U.S. INFORMATION SERVICES
MARKET ANALYSIS PROGRAM

Office Systems

Information Services Opportunities in Cross-Industry Markets

1992-1997

INPUT®

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

OCTOBER 1992

INFORMATION SERVICES OPPORTUNITIES IN CROSS-INDUSTRY MARKETS

1992-1997

EXCERPT

Office Systems

INPUT®

1280 Villa Street, Mountain View, California 94041-1194 (415) 961-3300

Published by
INPUT
1280 Villa Street
Mountain View, CA 94041-1194
U.S.A.

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

Information Services Opportunities in Cross-Industry Markets, 1992-1997
Office Systems

MAACO • 504 • 1992

Abstract

This document extracts Chapter VII, *Office Systems*, from INPUT's full report, *Information Services Opportunities in Cross-Industry Markets, 1992-1997*. The excerpt contains the *Introduction* (Chapter I) and *Office Systems* (Chapter VII) chapters from the full report, and also provides Appendix A, *Definition of Terms*, and the market-specific financials from Appendix B, *Forecast Data Base*.

The excerpt does not contain either the Executive Overview or Conclusions and Recomendations chapters from the full report, since these sections address all cross-industry market sectors at an overview level.

The extract is intended for readers who have an interest in a single cross-industry market sector. If data and analysis of other cross-industry market sectors is required, it can be obtained by purchasing the full report, *Information Services Opportunities in Cross-Industry Markets, 1992-1997*.

Table of Contents

Table of Contents (Continued)

Exhibits

Introduction

A
Purpose and Organization

This report is part of a series of market analysis reports written each year by INPUT on industry and cross-industry sectors of the U.S. information services industry. This report analyzes the cross-industry sectors of the U.S. information services industry.

1. Purpose

The objectives of this report are to:

- Forecast user expenditures during the next five years on information services for each of the seven cross-industry sectors
- Identify and discuss user department directions as they relate to each of the seven cross-industry sectors
- Identify technological issues and trends that are driving the use of information services for the cross-industry sectors
- Discuss the competitive environment and profile leading vendors in each of the cross-industry sectors
- Summarize findings through comparing and contrasting the cross-industry sectors

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

- Review the forces shaping their markets
- Develop internal corporate financial projections

- Identify new markets and product and services opportunities
- Assess the competitive trends
- Determine potential market directions
- Assist in prioritizing investments

2. Organization

This report is organized as follows:

- Chapter II is an overview of the cross-industry sectors of the information services market.
- Chapters III through IX are individual discussions of each of the seven cross-industry sectors. Within each chapter there are five sections.
  - Section 1, *Definitions*, introduces and defines each of the cross-industry sectors.
  - Section 2, *Information Services Markets*, presents the information services market forecasts by delivery mode and submode for each of the seven cross-industry sectors.
  - Section 3, *User Department Directions*, discusses and analyzes interviews with end-user organizations representing the seven cross-industry sectors.
  - Section 4, *Trends/Technology Ratings of Importance*, provides vendor and user respondent ratings of the relative importance of eight technologies.
  - Section 5, *Vendors and Competitive Environment*, discusses the competitive environment for information services within each of the cross-industry sectors and profiles leading and emerging vendors.
- Chapter X summarizes the conclusions of Chapters III through IX.
- Appendix A—*Definition of Terms*—provides definitions and descriptions of market structures and terms used throughout INPUT's reports.

- Appendix B—*Forecast Data Base*—provides a detailed forecast by delivery mode for each cross-industry sector. It also contains a reconciliation to the previous year's cross-industry sector reports.

B

Scope and Methodology

This report addresses the U.S. information services industry in seven cross-industry sectors. It includes only 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.

The seven cross-industry sectors identified by INPUT are:

- Accounting
- Human Resources
- Education and Training
- Engineering and Scientific
- Office Systems
- Planning and Analysis
- Sales and Marketing

2. Delivery Mode Definitions

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

For a more complete discussion of INPUT's information services industry structure and market sector definitions, please refer to the separate volume, INPUT's *Definition of Terms* found in the volume I binder of the 1992 Market Analysis Program reports.

3. Methodology

Data was collected and analyzed from in-depth telephone interviews with 37 vendors and 18 user departments representing all cross-industry sectors. In addition, INPUT's library was used as an information resource, as were the results of previous INPUT reports on key aspects of the information services industry.

C
Forecast Assumptions

In developing the five-year forecasts, INPUT has incorporated current economic assumptions regarding the outlook for the U.S. economy as a whole.

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

- The economic situation is showing signs of improvement and its impact on the information services market will be more favorable in 1992 and beyond than it was in 1991.

1. Economic Overview

The year 1991 was one in which the recession was expected to end, the recovery to start, and the ambiguities of an uncertain economy to gradually disappear. The end of the Middle East crisis brought a brief euphoria, as American troops, victorious in Iraq, returned home to hopes that the end of the conflict would "jump-start" the economy. Some encouraging signs were seen, but by year-end 1991, the U.S. economy was still sluggish, with no clear signs of a near-term sustainable recovery.

Phrases such as "all the necessary pieces to initiate and sustain a recovery are in place" have been common in the media, but as late as May 1992, the hoped-for sustainable upturn in the economy is just starting to be seen. Few disagree that a return to economic growth will happen, but opinions vary widely as to when a steady, sustainable turnaround will be solidly assured, how quickly the economy will rebound, and what the new growth rates will be for the country, the various industries and the financial resources that fuel the economy.

At present, economists are expecting an inflation-adjusted gross domestic product (GDP) to increase 2.8% from the fourth quarter of 1991 to the fourth quarter of 1992, and about the same increase in 1993. This will be the best economic performance in four years, but it is only half the average pace recorded in the initial years of previous recoveries.

2. Economic Impact

Official or unofficial, recession in the U.S. finally ended a decade of largely uninterrupted economic growth.

Economic growth is significant because 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. For example:

- The inflation rate of the past few years has been much more modest than in the mid-1980s and, as noted above, is expected to continue at modest levels. Because INPUT's forecasts and market sizes are in current dollars, lower inflation means lower growth.

- Real economic growth had been modest over the few years prior to the economic slowdown. As a result, deferred and canceled expansion plans in all industry sectors have slowed the expansion of information services expenditures. A 2.8% increase per year in the GDP for 1992 and 1993 is not likely to change this condition.

- The trend toward shifting information processing to smaller computers lowers the software products investment, based on current pricing practices. Thus, the quantities of software products sold increase, but revenue levels grow at a more modest rate.

The net economic influence on the cross-industry sectors for information services is that the slowdown in growth and constraints on budgets seen over the last two years will not appreciably change over the next two years.

Businesses that use cross-industry information services will still be dealing with their own market, product and organizational uncertainties, and although such an environment offers many opportunities for the use of new products and technologies, users are expected to continue their tendency toward cautious change and growth, and strong expense controls.

D
Related Reports

Related reports of possible interest to the reader include:

1. U.S. Markets

- *U.S. Application Solutions Market, 1991-1996*
- *U.S. Processing Services Market, 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 Forecast for Computer Software and Services, 1991-1996*
- *Trends in Processing Services—Western Europe, 1991-1996*

Office Systems

A
Definitions

The office systems cross-industry sector encompasses five application areas: integrated office systems, word processing, graphics, desktop publishing and electronic publishing.

1. Integrated Office Systems (IOSs)

IOSs typically include the following core functions, all of which are accessed from the same terminal, microcomputer or workstation:

- Electronic mail
- Decision support systems
- Time management
- Filing systems

Additional applications software—such as word processing, spreadsheet, and line-of-business software—is interfaced to, and accessible through, the IOS shell. IOS user expenditure forecasts in this report exclude these additional software products because they are purchased separately from the IOS.

An IOS performs in a similar way on all platforms. It has come to be viewed as the "glue" that connects workers with one another, enabling them to access data from multiple data bases resident on a number of hosts or servers, and enabling them to integrate line-of-business software with personal software productivity tools. Thus, an IOS is really more than an office system; it is a corporate communications environment.

IOSs capitalize on the cross-platform architectures of major vendors. Major hardware vendors—such as IBM, Data General, Digital, Hewlett-Packard and NCR—all offer IOSs.

The definition of an IOS is in a state of change, however, as the office concept begins to be replaced with the concept of integrated enterprise-wide environments. Applications software products within these environments will certainly not be limited to office products; the IOS will act as the integrating environment.

In addition to the IOSs mentioned above, more workflow and groupware products are beginning to appear:

- Lotus Notes is gaining recognition as a groupware product.
- WordPerfect's LAN-based Office (soon to be renamed WordPerfect Mail) provides E-mail, calendaring and scheduling on a corporate-wide basis.
- Digital's TeamLinks provides an environment for desktop integration through conferencing and videotext services across wide-area networks.
- NCR is developing a workflow product that will automate tasks that involve the efforts of a number of people within an organization or a number of resources.

For the time being, INPUT is including these types of groupware and workflow products within the IOS category of products.

2. Word Processing

Word processing is the most common microcomputer application and is a basic application within any IOS. Word processing addresses several levels of functionality, from the production of simple correspondence to large document generation where many people within different departments have input.

The newest releases of Word 5.0 and WordPerfect 5.5 include kerning, fractional-point control of line spacing, graphic importing, absolute positioning of graphic items on a page, and automatic text flow through a multipage and multicolumn document—features that were once the sole domain of desktop publishing software.

3. Graphics

Office systems graphics includes:

- Presentation graphics, which represents the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data. The presentation graphics software market is

almost exclusively microcomputer oriented (workstation-based graphics packages are primarily used for scientific and technical chores). Close linkages have been made among presentation graphics products, word processing and desktop publishing, as well as spreadsheets and DBMSs.

- Paint and line art including drawing programs, such as MacDraw and MacPaint, used for illustrations. Libraries of clip art objects are available for users who are trying to piece together presentations in a hurry. These products are closely tied to desktop publishing products.

- In the next few years, desktop scanners for both text (OCR) and graphics will begin to compete for desk space with personal computers and printers. As more people buy scanners, prices will drop. Even as prices drop, scanners are becoming more accurate and more versatile. The scanner market, however, is still too small to have a standardized software interface.

- Page description languages describe how text and graphics are displayed on the computer monitor and/or printed page.

- Electronic form programs allow users to create and print forms in-house. Some applications work with OCR scanners, allowing users to scan pictures and logos directly onto the forms. Over the next five years, electronic forms applications will increasingly be merged with digital document management, and reduce traditional printing costs and storage space requirements.

Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. However, graphics software that is data driven and ancillary to data analysis is included the planning and analysis cross-industry sector. CAD/CAM and CAE are included in the manufacturing industries vertical market reports. Graphical user interfaces, such as Microsoft Windows and IBM's Presentation Manager are systems software products and are included in the *U.S. Systems Software Market, 1991-1996* report.

4. Desktop Publishing

The distinction between graphics-based word processing and desktop publishing (DTP) is becoming blurred. Because DTP markets are being usurped at the low end by word processing packages, DTP vendors are looking at the sort of shared document production facilities that high-end, workstation-based publishing packages have always had. They are also attempting to automate more of the design process.

5. Electronic Publishing

Electronic publishing includes composition, printing, and editing software for documents containing multiple typefaces and graphics—including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

Electronic publishing software and turnkey systems automate the document creating process and allow the user to carry out tasks otherwise performed by graphic artists, typesetters and printers. Products run on mainframes, midrange systems and workstations.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document. Desktop publishing (DTP) on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer. The distinction is becoming blurred, however.

B
Information Services Markets

The overall size and growth rate for the office systems cross-industry sector IS expenditures are shown in Exhibit VII-1.

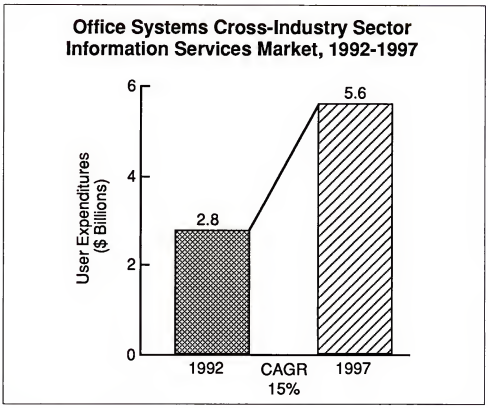
Office systems is truly a cross-industry application. And because of the generic nature of many office tasks, office systems are almost always purchased from outside vendors rather than developed in-house. It is not likely that office systems will become industry-specific. Rather, separate vertical applications software products will be accessible through, and integrated with, office systems. These are two key reasons why office systems is one of the largest sectors for information services.

However, during the 1992-1997 timeframe, this industry sector will experience challenges that may inhibit its growth. These challenges are:

- Near market saturation for standalone word processing, graphics, desktop and electronic publishing products
- Lack of market preparedness for wide-scale adoption of integrated products including IOSs, workflow and groupware products

These two forces tugging against one another will slow growth over the short term.

EXHIBIT VII-1



In the future, availability of integrated products and marketplace ability to implement them will fuel growth. Additionally, integration of the following kinds of technologies with office systems will promote growth of office systems products:

- Image scanning and optical disks
- Document management and text retrieval software—being pioneered by companies such as Verity and Information Dimensions
- Multimedia capabilities

Integrated Office Systems—A driving force for IOSs is customers' stated needs for integration and data access. Another driving force is that additional groupware/workflow/IOS products will continue to be introduced over the next five years.

Growth inhibitors include:

- Given the trend toward integration of separate office applications software products through a GUI, most notably Windows, users question the need for a full-blown IOS. An IOS, as it has been traditionally defined, may not be needed as the "glue."

- Although an uncertain economy will not have a negative impact on expenditures for relatively inexpensive personal productivity tools—such as PC-based word processors, graphics and DTP applications—IOSs may meet with skepticism.

- In addition, IOSs are still new technologies. Integration of applications and functions and hardware interoperability have a long way to go. In fact, these technology barriers will get worse before they get better: the multitude of operating systems such as Windows, DOS, UNIX, OS/2, System 7, and Solaris fragment the market rather than move the market toward standards.

- Customer confusion—due to the increasing number of choices of hardware, systems software and applications software technologies—is a negative influence overall for applications software products, including office systems.

- Implementing an integrated enterprise environment suggests that the user organization has fully implemented and integrated LANs. INPUT believes that only a small percentage of companies have fully integrated LANs. In addition, implementing an IOS implies that end-user organizations will need to re-engineer business functions and potentially fewer people will be needed—which, although desirable from a corporate standpoint, will be resisted by end-user departments.

Therefore, INPUT believes that in order to enhance product sales, vendors will need to continue their missionary selling efforts for the next several years.

Word Processing—Historically, the driving force for word processing software products expenditures was new personal computer unit sales and product upgrades providing richer features and functions. Now, however, personal computer shipments have slowed and word processors are approaching "features overload." Over the next five years these driving forces will be replaced by the following driving forces:

- Sales of pen-based computers will expand the market for common PC-based applications such as word processing and spreadsheets.

- A migration of products to new operating systems, including Windows, will continue to fuel the growth of the word processing market.

- Suite packaging—combining three or more applications software products together as a single product sale—is more pronounced this year. Suite packaging may enhance unit sales of word processing products but, over several years, INPUT believes this tactic will reduce expenditure growth because of the lower price per unit; purchase of a suite of products is considerably less expensive than the purchase of several individual products.

Graphics—INPUT believes growth of expenditures on graphics applications software products will remain relatively low for the following reasons:

- Graphics products have always been a lower priority than other commonly used packages such as spreadsheets and word processing packages.

- Graphics packages are in competition with graphically oriented word processing packages and spreadsheets. Some of the high-end word processors now have layout capability and can create a variety of attractive tables and bulleted charts. Some, such as WordPerfect's latest release, can import graphs and images. Similarly, many spreadsheets of recent vintage provide advanced graphing and layout capabilities, including color and three-dimensionality, sophisticated text editing and a variety of type styles and fonts.

Vendors of graphics products must strive to make their products more "business critical" to enhance sales.

Ways vendors are enhancing sales of their graphics products include:

- Graphics products are incorporating enhancements and upgrades, making the more sophisticated resemble low-end CAD.

- Ease of incorporation into word processed documents, through the use of GUIs, has enhanced the appeal of graphics software.

- Windows' capability to support live data links to other applications such as spreadsheets and data bases as well as graphics has also enhanced growth of graphics products. Thus, when a number in a spreadsheet changes, graphics and presentations can be automatically updated.

- On-screen presentations and the incorporation of multimedia will eventually enhance graphics usage.

- EISs, although a small market, are beginning to incorporate presentation graphics. Thus, a manager can request to see a series of slides as well as the backup spreadsheet the slides represent.

Desktop publishing—Introduction of the 300-dpi Apple LaserWriter with Adobe Systems Inc.'s PostScript page description language in January 1985 marked the advent of DTP. Such an obvious need existed for DTP that user expenditures grew and reached maturation rapidly.

As word processing packages became more sophisticated, they usurped what was the sole domain of desktop publishing packages. The most recent Microsoft and WordPerfect versions supply graphic image importing, graphical page preview, support for multiple type sizes and styles, detailed page layout controls, and drivers for high-end laser printers and typesetting machines.

At the high end, electronic publishing products from vendors such as Frame Technology and Interleaf, Inc. limit the market potential for sophisticated DTP.

In order to expand their markets, DTP vendors are adding additional functionality:

- Ventura and Aldus both now have data base publishers that enable users to more easily style and prepare data base information for incorporation into desktop publishing applications software products.

- Ventura is pursuing the color DTP market. Although market awareness and acceptance of color will take time, it may expand the market to include a broader function for DTP within corporations.

- Eventual work group publishing for DTP—including revision tracking and keeping specific areas/functions designated for specific people—will help to sustain the DTP market as well.

- View-only copying of electronic documents has large market potential and will be a growth inhibitor for DTP in the future. The advantages of maintaining and updating documents centrally and then distributing them for viewing to a large audience are obvious when compared to the process of hardcopy distribution.

Electronic publishing—Until the last year or two, the market for electronic publishing was limited to companies with ongoing complex publishing and technical documentation needs. Other, less sophisticated publishing needs are met by desktop publishing and word processing products.

Now, however, the availability of low-cost powerful desktop computers and affordable laser printers makes electronic publishing appealing to a broader audience. A stronger growth promoter over the long term will be the expanded role electronic publishing will play in document management and distribution.

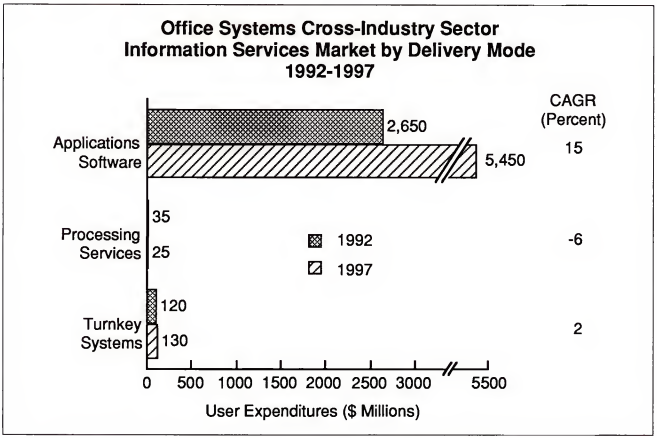
Document management and distribution addresses the coordination of the entire documentation process, including storing, searching, retrieving, routing, linking and distributing documents anywhere on the corporate network. Document management also addresses the problem of the timeliness and accuracy of document information.

Frame Technology and Interleaf both have "view-only" products for document distribution and viewing. However, interoperability and integration are ongoing challenges.

Because of the enormity of these challenges—as well as the potential for big payoffs—providing a document management solution will by no means be limited to electronic publishing vendors. Systems vendors with IOS products have an enormous amount to gain if they can devise an enterprise-wide document management strategy. Electronic publishing will play a valuable role, but it will have to make its presence strongly felt.

As can be seen from the forecast presented in Exhibit VII-2, applications software products expenditures will experience healthy growth over the next five years. However, expenditures on turnkey systems are flat and processing services expenditures are declining.

EXHIBIT VII-2

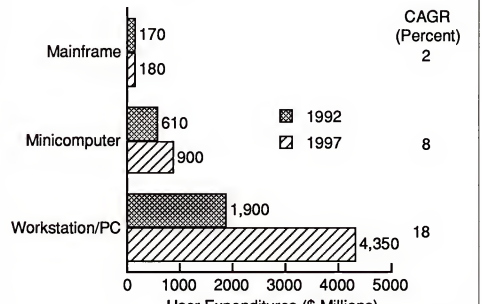


1. Applications Software Products

Exhibit VII-3 presents INPUT's expenditure forecast for office systems applications software products by platform size.

EXHIBIT VII-3

Office Systems Cross-Industry Sector Applications Software Products Market by Platform Size, 1992-1997



Mainframe and minicomputer—Growth of expenditures for mainframe- and minicomputer-based applications software products is due almost exclusively to price increases on previously existing WP and IOS licenses.

- To remain relevant to PC-oriented offices, midrange vendors all have office systems strategies tying their minicomputers to PCs to share data and, eventually, work cooperatively. IOS is a way to showcase the fact that minicomputers can interact effectively with PCs. These vendors will do best in IOS among their existing customer bases.

- Only a small portion of expenditure on word processing applications software products is for mainframe-based products. Word processing on minicomputers is also rapidly diminishing as WP remains strongly positioned as a personal productivity tool.

- By the very nature of its definition, desktop publishing is not on the mainframe or minicomputer.

- Electronic publishing software residing on mainframes and minicomputers is still in use, but there are few new sales. The typical application is data base publishing using data that resides on the mainframe. But strides are being made to create desktop electronic publishing packages that extract data from multiple data bases.

Workstation/PC—Practically all expenditure growth for office systems applications software products will come from workstation/PC-based product sales.

- A transition has been under way over the last two years from host/terminal-based IOSs to client/server-based IOSs, which means growth at the workstation/PC level. All IOS vendors have made or are making this transition.
  - Hewlett-Packard, NCR and AT&T IOSs now run on LANs rather than mainframes and are client/server in orientation.
  - IBM and DEC, the keepers of the first generation of proprietary office systems, have recently announced enhancements to their systems to operate on the client/server model as well.
- Lower-cost workstations and widespread availability of executive information systems (EISs), graphical user interfaces (GUIs), and relational data base management systems (RDBMSs) all serve to promote the use of department-level applications software products, including marketing and sales and electronic publishing.
- Until now, standard PCs and Macs have been underpowered for editing large, complex documents and color images. Now, with -386, -486 and UNIX platforms at a reasonable price, the market is expanding.
- A migration of all office systems products to Windows will continue to be a driving force for workstation/PC-based office systems products. In fact, the office systems market is embracing Windows more quickly and enthusiastically than any other cross-industry or industry-specific sector. Other multiuser and multitasking operating systems—such as Apple's System 7, UNIX, Windows NT, and new versions of OS/2—will gain momentum in the office systems market as well.

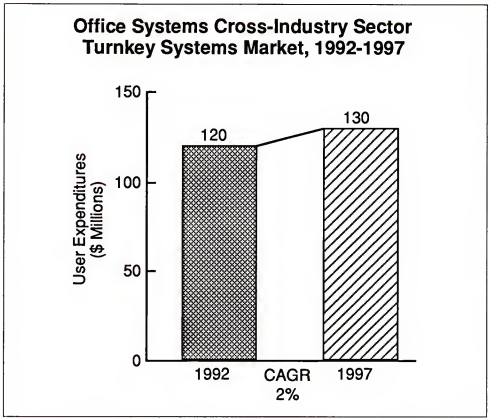
2. Turnkey Systems

According to DTP and electronic publishing vendors, an estimated 30% of revenues come from sales through turnkey systems vendors and VARs. DTP can use special hardware to increase productivity and add new capabilities, such as large-screen monitors and printers, and scanners.

A very small portion of word processing, IOS and graphics are sold through cross-industry VARs. Typically, VARs will bundle office systems products along with other line-of-business or industry-specific applications software products.

INPUT forecasts a CAGR of 2% for cross-industry DTP turnkey systems through 1997 (Exhibit VII-4), which is the same as last year's forecast.

EXHIBIT VII-4



- This slow growth is due to a trend among DTP applications software products and turnkey vendors to port their software to a number of standard hardware platforms. As this occurs, inventory carrying costs for multiple hardware platforms become prohibitive.

- Turnkey growth is slowing for electronic publishing as well, because the market for electronic publishing is simply not large enough to sustain a large number of VARs. Interleaf's exit from the turnkey business in 1990 was a signal of curtailment of VAR activity.

- Low profit margins on hardware, increased importance of standard hardware and multiplatform software left little incentive for many turnkey vendors/VARs to sell the hardware portion of a turnkey system. Therefore, turnkey vendors and VARs that sell electronic publishing applications software products are likely to be industry-specific VARs that can provide other vertical applications software products as well.

3. Processing Services

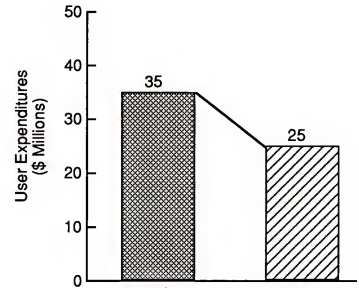
The processing services portion of the office systems information services market consists largely of presentation graphics services performed by outside service bureaus. Service bureaus convert the presentation graphics images either to color slides or to hard-copy prints used in the actual

presentation. So-called office automation services—such as PROFS, which was the predecessor to IBM's OfficeVision—are available on a timesharing basis by companies such as Litton Computer Services in case customers want them, but they are seldom used. Both integrated and standalone packaged solutions are widely available.

Exhibit VII-5 presents INPUT's processing services forecast. The negative CAGR is the same as INPUT's forecast last year.

EXHIBIT VII-5

Office Systems Cross-Industry Sector Processing Services Market, 1992-1997



A handful of national service bureaus and numerous small local companies offer slide production services, but many corporate users are bringing the slide-making process in-house after considering such factors as cost, convenience and control.

- With the widespread availability of PC-based solutions and low-cost slide-making equipment, users are able to produce quality graphic products in-house with ease.
- When confidential information needs to be converted into slides, going to an outside services firm is resisted.

C
User Department Directions

Office technology managers from a public transportation company and a pharmaceuticals firm were interviewed regarding office systems directions. In addition, the pharmaceuticals firm's creative services manager was interviewed about trends and issues relating to electronic publishing.

Both companies seek more and easier data accessibility and have in common the near-term goals of fully implemented and integrated LANs and integrated applications. Both are moving strongly toward GUIs. Both are working toward full network implementation and both are concerned about lack of knowledge on the part of users.

Other commonalities are that both respondents believe downsizing will have little or no impact on office systems. For both companies, data will continue to reside on the mainframe and the applications software products will continue to be either on the desktop or on a smaller file server. Neither company is making a major commitment to UNIX.

It is interesting to note that their comments about the office are not confined to a prescribed set of so-called office tasks or functions but are about enterprise-wide computing.

Public transportation firm—This company will have completed corporate-wide LAN implementation by year-end 1992. Standalone desktop office systems applications software will be replaced with LAN-based office applications software products because of their lower cost.

In addition to completing LAN implementation, this company's major office-related project this year is interfacing its mainframe bus scheduling system with a PC-based desktop publishing system for direct publication of schedules and pocket handouts, thereby eliminating the redundancies of hardcopy output and manual data input into the desktop publishing documents.

The company is standardizing on a single vendor's spreadsheets, word processing, and DBMS programs and is selecting additional applications software products that adhere to standards.

A future goal is to have data accessible on every desktop, but the interviewee believes this goal will be difficult to achieve; employees and managers are not knowledgeable enough about how to use PCs and the company has no training budget.

Pharmaceuticals firm—Whereas the first firm is just completing implementation of its first—albeit large—LAN, the second firm is completing integration of all of its previously existing E-mail systems. This company's focus over the near term will be to continue to add robustness to a corporate-wide network. Challenges include getting management to agree on technical strategies—such as standardizing on TCP/IP—and educating users about the capabilities of distributed networks and distributed computing.

As costs of networks come down, this firm will begin to look at ways to move larger quantities of data—which will eventually include FDDI (within two years on a selected basis)—to the desktop. Within the next two to three years, E-mail will become a background activity and data sharing will be the principal focus. Client/server architectures will be fundamentally important in this regard.

Whereas the first company is making initial efforts to integrate by interfacing two previously separate functions—a mainframe bus scheduling program to a desktop publishing system—the second company is beginning to assess groupware products, such as Lotus Notes, as a way of integrating a wide variety of different applications.

- Rather than standardizing on a single vendor as was the case with the public transportation company, this company will continue to support several different vendors' office applications software products. The company doesn't plan any vendor changes, but will not hesitate to switch vendors for an integrated office system that meets its requirements.

Creative Services Department, pharmaceuticals firm—This department's customers are the marketing groups within the firm. Cost/benefit trade-offs are driving this department.

- The company is bringing all electronic pre-press in-house this year to save costs.
- The department must justify its existence on the basis of lower costs compared to outside vendors.
- The department must cost justify any new information technology expenditures.

This department's existence is also based on providing higher quality output than can be obtained from external vendors. Thus any kind of electronic publishing equipment it buys must not only be reasonably priced, but must also provide high quality.

Needs include the following:

- Less templatizing and more flexibility in the way the final product is going to look
- More applications integration and more intuitive ways of working with the software
- More compatibility between formats—the ability to create a document of picture in high resolution and map it to a low-resolution application
- More network capacity so that large computer files can be electronically sent to the marketing department

D

Trends/Technology Ratings of Importance

Respondents within all cross-industry sectors, both vendors and users, were asked to rate various trends and technologies on a scale of one to five, where one is unimportant or having little impact and five is very important or having significant impact.

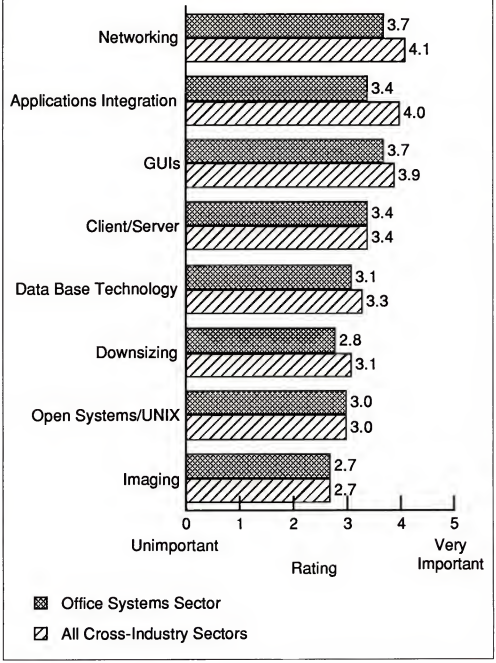
The technologies listed in Exhibit VII-6 were selected because INPUT believes they will receive the most attention from vendors and users over the next five years. In addition INPUT believes their impacts on vendors and users will be profound. Users who deploy these technologies will be re-engineering their business functions. And vendors will need to change not only their products, but also the ways in which they price, sell and support them.

Exhibit VII-6 shows the composite ratings of the office systems cross-industry sector compared to the ratings of all cross-industry sectors combined.

Interestingly, the office systems sector rating for applications integration is noticeably lower than the all cross-industry sectors combined rating. Vendors with IOS offerings and the more technologically advanced user organizations rated applications integration 5.0; on the other hand, vendors with a major focus on pieces of the office such as word processing or graphics—as well as more traditional users—rated applications integration considerably lower.

EXHIBIT VII-6

Office Systems Cross-Industry Sector Respondents' Indication of Relative Importance of Trends and Technologies



INPUT believes the applications integration rating underscores the challenges ahead in selling the IOS concept and product. It underscores the importance of standards and full LAN implementation on the technology side; but it also suggests that these technologies will require users to change from their former way of doing things, and this takes time.

Respondents for all cross-industry sectors were also asked to rate the technologies and trends in terms of importance five years from now. All technologies for all cross-industry sectors increase in importance over the five-year period.

By 1997, the office systems sector rating for applications integration is the same as for all cross-industry sectors combined (4.6). Thus this sector acknowledges the importance of this trend for the future but lacks consensus about its impact (or feasibility) now.

As is true with all cross-industry sectors, within the office systems sector vendor ratings are generally slightly higher than user ratings. The largest discrepancies are in the ratings for open systems/UNIX and data base technology. Vendors consider open systems/UNIX more important than do users (5.0 vs. 3.0) and users think data base technology is more important than vendors do (3.5 versus 2.6). Vendors view open systems and UNIX as key to applications integration and wide-scale implementation of their products. INPUT believes the users' lower scores indicate that user organizations are cognizant of the importance of open systems and standards but have not made a commitment to UNIX.

E

Vendors and Competitive Environment

1. Vendor Characteristics and Trends

Varying approaches to integration—Office systems vendors are approaching user needs for integration and enterprise-wide solutions by porting their products to Windows, developing client/server solutions, and beginning to provide groupware and workflow solutions. The competitive environment will change dramatically as IOSs continue their evolution from completely host-based systems, to PC network and client/server solutions that operate under a GUI, to workflow or groupware software.

- As more users purchase the Windows operating system, shifts in PC-based applications software products vendor leadership positions may occur. Effectively porting products to Windows and capitalizing on its functionality will take on more significance and be a more competitive

advantage than the "bells and whistles" of the applications software product itself. Because all vendors' products will essentially have the same ease-of-use features, customers will be more willing to switch vendors for the most solid Windows rendition.

Windows has created an opportunity for word processing vendors to provide the kinds of functionality initially only provided within DTP products running on Macintosh computers. As word processing packages take on the ease-of-use features and functionality of what used to be the sole domain of desktop publishing products, DTP vendors such as Aldus and Ventura Software will be pitted against WordPerfect, Lotus and Microsoft.

The DTP vendors will have to adopt a product strategy of increasing sophistication (which will cause them to compete directly against electronic publishing applications software products vendors) and/or broader-based product lines. The latter appears to be the strategy of choice. For example, Aldus now has a second, newer, product category it calls business communications products; and both Aldus and Ventura Software have introduced data base publisher packages.

- A prominent trend over the last several years has been a transition away from host/terminal-based IOSs to client/server-based systems. Data General, AT&T/NCR, and HP have all modified their IOS products to a client/server framework. Although DEC's All-In-1 Phase 2 has been slow in delivery, DEC has introduced client/server aspects of DEC All-In-1 and is moving away from using the VAX as the server. IBM OfficeVision client/server products are beginning to appear (OV/2 LAN) as well. As client/server products gain momentum, RDBMS companies are entering the fray. For example, Oracle now has its own electronic mail and word processing packages.

- Office systems is among the first application sectors to embrace the groupware concept. Examples of groupware activities are:

  - Lotus Notes is the most successful groupware product so far, and one of the first truly distributed systems. Notes facilitates group communications for decentralized or geographically dispersed organizations and is being used to develop and deploy such applications as customer tracking, status reporting, and project management. Although it is not specifically billed as an office system, it is being used for office systems applications such as information distribution, electronic mail, and collaborative discussions or authoring.

- In November 1991, Digital Equipment introduced a Windows-based series of products—TeamLinks—that provide conferencing and videotext services across wide-area networks. The initial implementation of TeamLinks will require VAX servers and Windows clients. However, DEC plans to offer the software on Intel-based and UNIX-based servers next year. DEC will also unveil workflow and work group software applications.

- Microsoft has also revealed plans for work group applications software products, which will be one of its central development themes in years to come.

- WordPerfect Office has also been described as a groupware product.

- Work group or collaborative publishing has the ability to spread publishing tasks to different members of a group via a network. Both Aldus and Quark are integrating aspects of Apple's new operating system—System 7.0—with existing products to facilitate cooperative DTP on networks.

• As the notion of work group software expands, additional companies with innovative approaches to groupware may enter the office systems market.

Alliances and acquisitions—In a broad sense, an IOS can now be loosely defined as simply multiple functions of an office nature for multiple users. New kinds of alliances and ongoing acquisitions reflect this broader definition. They also reflect a trend toward what used to be separate products increasingly being incorporated as features within a single system.

Two prominent alliances in the office systems cross-industry sector are the IBM/Lotus alliance and the Digital Equipment/Microsoft alliance.

• In June 1991, IBM announced it would market Lotus' Notes and cc:Mail as part of its office systems family. Eventually, these two products will be more tightly merged into Office Vision. IBM is thereby positioning itself in the work group/collaborative authoring arena. Lotus has become an IBM International Alliance partner, which implies stronger ties than IBM business partner status.

• In November 1991, Microsoft and DEC strengthened and expanded their alliance in the office systems arena. DEC will develop and sell Microsoft applications, such as the Excel spreadsheet and Visual Basic programming environment, that have been enhanced to work with DEC software. And Microsoft's new Windows NT will run on DEC's new alpha platform series.

2. Leading and Emerging Vendors

Leading vendors of each of the application types within office systems are listed in Exhibit VII-7.

EXHIBIT VII-7

Office Systems Cross-Industry Sector
Leading and Emerging Applications Software Products Vendors

Vendor	Integrated Office Systems	Word Processing	Desktop Publishing	Graphics
Adobe Systems				X
Aldus			X	X
Ashton-Tate		X		
Computer Associates				X
Data General	X			
Digital Equipment	X			
Hewlett-Packard	X			
IBM	X	X		X
Lotus				X
Micrografx				X
Microsoft		X		X
Software Publishing				X
Quark			X	
Ventura			X	X
WordPerfect		X		X
Deneba Software				X
Claris				X
Symantec (More II)				X

Integrated office systems—To remain relevant to PC-oriented offices, midrange vendors all have office systems strategies tying their minicomputers to PCs to share data and, eventually, work cooperatively. IOS is a way to showcase the fact that minicomputers can interact effectively with PCs. These vendors will do best in IOS among their existing customer bases.

Word processing—The top three vendors in the word processing segment are WordPerfect, Microsoft and Lotus. They all have similar customer sets and offer high-end, Windows-based products.

Graphics—Graphics vendors include Lotus, Microsoft, Aldus and Claris. All of these companies offer Windows-based products.

Desktop publishing—In addition to the original winners in DTP—Aldus and Ventura—low-end DTP is a valid but increasingly competitive market. Companies like Springboard Publisher (Minneapolis, MN) and Timeworks (Deerfield, IL) will face heavier competition.

Electronic publishing—There are only a handful of electronic publishing software vendors.

- The two leading workstation/PC electronic publishing vendors are Frame Technology and Interleaf, Inc.
- Other smaller vendors are ArborText, Compugraphic and Island Graphics.
- XYVISION is a leading minicomputer-based electronic publishing vendor; although it sells into some business environments, much of its sales are to the commercial and professional publishing market.

3. Vendor Profiles

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

a. Aldus Corporation

Aldus was founded in 1984 and developed a relatively inexpensive and easy-to-use software tool that would perform page layout and design functions on the Macintosh. It later developed PageMaker, which still generates about 50% of its sales. PageMaker was the first desktop publishing applications software product on the market and essentially put the Apple Macintosh on the map. The first Windows version of PageMaker was introduced in 1987.

Aldus is now focused on two product areas—its traditional core product group for page layout and graphics art design—and the newer category of business graphics and presentation products like Persuasion presentation graphics for Windows.

In recent years, Aldus has been acquiring technology, products and companies in its mission to build a stronger product line and decrease its reliance on a single product (PageMaker). In February 1990, it made its largest acquisition to date when it exchanged $26 million in stock for ownership of Silicon Beach Software, a maker of graphic arts software for the Apple Macintosh.

In May 1991, Aldus acquired publishing rights to PhotoStyler originally developed by U-Lead Systems. Now called PageMaker Database Edition, the product enables users to easily take data base files and turn them into published references like catalogs. In 1991 Aldus also obtained publishing and marketing rights to PageAhead, a bridge between data base management systems and PageMaker.

Aldus' Advanced Products Group is working with object-oriented programming techniques to develop new products that encompass not only electronic publishing as it is known today, but also technologies such as voice, video, CD ROM, and imaging. Products will be delivered within the next two years, offering electronic delivery as a medium rather than paper and/or film only. The company is broadening its product strategy.

Aldus' 1991 revenues were $167.5 million, a 24% increase over 1990 revenues.

b. Frame Technology Corporation

Frame's original FrameMaker product was UNIX-based and addressed the needs of technical users who produce documents and must integrate into other applications—such as MCAD, CAE and CASE.

Now, however, FrameMaker is available on workstations from Digital, Hewlett-Packard, NeXt Computer and Sun Microsystems, as well as Apple Computer's Macintosh. Frame has recently also released a Windows-based version of FrameMaker. FrameMaker International is available in 13 languages.

In addition to electronic publishing, Frame's product strategy includes a view-only version called FrameViewer (for UNIX) and FrameReader (for the Macintosh).

Licenses are sold to universities, corporations, research and government institutions, software development professionals, and publications groups.

Frame is working on development of tools to integrate FrameMaker with other applications. To this end, FrameMaker can be integrated with SoftBench, a software development integrated framework from Hewlett-Packard. The integration of FrameMaker into the SoftBench framework allows users to create and edit FrameMaker documents directly from other software applications, saving time and enhancing quality in the documentation process.

Frame Technology made an initial public stock offering in February 1992. Its fiscal 1991 revenues reached $41.9 million, an increase of 64% over 1990 revenues.

c. Hewlett-Packard Corporation, Cooperative Computing Division

In June 1990, Hewlett-Packard began shipping NewWave Office, which lets a system running UNIX, OS/2, or HP's own MPE operating system act as a server for clients that may include UNIX, DOS, Windows, OS/2 and Macintosh microcomputers. NewWave Office represents HP's first set of client/server products.

HP's object management facility is at the heart of NewWave Office applications. Through its Object Request Broker, HP is working on developing a standard protocol for distributed object management, which would be a major step toward distributed object computing.

Since its inception, the NewWave Office has expanded to provide an enterprise-wide solution, not just an office solution. HP's NewWave Office now consists of 28 software products and services, including decision support and information sharing services. It incorporates client/server software distribution capabilities, support for Novell's NetWare, platform support for the SCO UNIX System V 3.2, and agent- and object-based E-mail, networkwide ad hoc query, and terminal emulation capabilities.

Among new products scheduled to ship in 1992 are:

- OpenMail—a worldwide E-mail system with expanded functionality. HP will sell the product through OEMs as well as selling it directly.
- An information access component to NewWave Office will allow a knowledge worker to get to any structured data on any system from a single GUI.
- A mail-enabled, object-oriented workflow system
- A full concept-based retrieval system whereby a knowledge worker can locate information inside or outside the organization. This product will work in conjunction with a document management system.

d. IBM Corporation

OfficeVision is the replacement product for IBM's PROFS, a mainframe-based electronic mail product. New functionality for PROFS is only available to OfficeVision users.

OfficeVision is a family of graphical interface applications built on SAA so PCs can act not only as independent processors but also as workstations for access to mini and mainframe data and programs. It is designed to run under all IBM operating systems, including VM, MVS, OS/2 and OS/400. Each version provides a slightly different package of features.

Office Vision/2 LAN is IBM's client/server product offering. IBM has recently begun shipping its Windows client, which has the capability to run OV/2 LAN on a Novell network. All future work for OV/2 LAN will be done on the 32-bit version of OS/2 rather than the 16-bit version.

IBM has a reseller agreement with WordPerfect whereby WordPerfect will automatically come as part of OV/400.

IBM is positioning itself in the work group/groupware arena through the following IBM/Lotus agreements, announced in June 1991:

- IBM is remarketing Lotus Notes and cc:Mail as part of its office systems family. Eventually Notes will be tightly integrated into OfficeVision.
- IBM is licensing the Notes communications capability and data replication function for possible inclusion in future releases of OS/2. Notes functions will eventually become part of the base operating system or an extended service.
- IBM and Lotus are working toward developing a common E-mail system and address book for Notes, cc:Mail and OV/2 LAN. They are also jointly publishing APIs for E-mail and an address book that would be supported across Notes, cc:Mail and all OV platforms.
- Lotus is an IBM international alliance member. This means it has a higher degree of integration, from a company point of view, than does a business partner. Lotus and IBM will jointly develop products and make joint future announcements.

IBM will incorporate the support of additional independent software vendors. Even though it comes from a traditional host-based beginning, its strongest competitor may end up being Microsoft in all areas of systems and applications software products.

e. Interleaf, Inc.

Interleaf, founded in 1981, develops and markets electronic publishing applications software and provides systems integration and customization services. In November 1989, Interleaf announced a major restructuring that removed the company from the turnkey systems part of its business and refocused Interleaf on its major growth and value-added business of software and services.

Since its exit from the turnkey business, Interleaf has been pursuing the following:

- A multiplatform strategy; Interleaf products can now run on 386-based machines
- Broadening its product line to include document management tools such as its Document Manager product, which competes with products such as those from Odesta. It also recently introduced Worldview, a document management product targeted at large corporations with heavy document processing needs.
- Customizing its electronic publishing products for specific customers as well as for industry-specific markets through solutions that include access to multiple applications and data bases. Its "active document technology" enables authors to build a document that is very specific to their needs.
- Placing more emphasis on a view-only version of its electronic publishing product

Revenues for 1991 were $84.3 million, compared with $88.8 million for fiscal 1990; the company attributes the decrease in revenues to its move away from hardware sales. In July 1991, Interleaf acquired its German distributor, Interleaf GmbH for $8.4 million.

f. Lotus Development Corp.

This $829 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. Seventy percent of Lotus' revenues still come from this product. INPUT believes this is a precarious position for Lotus, given that the spreadsheet market is fiercely competitive.

The company is making strides toward lessening its dependence on 1-2-3 in the following ways:

- Lotus Notes has gained widespread recognition as an innovative work group package that rivals more sophisticated executive information systems such as those offered by Pilot and Comshare. It is an initial offering and additional products based around the Notes concept of work group solutions will follow, from Lotus as well as from its competitors.

- Lotus has acquired cc:Mail, which is now the leading electronic mail package.

- It continues to work with Novell and has recently signed an agreement whereby Novell will sell Notes through its VAR channel.

Other recent developments for this company are:

- The company is placing more emphasis on suite packaging; Lotus Suite includes cc:Mail, Ami Pro, Freelance, and 1-2-3 for $1,700 whereas each product priced separately would be in the $800 undiscounted retail range. Although the company may be able to gain additional incremental revenue, suite packaging is also a competitive response to similar moves by Microsoft and other major competitors.

- Lotus is making a strong move toward Windows and has introduced Works for Windows, a suite of products including 1-2-3, cc:Mail, Ami Pro and Freelance.

- The company has announced plans to move the Windows desktop suite to Microsoft's Windows for Pen Computing.

- The company is expanding its drive into the retail channel as well as increasing its direct mail sales.

g. NCR

The Cooperative Computing Systems Division (CCSD) is NCR's three-year-old software products division. Its original charter was to provide an integrated office system. Now, however, its primary product, Cooperation, has gone beyond the context of the office. Cooperation is billed as an enterprise-wide integrating environment. It is an interface that sits above the operating system to provide a common look and feel for the entire environment.

Components of Cooperation are:

- Cooperation is considered a client/server architecture where the server platform is either OS/2 or UNIX; clients are DOS. Future directions include the NT operating system.

- An Executive Information System—what CCSD terms a decision enabling system—is built into Cooperation, which allows the user to monitor business and take appropriate action.

- Cooperation also provides an object-oriented GUI which serves as a shell surrounding previously incompatible applications software products.

- The product or environment includes full text search, file retrieval, and file archiving within which a document is automatically converted to whatever the user is working with.

CCSD is divided into three divisions, one each for Cooperation, a workflow product, and object-oriented development.

h. Software Publishing Corp.

Software Publishing Corp. (SPC), founded in 1980, originally focused on entry-level, easy-to-use publishing applications software products. In recent years, SPC has changed its orientation to a more sophisticated product line. As part of this transition, in January of this year SPC sold its Entry Level Series (PFS:) product line to Spinnaker Software Corp. of Cambridge (MA) in a stock transaction valued at approximately $3.7 million.

Rather than publishing and word processing software, the company's current focus is on a more broadly-based information presentation and information access series of applications software products:

- Harvard Series of presentation graphics and project management products. Harvard Graphics is the leading presentation graphics product for PCs.

- The InfoAlliance Series of products, introduced in September 1990, and originally for OS/2 and Presentation Manager environments, now also runs under Windows. InfoAlliance lets users access and combine data from a variety of sources, including Ashton-Tate's dBase and IBM's Data Manager. It is billed as a graphical data access application generator for client/server and standalone environments.

- Professional Series of word processing, data management and spreadsheet products

As part of its transition to a more broadly based product line, SPC has redirected its development efforts away from OS/2 toward Windows. Its first Windows product, Professional Write PLUS, was introduced in March 1991. It is also compatible with the Pen Windows Operating System environment. Windows-based versions of Harvard Graphics and InfoAlliance software are available as well.

In July 1991, Software Publishing acquired Precision Software Ltd. for $25.4 million. Precision Software is the developer of Superbase, an RDBMS for Windows.

SPC's long-term information access development plans are based on the client/server model. InfoAlliance is slated for a key role in a new architecture. Other desktop information system products that the company plans to deliver in 1992 will provide more ways to view and access data.

Fiscal 1991 revenues reached $143.1 million, an increase of only 2% over 1990 revenues.

i. Ventura Software, Inc.

Ventura Software, a subsidiary of Xerox Corp., is a leading supplier of desktop publishing software with its Ventura Publisher products for DOS/GEM, Windows, OS/2 and Macintosh Editions. A likely addition would be a UNIX-based version.

Ventura's product strategy is to broaden its product line and increase product sophistication. Its key product directions are:

- Upgrades to Ventura Publisher
- A data base front end
- Color extensions

Ventura DataBase Publisher enables users to style and prepare data base information for Ventura Publisher, PageMaker and Interleaf. Ventura obtained the rights to the software from GTG Software Ltd., Berkshire, England. GTG will continue development.

The color extensions software—Ventura ColorPro, Ventura Scan, Ventura Separator, and Ventura PhotoTouch—are targeted at the midrange color desktop publishing market. Ventura's aim is to be the leader in affordable color prepress capabilities for Windows users. These products were developed under a technology licensing agreement with Pre-Press Technologies, Inc. of Carlsbad, CA.

A growing portion of Ventura's sales is international due to the mature state of the U.S. DTP market. It has native-tongue DTP products in Australia, Asia, Russia, Sweden, Spain, France, Germany and Portugal. Ventura has recently gone through a reorganization and has a new president at its helm.

j. WordPerfect Corporation

WordPerfect has built a competitive advantage through technology. Unlike its archrival Microsoft, it has had a very focused product orientation and a reputation for high quality in that niche. WordPerfect's focus is word processing and office systems applications software.

WordPerfect has grown into one of the world's largest PC software makers on the strength of its flagship word processing applications software product line for DOS. Now, however, with the shift to Windows, it has to prove itself in this arena. After repeated delays, WordPerfect for Windows began shipping in November, 1991. In the meantime, sales for DOS versions of WordPerfect Word have slowed.

Eighty percent of WordPerfect's total revenue comes from the PC Division, which provides a set of office productivity tools—including WordPerfect, WordPerfect Office PC, WordPerfect Office LAN, PlanPerfect, DataPerfect, and WordPerfect Executive—for IBM and compatible microcomputers.

WordPerfect's relatively new strategy is to port to as many platforms as seem to make sense. In recent years the company has moved beyond its MS-DOS roots to support UNIX and other minicomputer environments. WordPerfect products also run on Apple systems, Amiga and Atari computers, Data General systems, DEC VAX, and IBM 370. Altogether WordPerfect supports 15 versions of UNIX.

WordPerfect Office was the first LAN-based integrated office environment developed by a major PC software vendor. Introduced in October 1988, the system offers programs such as WordPerfect, PlanPerfect and DataPerfect, along with Office Modules that are generally found only in host-based integrated office systems. These include mail, notebook, calendar, and scheduler modules. It runs on PC Networks, VAX, Data General, Macintosh and UNIX systems. WordPerfect plans to introduce the system onto other platforms such as UNIX, VMS, Macintosh and OS/2.

Fiscal 1991 revenues were $634.2 million, an 18% increase over fiscal 1990 revenues.

Definition of Terms

A
Introduction

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

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

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

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

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

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

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

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

B

Overall Definitions and Analytical Framework

1. Information Services

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

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

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

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

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

2. Market Forecasts/User Expenditures

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

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

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

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

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

3. Delivery Modes

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

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

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

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

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

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

4. Market Sectors

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

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

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

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

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

5. Trading Communities

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

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

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

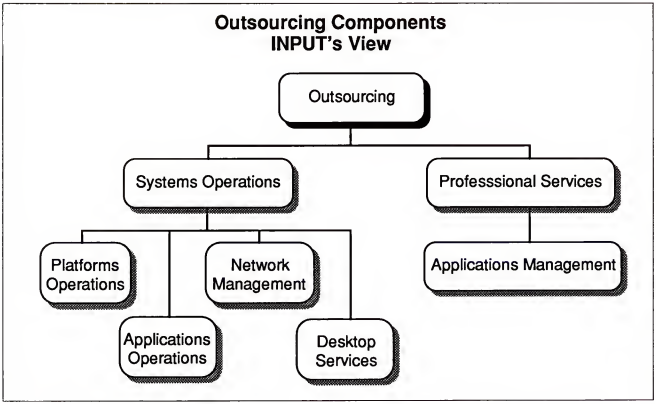
6. Outsourcing

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

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

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

EXHIBIT A-1



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

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

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

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

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

C
Delivery Modes and Submodes

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

1. Software Products

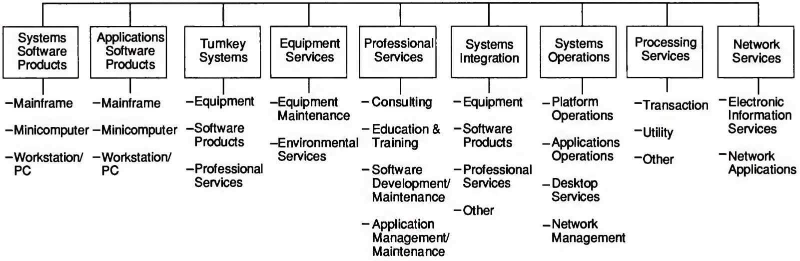
INPUT divides the software products market into two delivery modes: systems software and applications software.

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

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

EXHIBIT A-2

Information Services Industry Structure—1992



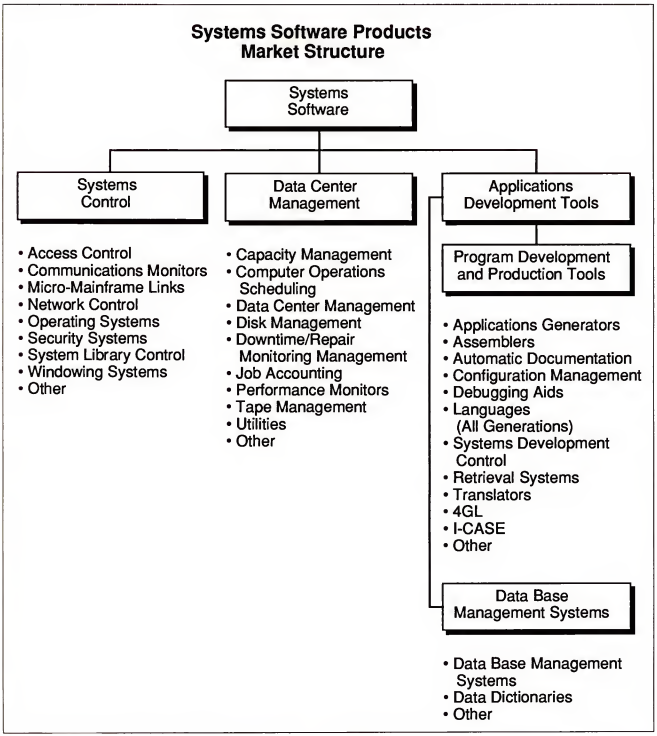
- Systems Software Products
  - Mainframe
  - Minicomputer
  - Workstation/PC
- Applications Software Products
  - Mainframe
  - Minicomputer
  - Workstation/PC
- Turnkey Systems
  - Equipment
  - Software Products
  - Professional Services
- Equipment Services
  - Equipment Maintenance
  - Environmental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

Source: INPUT

a. Systems Software Products

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

EXHIBIT A-3



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

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

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

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

b. Applications Software Products

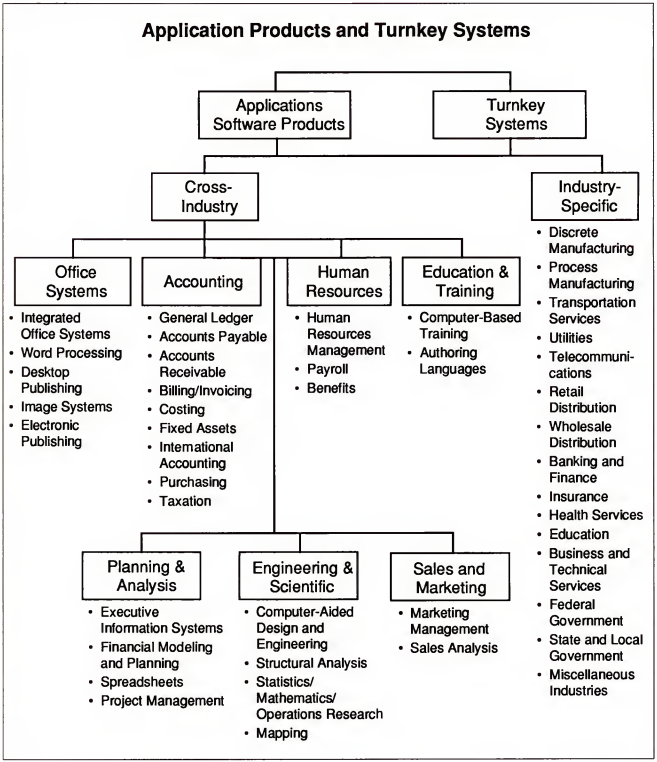
Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market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

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

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

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

EXHIBIT A-4



2. Turnkey Systems

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

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

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

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

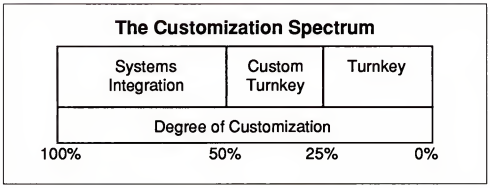
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such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

Turnkey systems have three components:

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

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

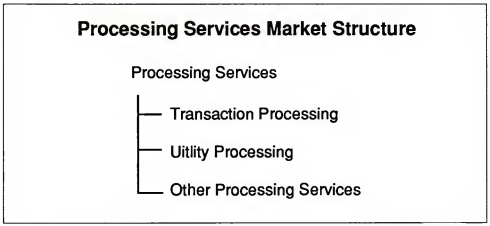
EXHIBIT A-5



3. Processing Services

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

EXHIBIT A-6



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

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

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

4. Systems Operations

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

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

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

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

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

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

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

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

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

5. Systems Integration (SI)

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

The components of a systems integration project are the following:

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

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

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

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

EXHIBIT A-7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

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

Other Miscellaneous Products/Services

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

6. Professional Services

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

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

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

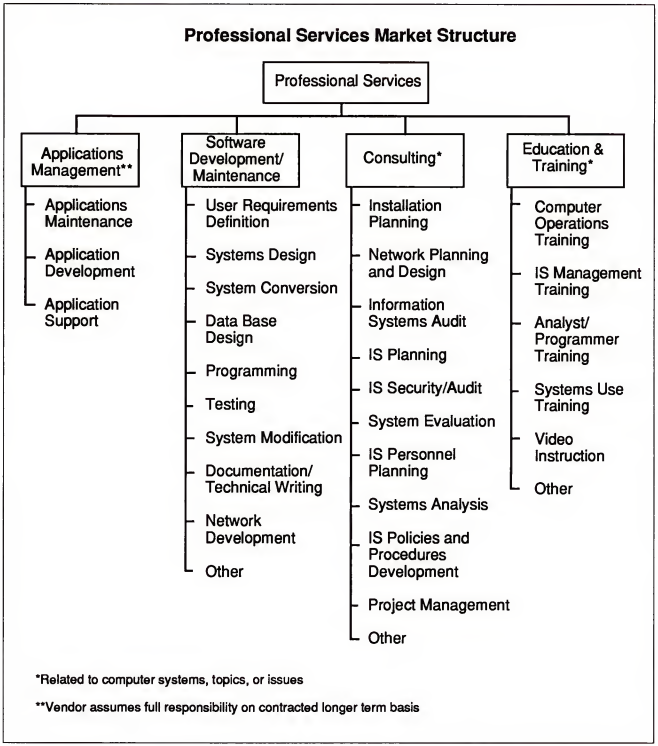
- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

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

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

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

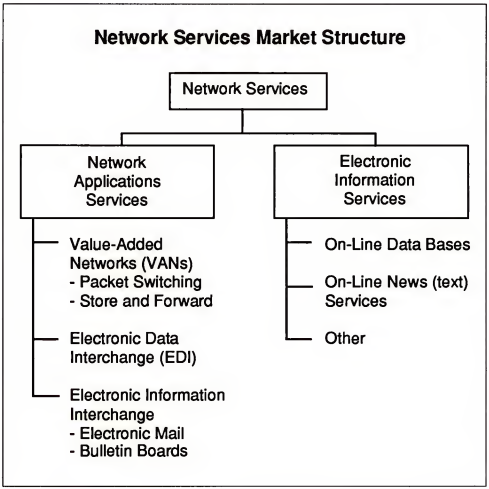
EXHIBIT A-8



7. Network Services

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

EXHIBIT A-9



a. Electronic Information Services

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

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

The two kinds of electronic information services are:

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

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

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

b. Network Applications

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

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

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

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

8. Equipment Services

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

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

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

D
Computer Equipment

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

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

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

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

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

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

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

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

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

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

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

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

E
Sector Definitions

1. Industry Sector Definitions

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

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

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

EXHIBIT A-10

Industry Sector Definitions

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

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

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

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

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

2. Cross-Industry Sector Definitions

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

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

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

The seven cross-industry markets are:

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

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

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

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

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

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

Office Systems consists of the following:

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

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

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

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

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

Engineering and Scientific encompasses the following applications:

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

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

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

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

Sales and Marketing encompasses marketing management and sales analysis application solutions.

- Sales and marketing includes:

  - Sales analysis
  - Marketing management
  - Demographic market planning models

3. Delivery Mode Reporting by Sector

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

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

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

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

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

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

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

EXHIBIT A-11

Delivery Mode versus Market Sector Forecast Content

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

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

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

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

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

F

Vendor Revenue and User Expenditure Conversion

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

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

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

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

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

EXHIBIT A-12

Vendor Revenue to User Expenditure Conversion

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

Forecast Data Base

Electronic publishing turnkey systems and applications software products have been added to this sector this year.

INPUT reduced its estimate of expenditures on minicomputer-based office systems because we believe it was overstated in the past. Minicomputer-based vendors are aggressively introducing integrated office systems (IOSs) to run on smaller platforms.

EXHIBIT B-1

Office Systems Cross-Industry Sector
User Expenditure Forecast by Delivery Mode, 1991-1997

Delivery Modes	1991 ($ M)	Growth 90-91 (%)	1992 ($ M)	1993 ($ M)	1994 ($ M)	1995 ($ M)	1996 ($ M)	1997 ($ M)	CAGR 92-97 (%)
Sector Total	2,552	11	2,826	3,145	3,588	3,999	4,665	5,594	15
Processing Services	36	-3	35	30	30	30	25	25	-6
- Transaction Processing	36	-3	35	30	30	30	25	25	-6
Turnkey Systems	116	3	120	120	125	125	130	130	2
Applications Software Products	2,400	12	2,671	2,995	3,433	3,844	4,510	5,439	15
- Mainframe	163	2	166	170	173	176	180	184	2
- Minicomputer	565	8	610	660	710	768	830	895	8
- Workstation/PC	1,672	13	1,895	2,165	2,550	2,900	3,500	4,360	18

EXHIBIT B-2

Office Systems Cross-Industry Sector
1992 MAP Data Base Reconciliation by Delivery Mode

Delivery Modes	1991 Market				1996 Market				91-96 CAGR per data 91 rpt (%)	91-96 CAGR per data 92 rpt (%)
	1991 Report (Fcst) ($ M)	1992 Report (Actual) ($ M)	Variance from 1991 Report ($ M)	Variance from 1991 Report (%)	1991 Report (Fcst) ($ M)	1992 Report (Fcst) ($ M)	Variance from 1991 Report ($ M)	Variance from 1991 Report (%)		
Sector Total	2,352	2,552	200	9	4,652	4,665	13	0	15	13
Processing Services	36	36	0	0	26	25	-1	-4	-6	-7
- Transaction Processing	36	36	0	0	26	25	-1	-4	-6	-7
Turnkey Systems	66	116	50	76	74	130	56	76	2	2
Applications Software Products	2,250	2,400	150	7	4,552	4,510	-42	-1	15	13
- Mainframe	163	163	0	0	176	180	4	2	2	2
- Minicomputer	634	565	-69	-11	1,190	830	-360	-30	13	8
- Workstation/PC	1,453	1,672	219	15	3,186	3,500	314	10	17	16

About INPUT

INPUT is a worldwide consulting and market research firm uniquely focused on the information technology services and software markets. Executives in many technically advanced companies in North America, Europe, and Japan rely on INPUT for data, objective analysis, and insightful opinions to support their business plans, market assessments, and technology directions. By leveraging INPUT's considerable knowledge and expertise, clients make informed decisions more quickly, and benefit by saving on the cost of internal research.

Since 1974, INPUT has compiled the most extensive research base available on the worldwide information services market and its key segments, providing detailed market forecasts, vertical industry sector analysis and forecasts and analysis of vendor strategies and products. INPUT delivers specific expertise in the fast changing areas of outsourcing, systems integration, EDI/electronic commerce, software development/CASE, and on the impact of downsizing.

Consulting services are provided by more than 50 professionals in major international business centers. Clients retain INPUT for custom consulting/ proprietary research, subscription-based continuous advisory programs, merger/acquisition analysis and detailed studies of U.S. federal government IT procurements.

Most clients have retained INPUT continuously for a number of years, providing testimony to INPUT's consistent delivery of high-value solutions to complex business problems. To find out how your company can leverage INPUT's market knowledge and experience to gain a competitive edge, call us today.

INPUT OFFICES

North America

San Francisco
1280 Villa Street
Mountain View, CA 94041-1194
Tel. (415) 961-3300 Fax (415) 961-3966

New York
Atrium at Glenpointe
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
Tel. (201) 801-0050 Fax (201) 801-0441

Washington, D.C.
1953 Gallows Road, Suite 560
Vienna, VA 22182
Tel. (703) 847-6870 Fax (703) 847-6872

International

London - INPUT LTD.
Piccadilly House
33/37 Regent Street
London SW1Y 4NF, England
Tel. (071) 493-9335 Fax (071) 629-0179

Paris - INPUT SARL
24, avenue du Recteur Poincaré
75016 Paris, France
Tel. (1) 46 47 65 65 Fax (1) 46 47 69 50

Frankfurt - INPUT LTD.
Sudetenstrasse 9
W-6306 Langgöns-Niederkleen, Germany
Tel. 0 6447-7229 Fax 0 6447-7327

Tokyo - INPUT KK
Saida Building, 4-6
Kanda Sakuma-cho, Chiyoda-ku
Tokyo 101, Japan
Tel. (03) 3864-0531 Fax (03) 3864-4114

M&S 459/01 5/92