MAPPA

INPUT

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March 19, 1992

Mr. Dave Richards
Director of Product Marketing
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Dear Mr. Richards:

Thank you for your participation in INPUT's research several months ago on trends and issues in planning and analysis applications software products. The results of the research have been published in a report, *Cross-Industry Markets, 1991-1996: Planning and Analysis Sector* which is part of INPUT's Market Analysis Program.

Enclosed are research bulletins on applications software products research which you may find interesting.

If you have any questions or would like more information on our report, please do not hesitate to call.

Sincerely,

C. Frances Borison

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Senior Consultant

CFB:bf

Enclosure

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March —

~~January~~ , 1992

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Sincerely,

Frances Borison
Senior Consultant

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Send 2 research Bulletins — MAP, Vol. II, No. 22 and 23

1/9/92

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11/7/91

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Market
Analysis
Program
(MAP)

Cross-Industry Markets 1991-1996

Planning and Analysis Sector

INPUT®

1280 Villa Street, Mountain View, CA 94041, (415) 961-3300

NOVEMBER 1991

CROSS-INDUSTRY MARKETS 1991-1996

PLANNING AND ANALYSIS SECTOR

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Introduction

Introduction

The planning and analysis cross-industry sector report is written each year by INPUT as one of seven reports on cross-industry sectors of the U.S. information services industry. The seven cross-industry sectors are:

1. Engineering and Scientific
2. Accounting
3. Human Resources
4. Planning and Analysis
5. Education and Training
6. Office Systems
7. Other Cross-Industry

These reports are included as part of INPUT's Market Analysis Program (MAP), a planning service for information services vendors.

A
Purpose and Organization

1. Purpose

The objectives of this cross-industry report are to:

- Introduce the reader to the planning and analysis cross-industry sector
- Identify the business and technological issues and trends that are driving the use of information services for the planning and analysis cross-industry sector
- Forecast user expenditures during the next five years on information services for the planning and analysis cross-industry sector
- Discuss the competitive environment and profile leading vendors in the planning and analysis cross-industry sector

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.

EXHIBIT I-1

Cross-Industry Sector Report Format

I. Introduction
- Introduce and define each of the cross-industry sectors.

II. Trends, Events and Issues
- An overview of the business climate within the cross-industry sectors and the information services industry as a whole.

III. Information Systems Environment
- The user perspective as it relates to information systems for the cross-industry sectors.

IV. Information Services Market Forecast
- Presentation of the information services market forecasts by delivery mode and submode for each of the seven cross-industry sectors.

V. Competitive Environment
- Discussion of the competitive environment for information services within each of the cross-industry sectors, and vendor profiles.

VI. Conclusions and Recommendations
- A summary of risks and opportunities.

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

Note: For definitions, the reader is referred to INPUT's *Definition of Terms* found in the overview binder of the Market Analysis Program.

Chapters I, II and III are common to all cross-industry sectors. Chapters IV, V and VI are written specifically for each of the seven individual sectors. Appendix A, Forecast Data Base, is also provided specifically for each of the seven cross-industry sectors.

B
Definitions

This report addresses the U.S. information services industry for the planning and analysis cross-industry sector. It includes user expenditures that are noncaptive (generally available to vendors). Many large organizations have portions of their information services requirements satisfied by internal divisions. The resulting expenditure is not available for competitive bid by the general vendor community and is not included in INPUT's projections.

1. Cross-Industry Sector Definitions

INPUT defines cross-industry information services as packaged functional application solutions that are used by multiple industry sectors. In other words, these application solutions are not verticalized. For example, accounting, and planning and analysis are functions that are similar enough across all industries to be considered markets in their own right for nonverticalized application solutions.

Planning and analysis tools support four application areas: Executive Information Systems (EIS), financial modeling or planning systems, spreadsheets, and project management.

a. Executive Information Systems (EISs)

EIS software began as an application or a tool for summarizing and storing existing data in a specialized data base that supported on-demand queries from the user. The goal was to turn data into information and make it available on demand in character and then graphical form. This was accomplished by linking the power of a relational data base on a host to the ease of use and presentation capabilities of the personal computer. Users tended to be adventuresome senior executives.

Now, in addition to yielding specialized information, EISs have become the executive's interface to E-mail, a variety of personal job aides and external data services. The development and implementation tasks have expanded, and the EIS software product has become a tool kit rather than an application.

b. Financial Modeling and Planning

Financial modeling is a generic decision support tool rather than a specific application-based tool for calculating "the answer." Financial modeling tools have functions such as time series analysis and forecasting, econometrics forecasting, and risk management and are also generalized tool kits for building customized analytical tools. Excluded from modeling and planning are specialized accounting-based software and bookkeeping systems, or programs that are specific to the banking and finance industry. However, income statements, for example, could be created by using a financial modeling tool kit.

c. Spreadsheets

Spreadsheets are by far the largest application, accounting for over $150 million of total user expenditures on planning and analysis tools. Spreadsheets have been around practically as long as the PC has, and are responsible for the rapid growth in use of PCs during the 1980s. Competition is heating up and products are continually upgraded. Enhancements include file linking to worksheet consolidation, three-dimensionality, data base connectivity, improved worksheet publishing, and interoperability across platforms.

Integrated software products that include word processing, presentation text, graphics, and DBMSs with a spreadsheet core are also considered part of the spreadsheet subsector within the planning and analysis sector.

d. Project Management

Whereas EISs, financial modeling, and spreadsheets are unstructured decision support tools, project management works best for structured projects that have solid deadlines and clearly defined activities. Project management programs structure the various parts of a job, integrating interim deadlines and limited resources so that all of the pieces fit together properly.

2. Delivery Mode Definitions

Cross-industry application solutions are delivered via applications software products, turnkey systems and transaction processing services. Management support information services such as systems operations, systems integration, professional services, information delivery services and systems software are excluded from cross-industry consideration.

a. 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 in two submodes.

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

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

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

b. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom application software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and support services provided. Many CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

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

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

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

Turnkey systems have three components:

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

c. Processing Services

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

- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process transactions and update client data bases. Transactions may be entered in one of four modes:
  - *Interactive* - Characterized by the interaction of the user with the system for data entry, transaction processing, problem solving and report preparation; the user is on-line to the programs/files stored on the vendor's system.
  - *Remote Batch* - Where the user transmits batches of transaction data to the vendor's system, allowing the vendor to schedule job execution according to overall client priorities and resource requirements.
  - *Distributed Services* - Where users maintain portions of an application data base and enter or process some transaction data at their own site, while also being connected through communications networks to the vendor's central systems for processing other parts of the application.
  - *Carry-in Batch* - Where users physically deliver work to a processing services vendor.
- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and/or data bases, enabling clients to develop their own programs or process data on the vendor's system.
- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

For a more complete discussion of INPUT's information services industry structure and market sector definitions please refer to INPUT's *Definition of Terms* found in the overview binder of the Market Analysis Program.

C
Related Reports

Related reports of possible interest to the reader include:

1. U.S. Markets

- *Cross-Industry Market Reports*
  - Accounting Sector, 1991-1996
  - Human Resources Sector, 1991-1996
  - Engineering and Scientific Sector, 1991-1996
  - Education and Training Sector, 1991-1996
  - Office Systems Sector, 1991-1996
  - Other Cross-Industry Sector, 1991-1996
- *U.S. Application Solutions Market Analysis Report, 1991-1996*
- *U.S. Processing Services Market Analysis Report, 1991-1996*
- *U.S. Industry Sector Markets, 1991-1996* (15 reports on all major industry sectors, e.g., insurance)

2. European Markets

- *The Western European Market for Computer Software and Services, 1991-1996*
- *Trends in Processing Services—Western Europe, 1991-1996*

Trends, Events, and Issues

II

Trends, Events, and Issues

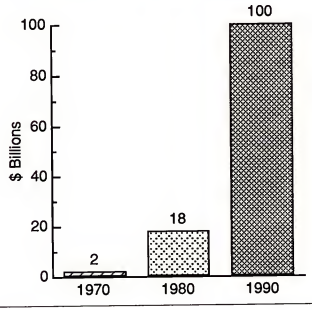
In this chapter INPUT provides an overview of the current business climate for the U.S. information services industry and for the delivery modes that comprise cross-industry application solutions. These are transaction processing services, applications software products and turn-key systems. The market forces and issues that are specific to this cross industry sector are dealt with in Chapters IV, V and VI of this report.

A
1990 Results

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

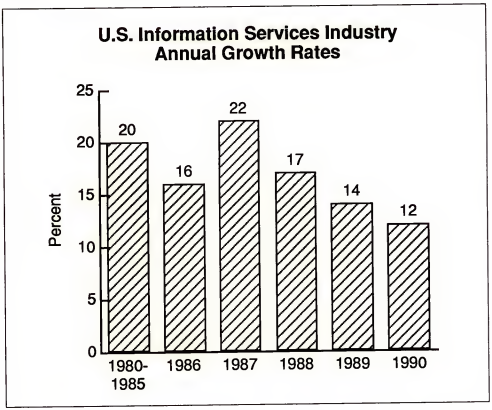
EXHIBIT II-1

U.S. Information Services Industry, 1970-1990



During 1990, the industry grew at just under 12%—from about $90 billion to $100 billion. As Exhibit II-2 indicates, 1990 growth rates reflect an intensification of a decline that started in 1989. The average annual growth during the first eight years of the decade was over 19%.

EXHIBIT II-2



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

On a delivery mode basis:

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

Exhibit II-3 summarizes 1990 results.

EXHIBIT II-3

U.S. Information Services Industry
1990 Results Summary

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

Growth in transaction processing services sold to cross-industry sectors fell to a level of 7% in 1990—lower than the growth during any year in the past decade. In several cross-industry sector markets—office systems and planning and analysis—growth rates for transaction processing services have been negative for the last two years.

Although there was wide variation in growth rates among the cross-industry sectors, total growth for cross-industry applications software products was 12% in 1990 compared to 21% in 1988.

User expenditure on turnkey systems sold to cross-industry sectors was only 5% higher in 1990 than 1989 and will maintain a low growth rate through 1996. The only cross-industry sector exhibiting moderately strong growth was the engineering and scientific sector, with a 12% increase in 1990.

B
Driving Forces

There are a number of fundamental forces impacting the information services industry in the 1991-1992 timeframe that will have measurable impact on the overall growth rate for the 1991-1996 five-year period covered by this market analysis report. Each force will affect the industry as a whole, as well as each of the eight delivery mode sectors used by INPUT to analyze the industry and its key trends.

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

EXHIBIT II-4

Information Services Industry
Primary Driving Forces, 1991-1996

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

C
Key Trends

1. Economic Impacts

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

- The inflation rate of the past few years has been much more modest than in the mid-1980s. INPUT forecasts and market sizes are in current dollars—thus lower inflation means lower growth.
- Real economic growth had been modest over the past few years prior to the recession that started in late 1990. Deferred and canceled expansion plans in all industry sectors certainly slow the expansion of information services expenditures.
- The shift of information processing to smaller computers lowers the software products investment, based on current pricing practices. Quantities of software products sold increase, but revenue levels grow at more modest rates.
- The shift of information processing to smaller computers also puts price pressures on processing services firms, who must then compete with downsized in-house solutions.

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

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

- At this point in 1991 (the fourth quarter), the economy remains in no-growth status, with some improvement expected by 1992. At the same time, inflationary pressures are modest. INPUT expects a modest growth year in 1991 and again in 1992. The expected slow upturn will have the following positive and negative impacts on the U.S. information services industry in the near term:

- Positive impacts include:

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

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

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

  - Decision processes are lengthened in a tight economy, causing deferral of major information systems projects.

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

The purchase of processing services tends to be a long-term decision. Business levels of processing services are tied to client usage agreements and will not experience significant cutbacks due to fluctuations in the economy. An opportunity exists in the sale of incremental capacity to companies wishing to delay hardware expenditures.

Applications software products markets—both cross-industry and industry specific—have felt few if any of the effects of a slowed economy. The fact that hardware sales will slow further in the short term due to the economy is offset by pressure on profits at end-user organizations; expenditure on software that is viewed as improving productivity and/or cutting costs is likely to experience growth even with a weakened economy.

Turnkey systems vendors, however, are experiencing moderately adverse effects from the slowdown in the economy.

- Hardware purchases are put on hold—and hardware is a key ingredient of the turnkey solution.

- VARs and turnkey vendors that sell predominantly to small companies will experience the adverse effects of an economic downturn as smaller firms are the first to cut back on capital expenditures.

Turnkey and VAR service contracts and support services, however, have not been negatively impacted by a slowed economy. In fact, this portion of their business is expanding as customers look for ways to leverage the products they already have.

2. Globalization

INPUT has cited globalization as a driving force for the past three years. During that time markets have opened, vendors have expanded their international focus, and users have begun to expect global capabilities.

- The European market is making progress toward a single market. Now 1992 is less than a year away and many changes are apparent. In addition, the European market is stronger than the U.S. market, although both are suffering in the current economy.

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

A high percentage of U.S. processing services firms' revenues is U.S.-based and is likely to remain so. For example, 95% of ADP's revenue is derived from the U.S. ADP is the largest transaction processing services firm, with revenues that are almost double the revenues of its nearest competitor.

Applications software products vendors, on the other hand, are rapidly expanding their revenues from non-U.S. sources. The following are notable examples of software firms expanding their presence in international markets:

- Computer Associates' net income from foreign operations was 28% of its total net income for 1990.
- Microsoft's international sales were 55% of total fiscal 1990 revenues.
- Oracle's international sales are now 49% of total revenues and edging up.

The largest turnkey systems vendors are also expanding their international presence. For example, Intergraph's non-U.S. revenues are now approaching 50% of total revenues.

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

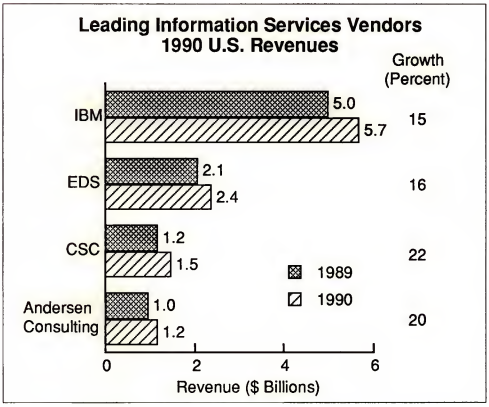
The primary negative impact from globalization is that it may make it harder for smaller vendors to grow and/or maintain independence.

3. Influence of Large Vendors

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

- The newer systems integration and systems operations sectors, though smaller than more traditional sectors such as professional services and processing services, are growing faster than the traditional sectors and are dominated by the leading vendors.
- A number of larger vendors are growing faster than the overall market. Exhibit II-5 lists four of the largest information services vendors that can be considered multi- or full-service vendors and reveals their U.S. 1989 and 1990 information services revenues. All four increased information services revenues by at least 15%, greater than industry growth as a whole.
- Certainly there are numerous smaller firms that are also growing faster than the general market, but overall, the dominance of the larger vendors is increasing.

EXHIBIT II-5



Size is becoming more important, as a predictor of both survival and the level of support an applications software products or a turnkey systems vendor can deliver to its customers.

Although there are few barriers to entry in the software arena, it is questionable whether a small software company or VAR can remain viable without alliances. VARs and the smaller turnkey systems vendors are at a disadvantage in terms of geographic reach. They may have the best software for a specialized niche, but no way to expand their customer base; marketing alliances are a key requirement for growth.

Small companies can no longer expect to survive on their own in the long term. Such companies need a broader distribution reach, and the advertising, marketing and public relations that only a larger buyer can provide. Size alone provides far greater benefits to the business side of a software operation than it does to product idea generation.

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

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

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

- As hardware profits decline, large hardware vendors are reorganizing in order to be more responsive to growing markets for software and services. DEC, for example, created its Software Products Group last year; and Sun has reorganized to create two software subsidiaries—one to develop more software and peripheral products and one to improve the UNIX operating system. IBM has also recently reorganized in order to grow its software and services business.

- Consolidation is also a factor. Mergers among the major accounting firms have reduced the number of players, but have given two of the firms (Ernst & Young and Deloitte Touche) added resources to follow the example of Andersen Consulting. A third—Price Waterhouse—is also experiencing significant growth in its information technology-based business.

Large transaction processing services vendors continue to acquire smaller regional and local firms, but not at the rate of previous years.

Applications software vendors will continue to consolidate as more emphasis is placed on integration and interoperability. Applications software products firms are not only acquiring each other, but are also acquiring firms that have new technology bases—such as transaction processing data bases and client/server CASE tools—that are of paramount importance to the growing need to develop better applications software products based on new technologies.

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

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

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

This bodes well for turnkey systems vendors and VARs whose added expertise in vertical niches is the basis of their success. It also bodes well for continued growth in industry-specific applications software products. However, increasing emphasis on specialization will have a negative

impact on turnkey vendors who compete as cross-industry sector vendors. And provision of tools for easy customization and integration will become increasingly important to success for vendors with cross-industry applications software products.

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

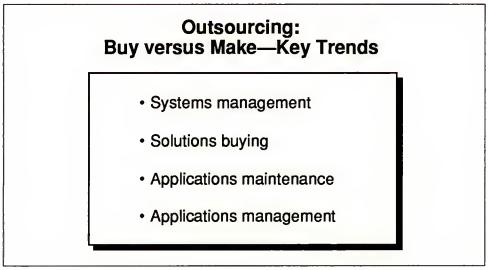
- Positive impacts include:
  - The larger vendors have the financial strength to minimize the risk of systems management services.
  - The larger vendors have financial resources available to invest in new technologies, often through investment in smaller and specialized firms.
  - A common set(s) of standards are more likely—IBM's SAA and DEC's NAS for example—which will cause conformity in the marketplace, more consolidation, eventual interoperability and portability.
- Negative impacts include:
  - Alliances may become a requirement for smaller technology firms to survive and prosper.
  - The dominance of the larger vendors will continue to grow.
  - Larger vendors tend to move more slowly, which will hamper development and acceptance of new technology. This slowness will provide opportunity to small vendors that seize technology initiative.

4. Outsourcing (Buy versus Make)

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

Key trends in outsourcing are listed in Exhibit II-6.

EXHIBIT II-6



a. Systems Management

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

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

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

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

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

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

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

b. Solutions Buying

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

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

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

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

c. Applications Maintenance and Applications Management

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

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

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

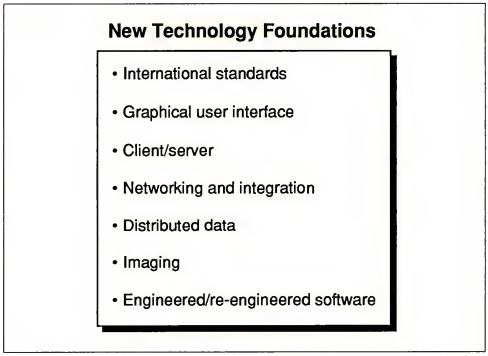
The trend toward outsourcing is creating new demand for the provision of additional services by applications software firms and turnkey systems vendors. Customers are beginning to want to pay vendors to maintain their software rather than hire their own people to do it. Increasing need for customization and integration is also creating new demand for outsourced services.

5. Shifting Technology Foundation

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

Exhibit II-7 lists the key elements of this shift in underlying technology. Each element is causing organizations to stop and rethink key aspects of their information systems infrastructure strategy. Rethinking can slow the adoption in the short term, and create new vendor opportunities over the longer term.

EXHIBIT II-7



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

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

- The user interface of the personal computer in its graphical pull-down menu and windowing form will be the only interface acceptable to users from now on. The text-based interfaces of the 1970s and 1980s will no longer be tolerated. Every major software product developer is re-engineering the user interfaces to its products. The widespread availability of easy-to-use graphical user interfaces will promote the use of application solutions by the general user base and will allow for use of more application solutions—both industry-specific and cross-industry—per user.

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

- The growing use of PCs, workstations, and LANs has mandated a move to integrate the information networks of large and small organizations. Today's networking products permit the distributed applications that have been discussed for years but were never possible.

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

PCs, workstations, LANs, DBMSs, and client/server technology have a potentially negative impact on transaction processing services vendors. Though such technologies may slow the growth of "conventional" transaction processing services, vendors that can adapt to them will gain a market

advantage. The challenges faced may be similar to those that occurred when timesharing services matured and then declined as companies provided internal capabilities and the age of the personal computer began. Looking back at that period may help processing services vendors find opportunities in the age of client/server technology.

Cross-industry and industry-specific applications software vendors are scrambling to develop RDBMS-based products to compete in the 1990s marketplace. Oracle launched this trend with its cross-industry financial applications software products. Vendors are writing products using general SQL tools and are teaming with RDBMS companies such as Ingres, Sybase, Gupta and Oracle to make their application solutions available across a range of RDBMSs and hardware platforms.

Applications software products vendors as well as hardware vendors will look to third parties, including turnkey systems vendors and VARs, as a way to distribute their new technology-based solutions. VARs and turnkey vendors will increasingly need to develop technological expertise as well as integration expertise in order to keep pace.

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

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

- Positive impacts from this shifting technology foundation include:
  - New types of solutions will become available.
  - The role of the end user in information systems can continue to expand.
  - Opportunities for new as well as existing vendors are created.
  - Application systems can be increasingly molded to the character of the organizations they support.
- Negative impacts are:
  - Any shift causes confusion and hesitation in the near term. The magnitude of the current technology shift could cause confusion and slow investment through the middle of the decade.

- The size of the task to shift to client/server technology in organizations with large centralized systems causes conflicting priorities between re-engineering and meeting new requirements.

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

- Growth is slowed while the new technology is understood and learned.

6. The Changing Buyer

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

This leadership has changed significantly in the past few years and promises to change even further. As integration becomes increasingly important the decision to purchase any given applications software product—be it cross-industry or industry-specific—will involve multiple departments/divisions and multiple levels of an organization. As the information services vendor moves to provide a full long-term service or a full solution, the general manager is becoming the buyer. The impacts are significant.

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

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

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

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

D
Summary

The year 1991 is exhibiting significant changes from the 1980s. The changes suggest more modest, but continued strong and stable growth for the information services industry.

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

- A market of $100 billion that is strongly impacted by the direction of the larger vendors should be expected to grow somewhat more slowly.
- The increasing tendency of larger organizations to turn to vendors for services that include real and significant elements of systems management and have a solutions orientation will lead to larger, longer term decisions—decisions that can take longer but have a lasting impact.
- The shift in the underlying technology foundation is for the better—more valuable and productive application solutions will result. But shifts bring re-engineering, reinvestment, and retraining, and require time and money.
- The role of the general manager concerning the deployment of information technology continues to increase. In many instances the general manager is more influential than the information systems manager, particularly regarding major decisions. Over time, the general manager's influence will have positive impacts on the size and growth of the information services industry—as long as the vendors provide satisfaction.

Information Systems Environment

III

Information Systems Environment

In order to better understand what was most on the minds of IS managers regarding applications software products, INPUT surveyed top computer executives in medium- to large-sized corporations. INPUT also conducted a series of telephone interviews with the respondents to obtain additional information about and clarification of some of the points in the written questionnaire. Turnkey systems and processing services were outside the scope of the survey.

The purpose of the questionnaire was to probe managers about specific areas of applications software products, such as their purchase plans, customization, product and vendor preferences, and key technology goals. INPUT was therefore able to test its previous conclusions about the marketplace as well as obtain additional insights.

Individuals completing the questionnaire were predominantly MIS directors and systems development and programming managers.

The views of 56 IS managers are tabulated and the results analyzed. Although large development budgets still exist, spending on packaged applications software products is healthy. Cross-industry products and products with little or no need for customization are generally preferred.

A
Demographics

Exhibits III-1 and III-2 show the distribution by vertical sector and revenues of the corporations that participated in the survey.

EXHIBIT III-1

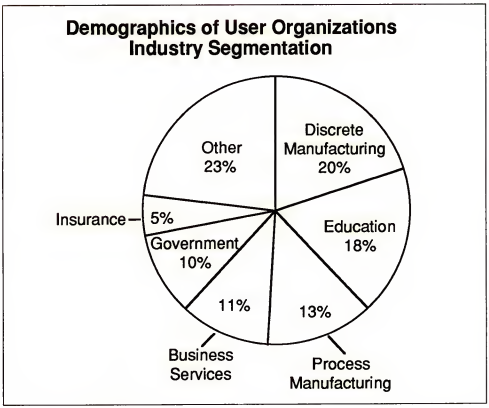
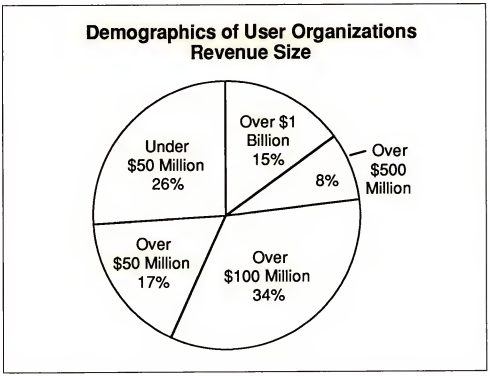


EXHIBIT III-2



- The mail survey included all industry segments. Industries with the greatest representation are: discrete manufacturing (20%), education (18%), and process manufacturing (13%). The largest sectors within the "Other" category—each consisting of about 5% of the survey sample—are transportation, retail distribution, and banking and finance.

- Fifteen percent of respondents have revenues over $1 billion; about 35% of the companies have revenues between $100 million and $500 million; 24% are between $50 million and $100 million in revenues; and 26% are under $50 million in revenues.

Although the sample represents a cross-section of vertical markets and company sizes, the survey results have been analyzed in total rather than by industry sectors or size groupings.

B

Applications Software Products Purchase Plans

Respondents were asked questions about overall budget size, cross-industry and industry-specific product spending, spending by platform size, and spending for new versus existing applications software products.

1. Budget Size

Exhibit III-3 shows the distribution of applications software products budgets.

EXHIBIT III-3

Applications Software Products Budget

Budget Size	Percent of Respondents
Over $1 million	2
Over $500,000	6
Over $250,000	13
Over $100,000	27
Under $100,000	52

- On average, the applications software products budget for 1991 is $291,000.

- The average budget will grow to $360,000 in 1992, a healthy 24% increase.

- The expenditure growth from 1991 to 1992 is higher than INPUT expected. The weak economy does not appear to have had a negative impact on applications software products expenditures for this survey sample. In fact, when questioned further, respondents indicated that the selective installation of new applications software products—including downsized solutions—is viewed as a means of minimizing corporate costs and improving productivity. Corporate restructuring through downsizing or acquisition also creates a need for new application solutions. Thus an economic slowdown enhances rather than inhibits applications software expenditures.

- Respondents were asked to indicate whether or not these amounts encompass all applications software packages purchased or licensed for their entire organization. If not, they were asked what percentage of total purchases they estimated the amounts to be. Respondents indicated that the figures given were about 70% - 80% of the total for their entire organization. The actual average budget for 1991 could therefore conceivably be in the $350,000-$400,000 range, growing to $430,000 to $500,000 in 1992.

2. Cross-Industry versus Industry-Specific

Respondents were asked to estimate the percent of budget spent on cross-industry and industry-specific applications software products. To assure accurate responses, INPUT's definitions of cross-industry and industry-specific applications software products were included in the questionnaire as follows:

- Cross-Industry—Software products that perform a specific function applicable to a wide range of industry sectors. Examples are accounting, financial modeling, human resources, payroll, word processing, spreadsheets.

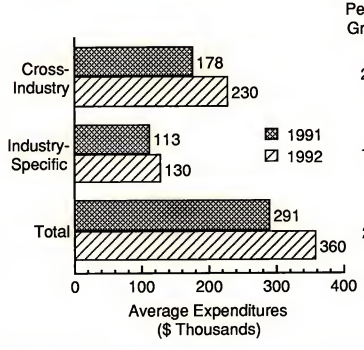
- Industry-Specific—Software products that perform functions related to solving needs unique to a specific vertical industry and sold to that industry only. Examples are portfolio management, MRPII, and medical record keeping.

- Data base management systems (DBMSs), graphical user interfaces such as Windows, and applications development tools, including CASE tools, are not considered applications software. Also excluded are processing services and network services.

Exhibit III-4 shows the respondents' average 1991 and 1992 budgets, broken out by these two categories.

EXHIBIT III-4

Cross-Industry versus Industry-Specific Applications Software Products Budgets



- Expenditures on cross-industry software do not only represent a higher percent of the budget; growth for 1992 is twice as high as for industry-specific software.

- Respondents with small or no industry-specific purchases had these comments:

  - They do not want to be locked into a specific solution they will have for years and are particularly reluctant to purchase industry-specific solutions, due to all the change under way in their industry as well as in the computer hardware and software industries.

  - Their needs are too specialized for industry-specific software and therefore they favor in-house development.

  - They want control over their software and want to be sure it can interoperate with what is already installed.

- The applications software selection for their type of hardware is meager.

- Too much customization would be required, which makes the software hard to maintain.

3. Expenditures by Platform Size

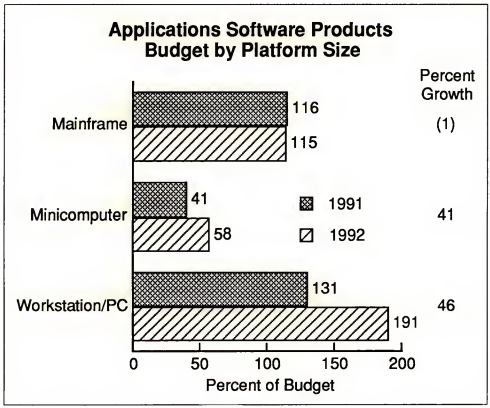
Respondents were asked to estimate the revenue percent split by platform size.

- As shown in Exhibit III-5, expenditure for applications software products that run on workstations and personal computers represents the largest proportion and is growing the fastest.

- Expenditure on minicomputer-based products represents the smallest proportion of the budget, but will be up 41% in 1992.

- Expenditures on mainframe-based applications software will be about the same in 1992 as in 1991.

EXHIBIT III-5



Respondents were then asked if the budget split by platform size is different for cross-industry and industry-specific applications software. Thirty-three percent indicated that the split was different, as shown in Exhibit III-6.

- For 33% of respondents, more is spent on cross-industry software for workstations and personal computers; and more is spent on industry-specific software for minicomputers.

EXHIBIT III-6

1991 Applications Software Products Budget by Cross-Industry/ Industry-Specific and Platform Size (33% of Respondents)

Platform	Percent of Respondents	
	Cross-Industry	Industry-Specific
Mainframe	45	46
Minicomputer	14	29
Workstation/PC	41	25
Total	100	100

Adding the responses of the 33% that said more is spent on cross-industry software for workstations/PCs (Exhibit III-6) to the 67% that did not notice any distinctions by platform size (Exhibit III-5) reveals the following (Exhibit III-7):

EXHIBIT III-7

1991 Applications Software Products Budget by Cross-Industry/ Industry-Specific and Platform Size (100% of Respondents)

Platform	Percent of Respondents	
	Cross-Industry	Industry-Specific
Mainframe	42	36
Minicomputer	14	21
Workstation/PC	44	43
Total	100	100

- For the survey sample as a whole, the only real distinction is that more industry-specific software is purchased for minicomputers; expenditures are 50% higher for minicomputer-based industry-specific software than for cross-industry software.

- For respondents in total, the split of cross-industry and industry-specific software running on workstations and personal computers is essentially the same.

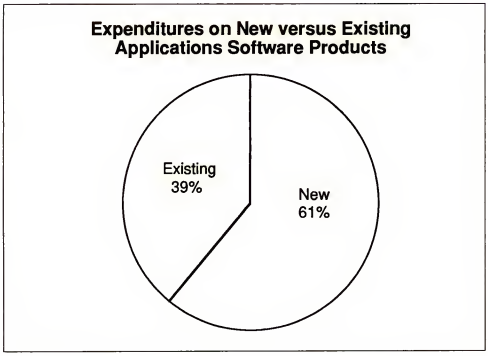
4. New versus Existing

Respondents were asked what percent was spent on new applications software packages versus maintenance and annual license fees for existing software. On average, 61% of their total 1991 budgets are for purchase of new applications software products and the remainder is for maintenance and annual license fees (Exhibit III-8). The percentage split is about the same for 1992.

- The percent spent on new purchases is noticeably higher than INPUT expected. Comparable INPUT data from other research indicates that this percentage is more in the range of 25%-30% spent on new applications software products and 70%-75% spent on maintenance/licensing fees.

- Plausible reasons for the seemingly high expenditure on new packages could be the continued shift towards PC spending and the significant number of small companies in the survey sample. Smaller companies are more likely to buy lower-cost software where maintenance costs are less significant.

EXHIBIT III-8



C

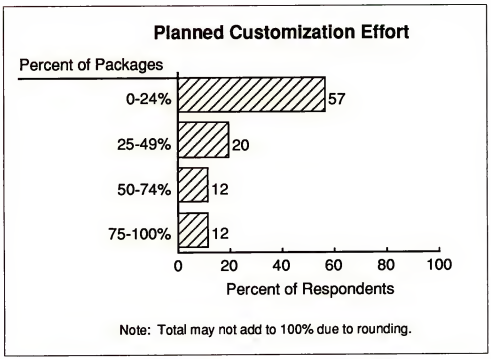
Planned Customization Effort

The question asked was, "Of all new applications software product purchases, what percentage of packages will you modify or customize?" The results are shown in Exhibit III-9.

- The majority of respondents will customize 25% or less of their purchases; only 12% of respondents will customize 75% or more of their applications software products. The average amount of customization is somewhere between 20%-30%.

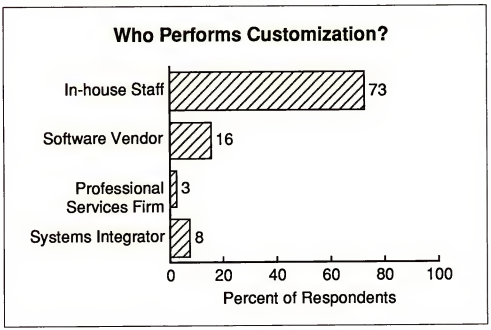
- Discussions with vendors reveal that vendors are increasing the customizability of their products and expanding their customization toolsets. Nonetheless, given responses to several of the other questions asked in this survey, users do not want to have to customize and they favor products that don't need it. In fact, as discussed in Section E below, easily customizable software is only a moderately important vendor selection criterion.

EXHIBIT III-9



- As shown in Exhibit III-10, of the customization that is performed, most is done in-house; only 25% is done by outside service vendors, including applications software firms. INPUT expects the amount performed by external service providers to increase.

EXHIBIT III-10



D

Total Applications Development Plans

- The average applications development budget for 1991 is $1.3 million, over four times greater than what is spent on packaged solutions. Therefore, even though purchase is on the increase, a great deal of applications development is still taking place.

- Overall, 52% of the budget is for enhancement/maintenance of existing systems and 48% is for development of new systems.

  - Responses ranged from a process manufacturer that purchases all of its applications software and a bank that purchases most of its software to a specialized business services firm that develops essentially all its company-specific applications software internally. The percent split may be dependent on vertical market and degree of need for specificity.

  - INPUT research in late 1990 indicated that 67% of budgets were for enhancement/maintenance and 33% for new development. Thus, the actual split may be about 60%/40%.

- Of the total applications development budget, an average of 63% is spent on internal development and 37% is spent on contracted professional services. Three respondents indicated that more than 70% of the total is spent on contracted services.

E

Product and Vendor Preferences

Respondents were asked to rank in order of significance seven specific reasons for purchasing new applications software products—1 being the most significant reason and 7 the least significant reason. Thus, a ranking of 3.5 indicates average significance within this set of criteria. The results are presented in Exhibit III-11.

- No single criterion ranked a 1, indicating lack of consensus about the single most important product selection criterion.

- New features are the most significant reason to purchase new applications software products and were rated 2.0 on average. For respondents, new features mean:

  - New functions not previously available and that they lack in-house expertise to develop

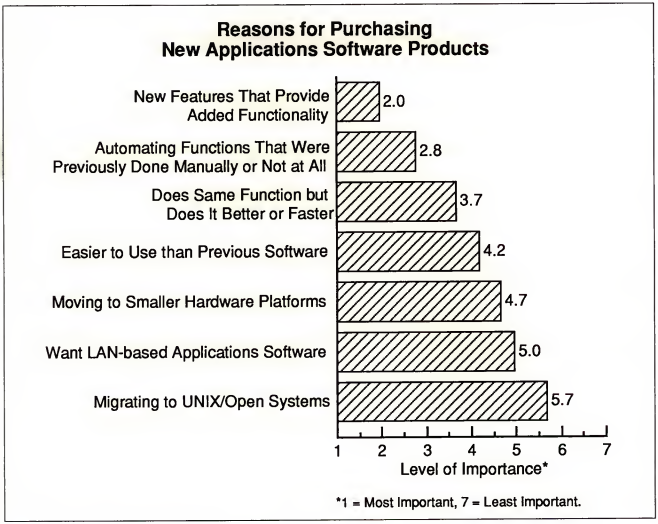
- Functions that decrease number of transactions necessary
- Portable across hardware platforms
- Expandability—meeting needs as company grows
- Interfaces to other application solutions

- Respondents ranked automating functions previously done manually as second in importance.

- The move toward smaller hardware platforms and the desire for LAN-based applications software ranked fifth and sixth of seven criteria. This is consistent with the relatively few mentions of downsizing and networking as key technology goals—23% and 27% of the respondents, respectively (see Section F below).

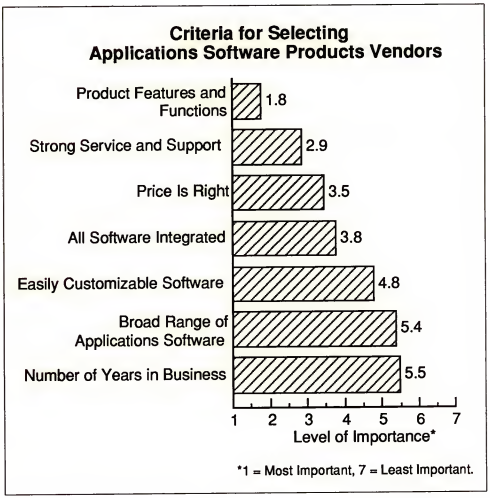
- UNIX/open systems ranks last as a reason to purchase new applications software products.

EXHIBIT III-11



Respondents were also asked to rank criteria in selecting an applications software products vendor, where 1 is the most significant/important reason and 7 is the least significant/important reason. The results are shown in Exhibit III-12.

EXHIBIT III-12



- The most important reason to select an applications software products vendor is the product features and functions, which is consistent with findings about reasons for purchasing a new product.
- Users are willing to pay more for not only features/functions but also strong service and support capabilities.
- It is interesting to note that integrated software is about in the middle (3.8) in terms of importance in selecting a vendor. This finding implies that for a product with new/better features and/or a vendor with strong service and support, users are willing to tackle integration themselves or hire someone to do it.

- For this survey sample, easily customizable software ranked only 4.8 in significance. This ranking implies that users do not customize purchased software to a large degree and is consistent with findings that, on average, users customize only between 20% and 30% of the applications software products they purchase.

- Given discussions with vendors, INPUT expected this ranking to be higher. Vendors are adding customization capabilities in hopes of expanding their market reach.

- A broad range of applications software from a single vendor is of less than average importance (5.4) as a vendor selection criterion. Clearly, users want to be able to choose from a variety of vendors; one-stop shopping for applications software is not critical.

- The number of years in business is ranked last as a vendor selection criterion.

These findings strongly suggest that room exists in the marketplace for new features/functions as well as for new vendors.

F
Key Technology Goals

Respondents were asked to list their three key technology goals over the next several years as they relate to applications software products. Similar goals are grouped into ten categories. Exhibit III-13 lists these categories and indicates the number of goals mentioned within each category.

- No category of goals was mentioned by more than 27% of respondents, indicating lack of consensus about technology directions over the next several years.

- Lower costs and improvement of overall productivity in a general sense is tied for first place as a key goal; it is assumed that this is the goal of all respondents, although not all of them mentioned it as a "technology goal."

- The two specific technology goals that came out on top are new or updated applications software and LANs/networking. Presumably they are viewed as key ways to lower costs and improve productivity. Each of these categories of goals was mentioned by 27% of the survey sample.

EXHIBIT III-13

Key Technology Goals

Category of Goals	Number of Responses
Lower Costs, Improve Overall Productivity	15
Install New/Updated Applications Software	15
LANs/Networking	15
Integration	13
Downsize Hardware/Software	13
Data Accessibility	12
Quick, Easy Applications Development	11
Ease of Use	9
Open Systems/UNIX	9
Other	4

- Although these findings cannot be used to forecast types of products that will be purchased, the following applications software product purchases/installations were mentioned: personnel/payroll/benefits, inventory management, financial systems, new banking applications, purchase order processing, office automation, warehouse management, process measurement, purchase request tracking, and point-of-sale systems.

- The technology goals of LANs/networking, integration, downsizing and data accessibility are interrelated. All enable users to access and share data and/or applications software products and resources more easily. About 45% of all mentions encompassed these four areas.

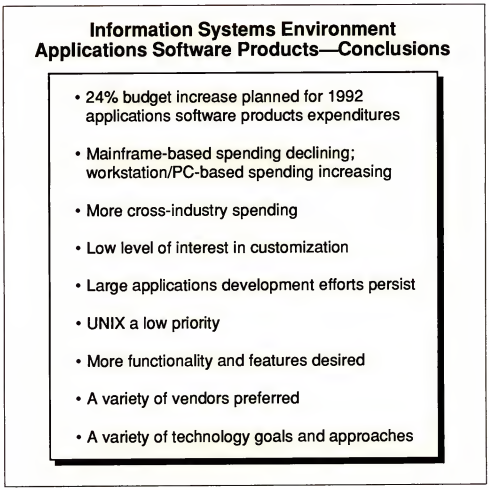
- It is interesting to note that these goals in fact precede faster/easier applications development. Quick/easy applications development is still among the top ten technology goals, but it is in the bottom third of the top ten. According to 1990 INPUT research, some of the approaches being used to control applications development resource consumption are: limiting resource allocation, purchasing packaged software products, re-engineering applications, and taking on maintenance-only functions.

- Three respondents mentioned EDI as a key technology goal.
- A variety of integration goals were mentioned, including:
  - Implement enterprise model
  - Integrate data bases
  - Operate over multiple platforms
  - Integrate applications
  - Link currently incompatible application systems
- Downsizing goals—mentioned by 23% of respondents—are evenly split between offloading the mainframe to minicomputers, workstations, PCs and PC-LAN configurations, and implementing client/server technology. Offloading the minicomputer was not mentioned.
- Data accessibility goals—mentioned by 23% of respondents—include more timely access to data, implementing EISs (executive information systems), improved ease of uploading to or downloading from the mainframe, easy-to-use reporting and query facilities, and implementing a DBMS.
- Faster/easier applications development was mentioned as a key technology goal by 16% of respondents. Examples of the kinds of goals related to development are:
  - Implement CASE (several mentions)
  - Reduce need for customization
  - Develop efficient development procedure
  - Obtain object-oriented DBMS
- Open systems/UNIX was mentioned as a technology goal by 16% of respondents, the same percentage as for improved applications development.

G
Survey Conclusions

Exhibit III-14 outlines the survey conclusions. A discussion of these conclusions follows.

EXHIBIT III-14



On average, planned expenditures for next year will be 24% higher than for 1991. This is a healthy increase, more than INPUT expected. INPUT's five-year forecast—presented in Chapter IV, Information Services Market Forecast—considers the survey results as well as other factors and research data.

A weak economy does not appear to be dampening expenditure plans; on the contrary, it may promote expenditures as users look to applications software products as a way to reduce costs and improve productivity within their corporations. Purchases of applications software products are being closely scrutinized; products that obviously improve productivity will be purchased while sales of other "nice to have but not necessary" products will suffer.

Spending on applications software products for workstations and personal computers is growing the fastest; spending on mainframe-based products shows a decline. This pattern is the opposite of that shown in research on systems software products: for systems software products, mainframe-based expenditures are still the highest. This suggests that the mainframe as data repository for offloaded or downsized applications is viable.

The survey sample spends more on cross-industry applications software products—61% of the total budget and growing—than on industry-specific products. Several respondents expressed the concern that industry-specific software isn't specific enough for their needs and they don't want to have to customize the product. A reason for lack of interest in customizing is that customized products are harder to maintain. Another comment in favor of internal development as opposed to purchasing industry-specific software is the desire to maintain control over corporation-specific solutions.

Given some of these concerns, large applications development efforts continue 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 would appear that the latter will provide the most immediate returns.

On the other hand, survey respondents expressed keen interest in products with new or better features and functions as well as products that can automate previously manual tasks. They want more specific products—that ideally require little or no customization—yet the profit structure of the industry may not provide much room for vendors to comply.

Integration of a vendor's applications software products and number of years in business are not high on the priority list of vendor selection criteria. This implies that being an established vendor is not necessarily a strong advantage in today's marketplace and that room exists for new market entrants. This may also imply added interest in turnkey vendors and VARs who can add specific functionality, and serve a smaller, specialized market.

Respondents indicated a wide variety of technology goals and approaches as they begin to shift along with shifting technology foundations. Foremost in their minds is to lower costs and improve corporate productivity. As expected, UNIX is a low priority; other frameworks such as SAA and NAS were not mentioned as (short-term) technology goals.

H
Turnkey Systems

Although the turnkey systems delivery mode was not included in this survey, it is included in this report as an application solution.

Generally speaking, turnkey systems—encompassing a total solution of software, hardware and service—are purchased for the fundamental purpose of running a business. In other words, 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.

Thus—in contrast to applications software package purchasing patterns indicated by the survey results—the software emphasis for turnkey systems is industry-specific rather than cross-industry. Another obvious distinction is that far fewer turnkey purchases are mainframe-based.

I Processing Services

According to separate market research findings, processing services will continue to exhibit some growth during the next five years, but growth will be selective, favoring certain markets and types of vendors. Processing services exhibiting the highest growth will be those that can be performed more economically by an outside services firm or those that organizations would like to offload because the procedures, updates, operational tasks and problem resolution are burdensome.

- The most common cross-industry processing service—payroll—may not cost less to run at a vendor's site, but clients feel that it is advantageous to have updates to tax tables, handling of checks, withholding and other payroll-related functions handled by an outside services firm.

- The quality of work is also a vital consideration for users. Providing the right application products and offering a competitive price will not offset late work, errors, or an inability to be responsive to inquiries and problems.

  End users are having more impact on the selection and use of information services, and they question why processing services vendors are not always responsive to opportunities such as:

  - Seeking additional opportunities for processing work with existing customers.

- Adding new applications or functions to their computing capabilities that would be useful to end users with workstation/PC resources, such as large-scale financial modeling or expert systems.

- Helping to move work in-house or to outsource in-house work.

Since there is more exploration of alternatives on the part of end users, processing services vendors must spend more time learning about and responding to the ideas of end users. According to respondents, the use of processing services will rise over the next several years but there will be more volatility in the market than previously experienced. Vendors will have to be more proactive in selling new accounts and holding on to existing ones.

Information Services Market Forecast

Information Services Market Forecast

This chapter presents user expenditure forecasts for planning and analysis cross-industry information services by delivery mode. Assumptions driving the forecasts are provided. Information in this chapter draws on the trends, events and issues presented in Chapter II, the user environment discussed in Chapter III, and the competitive environment discussed in Chapter V.

Note that these forecasts do not include industry-specific application solutions. The markets for these types of information services are presented in industry-specific MAP reports rather than the cross-industry reports.

Section A, Overview, discusses the overall size and growth rate of user expenditures for planning and analysis cross-industry information services. Section B, Delivery Mode Analysis, breaks out this same forecast into INPUT's delivery modes. The delivery modes that are applicable to cross-industry sectors are:

- Applications software products
- Transaction processing services
- Turnkey systems

The following five delivery modes are not included in this cross-industry report:

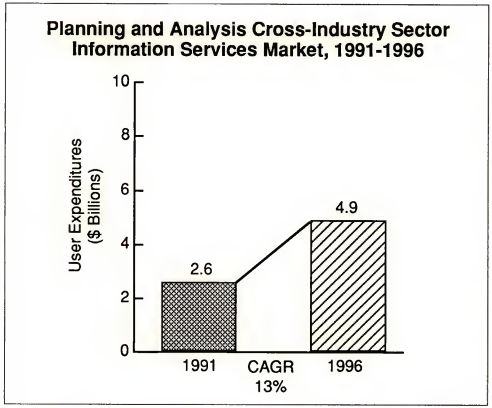
- Network services
- Systems software
- Systems integration
- Systems operations
- Professional services

In addition, utility processing services and other processing services are excluded. These seven areas are discussed in several of INPUT's delivery mode reports.

A
Overview

The size and growth rate for planning and analysis cross-industry sector IS expenditures are shown in Exhibit IV-1. This cross-industry sector is about the same size as the human resources cross-industry sector and is growing at about the same rate as the IS industry overall.

EXHIBIT IV-1



Almost 90% of this cross-industry sector's expenditures are for applications software products. In-house development of planning and analysis applications software is no longer considered a viable option for project management and financial modeling software, and it was never an option for spreadsheet software. Some in-house development of EISs still takes place but these are smaller projects that do not require a great deal of maintenance.

Industry-specific planning and analysis tools do exist—for example, project management applications software products for the aerospace and construction industries. However, industry specificity is a small portion of the total and not increasing appreciably. Vendors are more likely to develop products that incorporate functions for key industries, yet sell their products across all industries. Industry and company specificity tends to be covered by third parties that develop and market templates or add-ons for spreadsheets and financial modeling products.

Exhibit IV-2 lists overall driving forces impacting the demand for planning and analysis cross-industry information services in the 1991-1996 timeframe.

EXHIBIT IV-2

Planning and Analysis Information Services Driving Forces

- Quickening pace of change
- User needs for data accessibility and usability
- New technologies/new products

As we enter the 1990s, the fast pace of change with regard to technology, products and markets, organizational structures, and entire industries creates a business environment in which companies and individuals need to be able to thrive on chaos and adjust directions quickly. To adjust quickly, decisions need to be made quickly, which results in a growing demand for decision support tools.

As organizations assume flatter structures, executives and managers need to deal with a lower level of information and a broader information base. At the same time, senior executives have more responsibilities because there are fewer middle managers. This process encourages the use of, and is enabled by, planning and analysis tools that allow more objective dissemination of information to management, bypassing the need for a middle person. These developments will drive the need for efficiency in the use and analysis of information, internal and external, current and historical.

The wide-scale implementation of LANs has heralded a new era of personal computer use, one that enables vendors to address the needs described above. Tools are now available with which to access data bases spread throughout a corporation; graphical user interfaces allow for not only ease of use but also multitasking and application integration. Planning and analysis applications software products are establishing closer ties with, and becoming front ends to, data bases. In fact planning and analysis applications software products are natural for networking and DBMS access.

The availability of planning and analysis products that run on Windows is perhaps the strongest growth promoter for this cross-industry sector. Although DOS is expected to continue to outsell Windows for the next several years, a flurry of activity is underway to port planning and analysis products to Windows. Although growth in hardware shipments has slowed for all platform sizes, Windows is causing a wave of major purchases.

INPUT does not consider developments in UNIX to be a growth promoter for the planning and analysis sector. Although products are beginning to be ported to UNIX, there is minimal, if any, market demand.

Growth inhibitors are outlined in Exhibit IV-3.

EXHIBIT IV-3

Planning and Analysis Information Services Growth Inhibitors

- Mixed reaction to economic slowdown
- Product maturity
- Competition from other applications software products

The current economic climate is having a mixed impact on the planning and analysis cross-industry sector:

- Planning and analysis tools in general are a way to run businesses more efficiently; their purchase will be enhanced during an economic slowdown.
- PC-based spreadsheets will be purchased regardless of the economic climate.
- On the other hand, users are less likely to try something new and expensive during a downturn. A full-fledged EIS, for example, or a high-end project management product may be resisted by a first-time buyer.
- Turnkey systems vendors and VARs have felt the negative impact of the slowed economy as hardware expenditures are curtailed. Also, many of their sales are to smaller firms which are often hardest hit in a recession.

Although pent-up demand for new products is a driving force for applications software products expenditures in general, it is not a driving force for the planning and analysis cross-industry sector specifically. The planning and analysis sector, rather than experiencing pent-up demand for new products, is experiencing market maturity in spreadsheets, project management and financial modeling, and the need for missionary selling of EISs.

The whole of the application solutions market may be suffering from maturation in a general sense. During the 1980s reasonably good applications software products were an obvious improvement over former, typically manual ways of performing a task and were enthusiastically embraced with little questioning. Today, however, large users already have some software solution in place. Within the planning and analysis sector,

this is especially true of all the application areas except EIS. MIS organizations may think EIS is just one more end-user application they would rather not deal with; they may be threatened by the load they perceive it might cause.

Customer confusion—due to the increasing number of choices of hardware, systems software and applications software technologies—is a negative short-term influence overall on applications software products expenditures but does not appear to be a significant growth inhibitor for planning and analysis information services in particular.

Planning and analysis applications software products compete with each other and with other categories of applications software products in the following ways:

- The market for self-contained, low-end financial modeling products has been eroded by spreadsheets and financial modeling characteristics that have been built into applications such as spreadsheets, accounting applications software or sales and marketing software products.
- Low-end project management software competes with office automation calendaring and scheduling applications software products.
- Spreadsheets are taking on some of the qualities of an EIS or an EIS development tool and therefore take away from sales of what might be termed a separate EIS application software product.

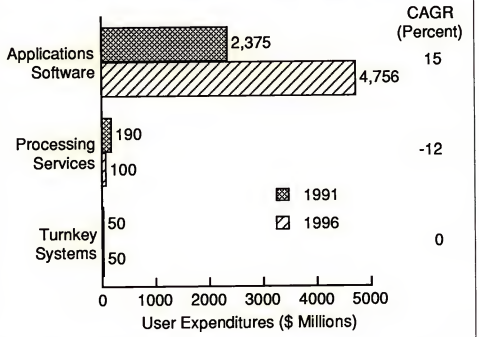
These kinds of competitive situations limit growth of portions of the planning and analysis software market.

B
Delivery Mode Analysis

As can be seen from the forecast presented in Exhibit IV-4, applications software products expenditures will experience healthy growth over the next five years; however, expenditure on turnkey systems is not growing and processing services expenditures are declining sharply.

EXHIBIT IV-4

Planning and Analysis Cross-Industry Sector Application Solutions by Delivery Mode, 1991-1996



Following is a discussion of each of the individual delivery mode forecasts.

1. Applications Software Products

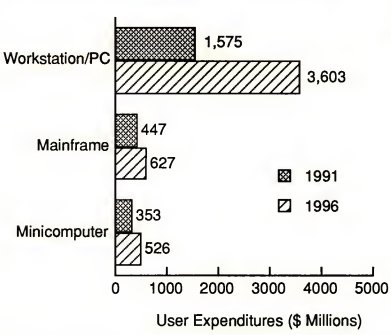
INPUT's estimate of the 1991 applications software products market by hardware platform for the planning and analysis cross-industry sector is presented in Exhibit IV-5.

Exhibit IV-5 reflects the following:

- Growth of expenditures for mainframe-based applications software products is due almost exclusively to price increases on previously existing licenses.
  - Project management products traditionally resided on large host computers and were used almost exclusively in industries such as aerospace and construction.
  - The bulk of financial modeling applications software products is still mainframe-based; and portions of EIS reside on mainframes.
  - Spreadsheets are being ported to mainframes to round out vendors' multiplatform product lines, not because they represent a potentially large market.

EXHIBIT IV-5

Planning and Analysis Cross-Industry Sector Applications Software Products Market, 1991-1996



- Expenditures on minicomputer-based planning and analysis products are primarily for ongoing licensing. As with mainframe-based products, vendors are making their planning and analysis products available on all platform sizes and this product availability causes some growth; as corporations downsize they are interested not only in desktop solutions but also—albeit to a far lesser extent—midsized solutions.

- As with all applications software products, the greatest growth will be at the workstation and, in particular, personal computer level. Planning and analysis as a function has a very broad and increasing appeal.

  - More people are acquiring project management skills; project management products are being effectively used, for example, in marketing departments, facilities management, smaller R&D departments, and finance departments.

  - Spreadsheets are becoming easier to use and therefore more widely accepted by executives as well as staff.

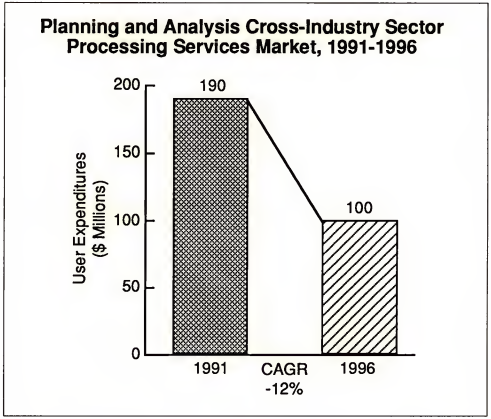
  - Project management and spreadsheet products for networked environments increases their usefulness.

  - EISs are becoming increasingly available at the desktop level and at lower prices; therefore, various types of knowledge workers as well as executives are beginning to use them. Nonetheless, infiltrating the knowledge worker market requires missionary selling.

2. Processing Services

Exhibit IV-6 presents INPUT's processing services forecast.

EXHIBIT IV-6



Planning and analysis tools are available on a timesharing basis by companies such as SAS and Comshare in case customers want them, but they are seldom used. Planning and analysis processing services is rapidly declining due to the following factors:

- Applications that lend themselves to a processing services solutions are those that are constantly changing. For example, payroll processing services must constantly incorporate new federal regulations and tax changes. The maintenance cost and headache to the end user is prohibitive to an in-house solution. Except for EISs, planning and analysis products do not generally need to incorporate external changes on an ongoing bases.

- Processing services are purchased for applications that are done on a regular basis but not constantly. For example tax processing services are employed quarterly or yearly. Planning and analysis tools, on the other hand, are used daily as personal or group productivity tools.

- Much planning and analysis can now be and is addressed at the PC level. Thus there is a limited need for the sophisticated planning and analysis tools that remote processing services implies.

- Planning and analysis tools must access in-house corporate data bases, which brings up security concerns.

- Various planning and analysis tools are integrated with one another, which inhibits consideration as a processing or timesharing service.

INPUT therefore does not believe the overall trend towards outsourcing will have a positive impact on processing services for this cross-industry sector. Thus this processing services forecast is considerably lower than the overall processing services forecast for all market sectors combined, which is 8%. In addition to this, INPUT has lowered its forecast this year for planning and analysis cross-industry processing services expenditures.

3. Turnkey Systems

Exhibit IV-7 shows INPUT's forecast for planning and analysis cross-industry sector turnkey systems. This cross-industry sector is the smallest and slowest "growing" of all turnkey sectors.

EXHIBIT IV-7

Planning and Analysis Cross-Industry Sector Turnkey Systems Market, 1991-1996

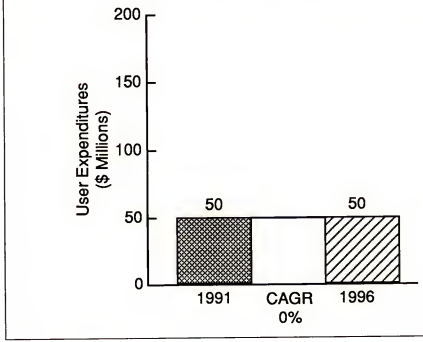


Exhibit IV-7 reflects the following:

- If and when the VAR channel is used, the VARs are likely to be industry-specific rather than cross-industry.
- Hardware platforms are being shipped with spreadsheets pre-installed through marketing alliances, but these do not constitute turnkey systems.
- The only relatively large and growing turnkey systems markets that are cross-industry are computer-based training within the education and training cross-industry sector, CAD within the engineering and scientific cross-industry sector, and desktop publishing within the "Other" cross-industry sector.

Competitive Environment

V

Competitive Environment

This section discusses the competitive environment for information services within the planning and analysis cross-industry sector. Key trends and vendor reactions to these trends are discussed. Leading and emerging vendors are identified and profiled.

A
Vendor Characteristics and Trends

Key trends are outlined in Exhibit V-1. Although each of the key trends is applicable to all applications software products, they are discussed below with emphasis on the planning and analysis cross-industry sector's uniqueness.

EXHIBIT V-1

Planning and Analysis Cross-Industry Sector
Vendor/Product Trends

- Acquisitions and alliances
- Windows
- Client/server
- Multiplatform
- Integration

1. Acquisitions and Alliances

Consolidation is expected to continue in this highly fragmented market as the multiplatform strategy continues to gather steam and as we continue to see a merging of planning and analysis functionality. Companies that compete in the planning and analysis sector are likely to compete in other areas of software as well; thus a broadly defined acquisition strategy which encompasses synergistic applications software products prevails.

Larger vendors are seeking acquisitions that will provide them with a more robust suite of complementary products and that work well in networked environments.

Examples of acquisitions that have taken place over the last twelve months are:

- In December 1990, Lotus acquired Samna Corporation for $65 million. Samna develops and markets the Ami family of word processing products, primarily for Windows. A significant portion of the purchase price was allocated to purchased research and development, resulting in a $53 million charge to Lotus' 1990 operations.

- In January 1991, Computer Associates acquired substantially all the assets of Manageware and its principal product, Compete!. Marketed now as CA-Compete!, the product is a multidimensional financial modeling tool for the Windows environment.

- In March 1991, Lotus acquired cc:Mail, Inc. for $25 million plus contingent payments based on future performance. cc:Mail is a LAN-based electronic mail product. cc:Mail now operates as a division of Lotus.

- In April 1991 Comshare, the EIS leader, acquired Execucom Systems, which not only has a solid EIS foothold but also has a financial modeling product offering.

- Borland has recently acquired Ashton-Tate in a pooling-of-interests transaction. Ashton-Tate provides microcomputer software products for DBMS, word processing, business graphics, decision support, and spreadsheet applications.

Generally speaking, hardware vendors' role in applications software products markets is expanding. To counter the potential threat of these formidable competitors, as well as to expand the marketing reach of their products, independent software vendors are seeking marketing alliances with equipment vendors.

Rather than turnkey systems vendors and VARs being a major force for this cross-industry sector, independent applications software products vendors are likely to negotiate alliances with equipment vendors to preinstall a set of software—including basics such as operating system, word processing and a spreadsheet package—before the computer is shipped to the customer. For example, as a promotional strategy, Digital Equipment includes Lotus 1-2-3 with the sale of each RISC platform it ships.

Marketing alliances are also being made between software vendors. Lucas Management Systems for example, sells Oracle RDBMS products.

2. Windows

Although DOS is expected to continue to outsell Windows for the next several years, a flurry of activity is under way to port planning and analysis products to Windows.

Planning and analysis products are very suitable to run under Windows for the following reasons:

- Ease of use is key in broadening the marketing appeal of sometimes complex analytical products.

- Planning and analysis products fit naturally with Windows, as they can easily and obviously capitalize on Windows' Dynamic Data Exchange (DDE), which provides automatic information exchange between applications, and object linking and embedding technology (OLE).

To shortcut the development process, several acquisitions have been made of companies that have already developed Windows products—for example Computer Associates' acquisition of ManageWare and its Compete! product and Lotus' acquisition of Samna Corp.

3. Client/Server

Vendors serving this cross-industry sector are getting on the client/server bandwagon and talking effusively and somewhat elusively about client/server. For this cross-industry sector, client/server is being implemented primarily at its lowest level, which is as a front end to a mainframe or minicomputer with a user friendly interface. The processing typically takes place either on the host or the client rather than being distributed. This is a first step towards true client/server but nonetheless an effective sales strategy for planning and analysis cross-industry vendors.

4. Multiplatform

It almost goes without saying that a multiplatform approach is one of the fundamental building blocks of planning and analysis vendors' strategy. Now, the user is faced with an increasing number of operating systems from which to choose. Corporatewide information access and distribution—which implies multiplatform—is a key to effectively maximizing usage of spreadsheets, project management, financial modeling and EISs.

As is true for the accounting cross-industry sector, network-based applications software products for multidivision and multilocation companies are beginning to appear. These types of products also imply a multiplatform approach. Vendors with these kinds of products tend to be small leading edge or new entrants. For example, IMRS Inc.—a small company in

Stamford, Connecticut that has just commenced a public offering—has a product line of information access and integration products that consolidate and report financial and other business data from multiple sources over networked personal computers.

Spreadsheets, along with word processing, have been among the first candidate applications software products that vendors are porting to UNIX. But according to software vendors, UNIX is not a growth factor yet for planning and analysis tools. Rather than responding to a strong market need, porting planning and analysis tools to UNIX is due to a push from equipment vendors who believe that their UNIX desktop platforms are more likely to gain acceptance if a basic and fundamental suite of office automation or personal productivity products are available for them.

5. Integration

The movement towards integration affects the planning and analysis cross-industry sector in the following ways:

- Continuing and increasingly higher levels of integration with data base capabilities
- Merging of planning and analysis functions
  - The more sophisticated spreadsheets, such as CA-Compete! have taken on financial modeling features and functions.
  - Spreadsheets have become front ends to DBMSs and are taking on some of the qualities of a low-end EIS.
- Tighter integration of planning and analysis applications with other application areas, e.g., spreadsheets, with word processing and graphics.

6. Features/Function Innovation

Spreadsheets, financial modeling and project management applications software products have been around for a long time. As much of the market has already purchased these products, vendors seek ways to expand their market penetration through:

- Ease-of-use enhancements to capture more first-time users
- Enabling users to solve more kinds of and more complex tasks

These two strategies expand product reach to the low end or general business professional as well as to the high-end users.

B

Leading and Emerging Vendors

Between 200 and 300 vendors supply financial modeling, EIS, spreadsheet and project planning applications software products. Leading vendors of each of these product types are listed in Exhibits V-2 and V-3.

EXHIBIT V-2

Planning and Analysis Cross-Industry Sector
Leading EIS Vendors

- Comshare
- Easel
- Holistic Systems
- Information Resources
- IBM
- Pilot Executive Software
- SAS Institute

Rather than full-fledged EIS systems, a number of companies, including Easel Corp. and SAS Institute, have tools with which the user can create his/her own EIS. Recent EIS entrants include Epic and Forest & Trees. Other larger vendors may enter this market as well.

EXHIBIT V-3

Planning and Analysis Cross-Industry Sector Leading Vendors in Modeling, Spreadsheets and Project Management

Vendor	Modeling/ Planning	Spreadsheets	Project Management
Computer Associates	x	x	x
Borland	x		x
IBM			x
Information Resources	x		
Lotus		x	
Lucas Management Systems			x
Microsoft		x	x
Multitech			x
Paperback Software	x		
Primavera		x	
Project Software Development			x
SAS Institute		x	x
Scitor			x
Software Publishing		x	x
Symantec		x	x
William H. Roetzheim & Assoc.		x	
WordPerfect		x	

C
Vendor Profiles

This section contains profiles of some of the leading vendors to show the diversity of types of companies and approaches.

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

Borland's mission is to provide the strongest interoperability foundation possible based on data bases, and from there to build the highest quality client applications available.

Borland's primary focus is:

- Languages, spreadsheets and DBMS products
- MS-DOS and the Windows operating environments
- Object-oriented programming technology

Borland will be broadening its reach with its acquisition of Ashton-Tate and will become the DBMS majority market share leader. The Borland/Ashton-Tate acquisition is the largest of the software acquisitions of 1991 and perhaps the most surprising. Borland International is only an 8-year-old company that has skyrocketed to fame through a hard-driving product and marketing strategy. When the merger is completed, Borland will be among the six largest public independent software vendors and will be the third largest personal computer applications software products company in the U.S.

Within the planning and analysis sector, Borland is third in spreadsheet market share after Lotus and Microsoft. Quatro Pro is its new-generation spreadsheet. Quatro Pro for Windows is scheduled to be released during the first quarter of 1992.

Borland is well known as a leader in the use of an object-oriented approach to software development process. Unlike traditional programming techniques, object-oriented programming permits the characterization of functions, data or instructions as "objects" that facilitate the design and implementation of software.

- Borland and IBM recently signed an agreement calling for Borland to develop specific object-oriented programming languages and development tools for IBM's OS/2 2.0. Borland's C++ for OS/2 will be the first product released under the agreement.

Prior to its acquisition by Borland, Ashton-Tate's calendar 1990 revenues were $230.5 million. With the acquisition of Ashton-Tate, Borland's revenues will be in the $450 million range.

2. Computer Associates International, Inc., 711 Stewart Avenue, Garden City, NY 11530-4787, (516) 227-3300

Computer Associates (CAI), with worldwide revenues of $1.348 billion for the fiscal year ended March 1991, markets and supports systems software products including RDBMSs, and applications software products for mainframes, minicomputers and microcomputers.

CAI's aim is to provide a wide variety of applications software products, planning and analysis tools being but one product area of many.

Computer Associates Business Decision Software includes:

- CA STRATAGEM, a fourth-generation language that combines object-oriented data management and programming techniques with data analysis.

- SuperCalc, a mainframe, midrange and microcomputer spreadsheet incorporating graphics, data access and PC upload and translation, and centralized consolidation. SuperCalc is viewed as a low-end CA STRATAGEM.

- CA Compete!, an IBM PC and compatible multidimensional spreadsheet and financial modeling product.

CA-STRATAGEM is designed for sophisticated multi-variable decisions and can handle extensive iterative analysis run on mainframes and minicomputers. It combines data management, modeling, statistics, management reporting and 4GL application development. It is billed as a decision support tool kit for extending applications such as budgeting, sales analysis and cost analysis rather than as a financial planning system.

CA-SuperCalc is designed for users familiar with spreadsheet-style consolidation and analysis and is considered a high-end product. It is touted as running on both minimal and state-of-the-art platforms. All SuperCalc products maintain compatibility with 1-2-3.

In an attempt to bolster its PC software line, in February 1991 CAI acquired ManageWare Inc. and its Compete! spreadsheet product. The only similar product is Lotus' Improve, available on the NeXT workstation. It runs on IBM PC and compatible personal computers under Windows.

CAI also has project management software, SuperProject and CA-UNIPACK/PEP, a series of four integrated software packages for application development management for project estimation, planning, and expert development advice. SuperProject for Windows was recently announced.

CAI's line of SQL products includes CA QbyX, a query product whereby users using Windows can access SQL information stored in CA DBMSs. The QbyX product can be used with CA SuperCalc and CA Compete!.

3. Comshare Inc., 3001 S. State Street, Ann Arbor, MI, 48108, (313) 994-4800

Founded in 1966, Comshare was one of the first companies to offer generalized processing services. During the 1980s the company began focusing its efforts on serving the decision support and EIS markets. Over the next twelve months Comshare will be phasing out its timesharing services.

In March 1991, Comshare acquired Execucom Systems Corp. for approximately $12 million. Execucom was a wholly owned subsidiary of MPSI Systems Inc. and an early leader in bringing artificial intelligence, expert systems and optimization modeling to decision support.

Comshare has traditionally developed its products for use on IBM and Digital computers. Its products now run on the desktop as well, including DOS, OS/2 and Macintosh. Execucom strengthens Comshare's position on these platforms and extends its reach into various UNIX platforms, including DEC Ultrix, Hewlett-Packard, Unisys, Sequent, SUN and IBM's RS/6000.

Comshare's products include:

- System W and its personal computer counterpart, One-Up, for management accounting applications
- Commander EIS for executive reporting
- Commander FDC for financial reporting
- IFPS, a former Execucom product, and IFPS Plus for unstructured financial decision support
- Executive Edge, an EIS and a former Execucom product
- Paradigm, a workstation-based software product combining spreadsheets, financial modeling languages and artificial intelligence, also a former Execucom product

In 1990, Comshare introduced News Navigator, an on-line access system to public information data bases. Comshare is also venturing into the application-/user-specific EIS area. ARTHUR, for example, integrates EIS technology with merchandise planning and performance tracking systems for the retail sector.

Commander EIS was the second EIS product to reach the market. It has the largest user base (about 750 sites) and now, with the Execucom acquisition, controls about 60% of the market.

Comshare has alliances with several professional services firms and accounting application vendors and is prepared to provide full professional services support.

Among its marketing alliances are agreements with Digital Equipment, Ross Systems, Price Waterhouse, Medicus Systems Corp. (a health care VAR), and J. D. Edwards. Comshare is also a supporter of IBM's Information Warehouse initiative and has announced ExecuView/SQL, a client/server application for accessing data residing in DB2.

Comshare's revenues reached $124.2 million for the fiscal year ending June 1991; 53% of revenue comes from non-U.S. sales.

4. Lotus Development Corp., 53 Cambridge Parkway, Cambridge, MA, 02142, (617) 577-8500

This $685 million software company continues to dominate the spreadsheet market with about a 50% share. Its market share, however, continues to be eroded by its formidable competitors Microsoft and Borland. Lotus' initial product, Lotus 1-2-3, was shipped in January 1983. The company shipped its second product, Lotus Symphony, in June 1984. It also has word processing and graphics products.

1-2-3 integrates spreadsheet, graphics, and data base functions in one memory-resident software package. 1-2-3 is available for Windows and in network versions. Lotus offers special editions of 1-2-3 for small business, government, education and hardware OEM markets.

In order to gain leverage and promote sales of its spreadsheets in general, Lotus is adding new products such as Notes, a network-based groupware product, and cc:Mail, a LAN-based electronic mail product.

Lotus has ambitions to be a dominant player in the networked PC arena and, although the attempted merger last year between Novell and Lotus did not pan out, Lotus no doubt has its eyes open for other opportunities.

The company has adopted a multiplatform strategy for its 1-2-3 product and has versions for UNIX workstations, DEC minicomputers, IBM mainframes, PCs and Macintosh computers.

5. Lucas Management Systems Ltd., 12701 Fair Lake Circle, Fairfax, VA 22033, (703) 222-1111

Lucas Industries is a $3.7 billion corporation serving aerospace, automotive and industrial systems markets worldwide. Metier, acquired in 1985 by Lockheed Corp as part of its Information Systems Group, was acquired in April 1990 by Lucas Industries in the U.K. as part of its Engineering and Science Division. Metier, a $90 million company, has been renamed Lucas Management Systems. It specializes in project management software. It has traditionally been a mainframe-based company, but now pursues a multiplatform strategy.

The flagship product, Artemis, is a 4GL with its own RDBMS that is oriented specifically toward project management. It is a tool kit that can be used as is or with applications built by the user. In 1991 Lucas released Artemis 7000—originally only for DEC VAX/VMS computers—for IBM RS/6000, Hewlett-Packard and Sun workstations and IBM -386 platforms.

In 1990 Lucas broadened its product offerings with the acquisition of K&H Professional Management Systems, based in Wayne, Pennsylvania. Lucas now markets two of K&H's former products: Prestige, a multiuser, multiproject LAN and minicomputer-based project management system; and I/CSCS, an integrated cost management system designed to generate the project information required by the U.S. government on DoD contracts.

6. Microsoft Development Corp., 16011 N.E. 36th Way, Redmond, Washington 97071, (206) 882-8080

As developer of MS-DOS and Windows, Microsoft continues to have a tremendous impact on the entire PC applications software products industry. Microsoft thereby has an advantage in that its applications software products development activities work closely with its systems software groups.

Microsoft will continue to heavily impact the applications software products industry as well as to participate in it. It is dropping core development of OS/2 3.0 in favor of a Windows-only strategy for PC and RISC workstations which will be called Windows NT (New Technology), and available in 1992. A low-end version of Windows will run on DOS, and Windows NT will be geared to more powerful computers and workstations.

Another of Microsoft's key strengths is a broad array of applications software offerings, including Microsoft Excel (spreadsheet), Microsoft Word, Microsoft PowerPoint (presentation graphics), and Microsoft Project. Excel is Lotus 1-2-3's most formidable competitor. All operate under Windows as well as DOS and several of them also operate under Apple's Macintosh operating system and its new System 7.0.

In addition to their availability as separately packaged products, Word, Excel and PowerPoint are being distributed together as The Microsoft Office for Windows.

Microsoft is now the largest worldwide independent software company, with fiscal 1991 revenues of $1.8 billion (up 56% over 1990).

7. Pilot Executive Software, 40 Broad Street, Boston, MA, 02109 (617) 350-7035

Pilot Executive Software was founded in 1984 and was the first company to offer commercial EIS technology.

Command Center, introduced in 1985, was the first true EIS to reach the market. As the ground breaker it created its own relational data base and PC interface, and forged a market concept based on a PC/host environment. Command Center has since then expanded from its traditional architecture to include a LAN design, and Pilot is enhancing its data pipeline capabilities as well.

LightShip, introduced in September 1990, is Pilot's PC and LAN-based EIS environment that operates on Windows 3.0. This product is sold through resellers and VARs. In addition, Pilot has an alliance with Information Builders to repackage its LightShip product as the FOCUS EIS.

In January 1991, Pilot acquired the Thorn EMI Computer Software division that owned the FCS (Financial Control System) product line and had Pilot's distribution in Europe. FSC is an integrated financial planning and decision support system that supports spreadsheet, modeling, analysis, consolidation, and data management functions. It operates on all major mainframe and minicomputer systems and on PCs. With the acquisition, Pilot's revenues for 1991 are approximately $50 million.

In addition to the outright ownership of the FCS product line, Pilot also acquired a new workstation-based Decision Support System for Windows 3.0.

8. SAS Institute, Inc., SAS Campus Drive, Cary, NC 27513 (919) 677-8000

SAS is fifteen years old, with 1990 revenues in excess of $240 million. SAS System, the Institute's flagship product, is an integrated applications software system for data access, management, analysis and presentation. SAS System, originally considered a statistical product, today has many of the features of a full planning and analysis tool.

SAS is a strong example of a specialist mainframe-based applications software company that has diversified in two key ways:

- Into multiple applications within a more broadly defined specialty
- Into multiple platforms

In recent years SAS has moved out of the statistical realm into EIS, project management, quality improvement, experimental design, and clinical and pharmaceutical software for data analysis. SAS will continue to look for opportunities to add new applications software products that are a natural fit with its existing suite of SAS System products as it pursues a strategy of "enterprisewide information delivery."

Recent or planned additions are SAS/Calc and SAS/EIS. In the future SAS may branch out even further. For example, a desktop publishing application is in the development stage.

SAS is pursuing a strategy of internal development rather than acquisition and plows 48% of its revenues back into R&D. In 1990 it completed a six-year, $100 million effort to completely rewrite all products in C language so that they can run on multiple platforms. Now being multivendor, multiplatform is a key aspect of SAS strategy.

SAS System runs on mainframes, minicomputers, UNIX-based workstations and PCs. MultiVendor Architecture (MVA) is a term used to describe the structural design of the SAS System. First conceived in 1984, MVA provides a software architecture that maximizes SAS System's ease of migration from one operating environment to another. With MVA, the SAS System runs the same across all environments SAS software supports. The institute's decision to rewrite the entire SAS System in the C programming language helped initiate its move to MVA.

SAS is among the companies that have announced support for IBM's Information Warehouse framework, a way in which IBM intends to help users organize and manage their data, positioning the mainframe as the conduit and access point to multiple data bases residing on multiple platforms.

Because of the variety of its products and markets, SAS has varying lists of direct competitors. Because of its statistics software products, SAS is also represented in the engineering and scientific cross-industry sector.

9. Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014-2132, (408) 253-9600

Symantec's product strategy has five key points:

- Market leadership
- Diversified applications and systems software product line
- Multiplatform products within a network environment, including MS-DOS, Windows, OS/2 and Macintosh
- Graphical user interfaces
- Internal development supplemented by acquisitions and third-party products

Symantec entered the microcomputer software market in 1982 with a single product, Q&A, an integrated DBMS and word processing. The company has expanded its product offerings to about 20 principal products. Acquisitions and licensing of third-party software products have provided the basis for much of this expansion, most of which has been in the area of systems software products in recent years.

In 1987 Symantec acquired Breakthrough Software Corp., developer of TimeLine project management software and TimeLine Graphics packages. These two packages are now among Symantec's most successful.

Symantec's TimeLine project management software product is touted as the first professional quality project management software product for the PC. Symantec recently introduced TimeLine 5.0 with enhanced features including Varying Resource Availability and Costs Over Time that allow for more accurate scheduling and enhanced data modeling. Multiple Project Resource Leveling allows for more efficient workgroup computing and connectivity.

Symantec's fiscal 1991 revenues (year ended March) were $116.3 million, up 56% from 1990. Much of this growth has been in international markets.

VI

Conclusions and Recommendations

Conclusions and Recommendations

A
Industry and IS Market Conclusions

The delivery modes that are analyzed and forecasted for the cross-industry sectors are applications software products, turnkey systems and transaction processing services. Taken together, the growth rate of user expenditures on these three delivery modes by the planning and analysis cross-industry sector will be 13% compounded annually over the next five years.

Expenditures on applications software products by the sector are forecast to grow at about the same CAGR as the industry average. PC-based spreadsheets—riding the Windows wave and capitalizing on networking—account for a large portion of this growth. Turnkey systems as a delivery mode is not growing, and the use of planning and analysis processing services is sharply declining.

Although UNIX is not a significant growth factor for this sector, the client/server concept and especially Windows is fueling new growth. Additionally, and importantly, emphasis on access to data and the marketplace interest in new methods of analyzing, using and understanding data continues to fuel growth.

Planning and analysis functions are merging. For example, spreadsheets are beginning to take on some of the characteristics of elementary EISs and low-end financial modeling tools. Financial modeling and analysis features are being built into other categories of applications software products, such as accounting. This merging activity promotes growth of spreadsheets, yet it limits growth of other types of planning and analysis tools.

EIS, financial modeling and project management applications software products are increasingly available to general business users; spreadsheets have been available to general users the longest.

A great deal of products are moved through the retail channel for this cross-industry sector. Although VARs are used as a distribution channel by vendors in this sector, they are predominantly industry-specific rather than cross-industry.

Expenditures on processing services for the planning and analysis sector will decline considerably (-12% CAGR) over the forecast period. The primary reasons are that planning and analysis application software products are available on affordable platforms; these products are becoming increasingly sophisticated and easily able to access data bases. User friendliness is also improving.

B

User and Vendor Issues and Recommendations

Exhibit VI-1 summarizes INPUT's overall recommendations to users and vendors in the planning and analysis cross-industry sector.

EXHIBIT VI-1

Planning and Analysis Cross-Industry Sector User and Vendor Recommendations

- User recommendations
  - Keep in mind
    - Integration
    - Multiplatform
    - Migration path and compatibility of product upgrades
- Vendor recommendations
  - Futures orientation
  - DBMS technology
  - A suite of compatible products
  - Solution selling

When selecting a planning and analysis application software product/vendor, end-user organizations need to select a vendor who understands the transitions under way and that will work with their customers to assist them during their migration to new technologies.

Within the IS industry as a whole, integration—hardware and software interoperability—is an increasingly important concern. Integration implies a multiplatform strategy as well as a clear migration strategy from existing products to product upgrades.

Vendors serving the planning and analysis cross-industry sector must be strong in data access technology and be able to implement high levels of integration. A vendor with a singular product—be it a spreadsheet, a project management or financial modeling product, or an EIS—will have a difficult time surviving without alliances with other applications software product vendors.

Vendors of desktop applications software products need to be able to make DOS more effective, as DOS will continue to outsell Windows over the next several years, and at the same time leverage future operating systems.

Given the mature nature of many applications software products, new products and product upgrades must provide an obviously better way of conducting business than was available before. They need to be marketed as solutions rather than tools.

It goes without saying that vendors are not expected to explore or offer new or additional planning and analysis processing services as there is negative growth here; vendors will continue to emphasize other processing services or exit the market entirely.

Turnkey vendors and VARs will continue to be used as a channel for this cross-industry sector as emphasis is increasingly placed on alternative distribution channels. However INPUT believes that, as the need for solutions and specificity continues to be voiced, the strategy of choice will be to target specific industries, which means that the activity is no longer considered cross-industry.

Appendix

Forecast Data Base

Exhibit A-1 presents the detailed 1991-1996 forecast for the planning and analysis cross-industry sector.

EXHIBIT A-1

Planning and Analysis Cross-Industry Sector
User Expenditure Forecast by Delivery Mode, 1990-1996

Delivery Mode	1990 ($M)	Growth 90-91 (%)	1991 ($M)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	CAGR 91-96 (%)
Sector Total	2,329	12	2,615	2,937	3,317	3,763	4,289	4,906	13
Processing Services	205	-7	190	167	147	129	114	100	-12
-Transaction Processing	205	-7	190	167	147	129	114	100	-12
Turnkey Systems	50	-	50	50	50	50	50	50	-
Applications Software	2,074	15	2,375	2,720	3,120	3,584	4,125	4,756	15
-Mainframe	415	8	447	478	512	548	586	627	7
-Minicomputer	324	9	353	384	415	449	486	526	8
-Workstation/PC	1,335	18	1,575	1,858	2,193	2,587	3,053	3,603	18

Exhibit A-2 presents the forecast reconciliation for the planning and analysis cross-industry sector.

Actual 1990 expenditures on turnkey systems and applications software products were slightly lower than anticipated. INPUT's processing services forecast indicates a more rapid decline in user expenditures than last year's processing services forecast for the period 1990-1995.

EXHIBIT A-2

Planning and Analysis Cross-Industry Sector
1991 MAP Data Base Reconciliation

Delivery Mode	1990 Market				1995 Market				90-95 CAGR per data 90 rpt (%)	90-95 CAGR per data 91 rpt (%)
	1990 Report (Fcst) ($M)	1991 Report (Fcst) ($M)	Variance from 1990 Report ($M)	Variance from 1990 Report (%)	1990 Report (Fcst) ($M)	1991 Report (Fcst) ($M)	Variance from 1990 Report ($M)	Variance from 1990 Report (%)		
Total	2,357	2,329	27	-1	4,377	4,289	88	-2	13	13
Processing Services	205	205	-	-	118	114	4	-3	-9	-12
Turnkey Systems	51	50	1	-2	51	50	1	-2	-	-
Applications Software	2,101	2,074	27	-1	4,208	4,125	83	-2	15	15

About INPUT

INPUT provides planning information, analysis, and recommendations for the information technology industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

Subscription services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services. INPUT specializes in the software and services industry which includes software products, systems operations, processing services, network services, systems integration, professional services, turnkey systems, and customer services. Particular areas of expertise include CASE analysis, information systems planning, and outsourcing.

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

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