficulty is compounded by the fact that there is a shortage of professionals with these skills in the marketplace. Users are unwilling to tolerate lengthy backlogs for solutions to business problems that need to be addressed today to stay competitive. Since users are becoming a more powerful voice in purchases of applications software, there will be an increased emphasis on packaged solutions to address needs.

How will these prepackaged products address the unique needs that the respondents discussed? Through customization, products can be adapted to specific user requirements, while at the same time expanding revenue-generating opportunities for software vendors. Software vendors' biggest competition for customization revenue seems to be the customer itself, with 80% of the respondents to INPUT's survey indicating that they expect to handle these needs internally. The software vendor that is knowledgeable about the needs of its chosen market and positions itself as a solutions provider can capture some of this customization work.

Upgrades/Ongoing Licensing and Maintenance: The various technologies that will drive demand for new types of products and services have been discussed. However, there are certain segments of the market that are considered to be mature. In the word processing and spreadsheet markets, for example, the market is considered to be near saturation. Since some of the mature segments represent a sizeable portion of the software market, one might question whether overall expenditures would be dragged down by these segments. In the software industry, where needs and technology are constantly evolving, upgrades are a way of life. Upgrade expenditures may have an even greater potential than new applications.

Economy: The selective installation of new applications software products—including downsized solutions—is viewed as a means of minimizing corporate costs and improving productivity. Users have more computing power on the desktop than they can use and seek software products that can share the processing power among various similar and dissimilar platforms so that this computing power will be used more effectively. Corporate restructuring through downsizing or acquisition also creates a need for new applications software products.

Customers are asking for new solutions and understand the advantages of downsized and open systems software. They are eager to purchase and are waiting for more product availability. Users are going ahead with selected applications software product purchases and are beginning to use the services of systems integrators to develop customized client/server and UNIX application solutions.

While the factors discussed above build a strong case for increased expenditures for applications software products, there are also some considerations that could inhibit growth, as shown in Exhibit VI-7.

EXHIBIT VI-7

Applications Software Products
Inhibitors to Growth

- User perceptions
- Consolidation
- Decreased hardware sales
- Market saturation
- Limited product availability

User Perceptions: Customer expectations to spend more on packaged software in the next five years mean good news to applications software vendors. However, how much expenditures will increase depends in part on how well the vendor can change buyers' perceptions of packaged software. Those companies that view certain applications needs as unique will be reluctant to switch to packaged software. Vendors need to change their image from that of standard product manufacturer to one of a service provider that can use existing products to help the buyer meet those unique needs. The buyers that INPUT interviewed look to their in-house staff for customization. For these buyers to switch to the vendor to customize products, buyers will need to be convinced that the vendor understands their requirements and has the capability to develop solutions tailored to their needs.

Consolidation: The 1980s and early 1990s saw a plethora of merger and acquisition activity. This resulted in the potential number of customers in certain industry segments shrinking. In the banking industry alone, the number of bank ownership groups in the U.S. went from approximately 12,000 in 1991 to about 9,000 today. As the newly merged companies took advantage of economies of scale to operate more efficiently, headcount was reduced at these firms.

Software expenditures, along with other IS purchases, have been reduced in the markets heavily affected by this consolidation activity. Vendors focused on these markets need to look for new sources of revenue to overcome losses in these areas.

Decreased Hardware Sales: Mainframe and minicomputer software purchases tend to be tied to hardware purchases. For certain PC software, such as generic cross-industry applications, growth is linked heavily with hardware sales. Purchases of office systems types of applications—such as word processing—generally occur when PCs are purchased or LANs are implemented. As companies delay decisions to make new hardware purchases due to budget constraints, software growth falls off accordingly.

Market Saturation: During the 1980s a reasonably good applications software product was an obvious improvement over former, typically manual, ways of performing a task and was enthusiastically embraced with little question. Today, however, users already have some software solution in place; they are willing to buy a replacement only if it provides new and better features than the software that is already installed.

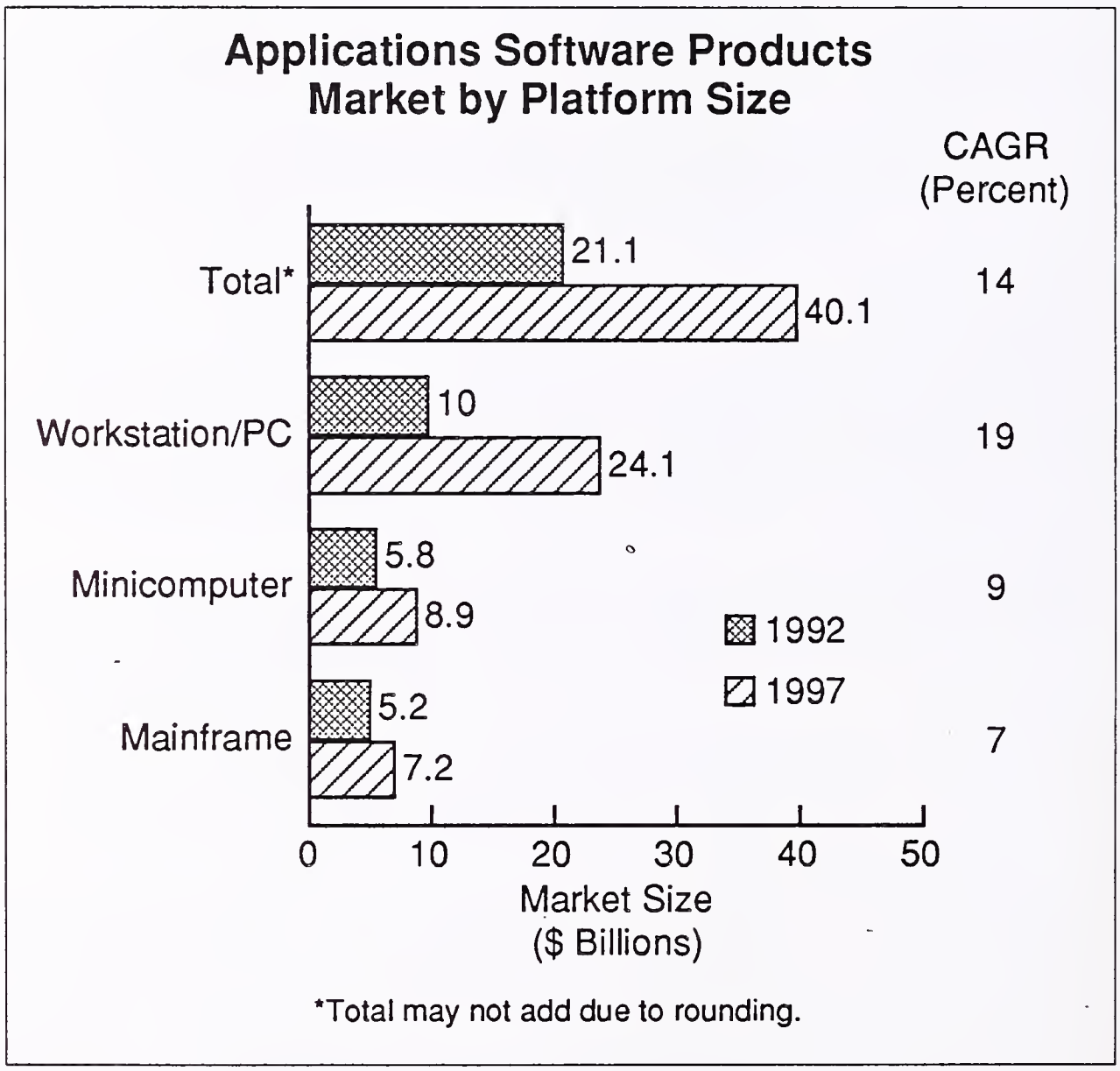
Limited Product Availability: While new technology developments may be driving the market, the time involved in developing software for these technologies, coupled with customer confusion regarding which new technologies to embrace, is an inhibiting factor.

While Windows hit the market by storm, it took time for developers to make software available to operate in that environment. Many new technology-based products are still on the drawing board. There are still a limited number of vendors that have thus far made major commitments to supply UNIX-based applications software products. Some client/server applications software products are available, but many are just repackaged versions of existing solutions offered until true client/server options can be developed.

2. Forecast by Platform Size

Exhibit VI-8 shows the market by platform size.

EXHIBIT VI-8



Even though unit sales of mainframe-based applications software products are declining, prices continue to increase. INPUT is therefore forecasting a 7% CAGR for the forecast period. In addition, price increases drive up the amount spent on maintenance, which is estimated to account for the majority of user expenditures.

Many central software systems are as much as 10 to 15 years old; thus, significant system upgrades based on old architectures and languages are impractical. Replacement raises financial problems and invites major re-examination of system requirements and functions, which could prove costly and disruptive to ongoing operations. Therefore, the trend is to develop or purchase new software for client/server architectures, networked PCs, and minicomputers, thereby off-loading applications from the mainframe, rather than replacing or significantly modifying mainframe-based applications software.

Software for mainframes is shifting from application-specific to generalized multi-application data bases. Mainframes will become repositories of data that users can access to meet specific needs.

The highest growth will continue to be for workstation- and PC-based applications software products.

Minicomputer-based applications software products will also exhibit continued growth, but not as strong as workstation- and PC-based product growth. This growth continues to come from customers that are rounding out the applications software product suites that run on the AS/400. Growth will also be promoted by new technologies and products.

3. Forecast by Industry-Specific versus Cross-Industry Sector

Industry-specific software represented 55% of the applications software market in 1991. This percentage is expected to continue throughout the next five-year period. Growth rates are projected to be the same for industry-specific and cross-industry products, with a CAGR of 14% projected for both categories.

Cross-industry applications have the advantage of a wide-ranging customer base with requirements that more easily lend themselves to packaged solutions than in some industry-specific areas. The larger market is offset, however, by a lower average price tag than in industry-specific areas. Vendors need to sell more to make more, requiring mass marketing techniques and a variety of channels of distributions. Some segments of this market have become more mature, resulting in slower growth in these segments.

Industry-specific software sales have been hampered by customer concerns for specificity and a tendency to develop systems in-house. The sales cycle for such software is typically longer and is focused on a more limited market. Vendors need to emphasize their industry knowledge in the sales of such products. The price for solutions tailored to the needs of a particular industry is higher. Overall, expenditures are greater for these products than for cross-industry products. As companies use packaged software more in the future, as an alternative to in-house development, the potential market for industry-specific software is significant.

The largest and fastest-growing markets for industry-specific applications software products are listed in Exhibit VI-9.

EXHIBIT VI-9

Applications Software Products Market
Industry-Specific Software

Largest 1991	($ Millions)	Fastest Growing	CAGR (Percent)
Banking/Finance	2,040	Telecommunications	20
Discrete Manufacturing	1,967	Medical	16
Medical	985	Insurance	15
Business Services	880	Business Services	15
Insurance	826	Discrete Manufacturing	14

Although banking and finance is the largest industry-specific market for applications software products, it is expected that in 1992 it will have been surpassed by discrete manufacturing, which will continue to be the leader. Linking the factory floor with business/planning and engineering/design areas will continue to drive user expenditures for discrete manufacturing applications software products. Banking and finance will continue to be the second-largest market.

Telecommunications industry applications have traditionally been developed internally, with as much as 90% of applications resulting from internal development. Since deregulation, however, telecommunications companies are looking increasingly to outside providers.

Overall growth promoters for the business services sector are the trend toward a service economy and the fact that its businesses—such as real estate, law and accounting—are information-intensive.

In the 1991 market forecast report for application solutions, the most prevalent application and the largest cross-industry sector was accounting. However, office systems surpassed accounting in 1991, as shown in Exhibit VI-10. The fastest-growing sector is planning and analysis

EXHIBIT VI-10

Applications Software Products Market
Cross-Industry Software

Largest 1991	($ Millions)	Fastest Growing	CAGR (Percent)
Office Systems	2,400	Planning/Analysis	17
Accounting	2,250	Engineering/Scientific	14
Planning/Analysis	1,620	Office Systems	11

The actual amounts of user expenditures, and growth rates, are provided in individual industry and cross-industry sector reports within INPUT's Market Analysis Program.

C

Turnkey Systems Products

The turnkey systems market is forecast to reach $18.4 billion by 1997. The CAGR for turnkey systems is forecast to be 8% for the 1992-1997 period. Several strong growth promoters and inhibitors are affecting growth for these products/services.

1. Driving Forces

The key driving forces behind turnkey systems growth during the next five years are summarized in Exhibit VI-11.

EXHIBIT VI-11

Turnkey Systems
Driving Forces

- Solutions selling
- Specialized needs
- New technology
- Hardware manufacturing reliance on VARs

Solutions Selling: One of the key trends, discussed in Chapter V, is the focus on selling solutions instead of products. The end user is becoming increasingly involved in purchasing decisions. These buyers are not interested in becoming technically savvy regarding system implementation. Instead, the buyers talk in terms of what they want to achieve from a business perspective, and expect the vendor to provide an easy-to-use solution to this need. Often this solution may require integration of a variety of products, customization and/or user support. Turnkey vendors are equipped to seize this market opportunity since their focus is to address a need through providing software packaged with hardware along with professional services. These vendors are referred to as value-added resellers (VARs) due to the emphasis placed on the value that they add to the generic hardware and software.

Specialized Needs: As reported in Chapter IV, many buyers believe that they have unique needs that can't be met today by application solutions. Yet they recognize the need to phase down in-house development. Many software vendors believe that customers' needs are not as unique as customers might think, and issues can be addressed through packaged software. Whether the needs are unique or not, the perception on the part of the buyer is that the software vendor cannot provide a solution.

Turnkey vendors are better positioned to address specialized needs. They have traditionally focused their efforts on specific vertical markets and thus have gained some knowledge about their targeted industries. This knowledge, coupled with their experience in putting together solutions as part of their offerings, could position them well to address unique needs.

New Technologies: The ongoing technology changes toward downsizing and distributed processing can be beneficial to the turnkey provider in the same way that the software vendor benefits. New technology creates a demand for new products and services, increasing the potential market.

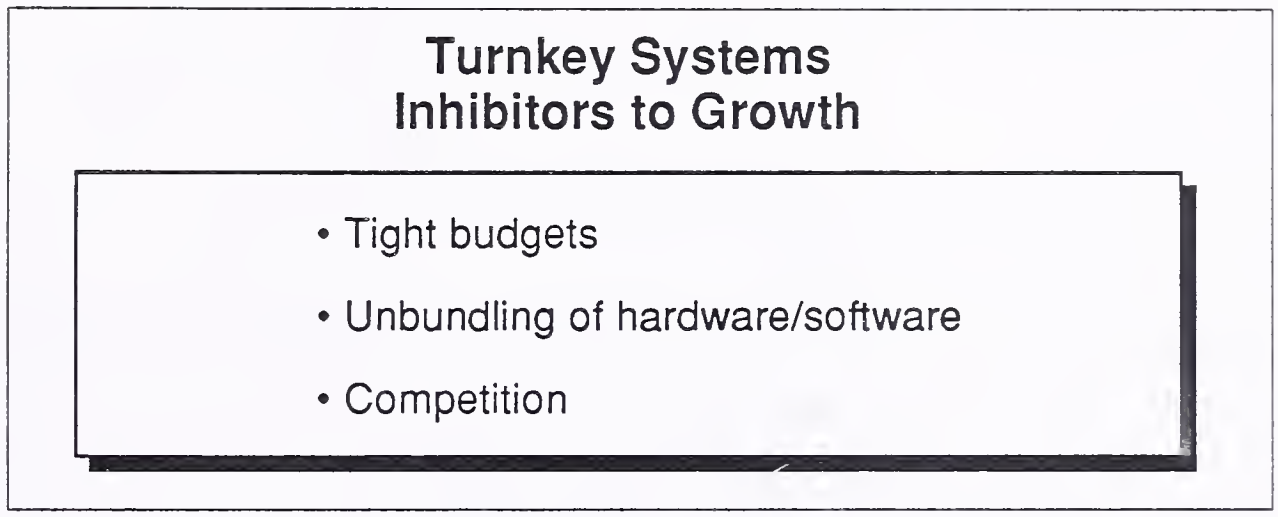
More powerful and smaller hardware platforms facilitate a deeper penetration of application solutions within small companies; and turnkey vendors and VARs generally sell to small and midsized firms. This underlying growth promoter has fueled turnkey systems/VAR growth since the advent of the personal computer, and it will continue to do so.

An infusion of new products—applications software products as well as hardware products—will fuel the VAR channel. Faced with the complexities and time involved in engineering/re-engineering their own software products, turnkey vendors and VARs are likely to become a willing conduit for other vendors' applications software products. Turnkey vendors/VARs will add the necessary customization. Other vendors' applications software products sold through the VAR channel become part of the turnkey systems/VAR delivery mode.

Hardware Manufacturers' Reliance on VARs: Equipment vendors have been bolstering their indirect channels' recruitment efforts and programs. As the cost of maintaining a direct sales force increases and hardware platforms get smaller, equipment vendors need viable alternative channels for their new generations of hardware. Vendors also need to rely more on the VAR/turnkey channel to provide support.

Growth for the turnkey systems delivery mode will be inhibited by the factors listed in Exhibit VI-12.

EXHIBIT VI-12



Tight Budgets: Unlike application solutions, turnkey systems providers/VARs have been negatively impacted by IS budget constraints. Companies have been reluctant to spend dollars on hardware, slowing growth in the turnkey systems area. Many turnkey vendors sell predominantly to small companies, which typically are the first to cut capital expenditures when economic times are hard.

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

Unbundling of Hardware/Software: Since hardware has become a commodity, buyers want to shop around for the best deal available and purchase software separately. At the same time, the turnkey vendors are finding that, since margins are so low, there are no real benefits from the hardware side of their business. The real revenue potential comes from software and professional services. Turnkey vendors don't want to limit their market to specific hardware platforms, particularly since users are looking for multiplatform solutions.

As personal computers become more readily available at lower prices and through alternative distribution channels—including mail order, discount houses and superstores—the advantages of turnkey systems have been eroded. Hardware sales have become so price-driven that many VARs simply cannot afford to compete.

As turnkey vendors and VARs have focused primarily on personal computers and workstations, the price of the applications software products they sell has been comparatively low. Smaller hardware platforms dictated that the software would also be lower priced. This will continue to be the case until new UNIX and client/server solutions fill the pipeline.

Some VARs and turnkey vendors are exiting the business for the following reasons:

- Hardware margins are declining.
- The risk of being tied to an obsolete workstation is too great.
- They cannot afford to re-engineer their products or do not have the expertise to support the new products.
- They cannot afford to carry multiple hardware product lines if and when they adopt a multivendor, multiplatform strategy for their software.

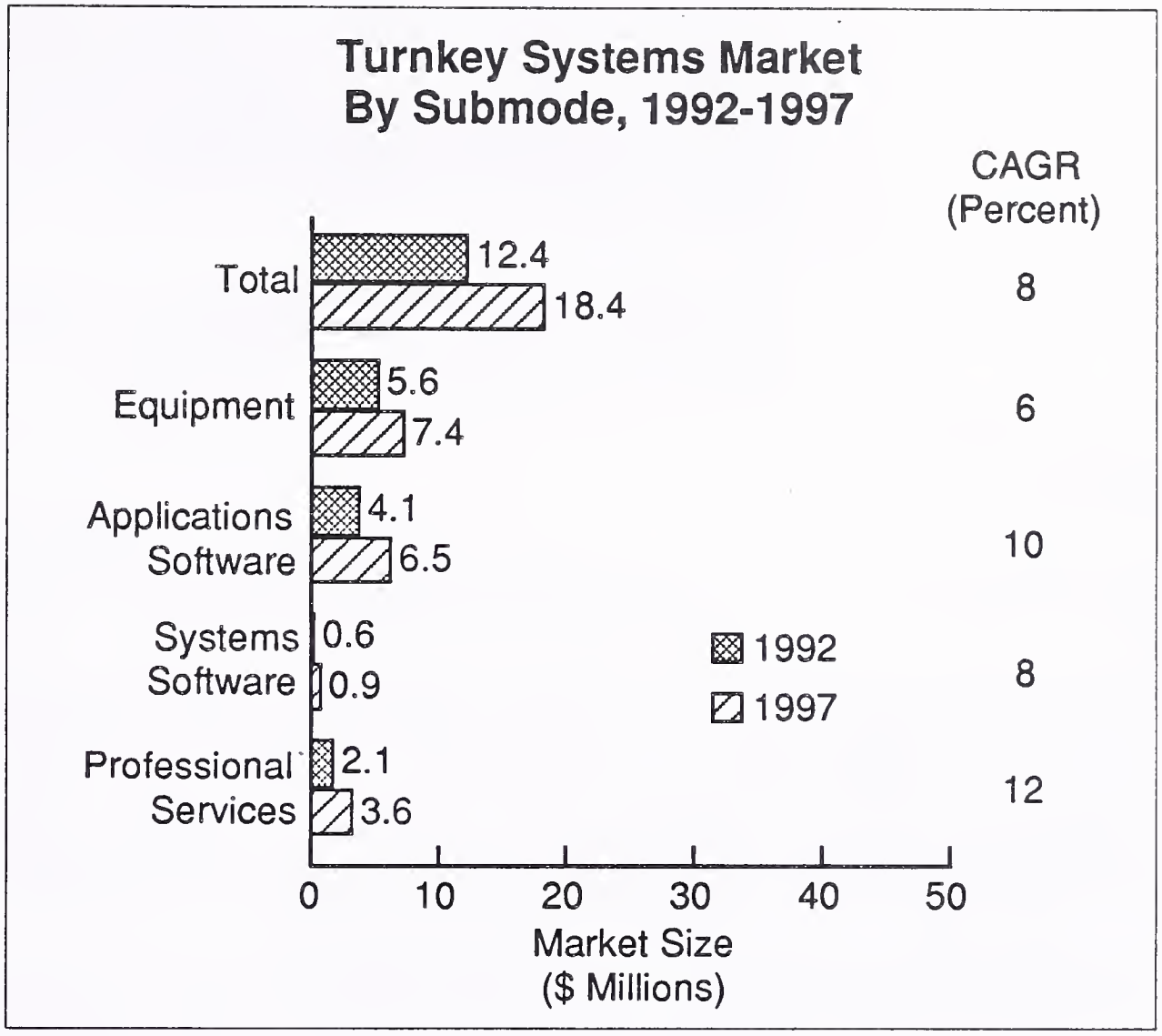
Competition: As hardware becomes a less profitable part of the package, turnkey vendors are turning their attention to the software and professional services part of their service. This shift puts turnkey vendors in head-to-head competition within these delivery modes, along with systems integrators. The lines between these delivery modes will blur as customers demand customized solutions to address their business needs.

Many turnkey vendors are finding that they need to diversify into other, higher growth information technology areas to survive.

2. Forecast by Submode

Exhibit VI-13 reflects the following turnkey systems trends:

EXHIBIT VI-13



- The equipment portion of turnkey systems will continue its decline as a portion of the whole. However, with the introduction of new hardware to address the market for client/server solutions, turnkey systems expenditures will continue to be bolstered until margins on the new equipment decline. Also, as hardware vendors seek new channels of distribution, they will have the incentive to negotiate favorable arrangements with turnkey vendors.

- The applications software products portion of turnkey systems is expected to grow at a compound annual growth rate of 10% through 1997. There will be an increase of new applications software products from independent software and systems vendors that are seeking alternative channels for their downsized products.

- Professional services—including systems integration, UNIX, client/server implementation and customization—will be attractive to VARs because of the higher margins. Although there is increasing need for these services, INPUT has not adjusted the CAGR for the professional services portion of turnkey upward from last year's forecast because of the strong response to this need by many different IS delivery modes that are in competition with turnkey systems/VARs.

3. Forecast by Industry-Specific versus Cross-Industry Sector

Primary markets for turnkey systems are industry-specific markets and usually specific niche segments within such markets. Examples include hospital management, physicians' group practice and insurance agency systems.

The strongest application areas for turnkey systems/VARs are listed in Exhibit VI-14. As with applications software products, the largest market for turnkey systems is discrete manufacturing.

EXHIBIT VI-14

Turnkey Systems
Industry-Specific Markets

Largest 1991	($ Millions)	Fastest Growing	CAGR (Percent)
Discrete Manufacturing	2,798	Telecommunications	12
Medical	994	Utilities	10
Banking/Finance	965	Transportation	10
Federal Government	900	Discrete Manufacturing	10
Business Services	810	Process Manufacturing	10

The federal government has contributed significantly with its acquisition of turnkey desktop products.

The growth in turnkey systems in the telecommunications sector results from the need for an increasing number of application-driven services—such as voice messaging, E-mail and EDI—and the need for universal gateways that are operated as standalone systems.

As seen in Exhibit VI-15, turnkey systems expenditures for cross-industry applications are considerably less, with accounting leading the list with $435 million in expenditures in 1991.

EXHIBIT VI-15

Turnkey Systems
Cross-Industry Markets

Largest 1991	($ Millions)	Fastest Growing	CAGR (Percent)
Accounting	435	Education/Training	11
Sales (Marketing)	275	Sales/Marketing	9
Engineering/Scientific	123		

Growth in most of these areas is expected to be modest, generally in the 5% or less range. Buyers are expected to be less and less likely to purchase cross-industry solutions as part of a turnkey package. For many of these applications, expenditures are likely to be for replacement packages. Requirements are generic enough that it is more cost-effective to purchase software separately from hardware expenditures.

Higher growth rates are expected in the education and training and sales/marketing areas.

The actual amounts of user expenditure and growth rates are provided in individual industry and cross-industry sector reports within INPUT's Market Analysis Program.

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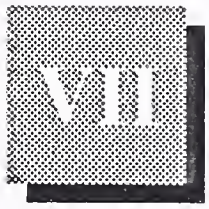


Competitive Environment

A
Competitor Trends

1. Dominance of Large Vendors

The software industry has its roots in entrepreneurial ventures, with the majority of its vendors having fewer than 100 employees and revenues under $1 million. Until recent years no vendor had achieved a very large market share. That picture has changed, however. While the plethora of smaller companies remains, there are now some industry "giants" that are influencing the direction of the market heavily. According to Jeff Tarter's *Softletter*, 76% of the sales of the top 100 independent software vendors (ISVs) in 1991 were attributed to the top ten companies. Their success has resulted from the growth of specific technologies in the marketplace and extensive merger and acquisition activity.

Companies developing software for PCs and networking are realizing the greatest increase in revenue. Microsoft's worldwide revenues for 1991 (including operating systems and international revenue) were the largest of all software vendors at $1.8 billion. Fiscal year 1992 revenues jumped to $2.7 billion. Borland boosted its standing dramatically with its acquisition of Ashton-Tate in 1991.

There is some concern that the trend for large companies to dominate could stifle innovation. This domination makes it more difficult for start-up companies to gain a foothold in the market. The deep pockets and established VAR relationships that the market leaders have give them a clear advantage in promoting their products. This advantage leaves entrepreneurs to limit their efforts to niche markets. However, even in specialized markets, the vendor's ultimate success is often reliant upon strategic alliances and VAR relationships.

2. Acquisitions and Alliances

In large part, the growth of market leaders can be attributed to unprecedented merger and acquisition activity in the 1980s and continuing into the 1990s. In 1991, there were nearly 200 software deals completed, representing an increase of 14% over 1990. Acquisition provides a way for application solutions vendors to gain access to new geographic areas and technologies in a more timely manner than would be possible on their own.

Rapid changes in technology have put pressure on the larger vendors to provide new products quickly. For example, the dramatic success of Windows has made it necessary for application solutions vendors to provide products for this environment or risk losing market share. User interest in client/server architecture and interoperability creates demand for capabilities that even the largest providers may find difficult to develop in-house. However, acquisition of a company that has developed a niche product can allow them to provide needed capabilities. For the smaller company, acquisition can provide the deep pockets needed to penetrate the market. Key acquisitions in 1991 and 1992 are presented in Exhibit VII-1 and Exhibit VII-2.

EXHIBIT VII-1

1991 Acquisition Activity

Buyer	Company Acquired
Borland	Ashton-Tate
Symantec	Peter Norton Computing
Computer Associates International	Pansophic
Computer Associates International	On-Line Software
Novell	Digital Research

EXHIBIT VII-2

1992 Acquisition Activity

Buyer	Company Acquired
Computer Associates International	Nantucket
Microsoft	Fox Software, Inc.
Legent	Goal Systems

Turnkey system/VAR acquisition and consolidation has also occurred. Several VARs in the $2 million to $3 million range, with little capital, have grown only modestly over a period of time and are ripe for acquisition. Acquisitions will be made not only for technology purposes, but also for geographic expansion or vertical sector expansion.

Large VARs have been able to secure small rounds of venture-based financing in order to acquire other VARs. VARs are continuing to expand out of the niche region to establish a national presence by acquiring other, smaller VARs.

Merger and acquisition activity in 1992 has decreased, however. Vendors are pursuing strategic alliances in marketing their products/services. This activity is being driven by market interest in solutions selling and open systems. In the past, vendors sold their products to technically savvy IS professionals who understood the bits/bytes of the computer world. Today, increasingly, products are being sold to users whose focus is on obtaining a solution to a business problem. Since no one vendor can be all things to all people, software, hardware and services vendors are developing alliances to address business concerns. Also, as users move toward the use of multiple platforms and require interoperability, alliances will continue to be critical to addressing these needs.

A significant alliance, which illustrates this "sign of the times", is the Taligent venture between IBM and Apple to develop open systems solutions.

3. International Market

Software solutions vendors have derived a significant portion of their revenue in recent years from their overseas operations. The Department of Commerce reports that in 1991, over 50% of the U.S. software companies'

revenues were obtained from the international market. Exhibit VII-3 shows income from foreign operations for several leading U.S.-based vendors.

EXHIBIT VII-3

International Revenues
U.S.-Based Software Companies

Vendor	Percent of Revenues International
Microsoft	60
Computer Associates International	45
Lotus Development Corporation	51
Dun & Bradstreet Software	30
Borland International, Inc.	38
The ASK Companies	40

While the U.S. still represents the largest single market for packaged software solutions, the maturity of certain segments will make vendors increasingly rely on international sales for growth.

A number of turnkey vendors/VARs are expanding regionally and nationally, as well as selling internationally. VARs are forming strategic alliances with each other or acquiring other VARs as a means of expansion.

4. Service and Customization Expansion

The availability of downsized solutions brings with it a host of integration issues. Increasing emphasis on integration causes challenges for vendors whose product lines consist of multiple applications that have been acquired (rather than "homegrown") along the way, and for vendors that do not have a complete suite of products.

In light of the importance of integration, applications software products vendors and VARs will increasingly provide additional services to their customers. In doing so, they at times will work with, and at other times compete against, systems integrators.

A discernible shift is under way toward more tailoring of applications software products by both software vendors and their customers. The ease with which a product can be tailored and the increased availability of tools with which to do this are compelling selling points. Vendors want to eliminate as much as possible the need for hard-coded modifications.

The ability of companies to gain true value out of today's personal computer and client/server applications products is predicated on some level of customization. The ability for a VAR to develop a profitable business from low-priced hardware and software is also dependent on customization services.

5. Increased Competition

Competition will come from a variety of sources, as described below.

Equipment Vendors: The application solutions market has traditionally been the domain of Independent software vendors and turnkey providers. The primary business of these companies is to develop and sell packaged software solutions. However, as hardware increasingly becomes a commodity with decreasing margins, equipment vendors need to look to other sources of revenue. The directions where equipment vendors have focused their efforts are in software and services.

While IBM's software growth in 1991 was disappointing, with only 6% growth, its $10.5 billion revenue for software makes it greater that the top ten ISVs combined. Software revenues grew from 10% of sales in 1986 to 16% in 1991

DEC's Software Products Group is in charge of developing, packaging and pricing applications software products for general distribution. Its 1991 revenues were $2.8 billion, representing 20% of total revenues.

Sun has two software subsidiaries—one to develop more software and peripheral products and one to improve UNIX.

Despite overall poor performance on the hardware side, hardware vendors' market share of applications software products is expected to increase during the 1990s.

Service Providers/Systems Integrators: Network and systems integrators offer the same kinds of services that many turnkey vendors/VARs and applications software products vendors offer. However, they profess nonalliance with any specific vendors' product offerings. As open systems gain momentum, this nonallegiance will gain increasing favor.

In addition, some systems integrators buy the rights to applications software they have developed for their customers and resell "shell" versions of it to additional customers.

Traditional Dealers: This channel is splintering as some dealers become mass merchandisers and others are taking on the appearance of VARs.

B
Leading Vendors

The leading applications software products vendors are shown in Exhibit VII-4, and the leading turnkey systems vendors are listed in Exhibit VII-5. Revenues for each company are developed from a combination of INPUT interviews and information from INPUT's vendor files. Revenues are noncaptive U.S. revenues only.

EXHIBIT VII-4

Applications Software
Leading Vendors
U.S. Packaged Software Revenue

Vendor	1991 Revenues* ($ Millions)
Computer Associates International	790.8
Microsoft Corp.	723
Lotus Development Corp.	406
WordPerfect	404
Dun & Bradstreet	384
Borland	311

*Revenue includes U.S. revenue for packaged software which in some cases includes systems software.

EXHIBIT VII-5

Leading Turnkey Systems Vendors

Vendor	1991 Revenues ($ Millions)
Intergraph	507
ASK Computer	280
Reynolds & Reynolds	194
Schlumberger	184
Mentor Graphics	152
Triad	119

The largest companies in the 1990s will not necessarily be the same as the largest companies in the 1980s. As the market switches to workstations and client/server architectures, only the companies that successfully re-engineer their software, or that develop (or purchase) entirely new products in a timely manner will grow.

The list in Exhibit VII-5 shows the largest turnkey companies, most of which have been in existence for many years and play a strong role in one or more vertical industry sectors. One example is Reynolds and Reynolds, which has long had a leading position in the automotive dealership market. Note that computer systems vendors that also sell software bundled with their general-purpose hardware are not considered turnkey systems vendors and are therefore not listed.

The following are profiles of several applications software products and turnkey systems companies. They are representative of the types of companies and strategies operating in the application solutions marketplace. Exhibit VII-6 lists the vendors profiled.

EXHIBIT VII-6

Vendors Profiled

- American Management Systems, Inc.
- Autodesk, Inc.
- Borland International, Inc.
- COIN Dealership Systems, Inc.
- Microsoft Corporation
- Policy Management Systems Corporation
- Software Publishing Corporation

C
Company Profiles

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

a. Company Background

American Management Systems, Inc. (AMS) was founded in 1970 and offers a variety of products and services—including applications software, systems integration, consulting, professional services and systems operations. Its targeted market includes large financial services firms, federal, state and local government, colleges, energy and telecommunications companies.

Total 1991 revenue reached $285.2 million, a 9% increase over 1990. Revenues increased in all of AMS' target markets, with the exception of financial services. The largest increases were realized in the energy and federal government markets.

b. Company Strategy

AMS targets key vertical markets and develops long-term relationships with them by offering a variety of products and services to meet the needs of those markets. AMS derives about 85% of its business each year from clients with whom it has worked the previous year.

In addition to the software packages offered to its customers, AMS provides systems integration, consulting and other professional services to help the customer develop solutions to their unique business problems.

c. Key Products and Services

AMS'applications software products are industry-specific to the markets it targets. It includes products in the following areas:

Credit Management: Available packages focus on credit application processing, credit bureau request processing and loan processing—along with collection management and risk management decision support.

Corporate Banking: Systems are provided for letters of credit, customer entry, collection processing and corporate deposits.

Energy: Systems focus on oil/gas information management and revenue management.

Government Systems: Financial Systems exist for federal, local and other government entities, along with the OASIS Tax Management and government HR system.

Education Systems: Local school district accounting,admissions, payroll and alumni records systems are provided.

Telecommunications: Customer contact systems, account management, message processing, order management, customer management and billing are included.

2. Autodesk, Inc., 2320 Marinship Way, Sausalito, CA 94965, (415) 332-2344

a. Company Background

Autodesk was incorporated in 1982. It designs, develops and markets a family of computer-aided design and drafting (CAD) software products for desktop computers and workstations.

Fiscal 1992 revenue was $284.9 million, which was a 20% increase over fiscal 1991.

b. Company Strategy

The company's strategy is to offer low-cost, easy-to-use CAD packages that run on various computers and operating systems. Autodesk has maintained an open architecture on its products to facilitate third-party development of peripheral and complementary products.

c. Key Products and Services

The company's principal product, AutoCAD has over 600,000 users worldwide. It accounted for over 90% of the company's revenues in 1992.

The remaining products include other types of CAD and multimedia products.

AutoCAD is used in a variety of applications—including facilities management; mechanical computer-aided design, architecture, engineering and constructions; geographic information systems, and electronic design automation.

The Autodesk Retail Products Division offers low cost products for design professionals, home computer users, educators, research scientists and computer graphics designers.

The Multimedia Division offers products that combine still images, text and animation for use in corporate presentations, advertising, graphics and video/film production markets.

The Scientific Modeling Division is focused on the development and marketing of software products to increase the productivity of chemists, biochemists, physicists, material scientists and educators.

3. Borland International, Inc., 1800 Green Hills Rd., P.O. Box 660001, Scotts Valley, CA 95066-0001, (408) 438-8400

a. Company Background

Borland International, Inc., was founded in 1983. It markets and supports data base products, spreadsheets and programming languages for personal computers.

In 1991, Borland acquired Ashton-Tate in a record $440 million deal. Ashton-Tate, which was formed in 1980, became known for its data base management, word processing, business graphics, decision support and spreadsheet applications. This acquisition brought Borland into one of the top positions for software vendors.

Borland's revenues for fiscal year 1992 were $482.5 million. All of its revenues were obtained from PC software products.

b. Company Strategy

Borland's strategy is to develop products in major software categories that provide solutions to customer needs using MS-DOS, OS/2 and MS-Windows and other selected operating environments. The company uses object-oriented programming techniques.

Borland's focus is on continuing to be a dominant player in the data base market through product development, alliances and acquisition. Its relational data base management system positions it for growth as client/server applications develop in the future. Its products are focused at the PC level.

c. Key Products and Services

Borland's products include data base, spreadsheet, language compilers and other desktop management products, as described below.

Paradox is a relational data base management system designed for single PC users and for multiple users on LANs. The Paradox SQL Link product allows users to access remote data stored in SQL format.

Borland's acquisition of Ashton-Tate added a range of microcomputer software products, including the dBASE family of data base management systems, word processing, integrated decision support and business graphics.

Quattro Pro is Borland's advanced electronic spreadsheet for MS-DOS environments.

Borland also offers language compilers and tools for developers.

ObjectVision runs under Windows and allows users to create business applications by re-creating commonly used business forms on screen and linking them.

4. COIN Dealership Systems, Inc., 3300 Breckinridge Boulevard, Duluth, GA 30136-4907, (404) 717-1700

a. Company Background

COIN Dealership Systems develops, markets and supports turnkey systems to automate the finance, insurance and sales functions in automobile dealerships. COIN previously operated as the Automotive Division of COIN Financial Systems. In 1989, COIN spun off its banking systems division and in 1990, it purchased Convergent Dealership Group from Unisys, thus tripling its size.

COIN's 1991 revenue was $66 million, as compared to $18 million in 1990. All revenues come from turnkey system sales.

b. Company Strategy

COIN's focus is on one vertical market and the myriad of functions required to support that business—namely, automobile dealerships. It offers one-stop-shopping for a dealer's information needs. It provides integrated hardware and software solutions for a variety of dealership sizes.

c. Key Products and Services

The COIN dealership system offers modules that support the sales, parts, service and accounting functions of automobile dealerships. These modules manage the sales cycle and support repair order and dispatching. The parts system supports parts inventory management.

COIN offers various systems based on the size of the dealership. Systems are available on Texas Instruments computers, supporting one to 79 users.

5. Delphi Information Systems, Inc., 31416 West Agoura Road, Westlake Village, CA 91361-4672, (818) 706-8989

a. Company Background

Delphi Information Systems was founded in 1976. It provides turnkey systems and associated support services to independent property and casualty insurance agencies and brokerages.

Delphi's fiscal 1992 revenue reached $42.4 million, a 60% increase over 1991. This increase is primarily attributed to acquisitions.

b. Company Strategy

The company targets independent insurance agents/brokers that offer and sell property and casualty insurance policies covering such risks as fire, theft and liability. Delphi markets its systems to independent agencies with 120 or more employees.

The company has been using acquisitions to expand its market opportunities. It acquired Redshaw, which added small- to medium-sized insurance agencies to its customer base of large agencies. The company also acquired McCracken Computer, which was one of its largest competitors.

c. Key Products and Services

Delphi's systems automate independent agencies in areas that include sales management, policy and claims administration, accounting, financial reporting, and electronic interfaces with the computers of insurance carriers.

Delphi's systems operate on the UNIX-based IBM RISC System/6000, IBM AS/400 and SCO UNIX-based PC computer hardware platforms.

Delphi's software currently operates on about 63,000 workstations and terminals at more than 3,200 customer sites, representing close to 50% of all workstations installed at independent agencies.

6. Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399, (206) 882-8080

a. Company Background

Microsoft was founded in 1975 by William Gates and Paul Allen and was incorporated in 1981. The company designs, manufactures, markets and supports microcomputer systems and applications software products and related products.

Total revenue for 1991 was $1.8 billion, an increase of 58% over the previous year. U.S. revenues for packaged software in 1991 were $723 million. Estimated revenue for fiscal year 1992 is $2.7 billion. Revenue in the first quarter of 1992 was $818 million. Since 1986, Microsoft has achieved an average annual growth of 56%.

Approximately 85% of Microsoft's revenue is obtained from software products and related support services. Microsoft markets its software products through OEM and retail sales.

b. Company Strategy

With the success of its Windows interface and plans for Windows NT, Microsoft is positioning its operating systems products to be the common interface for enterprise networks.

As certain segments of the market mature, Microsoft is seeking to diversify through entry into new markets and strategic third-party alliances. It's acquisition of Fox Software in 1992 supports its move into the data base market, where it has not previously had a presence.

Microsoft is making use of software suites to leverage its more successful programs to increase market share in areas where it is not quite so successful. The company has also bundled in other third-party software with its operating system to promote Windows usage. Arrangements to bundle applications software with hardware and operating systems position Microsoft to increase its dominance.

Microsoft is focusing on network and workgroup computing and positioning itself as a solutions provider. It has targeted vertical markets and developed an industry specialist program to link together with other vendors offering complementary services in order to address unique vertical market needs.

Microsoft is also looking at the small office/home office (SOHO) market for potential growth.

c. Key Products and Services

Microsoft offers more than 75 PC software products in 25 languages for business and professional use. The company's products are available for a range of IBM and compatible PCs and the Apple Macintosh.

The company offers business applications software products that provide word processing, spreadsheet, file management, presentation/graphics, communications and project management.

Microsoft offers three of its most popular applications—Word, Excel and PowerPoint—as part of a single package, Microsoft Office.

Its acquisition of Fox, along with its development of its Cirrus product, has positioned the company to enter the data base market with a splash.

Microsoft offers technical support for all of its products through its Product Support Group. Microsoft University provides technical training for software developers and data processing professionals.

7. Policy Management Systems Corporation, P.O. Box Ten, Columbia, SC 29202, (803) 735-4000

a. Company Background

Policy Management Systems Corporation (PMSC) was formed in 1974. It provides processing and electronic information services, applications software products and associated support services to the insurance industry.

The company's total 1991 revenue reached $415.4 million, a 20% increase over 1990 revenue. Approximately 18% of the company's revenue is obtained from applications software.

In January 1991, the company acquired Management Data Communications Corporation of Chicago, which provides applications software and processing to the group health insurance industry in the U.S.

b. Company Strategy

The company's strategy is to provide solutions to a range of needs affecting a specific vertical market—insurance. There are over 3,200 property and casualty insurance companies in the U.S., along with group life and health providers and independent agents and adjusters. PMSC focuses on building a larger base of recurring systems licensing and services.

PMSC has made use of alliances and acquisitions to strengthen its position in the marketplace. IBM has had a minority interest in PMSC since 1989. Together, IBM and PMSC develop and market automated solutions for the insurance industry, collaborating on sales and marketing programs and systems development.

c. Key Products and Services

The company offers over 100 primary products and services, including more than 70 software products. Its primary software products run on medium- and large-scale IBM and compatible computers. Some products run on PCs and intelligent workstations.

PMSC's software products automate most insurance processing functions as well as various accounting, financial reporting and cash management functions.

Series III is an integrated family of products targeted to large companies that will fully automate the insurance process from the initial application for insurance to annual statement preparation.

Customers may use software licensed from the company on a remote processing basis.

The company has third-party marketing agreements with certain software vendors to market certain of their systems software products to PMSC's customers. These products are designed to perform noninsurance functions or to improve the control and productivity of computer resources.

8. Software Publishing Corporation, 3165 Kifer Road, Santa Clara, CA 95051, (408) 986-8000

a. Company Background

Software Publishing Corporation, founded in 1980, supplies business productivity software for personal computers.

In July, 1991, the company acquired Precision Software Ltd., of Surrey, England. This acquisition gave the company immediate access to the Windows market due to Precision Software's relational data base management software, which operates in the Windows environment.

Revenue for fiscal 1991 reached $143.1 million, a 2% increase over 1990 revenues.

One hundred percent of Software Publishing's fiscal 1991 revenue was derived from the sale of PC applications software products through independent distributors, retailers and OEMs.

The company's products are designed for IBM and compatible PCs that operate in the DOS, Windows and OS/2 environment.

b. Company Strategy

Software Publishing's products are targeted to three types of business users: managerial and professional computer users; information management computer users; and corporate and individual applications developers.

The company has made use of alliances and acquisitions to grow and increase market penetration.

The company has been struggling in its transition from DOS- to Windows-based applications. Recently the company announced management changes and reductions in work force due to poor fourth quarter earnings.

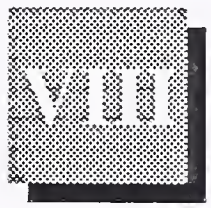
c. Key Products and Services

The company's focus is on the following three categories of products:

Information presentation: Harvard Graphics has achieved market dominance as a business presentation package targeted for managers and professional computer users.

Word processing: Professional Writes and OfficeWriter are designed to enhance the productivity of business professionals, with minimal learning time required.

Information management products: Products such as InfoAlliance, Superbase and Professional File are designed for the information management computer user, as well as the independent applications developer.



Conclusions and Recommendations

A Conclusions

INPUT has drawn a number of conclusions about the direction of the application solutions market based on an extensive review of secondary sources, interviews with IS decision makers and discussions with vendors serving this market. These conclusions are listed in Exhibit VIII-1 and are described in this chapter, along with relevant recommendations.

EXHIBIT VIII-1

Conclusions

- Downsizing is changing the applications solutions market
- Enterprise computing is the model for the 90s
- Continued growth is expected in applications solutions market
- Solutions selling is necessary to be competitive
- Applications solutions vendors will be competing with other delivery modes
- Big vendors will keep getting bigger

Downsizing Is Changing the Application Solutions Market

Applications software products and turnkey systems experienced healthy growth rates in the late 1980s and early 1990s. This growth was driven largely by the proliferation of PCs, workstations and LANs. Now, just when these hardware markets are starting to see some saturation, along comes downsizing to give application solutions another boost.

Downsizing is changing the model for IS computing in companies today. Functions that previously were handled in a host environment are now being distributed from the host to servers on LANs, with the host serving as a data repository. Most of the executives INPUT spoke with expect to downsize key applications within the next five years.

As a result of downsizing and associated technological developments, the application solutions market is changing. Features are constantly being modified to be competitive, with ongoing updates needed.

Whereas in the mainframe world, software was sold to a limited market at high prices, today's software solutions are sold to an ever-growing number of users at prices that are lower. Vendors need to expand their channels of distribution to reach customers and more carefully target the segments they wish to reach. Advertising is growing in importance as a way to market products.

Pricing structures are also undergoing dramatic changes as customers rebel against tiered pricing structures.

Vendors are becoming more creative in how they market by using applications suites and bundling with hardware.

Enterprise Computing Is the Model for the 1990s

While the mainframe and midrange systems controlled mission-critical applications in the past, the PC was the domain of personal productivity and analysis tools. Today, the trend is not only toward downsizing, but also "right-sizing", which refers to making use of all three of these platforms using the hardware that is most functional for a particular application. These platforms are linked through networks and data are integrated through the use of data base management systems.

As companies downsize and move toward distributed processing, they are evaluating the client/server architecture, where applications processing and storage are shared between client devices such as PCs and servers. While the move toward client/servers is just beginning, the majority of executives interviewed by INPUT expect to implement this architecture by 1997. The end result will be a positive one for the application solutions market.

Continued Growth Expected in Application Solutions Market

INPUT forecasts double-digit growth rates for applications software in the next five years, with turnkey systems achieving at CAGR of 8%. This growth is projected despite lower-than-expected expenditures in industries such as banking and telecommunications in the past year and the maturity of many of the cross-industry markets.

Downsizing and client/server solutions are creating demand for new products to operate in those environments. The success of graphical user interfaces, in particular Windows, will contribute significantly to this growth. As the move toward open systems progresses and users demand interoperability, new software solutions will be required. Ongoing upgrades will also contribute to revenue growth.

In the turnkey systems area, new technology developments will provide opportunities for new product offerings.

Solutions Selling Necessary to Be Competitive

Application solutions purchasing will be increasingly influenced by the end user. Users will select the application solutions that best address their business problems. Users expect those solutions to work in their operating environments and platforms. They also expect solutions to be easy-to-use, easily modified and run on different mainframes and servers. Application solutions providers will need to need to have strong customer support. In short, vendors will need to migrate from being product companies to becoming service companies.

Application Solutions Vendors Will Be Competing with Other Delivery Modes

As vendors move toward becoming more service-oriented, it will become increasingly more difficult to differentiate software companies from systems integrators and professional services companies. Turnkey systems vendors, in particular, will become more similar to software and services vendors as their allegiance to specific hardware decreases.

Big Vendors Keep Getting Bigger

In an industry where small companies still are prevalent, the leaders are achieving dominance, affecting the ability of smaller vendors to compete. Growth has been achieved both through acquisition and through expansion in the marketplace.

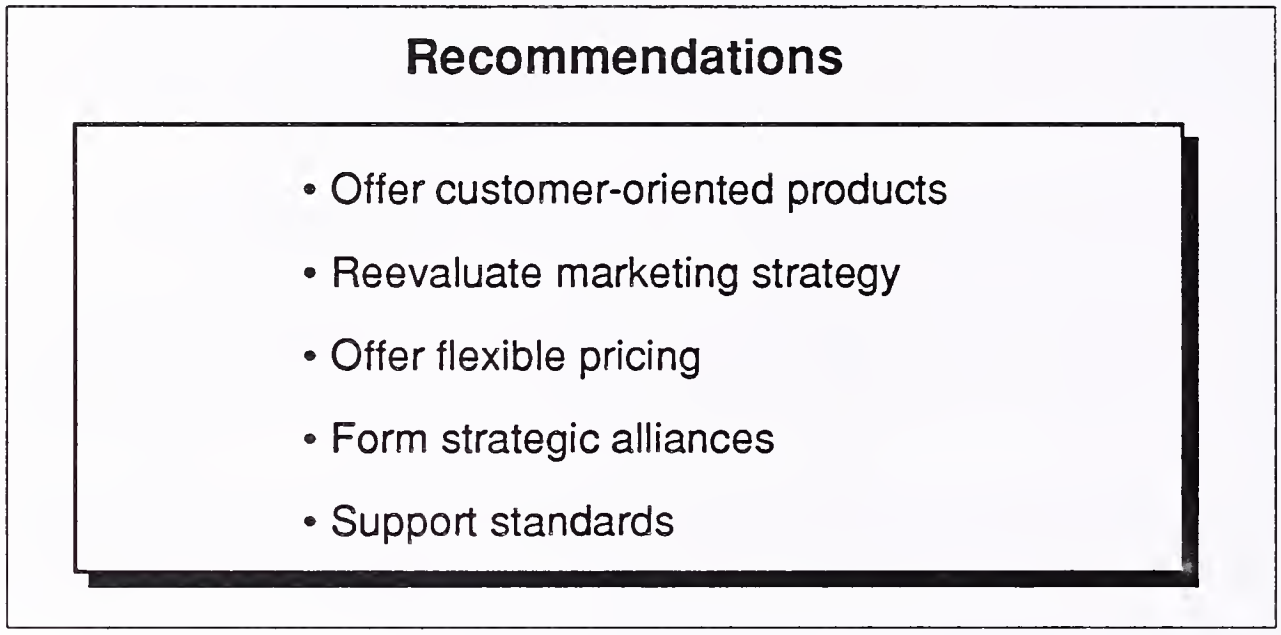
Alliances and cross-marketing agreements are taking place to increase market penetration. This leaves the smaller companies to fill niche markets or align themselves with another, more dominant vendor with complementary products.

B

Recommendations

Vendor recommendations are outlined in Exhibit VIII-2 and briefly discussed below.

EXHIBIT VIII-2



Offer Customer-Oriented Products

More and more, end users are becoming the key customers. Those customers know what they want an application to accomplish, but they don't want to worry about the systems behind the application. Users will increasingly expect plug-and-play products, along with templates for easy tailoring and modification. Users will want products that are scalable to be used on multiple platforms. Products need to be easily maintained and reliable. Network capability and compatibility with object-oriented environments will also be important factors.

Since users will be reluctant to do maintenance and troubleshoot problems themselves, they will come to expect that type of service from the vendor.

As IS budgets shrink, companies will look outside to handle industry-specific needs that previously were developed internally. Since companies believe that many of these needs are unique, they will be looking to do business with third parties that really understand their needs from a business perspective. If application solutions vendors do not demonstrate this level of business understanding, buyers have the option of working with systems integrators or professional services companies instead.

Re-evaluate Marketing/Sales Strategies

Vertical markets that can benefit specifically from vendor products should be targeted specifically with industry-knowledgeable people hired to sell to that market.

With the size of the market for PC/workstation and LAN products, field sales is becoming less and less realistic. Mass marketing techniques will increasingly be needed to reach the base of potential users for low-cost cross-industry applications. At the same time, competition for retail shelf space is forcing the vendor to use more targeted promotions and direct mail to reach potential buyers. Mailing lists are becoming a valuable commodity as vendors strive to determine the market profile for their products.

Vendors should offer applications through packages, such as applications suites, and bundling with hardware. This increases market penetration across the board and provides an incentive to the customer to maintain an ongoing vendor relationship.

Vendors are under pressure not only to have better products, but also to be better sales professionals. They will have to listen carefully to the needs of their customers and be solutions-oriented rather than technology-oriented. In order to meet these demands, provision of high-quality education, service and support—or aligning with a company that can provide these—is critical to success.

Offer Flexible and Competitive Pricing Options

Buyers have already rebelled against traditional tiered pricing structures, and even market leaders like IBM and Computer Associates International have had to bow to the pressure.

Pricing is a complex issue today as new technologies and changes make old pricing structures inequitable. Vendors will need to continually re-evaluate their approach to pricing to be competitive and achieve adequate profit margins.

In the future, the emphasis on pricing will be flexibility. Buyers want the option to buy or lease. For some applications, usage-sensitive pricing will be an attractive option. Still other buyers will want to take advantage of bundled software as part of hardware purchases.

Users will want to take advantage of the price breaks associated with purchasing application suites, but also make sure that the package includes what they need specifically.

As client/server technology increases in use, pricing schemes will need to be developed to operate in this environment.

Sensitivity to end-user needs will be critical to successful pricing strategies.

Form Strategic Alliances

Given the trend toward applications downsizing and mounting interest in integration, vendors in the 1990s will be selling to a diverse customer set that includes various departmental managers as well as centralized IS managers. Vendors must, therefore, be able to sell to a variety of customers at a tactical as well as strategic level. As the ultimate corporate IS goal is enterprise-wide computing, any given vendor must provide a united front and the ability to meet multiple needs within a corporation.

In order to meet these needs, a large vendor may need to form alliances with firms that have expertise it lacks. Alliances are particularly important for the success of the smaller niche vendors, which may lack the marketing abilities to go it alone.

Even the market leaders are not able to provide across-the-board solutions to their customers. As discussed, the buyer does not want to function as a project manager responsible for integrating multiple vendor products. The vendors will need to provide this role in the future.

As traditional applications markets mature, vendors will need to diversify their product offerings to meet needs for new products. Companies like Microsoft are using acquisition as a means to gain market strength in areas where they have not had a presence. For many other vendors, strategic partnerships present a way to diversify and offer appropriate customer solutions.

Support Standards as Developed

In this fast-changing industry, it has been difficult for true standards to be developed. While users and vendors alike have recognized and been moving toward standards and open systems, it has been a slow process, complicated by the myriad of new product introductions that have taken place along the way.

Vendors need to be aware of *de facto* standards as they develop and be ready to offer products that conform. For example, when Windows took the market by storm, application solutions providers had to provide Windows products to stay competitive.

It will be even more important for vendors to comply with industry standards as they are developed. Buyers today are seeking solutions that will work on multiple platforms and operating systems. Product standardization will make it easier for buyers to make use of technology as a tool to support their business while being insulated from the technical aspects of computer systems.

In order to support a multivendor and multiplatform strategy, turnkey vendors must either diminish reliance on hardware or support a broad range of hardware platforms. Vendors are under more pressure to open up their systems. Customers may still want a turnkey solution, but don't want to feel limited to specific hardware.

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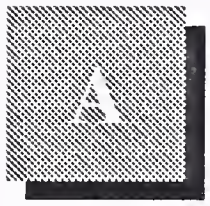


Definition of Terms

A
Introduction

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

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

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

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

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

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

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

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

B
Overall Definitions and Analytical Framework

1. Information Services

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

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

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

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

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

2. Market Forecasts/User Expenditures

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

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

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)

- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

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

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

3. Delivery Modes

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

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

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

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

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

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

4. Market Sectors

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

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

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

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

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

5. Trading Communities

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

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

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

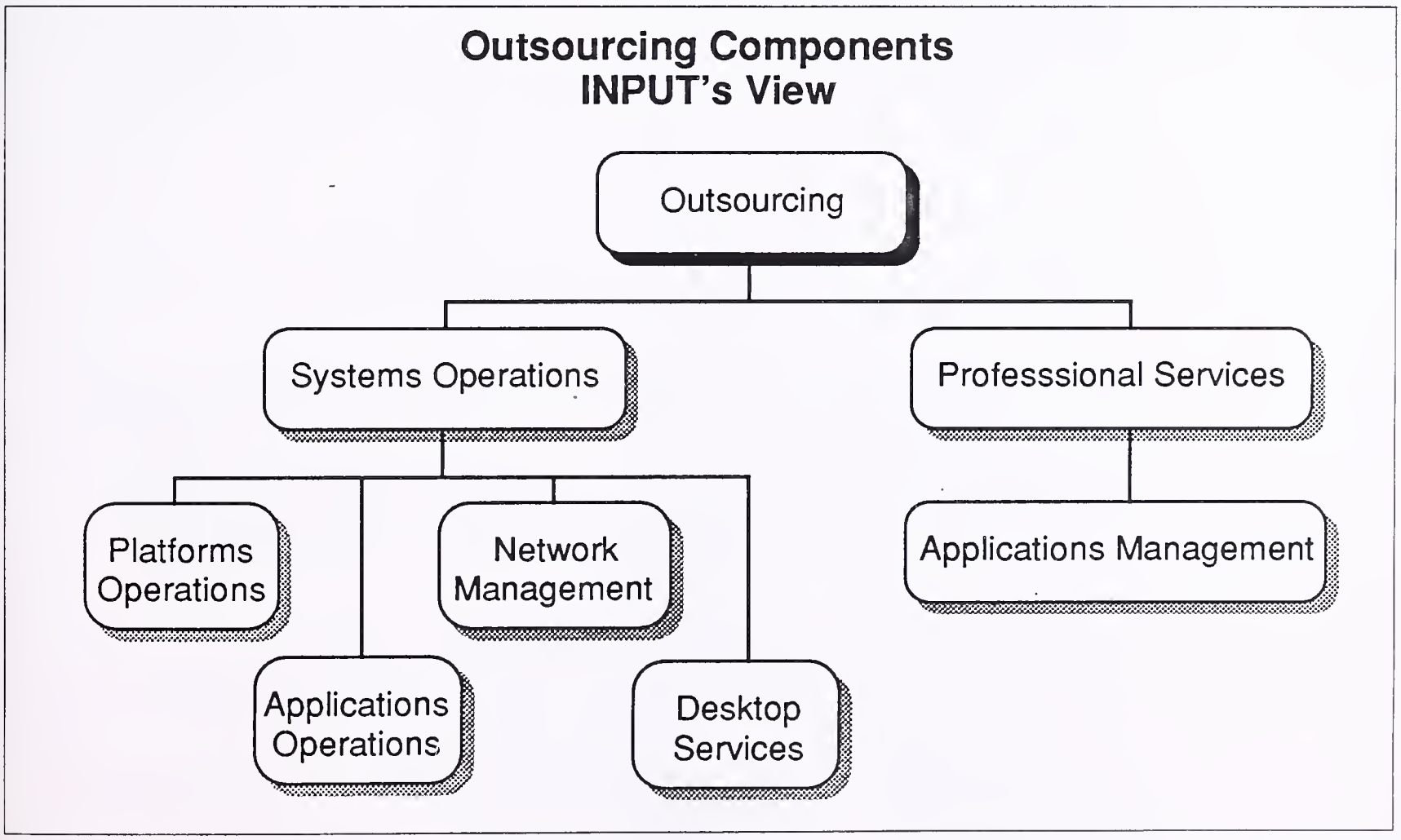
6. Outsourcing

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

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

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

EXHIBIT 1



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

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

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

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

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

C

Delivery Modes and Submodes

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

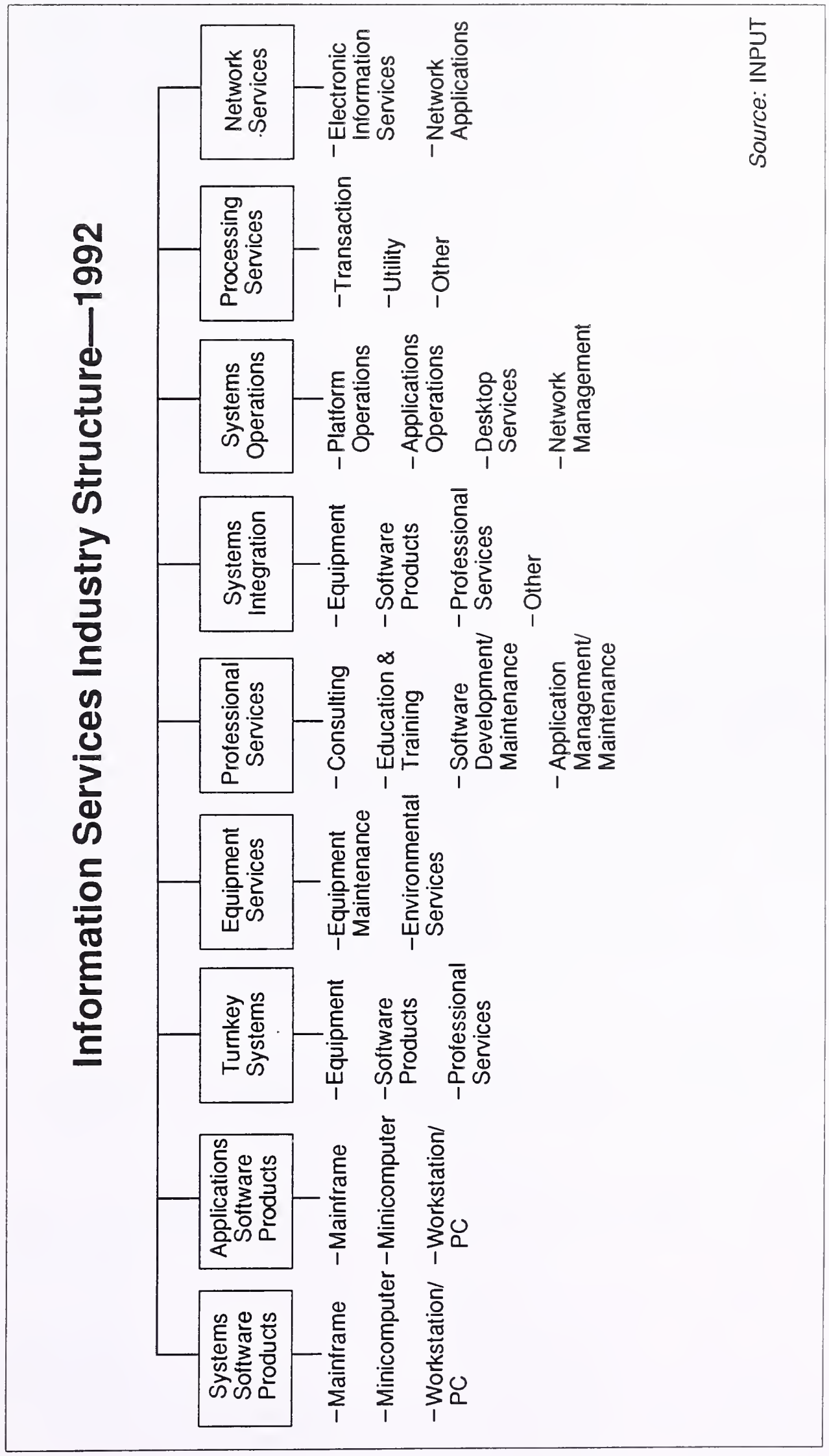
1. Software Products

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

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

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

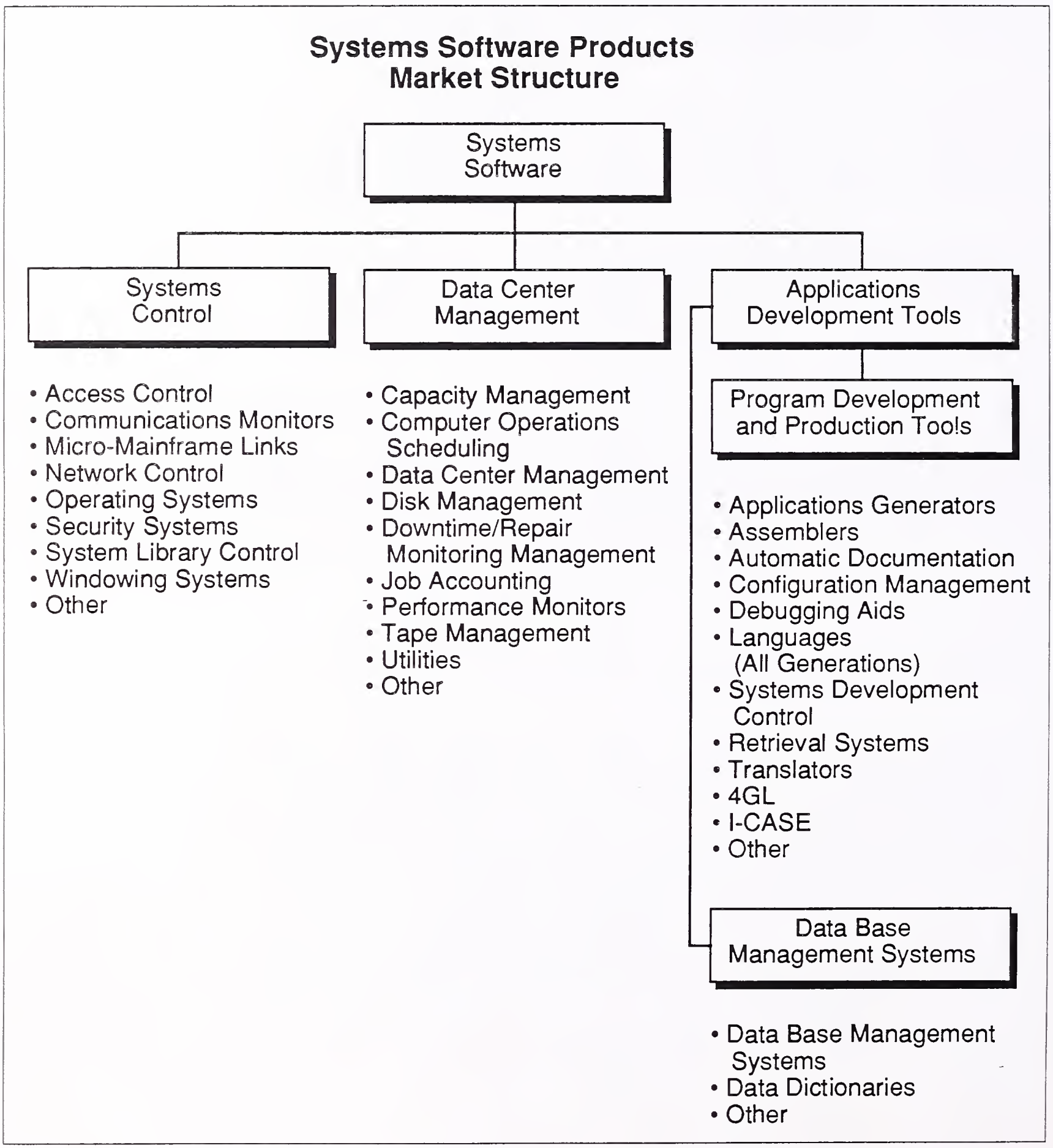
EXHIBIT 2



a. Systems Software Products

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

EXHIBIT 3



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

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

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

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

b. Applications Software Products

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

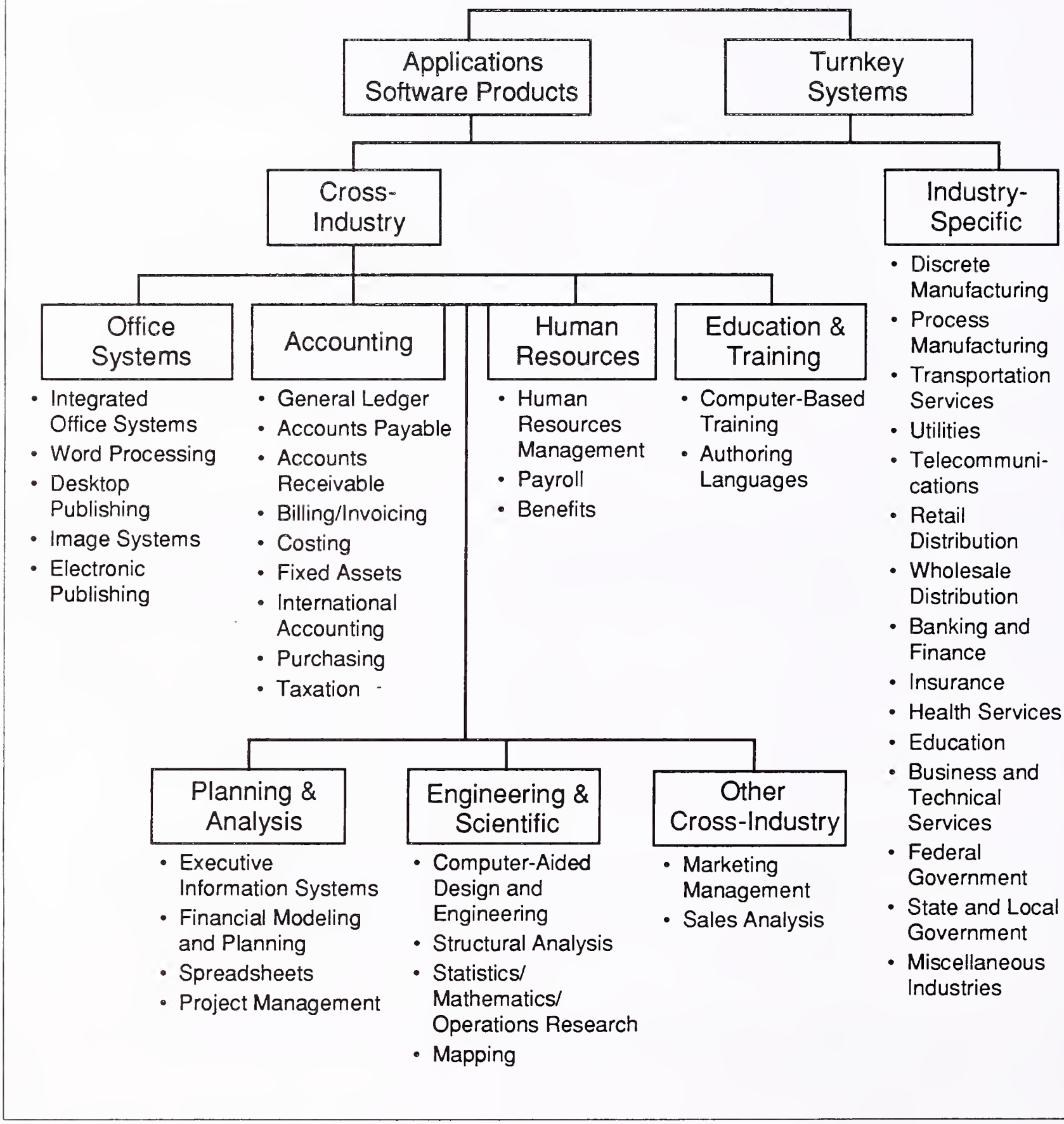
- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile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

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

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

EXHIBIT 4

Application Products and Turnkey Systems



2. Turnkey Systems

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

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

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

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

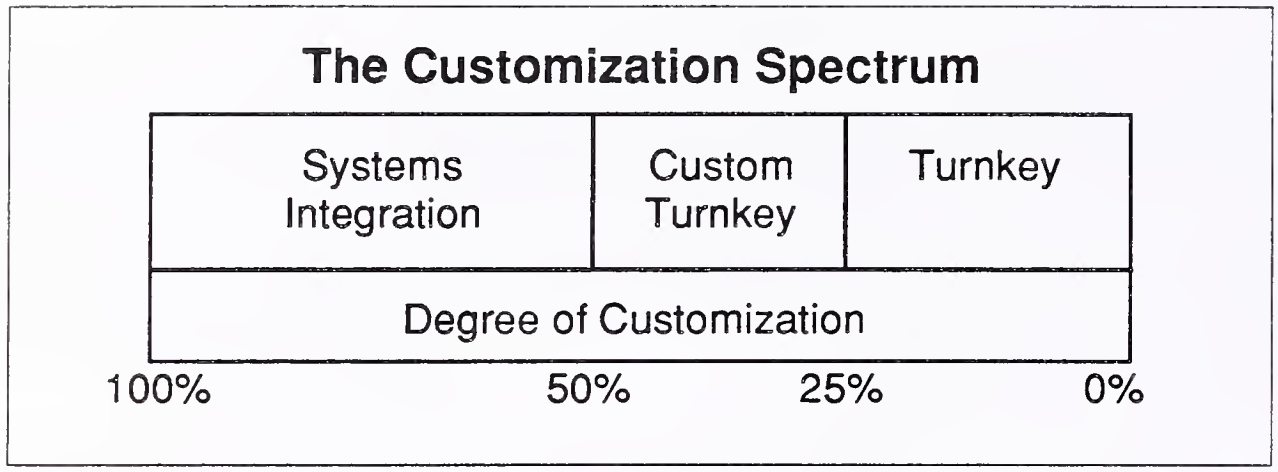
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such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

Turnkey systems have three components:

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

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

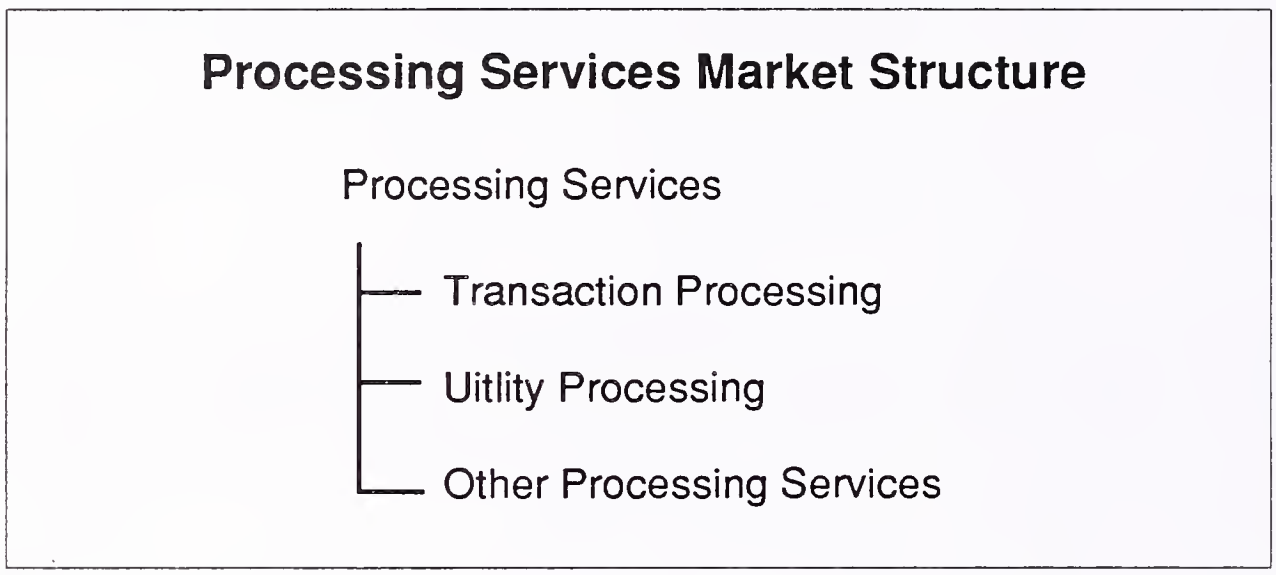
EXHIBIT 5



3. Processing Services

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

EXHIBIT 6



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

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

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

4. Systems Operations

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

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

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

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

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

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

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

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

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

5. Systems Integration (SI)

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

The components of a systems integration project are the following:

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

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

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

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

EXHIBIT 7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

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

Other Miscellaneous Products/Services

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

6. Professional Services

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

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

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

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

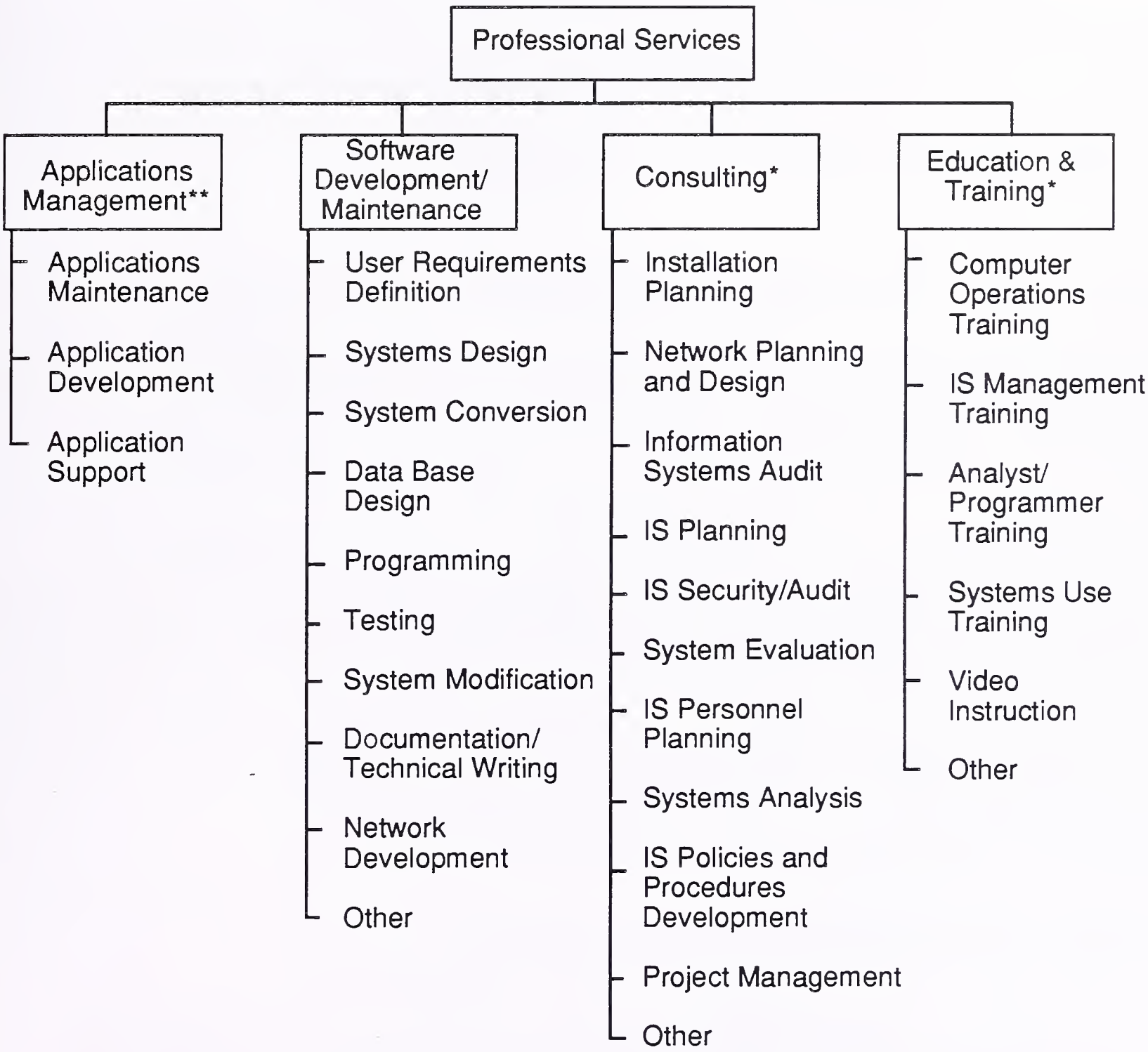
☆ *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

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

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

EXHIBIT 8

Professional Services Market Structure



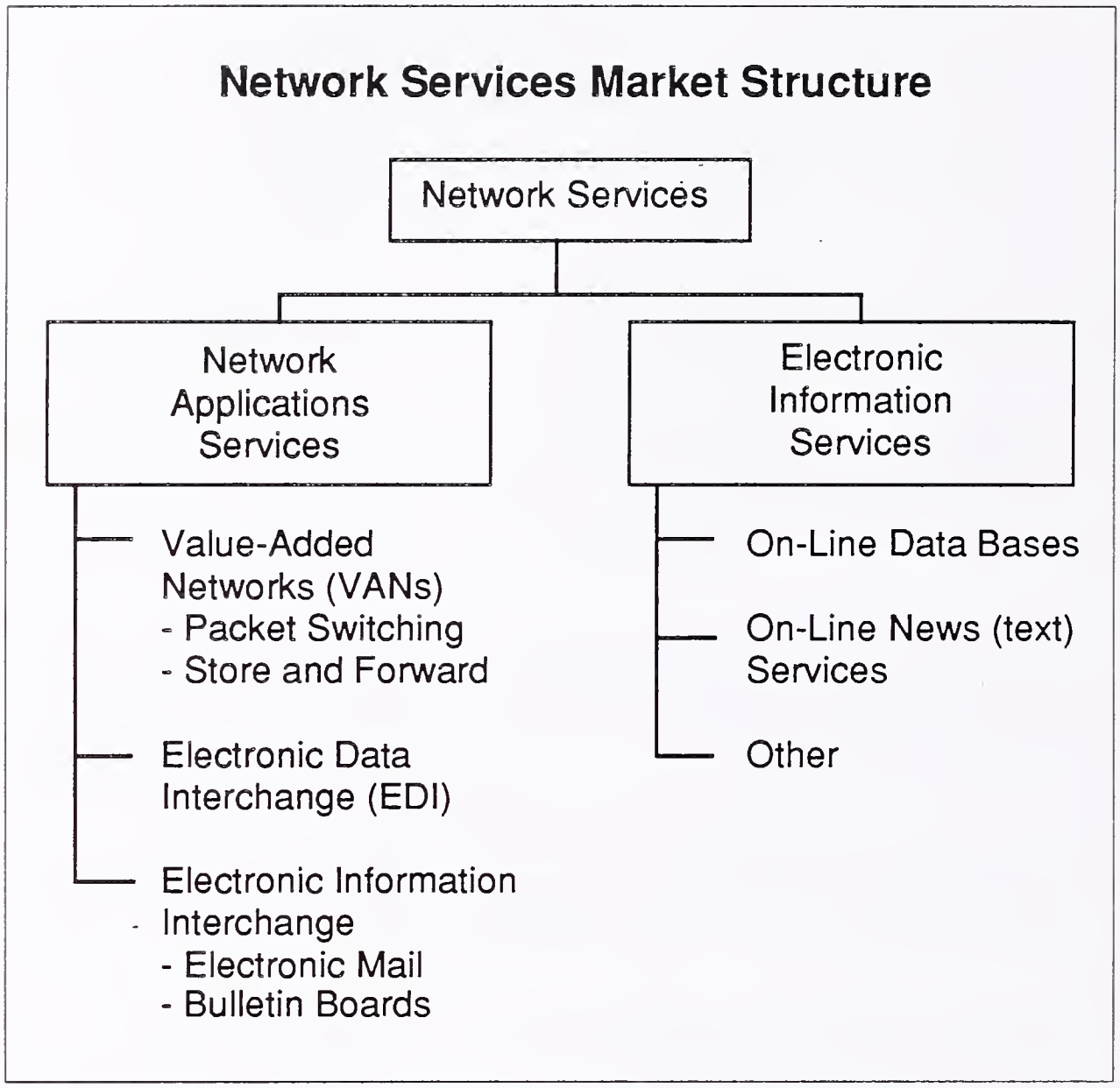
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

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

EXHIBIT 9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

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

The two kinds of electronic information services are:

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

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

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

b. Network Applications

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

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

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

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

8. Equipment Services

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

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

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

D
Computer Equipment

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

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

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

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

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

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

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

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

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

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

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

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

E

Sector Definitions

1. Industry Sector Definitions

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

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

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

EXHIBIT 10

Industry Sector Definitions

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

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx	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 10 (CONT.)

Industry Sector Definitions

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

2. Cross-Industry Sector Definitions

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

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

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

The seven cross-industry markets are:

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

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

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

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

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

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

Office Systems consists of the following:

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

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

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

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

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

Engineering and Scientific encompasses the following applications:

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

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

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

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

Other encompasses marketing/sales and electronic publishing application solutions.

• Sales and marketing includes:

- Sales analysis
- Marketing management
- Demographic market planning models

3. Delivery Mode Reporting by Sector

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

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

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

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

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

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

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

EXHIBIT 11

Delivery Mode versus Market Sector Forecast Content

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

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

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

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

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

F

Vendor Revenue and User Expenditure Conversion

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

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

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

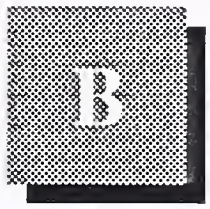
To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

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

EXHIBIT 12

Vendor Revenue to User Expenditure Conversion

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



Forecast Data Base

A

Forecast Data Base

Exhibits B-1 through B-6 present the detailed 1992-1997 forecast for applications software products and turnkey systems. The forecasts are presented by platform size and submode and by market sector.

EXHIBIT B-1

Applications Software Products and Turnkey Systems Forecast by Platform Size and Submode, 1991-1997

Delivery Mode	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
SW and Turnkey Market	30,325	11	33,545	37,374	41,601	46,358	51,687	58,530	12
Turnkey Systems	11,403	9	12,483	13,594	14,642	15,984	16,997	18,402	8
-Equipment	5,359	5	5,617	5,981	6,296	6,548	6,799	7,361	6
-Software	4,219	12	4,744	5,166	5,710	6,291	6,820	7,384	9
• Applications Software	3,628	14	4,127	4,494	5,025	5,536	6,010	6,498	10
• Systems Software	591	4	617	672	685	755	810	886	8
-Professional Services	1,825	16	2,122	2,447	2,636	3,145	3,378	3,657	12
Applications Software	18,922	11	21,062	23,760	26,959	30,374	34,690	40,128	14
-Mainframe	4,960	5	5,234	5,619	5,984	6,256	6,669	7,165	7
-Minicomputer	5,375	9	5,846	6,365	6,907	7,502	8,158	8,878	9
-Workstation/PC	9,587	16	9,982	11,796	14,068	16,616	19,863	24,085	19

EXHIBIT B-2

Applications Software Products
User Expenditure Forecast by Market Sector, 1991-1997

Market Sector	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Delivery Mode Total	18,922	11	21,062	23,780	26,959	30,374	34,690	40,128	14
Vertical Industry Markets	10,771	11	11,992	13,647	15,488	17,482	19,854	22,662	14
Discrete Manufacturing	1,967	13	2,224	2,530	2,881	3,295	3,799	4,380	14
Process Manufacturing	595	15	683	782	899	1,036	1,198	1,378	15
Transportation	387	11	431	478	538	596	670	776	12
Utilities	201	12	225	254	287	325	367	415	13
Telecommunications	344	19	410	489	586	701	841	1,008	20
Retail Distribution	270	12	302	342	386	436	493	557	13
Wholesale Distribution	527	11	587	662	743	845	958	1,083	13
Banking & Finance	2,040	4	2,120	2,438	2,662	2,807	3,102	3,415	10
Insurance	826	8	891	994	1,188	1,394	1,590	1,819	15
Medical	985	14	1,125	1,296	1,505	1,768	2,089	2,423	17
Education	667	11	740	829	921	1,012	1,123	1,247	11
Business Services	880	16	1,017	1,177	1,367	1,590	1,791	2,060	15
Federal Government	680	16	790	875	970	1,065	1,155	1,355	11
State & Local Govt.	165	15	190	220	250	280	315	350	13
Misc. Industries	237	8	257	280	305	332	363	396	9
Cross-Industry Markets	8,151	11	9,070	10,133	11,471	12,892	14,836	17,466	14
Accounting	2,250	8	2,440	2,650	2,920	3,200	3,570	4,200	11
Education & Training	201	6	213	223	241	263	295	331	9
Engineering & Scientific	651	12	727	810	905	1,010	1,135	1,265	12
Human Resources	694	10	765	850	950	1,060	1,215	1,400	13
Office Systems	2,400	11	2,671	2,995	3,433	3,844	4,510	5,439	15
Planning & Analysis	1,620	17	1,894	2,213	2,592	3,040	3,577	4,210	17
Other Cross-Industry (Sales & Marketing)	335	7	360	392	430	475	534	621	12

EXHIBIT B-3

Mainframe Applications Software Products
User Expenditure Forecast by Market Sector, 1991-1997

Market Sector	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Delivery Mode Total	4,960	5	5,234	5,619	5,984	6,256	6,669	7,165	7
Vertical Industry Markets	3,184	6	3,368	3,662	3,931	4,095	4,412	4,759	7
Discrete Manufacturing	383	7	410	442	467	492	524	557	6
Process Manufacturing	169	11	187	202	218	235	256	279	8
Transportation	140	6	149	155	169	175	182	189	5
Utilities	45	11	50	53	56	60	64	73	8
Telecommunications	174	15	200	230	265	304	350	402	15
Retail Distribution	49	4	51	55	58	62	66	70	7
Wholesale Distribution	245	4	255	268	275	287	298	310	4
Banking & Finance	898	4	933	1,073	1,170	1,174	1,294	1,423	9
Insurance	317	4	329	341	368	394	421	455	7
Medical	369	7	395	422	446	470	500	530	6
Education	80	3	82	82	87	88	90	92	2
Business Services	119	3	122	124	128	131	134	137	2
Federal Government	125	4	130	135	140	140	145	150	3
State & Local Govt.	55	9	60	65	70	70	75	80	6
Misc. Industries	16	-6	15	15	14	13	13	12	-4
Cross-Industry Markets	1,776	5	1,866	1,957	2,053	2,161	2,257	2,406	5
Accounting	757	4	790	820	850	890	920	1,000	5
Education & Training	55	2	56	56	58	60	61	62	2
Engineering & Scientific	146	8	158	170	185	200	215	230	8
Human Resources	265	6	280	295	310	325	340	360	5
Office Systems	163	2	166	170	173	176	180	184	2
Planning & Analysis	200	8	216	233	252	270	287	300	7
Other Cross-Industry (Sales/Marketing)	190	5	200	213	225	240	254	270	6

EXHIBIT B-4

Minicomputer Applications Software Products
User Expenditure Forecast by Market Sector, 1991-1997

Market Sector	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Delivery Mode Total	5,375	9	5,846	6,365	6,907	7,502	8,158	8,878	9
Vertical Industry Markets	3,482	9	3,811	4,199	4,589	5,026	5,504	6,043	10
Discrete Manufacturing	1,046	11	1,158	1,263	1,389	1,522	1,685	1,865	10
Process Manufacturing	207	12	231	251	275	305	337	374	10
Transportation	105	9	114	124	135	147	156	166	8
Utilities	65	8	70	78	86	95	102	115	10
Telecommunications	82	22	100	122	149	182	222	270	22
Retail Distribution	113	10	124	137	151	164	177	189	9
Wholesale Distribution	122	12	137	152	168	186	200	220	10
Banking & Finance	653	4	678	780	853	934	1,027	1,126	11
Insurance	119	5	125	128	132	135	138	142	3
Medical	290	9	316	344	375	409	449	489	9
Education	167	8	180	201	214	224	240	255	7
Business Services	216	9	236	256	278	303	325	354	8
Federal Government	175	20	210	220	235	250	265	285	6
State & Local Govt.	35	14	40	45	45	60	65	70	12
Misc. Industries	87	6	92	98	104	110	116	123	6
Cross-Industry Markets	1,893	8	2,035	2,166	2,318	2,476	2,654	2,835	7
Accounting	560	7	600	630	670	710	750	800	6
Education & Training	26	4	27	27	28	28	29	29	1
Engineering & Scientific	241	10	265	290	320	350	390	425	10
Human Resources	256	7	275	295	320	345	375	400	8
Office Systems	565	8	610	660	710	768	830	895	8
Planning & Analysis	170	5	178	180	180	180	180	180	0
Other Cross-Industry (Sales/Marketing)	75	6	80	84	90	95	100	106	6

EXHIBIT B-5

Workstation/PC Applications Software Products
User Expenditure Forecast by Market Sector, 1991-1997

Market Sector	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Delivery Mode Total	8,587	16	9,982	11,796	14,068	16,616	19,863	24,085	19
Vertical Industry Markets	4,105	17	4,813	5,786	6,968	8,361	9,938	11,860	2
Discrete Manufacturing	538	22	656	825	1,025	1,281	1,590	1,958	24
Process Manufacturing	219	21	265	330	406	496	605	725	22
Transportation	142	18	168	199	234	274	332	421	20
Utilities	91	15	105	123	145	170	201	227	17
Telecommunications	88	25	110	137	172	215	269	336	25
Retail Distribution	108	18	127	150	177	210	250	298	19
Wholesale Distribution	160	22	195	242	300	372	460	553	23
Banking & Finance	489	4	509	585	639	699	781	866	11
Insurance	390	12	437	525	688	865	1,031	1,222	23
Medical	326	27	414	530	684	889	1,140	1,404	28
Education	420	14	478	546	620	700	793	900	13
Business Services	545	21	659	797	961	1,156	1,332	1,569	19
Federal Government	380	18	450	520	595	675	745	920	15
State & Local Govt.	75	20	90	110	135	150	175	200	17
Misc. Industries	134	12	150	167	187	209	234	261	12
Cross-Industry Markets	4,482	15	5,169	6,010	7,100	8,255	9,925	12,225	19
Accounting	933	13	1,050	1,200	1,400	1,600	1,900	2,400	18
Education & Training	120	8	130	140	155	175	205	240	13
Engineering & Scientific	264	15	303	350	400	460	530	610	15
Human Resources	173	21	210	260	320	390	500	640	25
Office Systems	1,672	13	1,896	2,165	2,550	2,900	3,500	4,360	18
Planning & Analysis	1,250	20	1,500	1,800	2,160	2,590	3,110	3,730	20
Other Cross-Industry (Sales/Marketing)	70	14	80	95	115	140	180	245	25

EXHIBIT B-6

Turnkey Systems
User Expenditure Forecast by Market Sector, 1991-1997

Market Sector	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Delivery Mode Total	11,403	9	12,483	13,594	14,642	15,736	16,997	18,402	8
Vertical Industry Markets	10,260	10	11,282	12,334	13,317	14,342	15,525	16,833	8
Discrete Manufacturing	2,798	11	3,097	3,404	3,727	4,084	4,509	4,975	10
Process Manufacturing	558	10	614	676	744	817	899	990	10
Transportation	277	9	302	332	366	402	448	495	10
Utilities	94	11	104	115	126	139	153	168	10
Telecommunications	472	12	529	592	664	743	832	932	12
Retail Distribution	707	7	754	804	858	915	992	1,061	7
Wholesale Distribution	487	7	522	559	604	653	683	731	7
Banking & Finance	965	5	1,010	1,162	1,272	1,370	1,485	1,599	10
Insurance	301	5	316	331	344	358	374	396	5
Medical	994	7	1,060	1,116	1,161	1,192	1,269	1,332	5
Education	231	7	247	265	283	303	324	347	7
Business Services	810	9	885	962	1,045	1,129	1,235	1,346	9
Federal Government	900	25	1,125	1,245	1,290	1,340	1,375	1,450	5
State & Local Govt.	175	11	195	215	240	265	290	315	10
Misc. Industries	491	6	522	556	593	632	657	696	6
Cross-Industry Markets	1,143	5	1,201	1,260	1,325	1,394	1,472	1,569	5
Accounting	435	3	450	460	475	490	505	520	3
Education & Training	110	9	120	130	140	155	170	200	11
Engineering & Scientific	123	5	129	136	142	149	157	167	5
Human Resources	84	1	85	90	90	90	90	95	2
Office Systems	116	3	120	120	125	125	130	130	2
Planning & Analysis	0	0	0	0	0	0	0	0	0
Other Cross-Industry (Sales/Marketing)	275	8	297	324	353	385	420	457	9

B

Forecast Reconciliation

The forecast reconciliations for applications software and turnkey systems are shown in Exhibits B-7 through B-12.

EXHIBIT B-7

1992 Data Base Reconciliation
Applications Software Products and Turnkey Systems

Delivery Mode	1992 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Sofware and Turnkey Systems	31,318	30,325	-993	-3	55,440	51,687	-3,753	-7	12	11
Turnkey Systems	11,476	11,403	-73	-1	17,410	16,997	-413	-2	9	8
-Equipment	5,273	5,359	86	2	6,980	6,799	-181	-3	6	5
-Software	4,326	4,219	-107	-3	7,010	6,820	-190	-3	10	10
• Apps. SW	3,734	3,628	-106	-3	6,224	6,010	-214	-3	11	11
• Systems SW	592	591	-1	0	786	810	24	3	6	7
-Prof. Services	1,877	1,825	-52	-3	3,420	3,378	-42	-1	13	13
Applications SW	19,842	18,922	-920	-5	38,030	34,690	-3,340	-9	14	13
-Mainframe	5,315	4,960	-355	-7	7,260	6,669	-570	-8	6	6
-Minicomputer	5,749	5,375	-374	-7	9,155	8,158	-997	-11	10	9
-Workstation/PC	8,778	8,587	-191	-2	21,615	19,863	-1,752	-8	20	18

EXHIBIT B-8

1992 Data Base Reconciliation
Applications Software Products Market

Market Sector	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Applications Software Products Market	19,842	18,922	-920	-5	38,030	34,690	-3,340	-9	14	13
Vert. Ind. Markets	10,894	10,771	-123	-1	20,643	19,854	-789	-4	14	13
Discr. Mfg.	1,967	1,967	0	0	3,799	3,799	0	0	14	14
Process Mfg.	595	595	0	0	1,198	1,198	0	0	15	15
Transportation	390	387	-3	0	661	670	+9	+1	11	12
Utilities	202	201	-1	0	366	367	+1	0	13	13
Telecomm.	378	344	-34	-9	930	841	-89	-10	20	20
Retail Distribution	272	270	-2	0	506	493	-13	-3	13	13
Wholesale Distr.	527	527	0	0	958	958	0	0	13	13
Banking & Finance	2,270	2,040	-230	-10	3,480	3,102	-378	-11	9	9
Insurance	852	826	-26	-3	1,750	1,590	-160	-9	15	14
Medical	985	985	0	0	2,089	2,089	0	0	16	16
Education	676	667	-9	-1	1,143	1,123	-20	-2	11	11
Business Services	880	880	0	0	1,791	1,791	0	0	15	15
Federal Govt.	520	680	160	31	1,316	1,155	-161	-12	20	11
State & Local Govt.	143	165	22	15	293	315	22	8	15	14
Misc. Industries	237	237	0	0	363	363	0	0	9	9
Cross-Ind. Markets	8,948	8,151	-797	-9	17,387	14,836	-2,551	-15	14	13
Accounting	2,250	2,250	0	0	3,992	3,570	-422	-11	12	10
Ed. & Training	242	201	-41	-17	558	295	-263	-47	18	8
Eng. & Scientific	651	651	0	0	1,344	1,135	-209	-16	16	12
Human Resources	694	694	0	0	1,242	1,215	-27	-2	12	12
Office Systems	2,250	2,400	150	7	4,552	4,510	-42	-1	15	13
Planning & Analy.	2,375	1,620	-755	-32	4,756	3,577	-1,179	-25	15	17
Other Cross-Ind. (Sales/Marketing)	486	335	-151	-31	943	534	-409	-43	14	10

EXHIBIT B-9

1992 Data Base Reconciliation
Mainframe Applications Software Products Market

Market Sector	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Mainframe Applications Software Products Market	5,315	4,960	-355	-7	7,260	6,669	-591	-8	6	6
Vert. Ind. Markets	3,306	3,184	-122	-4	4,670	4,412	-258	-6	7	7
Discrete Mfg.	383	383	0	0	524	524	0	0	6	6
Process Mfg.	169	169	0	0	225	256	31	14	6	9
Transportation	143	140	-3	-2	182	182	0	0	5	5
Utilities	46	45	-1	-2	64	64	0	0	7	7
Telecom.	184	174	-10	-5	370	350	-20	-5	15	15
Retail Distribution	48	49	1	2	63	66	3	5	6	6
Wholesale Distr.	245	245	0	0	298	298	0	0	4	4
Banking & Finance	1,010	898	-112	-11	1,540	1,294	-246	-16	9	8
Insurance	327	317	-10	-3	438	421	-17	-4	6	6
Medical	369	369	0	0	500	500	0	0	6	6
Education	82	80	-2	-2	91	90	-1	-1	2	2
Business Services	119	119	0	0	134	134	0	0	2	2
Federal Govt.	110	125	15	14	151	145	-6	-4	5	3
State & Local Govt.	55	55	0	0	77	75	-2	-3	7	6
Misc. Industries	16	16	0	0	13	13	0	0	-4	-4
Cross-Ind. Markets	2,009	1,776	-233	-12	2,590	2,257	-333	-13	5	5
Accounting	757	757	0	0	920	920	0	0	4	4
Ed. & Training	40	55	15	38	46	61	15	33	3	2
Eng. & Scientific	146	146	0	0	215	215	0	0	8	8
Human Resources	265	265	0	0	338	340	2	1	5	5
Office Systems	163	163	0	0	176	180	4	2	2	2
Planning & Analy.	447	200	-247	-55	627	287	-340	-54	7	7
Other Cross Ind. (Sales/Marketing)	191	190	-1	0	268	254	-14	-5	7	6

EXHIBIT B-10

1992 Data Base Reconciliation
Minicomputer Applications Software Products Market

Market Sector	1991 Market				1996 Market				91-96 CAGR per data 90 rpt (%)	91-96 CAGR per data 91 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Minicomputer Applications Software Products Market	5,749	5,375	-374	-7	9,155	8,158	-977	-11	10	9
Vert. Indus. Mkts.	3,550	3,482	-68	-2	5,654	5,504	-150	-3	10	10
Discr. Mfg.	1,046	1,046	0	0	1,685	1,685	0	0	10	10
Process Mfg.	207	207	0	0	356	337	-19	-5	11	10
Transportation	105	105	0	0	156	156	0	0	8	8
Utilities	65	65	0	0	102	102	0	0	9	9
Telecom.	93	82	-11	-12	251	222	-29	-12	22	22
Retail Distribution	124	113	-11	-9	205	177	-28	-14	11	9
Wholesale Distr.	122	122	0	0	200	200	0	0	10	10
Banking & Finance	720	653	-67	-9	1,085	1,027	-58	-5	9	9
Insurance	123	119	-4	-3	145	138	-7	-5	3	3
Medical	290	290	0	0	449	449	0	0	9	9
Education	171	167	-4	-2	252	240	-12	-5	8	8
Business Services	216	216	0	0	325	325	0	0	9	9
Federal Govt.	150	175	25	16	270	265	-5	-2	12	9
State & Local Govt.	31	35	4	13	57	65	8	14	13	13
Misc. Industries	87	87	0	0	116	116	0	0	6	6
Cross-Ind. Mkts.	2,199	1,893	-306	-14	3,501	2,654	-847	-24	10	7
Accounting	560	560	0	0	750	750	0	0	6	6
Ed. & Training	26	26	0	0	36	29	-7	-19	7	2
Eng. & Scientific	241	241	0	0	415	390	-25	-6	11	10
Human Resources	256	256	0	0	376	375	-1	0	8	8
Office Systems	634	565	-69	-11	1,190	830	-360	-30	13	8
Planning & Analy.	353	170	-183	-52	526	180	-346	-66	8	1
Other Cross-Ind. (Sales/Marketing)	129	75	-54	-42	208	100	-108	-52	1-	6

EXHIBIT B-11

1992 Data Base Reconciliation
Workstation/PC Applications Software Products Market

Market Sector	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Workstation Applications Software Products Market	8,778	8,587	-191	-2	21,615	19,863	-1,752	-8	20	18
Vert. Ind. Markets	4,038	4,105	67	2	10,319	9,938	-381	-4	21	19
Discrete Mfg.	538	538	0	0	1,590	1,590	0	0	24	24
Process Mfg.	219	219	0	0	617	605	-12	-12	23	23
Transportation	142	142	0	0	323	332	9	3	18	19
Utilities	91	91	0	0	200	201	1	0	17	17
Telecom.	101	88	-13	-13	309	269	-40	-13	25	25
Retail Distribution	100	108	8	8	238	250	12	5	19	18
Wholesale Distr.	160	160	0	0	460	460	0	0	24	24
Banking & Finance	540	489	-51	-9	855	781	-74	-9	10	10
Insurance	402	390	-12	-3	1,167	1,031	-136	-12	24	21
Medical	326	326	0	0	1,140	1,140	0	0	28	28
Education	423	420	-3	0	800	793	-7	0	14	14
Business Services	545	545	0	0	1,332	1,332	0	0	20	20
Federal Govt.	260	380	120	46	895	745	-150	-17	28	14
State & Local Govt.	57	75	18	32	159	175	16	10	23	18
Misc. Industries	134	134	0	0	234	234	0	0	12	12
Cross-Ind. Markets	4049	4,482	433	11	11,296	9,925	-1,371	-12	19	17
Accounting	771	933	162	21	2,322	1,900	-422	-18	20	15
Ed. & Training	146	120	-26	-18	476	205	-271	-57	22	11
Eng. & Scientific	218	264	46	21	714	530	-184	-26	22	15
Human Resources	144	173	29	20	528	500	-28	-5	25	24
Office Systems	1,297	1,672	375	29	3,186	3,500	314	9	17	16
Planning & Analy.	1,335	1,250	-85	-6	3,603	3,110	-493	-14	18	20
Other Cross-Ind. (Sales/Marketing)	138	70	-68	-49	467	180	-287	-61	23	21

EXHIBIT B-12

1992 Data Base Reconciliation
Turnkey Systems Market

Market Sector	1991 Market				1996 Market				91-96 CAGR per data 90 rpt (%)	91-96 CAGR per data 91 rpt (%)
	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($M)	1992 Report (Fcst) ($M)	Variance from 1991 Report ($M)	Variance from 1991 Report (%)		
Total Turnkey Systems Market	11,474	11,403	-71	-1	17,410	16,997	-413	-2	9	8
Vert. Ind. Markets	10,063	10,260	197	2	15,500	15,525	25	0	9	9
Discrete Mfg.	2,798	2,798	0	0	4,715	4,509	-206	-4	11	10
Process Mfg.	568	558	-10	-2	1,000	899	-101	-10	12	10
Transportation	275	277	2	1	443	448	5	1	10	15
Utilities	93	94	1	1	172	153	-19	-11	13	10
Telecom.	519	472	-47	-9	931	832	-99	-11	12	12
Retail Distribution	707	707	0	0	992	992	0	0	7	7
Wholesale Distr.	487	487	0	0	683	683	0	0	7	7
Banking & Finance	1,000	965	-35	-4	1,460	1,485	25	2	8	9
Insurance	311	301	-10	-3	397	374	-23	-6	5	4
Medical	994	994	0	0	1,269	1,269	0	0	5	5
Education	231	231	0	0	324	324	0	0	7	7
Business Services	810	810	0	0	1,235	1,235	0	0	9	9
Federal Govt.	612	900	288	47	938	1,375	437	47	9	9
State & Local Govt.	167	175	8	5	284	290	6	2	11	11
Misc. Industries	491	491	0	0	657	657	0	0	6	6
Cross-Ind. Markets	1,411	1,143	-268	-19	1,910	1,472	-438	-23	6	5
Accounting	435	435	0	0	504	505	1	0	3	3
Ed. & Training	182	110	-72	-40	293	170	-123	-42	10	9
Eng. & Scientific	123	123	0	0	173	157	-16	-8	7	5
Human Resources	84	84	0	0	92	90	-2	2	2	1
Office Systems	66	116	50	75	73	130	57	78	2	2
Planning & Analy.	50	0	-50	-100	50	0	-50	-100	0	0
Other Cross-Ind. (Sales/Marketing)	471	275	-196	-42	725	420	-305	-42	9	9

Applications Software:

- In looking at the applications software market as a whole, there was an overall negative variance of 5% for 1991 as compared with our projections last year. This variance was generally the result of lingering effects of the recession in some sectors, over-optimistic projections in others and the maturity of certain software products. The cumulative effect of the adjustment is a negative variance of 9% in 1996 as compared with last year's projections.

- Despite adjustments mentioned above, the CAGR for applications software for 1992-1997 is projected at 14%, which is the same as projected last year for the 1991-1996 timeframe.

- The industry-specific sectors where 1991 revenues were less than projected included the federal government, banking and finance, and insurance. All have experienced significant financial setbacks as a result of the economy. For banking and insurance, CAGRs for 1992-1997 are expected return to previously projected levels of 10% and 15% respectivly. For the federal government, the CAGR was adjusted downward to 11% to reflect ongoing budgetary cutbacks.

- Telecommunications, while achieving expenditures 9% below projections for 1991, is expected to have application solutions growth of 20% for 1992-1997.

- In the cross-industry markets, negative variances in 1991 of 32%, 31% and 17% were realized for planning and analysis, sales and marketing, and education and training. In the first two categories, CAGRs are healthy at 17% and 12% respectively. The CAGR for education and training is 9%.

- While variances were noted at all platform levels, lower-than-expected growth was more prevalent at the mainframe and minicomputer level.

Turnkey Systems:

- For turnkey systems, 1991 expenditures were 1% less than projected overall. Expenditures in 1996 vary by only -2% as compared with last year's projections.

- Industry-specific variances for 1991 were focused on transportation (-17%), telecommunications (-9%) and banking and finance (-4%). Expenditures for the federal government sector in 1991 were 47% more than projected due to implementation of large desktop projects during that time period. The CAGR for the federal government for 1992-1997, however, has been reduced to 5% from the 9% projected last year due to budget problems.

- In the cross-industry area, negative variances for 1991 were found in education and training along with planning and analysis, which has essentially ceased to exist in a turnkey format. Office systems expenditures were higher than expected.