

SOFTWARE PRODUCTS MARKET.

1987 - 1992

INPUT

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DECEMBER 1987

# SOFTWARE PRODUCTS MARKET, 1987-1992

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***Software Products Market 1987-1992***

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## Abstract

This year's annual survey provides analysis and five-year forecasts of the U.S. software product market for the period 1987-1992. The forecasts contained in this report segment the market into mainframe/mini and micro segments.

The five-year forecast period, using the base year of 1986, covers twenty different Industry-Specific (fourteen) and Cross-Industry (six) markets in addition to market forecasts on the three sectors contained in Systems Software. These three sectors are Systems Control, Data Center Management Tools and Application Development Tools.

The report also discusses issues and trends and provides recommendations on how vendors can take advantage of the key events driving the market.

The report contains 56 pages and 24 exhibits.



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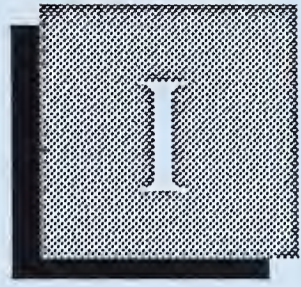
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# Introduction







## Introduction

The Software Products Market report is one of four annual updates provided as part of the Market Analysis and Planning Service. The four annual reports (one for each delivery mode) are:

- Software Products Market, 1987-1992
- Processing/Network Services Market, 1987-1992
- Professional Services Markets, 1987-1992
- Turnkey Systems Markets, 1987-1992

### A

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#### Purpose of this Report

- The report reviews and analyzes the software market in two parts: 1) the mini/mainframe and 2) the microcomputer.
- This report will provide vendors insight and direction to:
  - understand the factors driving the software market;
  - evaluate new product opportunities;
  - identify new market opportunities;
  - determine the prioritization of resources;
  - and quantify the revenues expended in key segments.

### B

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#### Scope and Organization

- The report consists of user expenditures in the U.S. that are noncaptive (expenditures that are competitively available or free to outside organizations). User expenditures are the dollars spent to procure the particular software product and may include markups based on the channel of distribution utilized.
- Thus a company that sells through a distribution channel (most micro software is sold in this fashion) will receive roughly one-half the retail

price. The other half supports the channel participant.

- The report consists of five chapters and two appendices. These are:
  - Chapter II—an Executive Summary describing the major points and findings in the report. This chapter is written in a presentation style format with a script.
  - Chapter III—covers the software products market in terms of opportunities, issues, trends and driving factors. Market sizing and forecasts are provided for the 1987-1992 timeframe. More than twenty major industry-specific and cross-industry market segments are provided for applications software. In addition, systems software analysis is provided describing the major segments of Systems Control, Data Center Management and Applications Development (or Applications Enabling).
  - Chapter IV—provides the macro factors or major issues and trends imparting the software products market.
  - Chapter V—presents the major competitive factors and developments unfolding in the industry and profiles selected vendors and their actions.
  - Appendix A—provides information to define terms used in this report.
  - Appendix B—lists other INPUT reports that are related to the subject matter covered in this report.
  - Appendix C—provides a ranking and brief description of the 1986 independent software vendors.

## C

### General Information

- Exhibit I-1 portrays the structure of the software products market. It shows the software products market to be composed of two major categories: Systems Software and Applications Software.
- Exhibit I-2 shows the Systems Software portion further structured into 3 main areas: Systems Control, Data Center Management and Applications Development (also known as Applications Enabling). Each of these areas is further described in terms of specific functions.
- Exhibit I-3 shows the Applications Software portion structured into 2 main areas: Cross-Industry and Industry-Specific. Each of these areas in turn are broken down into sectors. Industry-Specific sectors are the



same as the 14 sectors reported in the MAPS binders wherein vertical market information is provided. Similarly, Cross-Industry sectors are the same as those reported on in the general MAPS Cross-Industry reports.

EXHIBIT I-1

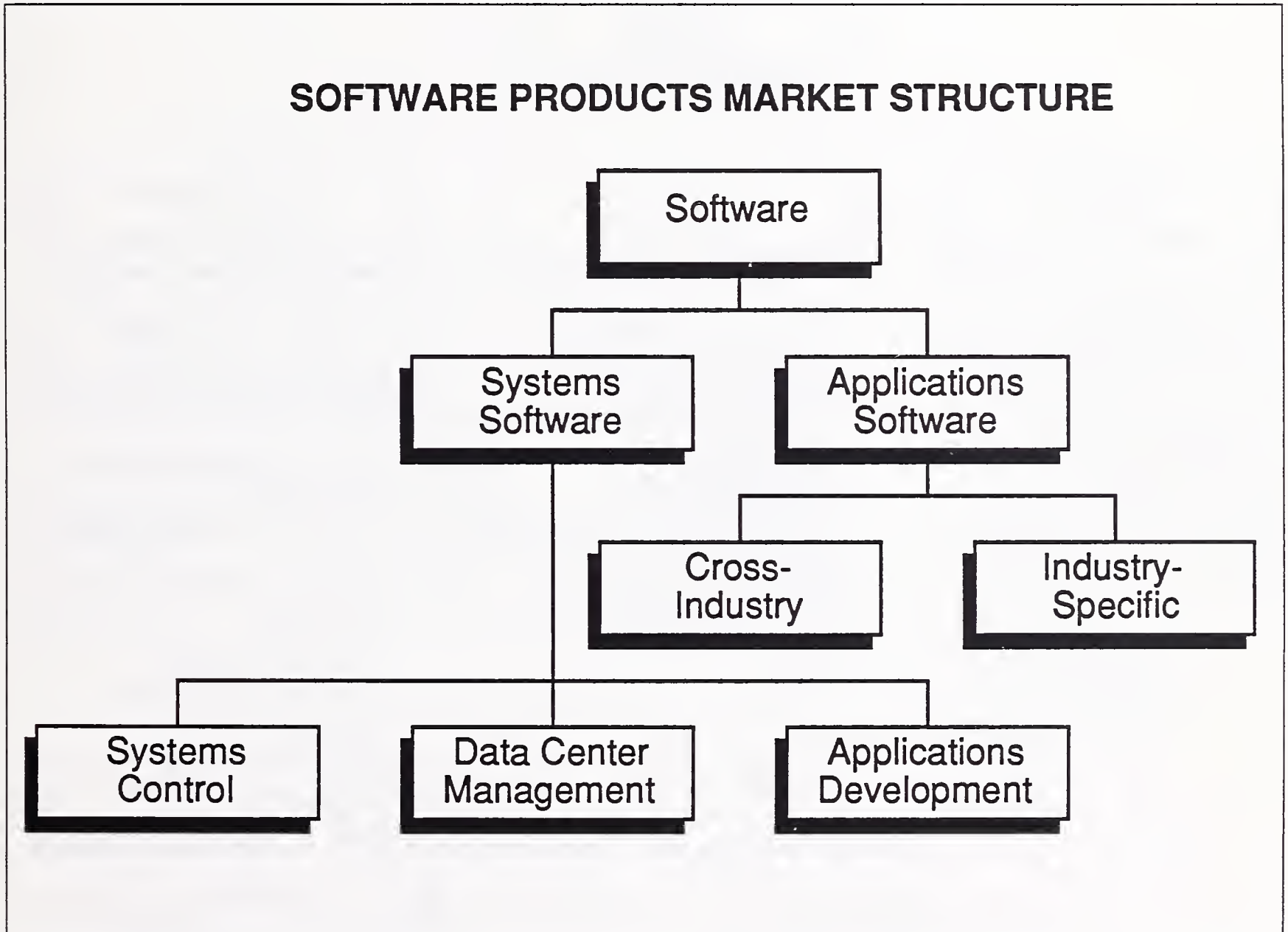


EXHIBIT I-2

## SYSTEMS SOFTWARE PRODUCTS MARKET STRUCTURE

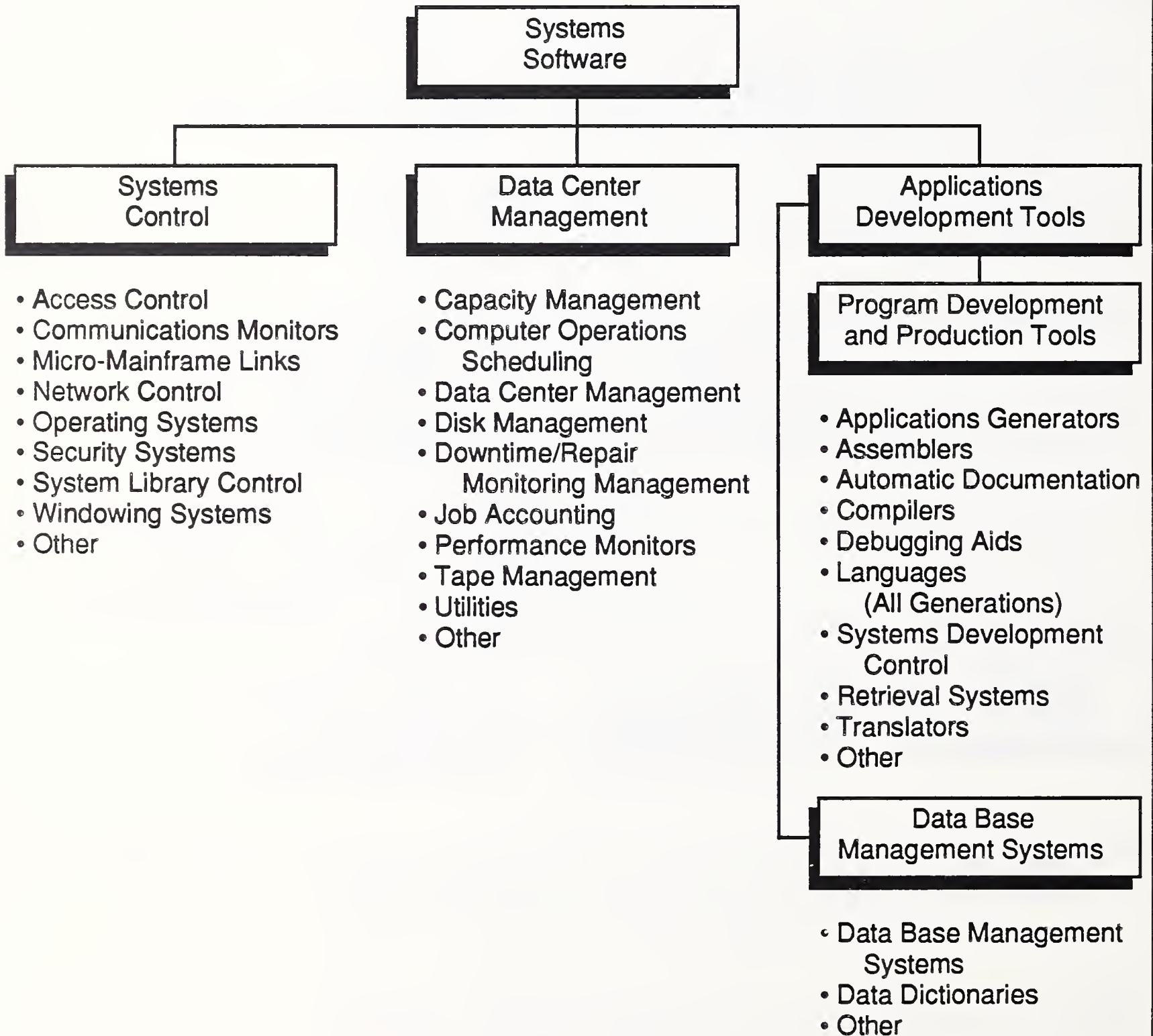
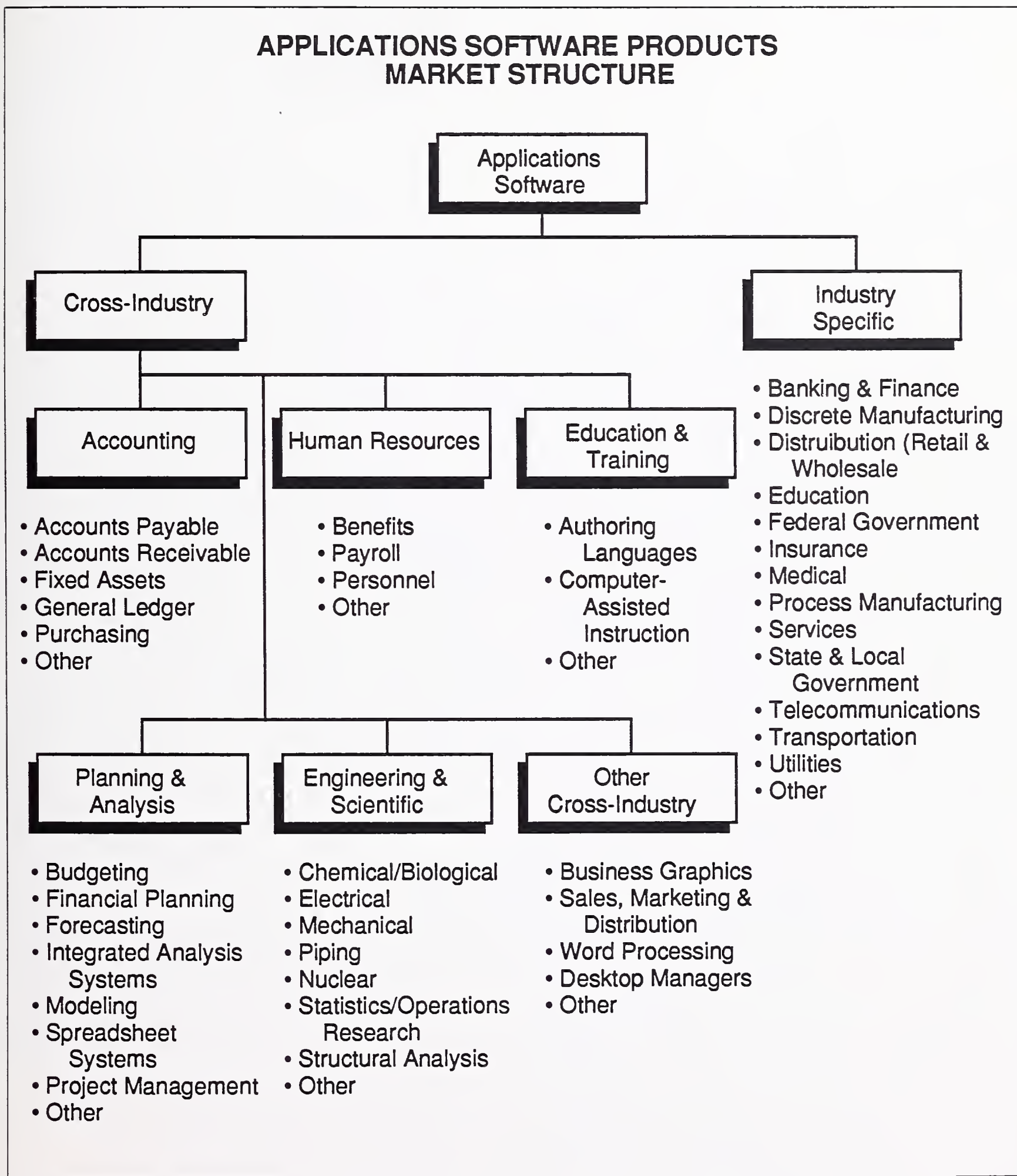
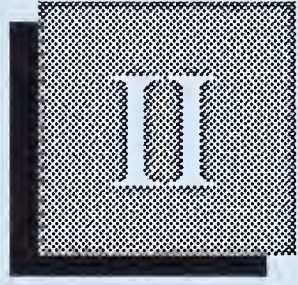


EXHIBIT I-3







# Executive Overview







## Executive Overview

### A

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#### Software Products Fastest Growing Delivery Mode

The Information Services market continued its overall growth in 1986 reaching \$54.6 billion. This represented a growth of 17% over 1985 and signalled a getting back on track from growth in the early 1980's. Software Products is the fastest growing delivery mode and will overtake Processing/Network Services in 1988.

The four delivery modes tracked by INPUT are presented in Exhibit II-1. It is interesting to note that Software Products in 1992 will be almost as large as the entire Information Services market was in 1986.

The largest factor in the sustained growth of the Software Products delivery mode is the keen desire of numerous end users to benefit from computer technology. Many more users are able to take control of developing applications that improve productivity or provide a competitive advantage due to the easy user interfaces currently available and the cost/performance benefits of the newer hardware platforms.

### B

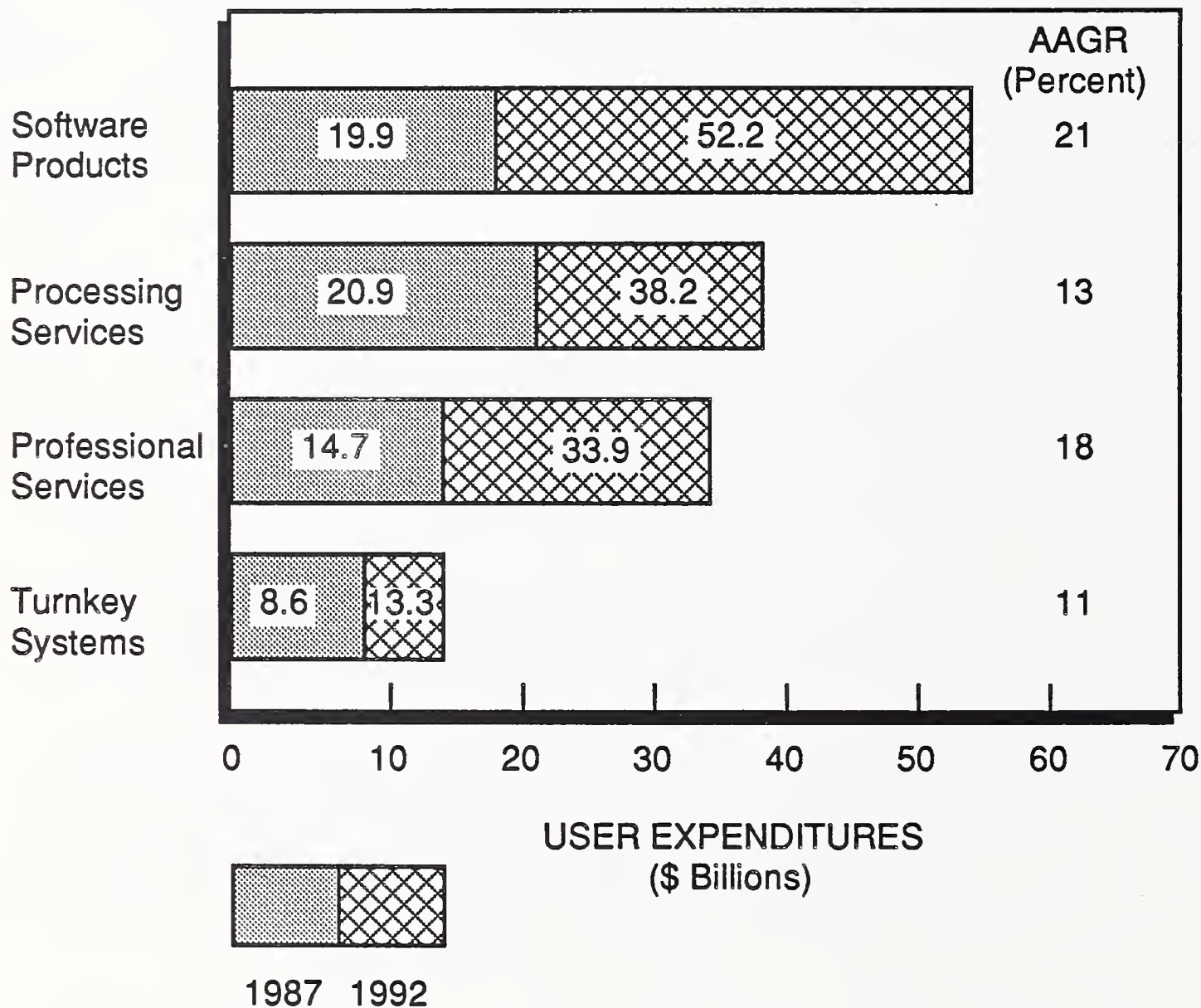
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#### The Slowdown is Overcome

- In 1986 the growth rates improved from the observed slowdown in 1985. While it is unlikely that the growth rates will come back to those of the 1983-1984 timeframes it should be noted the base expenditure is significantly higher, making the greater than 30% increases very difficult to repeat.
- There are several factors contributing to this overall growth as follows (see Exhibit II-2):
  - The U.S. economy has gotten better in general and business sentiment is favorable in most areas of the economy. This suggests a better buying climate and the willingness to make investments and procure additional computer equipment.

EXHIBIT II-1

### SOFTWARE PRODUCTS FASTEST GROWING DELIVERY MODE



- Large scale programs are being financed to improve the computer utilization of the enterprise. These systems lead to more software developments and/or use of off-the-shelf products to meet system requirements.
- Software Product functionality has increased sophistication as well as flexibility to meet end users' needs to develop their own systems. This has caused a user autonomy phenomena whereby users have the ability to develop their own systems on hardware they specify, procure and control.



## EXHIBIT II-2

**THE SLOWDOWN IS OVERCOME**

- 1986 Growth Rates Improve Over 1985
- U.S. Economy Getting Better—Still Not Quite On Track
- Large Scale Programs Require More Software  
Off the Shelf Products are Generally More Useful...  
Sophisticated
- Departmental Systems and Workstation Surge  
Pulls Through Software
- Absorption and Confusion Being Overcome

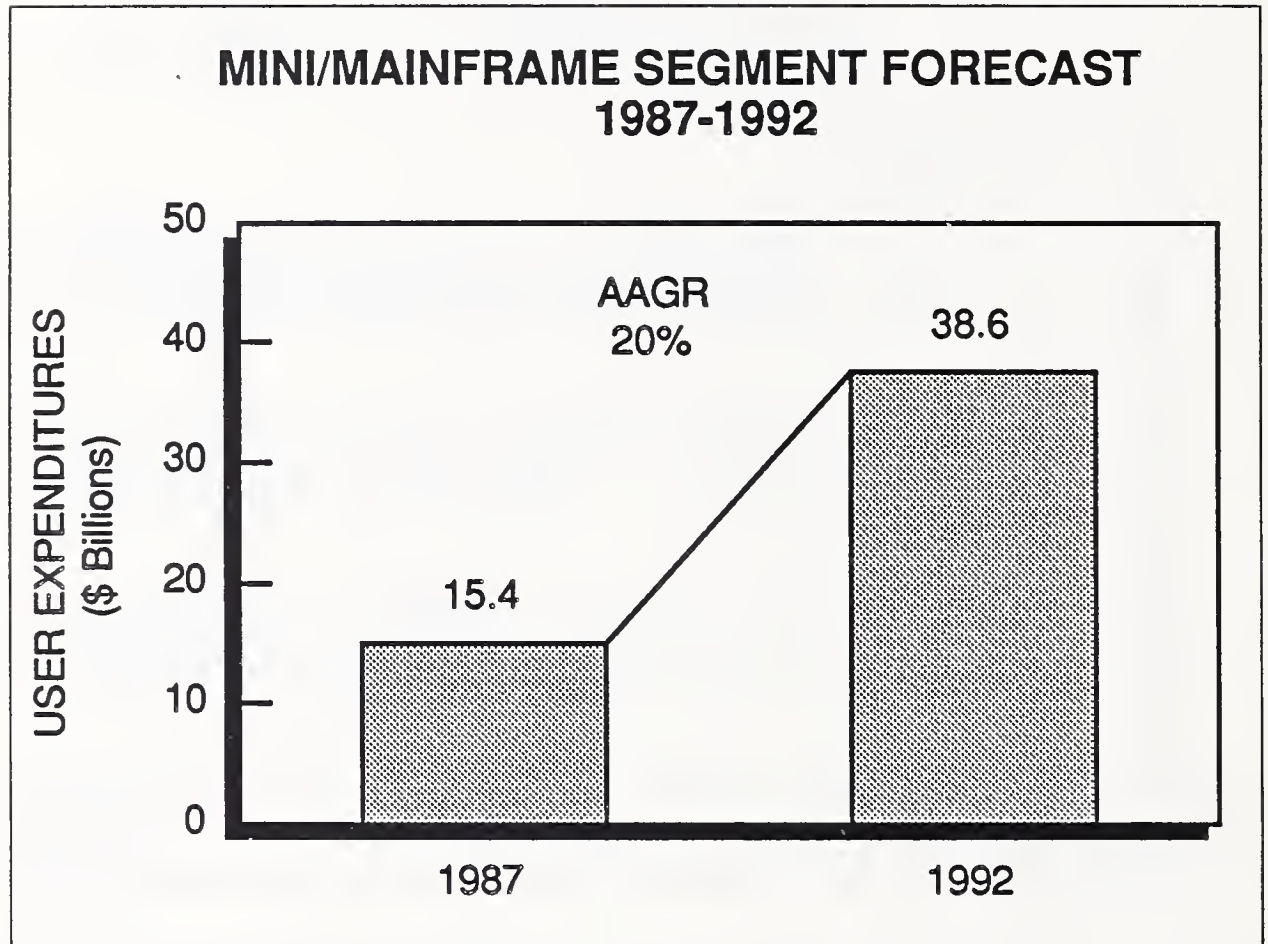
- This autonomy has given rise to increased sales for departmental and micro hardware platforms. The increased number of hardware systems pulls through systems software and developmental applications software. Each system requires an operating system, system utilities, DBMS, application development tools and applications software.
- The effective use of the software products previously purchased has occurred causing additional needs to surface. Part of the slowdown observed in 1985 was due to the need to absorb and digest the previous software product procurements. This digestion has occurred and enterprises are anxious for more.

**C****Mini/Mainframe  
Segment Forecast,  
1987-1992**

- The mini/mainframe segment of the Software Products delivery mode is growing at a respectable 20%. This growth is above the average growth of the entire Information Services market. The combining of the mini and mainframe does not provide a true picture of either area and

will be discontinued. Next year's report will separate mainframe and mini software (see Exhibit II-3 below).

EXHIBIT II-3



- Based on the dramatic growth of mini/departmental systems and the observed slowdown in large mainframe shipments there is no doubt the majority of the growth is occurring in the mini-portion of the segment. Many mainframe vendors are taking a hard look at how to leverage themselves into the mini/departmental arena and may have found a blessing from IBM's announcement of the 9370 in late 1986. The 9370 shipped two months earlier than originally forecasted as IBM tried to counter DEC.
- The growth of the mini area is predicated on the strong trend toward distributed processing and departmental responsibility for mission critical applications being executed and installed by the local persons. These individuals are buying software solutions off the shelf or using relational DBMS and 4GL tools to create the specific applications desired.
- Key application areas that are growing reflect the fact that more end users are getting involved in development. For example, in the mini/departmental arena INPUT has measured that the leading edge DBMS vendors have had incredible growth selling their relational DBMS

products. Companies such as Oracle, Relational Technology, and Informix have grown at greater than 80%.

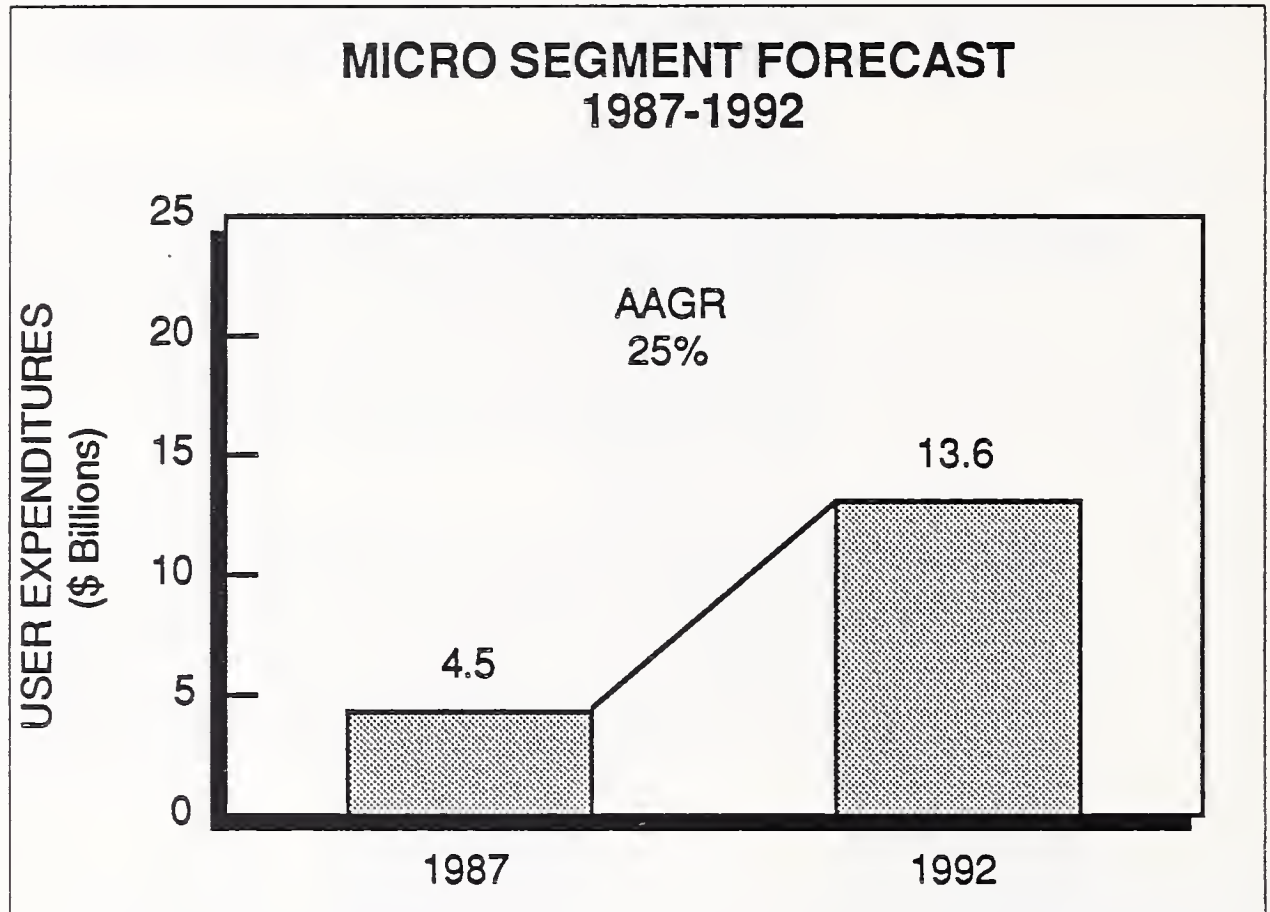
- In the mainframe environment the MIS group has tended to focus on obtaining more performance and productivity out of the environment. This has provided a significant opportunity for companies in the System Software market especially those in Data Center Management systems. Companies such as Morino, VM Software, Duquene, Altai and Computer Associates (both UCCEL and CAI) have grown at above the Software Products annual growth rate.
- Alliances have been formed to provide applications solutions to end users. IBM has grown its Solution Pacs solutions to become a more significant offering and DEC has been developing its Solution Systems approach. This heralds the active involvement of the two major manufacturers. INPUT projects that Unisys, Hewlett-Packard and the others (i.e. Data General, Prime, NCR) will enhance their existing programs.

## D

### Micro Segment Forecast, 1987-1992

- The micro segment continued its explosive hardware growth in mid-1986 after slowing down in the previous two quarters (first and second quarters 1986). This growth seemed unlikely as the rumor of an impending IBM "new" personal computer was constantly in the press. Nonetheless, it did occur, providing a strong basis for increased software products growth. IBM finally announced its new PS/2 product line in April of 1987.
- Micro software as shown was \$3.5 billion in 1986 grew to \$4.5 billion in 1987 and is projected to grow to \$13.6 billion in 1992. This represents an average annual growth of 25%. Exhibit II-4 graphically depicts the micro software products segment.
- Clearly, as the general growth of PCs and compatibles occurs so grows the micro software products segment. Microsoft, Ashton-Tate and Lotus have been sustaining very large growth rates.
- Desktop publishing applications continues to grow at a fast clip, with Pagemaker (from Aldus) leading the pack and Ventura (Ventura Software/Xerox) following close behind.
- New application opportunities are made possible as the price/performance of the microcomputers improves with more memory (3MB), processing power (286 and 386), operating system (OS/2) functionality, and more disk storage (70, 120 MB). INPUT has observed the growth of applications development tools such as DBMS products (Oracle, Relational Technology, Informix, Information Builders) and Case tools

EXHIBIT II-4



(NASTEC, Index Technology, Knowledgware) enhancing the micro-computer in the totality of the Information Services market.

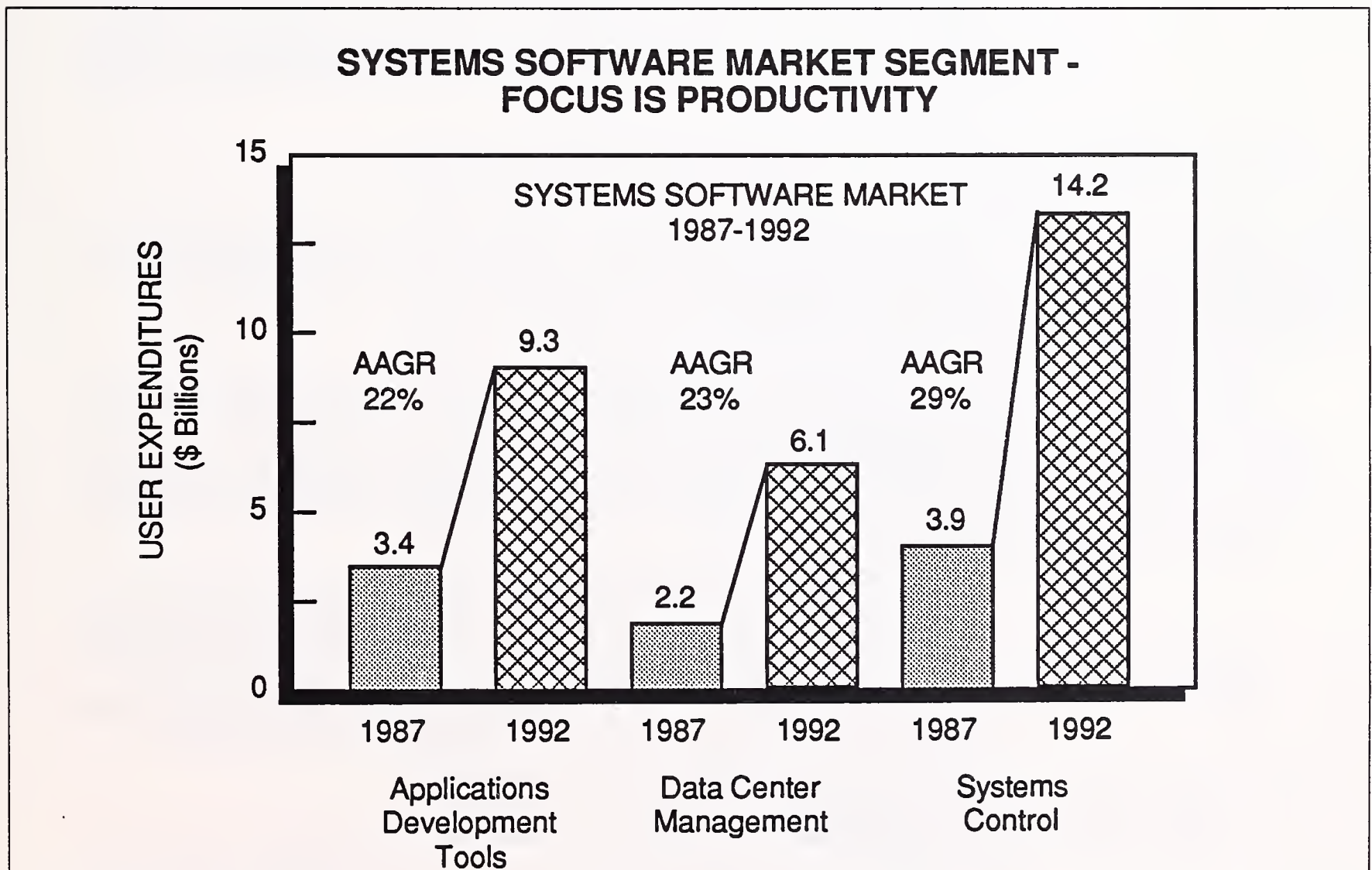
- The micro application capability is quickly growing from a single application/single user interface to one being contained in an integrated multiple discipline arena wherein the micro user is involved in a broader, more expansive solution. LANs and micro/mainframe links have spawned software products that fully integrate the micro platforms.
- As the platform becomes more sophisticated or complex in terms of the resources available it is likely that the need to “manage” this environment will occur. INPUT projects increased usage of Data Center Management Tools to more effectively manage the microcomputer environment in the forecast period of 1987 through 1992.
- INPUT projects a consolidation of the number of microcomputer vendors during the forecast period. There are too many vendors pursuing each of the application segments. The very small will be acquired by the very big companies such as Ashton-Tate, Microsoft, Lotus and Computer Associates. The mid-range companies will merge to get applications synergy and corporate economics of scale, e.g. Borland International and ANSA Software.

## E

## Systems Software Market Segment—Focus is Productivity

- Systems Software products provide the general “life” and environment to the computer hardware. The more complex and larger the hardware system, the more resources to manage (with productivity) and the more sophistication that can be provided.
- The Systems Software portion of Software Products is segmented into the three main areas: Systems Control, Data Center Management and Application Development Tools. Systems Control software (e.g. operating systems, networking tools) provides the first level of software functionality. Applications Development tools provides the next level, allowing for business applications to be developed to provide mission critical benefits to the enterprise. Finally, Data Center Management Tools provide the capabilities to effectively manage the environment to maximize the performance and resources available in the hardware environment.
- In Exhibit II-5 the three segments are all growing, with Systems Control growing at 29%, followed by Data Center Management growing at 23% with the rear being brought up by Applications Development Tools at 22%.

EXHIBIT II-5



- The growth systems software packages are in the Computer Aided Software Engineering (CASE) market, the relational Data Base Management Systems (DBMS) market and in the Data Center Management Tools market, most notably in Job Scheduling, Capacity Planning, and Tape and Disk Management.
- The major growth in terms of percentages for systems software is occurring on the micro platforms. Micro platforms are becoming much more sophisticated and have considerable resources to manage to obtain the maximum benefit to the owner. Micro systems are expanding to become important modes in applications that are coupled with main-frame software systems and departmental/mini systems.
- IBM has announced a new applications environment/architecture called Systems Application Architecture (SAA). The SAA concept is one wherein applications will span different hardware platforms providing common user interfaces, common functionality and distributed capability. This is a concept that has been implicitly available from Digital Equipment Corporation (DEC) for at least seven to eight years.
- SAA is important in that for the first time IBM is essentially guaranteeing applications will work across hardware platforms thereby protecting application investment. This implies that after an application is developed, (of course using those components that make up SAA), the user will be able to migrate to other hardware environments with no major effort expended.

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**F**

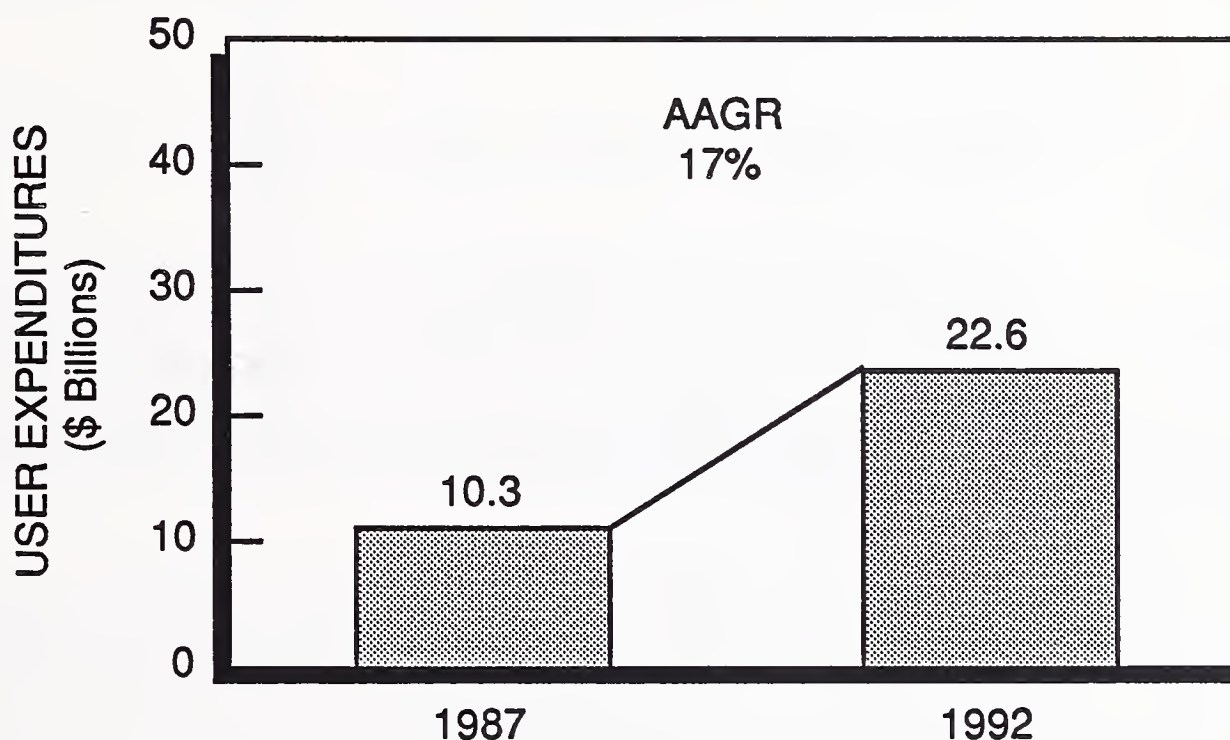

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**Applications  
Software Segment,  
1987-1992**

- Applications are the discernable difference in obtaining effective use from the computer hardware. They provide the true benefit of the computer system.
- Organizations are seeing applications permeate the enterprise, providing more productive results and information than previously available through manual methods. As this occurs the organization receives more benefit and thereby procures more computers, causing an applications spiral.
- Exhibit II-6 shows the Applications Software segment growing at an annual growth rate of 17%. Applications will account for \$10.3 billion in user expenditures in 1987 and increase to \$22.6 billion in 1992. These are the expenditures for both industry-specific and cross-industry applications software. Industry-specific applications are growing slightly faster than cross-industry applications.
- Most organizations have implemented the cross-industry applications and thus this is a "mature" segment. The industry-specific applications

## EXHIBIT II-6

### APPLICATIONS SOFTWARE SEGMENT FORECAST 1987-1992



are being implemented to allow the enterprise to have more depth and impact in running the business. This is where the greatest rate of return is and is an area heavily supported by management.

- The leading industry segments in 1987 using industry-specific applications are Banking and Finance, Discrete Manufacturing and Medical. There is no doubt that the other industries will grow in usage as vendors “attack” application areas or as ingenious users see ways to perform their tasks more effectively. The leading industries in 1992 will be Banking and Finance, Discrete Manufacturing and Medical. But while there is no change occurring over the forecast period it should be noted that the Distribution and Insurance industry segments are a close fourth and fifth respectively. These industry areas are growing due to the following major factors:
  - In the Banking and Finance industry segment there is continued efforts to develop and market major software systems to run the business.
  - In the Discrete Manufacturing industry segment CIM applications continue to be defined and used to manage the business, and the

expectations of fully integrated systems will spawn growth.

- In the Medical industry segment the automation of manual accounting procedures is stimulating growth and will provide increased applications software potential. Hospital Information Systems, Clinic and Laboratory Systems and Dentist/Physician Patient Accounting Systems are typical application systems.

## G

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### Conclusions and Recommendations

- Exhibit II-7 lists the major findings of the report.
- In the IBM environment, software vendors must evaluate how they can take advantage of SAA. Adhering to SAA concepts insures the software products vendor hardware platform breadth as IBM itself implements SAA. It is INPUT's strong belief that those software products vendors that have written applications in C will have the easiest time porting within SAA.
- Hardware technology is continuing to change, especially in the microcomputer products area. The sophistication of the INTEL 386 (and forthcoming 486 chips) and the Motorola 68000 (20 and 30) provide the opportunity to run more processing intensive applications. The additional processing capability will be used in providing more user-friendly interfaces in addition to allowing more application functionality.
- INPUT is forecasting that many more mainframe and minicomputer applications will migrate down to the PC platform as the platform grows larger in resources. This has already occurred in the DBMS software products group with mainframe/mini versions being fully supported in the PC (with extended memory boards). Examples of this are Oracle, Relational Technology, Information Builders and Informix. Based on these capabilities it is more than likely that significant applications built on these data bases will be supported as well.
- Vendors must continually look for new product opportunities or ways to make major enhancements of existing successful products. INPUT has observed that product life cycles are contracting as new capabilities are brought to market more quickly obsoleting previous capabilities. In addition, the fastest growing companies are observing that the new products tend to have the explosive growth and become "additives" to the installed base as well as open new customer opportunities.

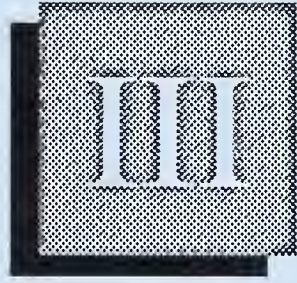


EXHIBIT II-7

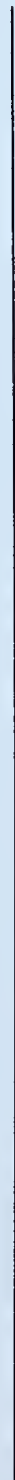
**CONCLUSIONS**

- Evaluate IBM's Systems Applications Architecture
- Stay Close to Hardware Technology
- Stay Close to Customer Needs
- Determine Alliance Potential
- Integrate Functionality to Broaden Product





# Market Size and Forecasts







## Market Size and Forecasts

### A

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#### Market Forecasts

#### 1. Overall Market, 1987-1992

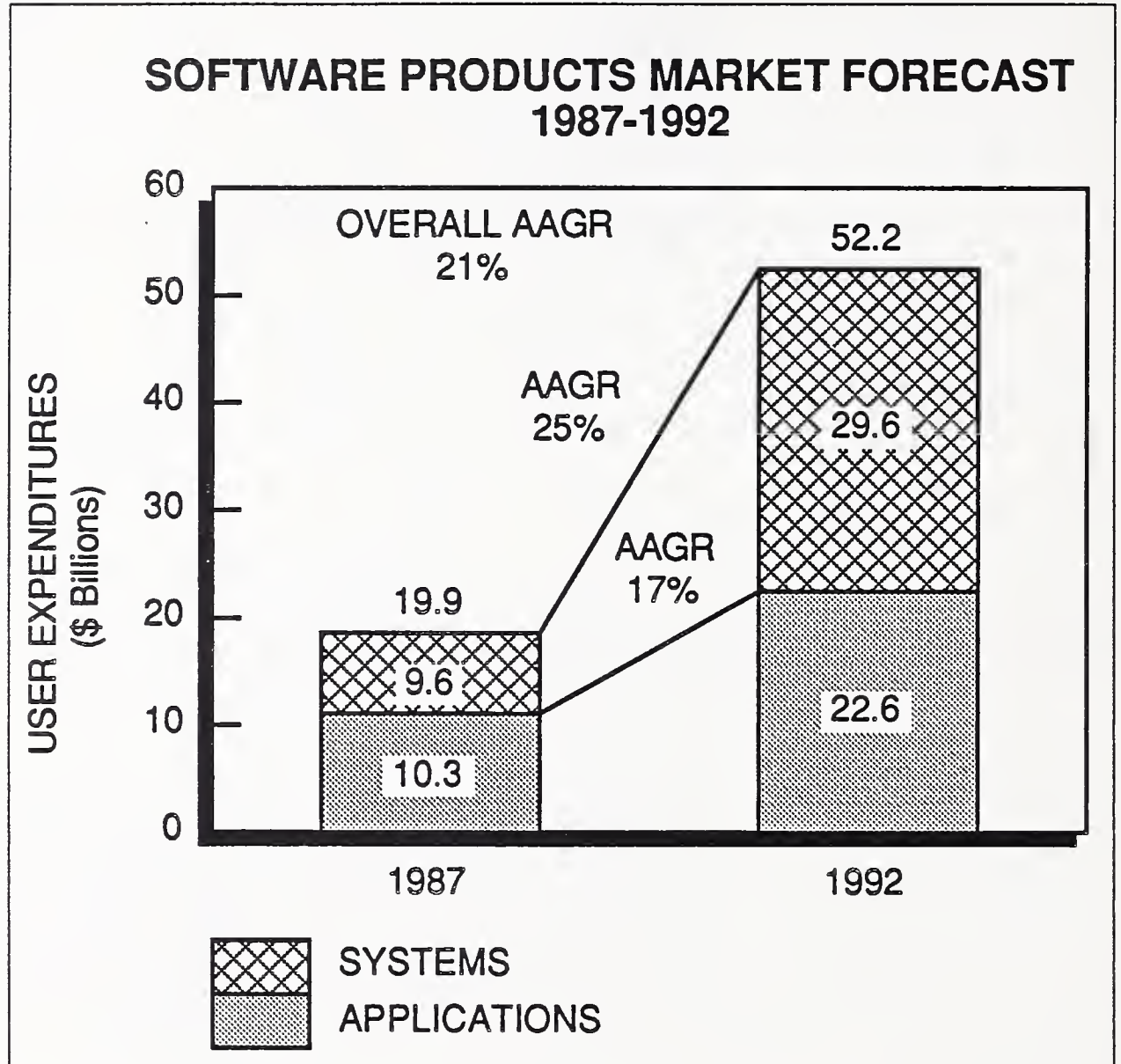
##### a. Overview

- Software Products will be the fastest growing delivery mode in the 1987-1992 forecast period. It will grow from \$19.9 billion in 1987 to \$52.2 billion representing an average annual growth rate (AAGR) of 21%. The 1992 value will be almost as large as the entire information services market was in 1986. Exhibit III-1 shows this information. Also shown in Exhibit III-1 is the growth of the Systems Software and Applications Software market segments.
- Software Products segmented by hardware platform is shown in Exhibit III-2 for 1986. In 1992 the micro portion of the market will represent 26% of the software products market. This is an increase from the 23% in 1987. The driving factor for this change is the number of PS/2, PCs and clones that will be available, coupled with the enhanced software available to provide more function at the user's tabletop. Thus the number of microcomputers will continue to increase and the total software per microcomputer will be increasing.

##### b. Driving Forces

- The Software Products market will continue its strong growth based on the factors presented below.
  - The hardware base of products will continue to grow causing general demand for the software required to make the hardware useful.
  - Integrated applications systems will be available across all the hardware platforms, providing easier migration, easier and faster learning,

EXHIBIT III-1



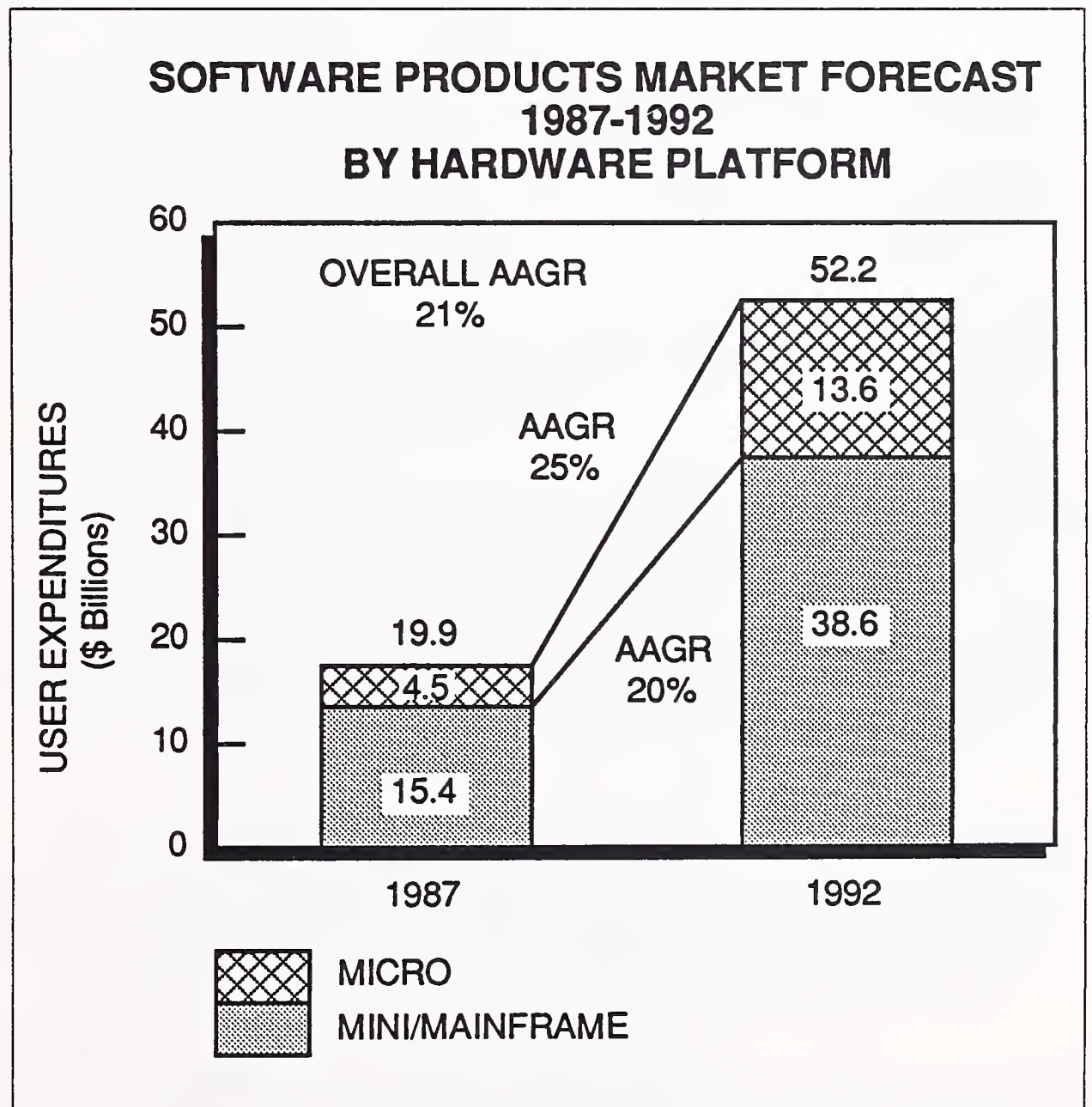
and more general functionality. The software will do more for the user and support application requirements that further represent the basis of the user's business.

- The software products vendors will tend to keep their prices from eroding rapidly by providing more integration and functionality to meet user requirements.
- The user population will generally be more sophisticated due in large measure to the training provided in the secondary and college institutions. This is an outgrowth of the last five to seven years, wherein Apple, IBM, Compaq and the PC-clones have made significant penetration in the educational sector. The current high school and college population has become more computer conversant and comfortable with computer software.
- Demand for more systems software to provide users the capability to "build" their computer applications will continue in the micro and mini environments. This will stimulate a "productivity" focus. Minis

and micro users will be looking for tools to better manage their hardware environments as the technology provides more performance potential.

- New applications embedding AI, CASE, and Desktop Publishing will alter how users can enhance their business impact.
- Executives and senior management who previously were shy and reluctant to use a computer system will find it simple to use Executive Information Systems applications to run their businesses. These systems, based on simple user interfaces (and in some cases touch screens), will provide key exception reporting capabilities to the executive.

EXHIBIT III-2



## c. General Issues

## (i) Standards

- There has been significant effort expended in developing reasonable “standards” to provide a baseline of uniformity within the information services industry. Exhibit III-3 shows the major elements of hardware and software that have become standardized through either formal committee proceedings or defacto by virtue of user or manufacturer consensus.

EXHIBIT III-3

**"STANDARDS" IN PROGRESS**

Screen	Windows, GEM, News, X, Presentation Mgr.
Graphics	DMS, CGM, CGI
Communications	OSI, SNA, Ethernet, NFS, Token Ring
DBMS	Codd's Rules, SQL, DB2
Printers	Postscript, Interpress
Platform Independence	SAA, Independent Vendor Strategy, OS Portability, UNIX + C

- These “standards” provide a known environment that most software products vendors can build their software to with the understanding and knowledge that the user is expecting this environment.
- The formation of the Committee on Standards industry group has provided leadership from the major manufacturers to the Computer Industry that standards are acceptable, and more importantly, desirable. This has had an important impact on software companies.
- In the micro world OS/2 will be the standard for the PS/2 much like DOS is the standard for the PC. In the mini environment for the DEC,



VAX, VMS, and UNIX have become somewhat standard and for the IBM environment it has been VS and MVS (9370).

- In the mainframe environment MVS/XA has become the standard. IBM has suggested that VM will be an important operating system to deal with in the coming years. This will provide significant opportunity for software products especially System Control and Data Center Management Tools.

(ii) Platform Independence

- IBM announced System Application Architecture in late 1986. This announcement was designed to solve the migration dilemma of its customers, where users had to relearn applications, interfaces, and system conventions in order to make productive use of the new hardware environment.
- IBM had fostered the lack of consistency between hardware platforms by allowing the different responsible development organizations a free hand in developing their products. This gave rise to a diverse operating systems and hardware architecture to solve the needs of the different user environments.
- In the meantime other computer manufacturers had implicitly produced a family of hardware products that made it extremely easy for users to migrate as their resource needs grew.
- The 9370 announcement in October of 1986 stating that it was able to run MVS was a direct response to providing a solution that would allow the user to grow by essentially adding more powerful hardware.
- Exhibit III-4 shows the essence of SAA and some of its components at this time. Those components that have been announced will be available on all hardware platforms that IBM is marketing now and in the future. There is significant corporate commitment to this strategy.
- Unlike Systems Network Architecture (SNA), which was announced in 1974 and is still not done (admittedly it has been a moving target), there is corporate VP responsibility and immense management time throughout the organization to make SAA happen in a reasonable time frame. INPUT expects major pieces of SAA will be available in twelve to eighteen months.
- Those products that are not included in SAA can still be considered "strategic" products by IBM, meaning that the IBM corporation is committed to making enhancements and supporting the product.

## EXHIBIT III-4

**IBM'S SYSTEMS APPLICATION ARCHITECTURE (SAA)**

Common User Access	Icons, Color, Graphics, Mouse
Common Programming Interface	SQL, QMF, Cobol, Fortran, C, etc.
Common Communications Support	3270 Data Systems, SNA, Token Ring LAN, etc.

- INPUT believes that SAA was long overdue and has to make the IS manager take a fresh view of how IBM can solve the corporate applications needs through hardware and software.
- Applications and Systems Software (especially Application Development Tools) vendors will be able to develop applications that will automatically be available in the micro, mini and mainframe environments based on the SAA premise expressed by IBM. IBM will provide extensive documentation describing the SAA environment in fourth quarter 1987, to allow independent software vendors to provide their products within the SAA framework.

## d. Hardware Vendors vs. Independents

- The computer system manufacturers or hardware vendors sell a significant portion of the Software Products directly to the end users. In 1986 the hardware vendors accounted for 28% of the Software Products market. Exhibit III-5 shows the ten leading vendors of software products with six of ten being hardware vendors.
- Clearly hardware vendors tend to have an advantage in selling software for numerous reasons:
  - They are there at the original point of sale.

## EXHIBIT III-5

### TEN LEADING SOFTWARE PRODUCTS VENDORS 1986

RANK	COMPANY	USER EXPENDITURE (\$ Millions)
1	IBM	2,900
2	DEC	618
3	HP	225
4	Lotus	218
5	Computer Associates	159
6	Ashton-Tate	158
7	UNISYS	157
8	Wang	156
9	Microsoft	151
10	Data General	147

- They can dominate the systems software arena, especially operating systems, compilers and utilities.
- They can offer single point of sale and no finger pointing.
- The ten leading independent software vendors are shown in Exhibit III-6. Most of the expenditures are for Systems Software primarily Application Development Tools (i.e. DBMS, 4GL) and Cross-Industry Applications (i.e. spreadsheets, graphics and accounting).
- Lotus, Ashton-Tate, Microsoft and to a lesser extent Computer Associates and UCCEL have all benefited from the major growth in the microcomputer arena. Lotus celebrated its five year anniversary in 1987 and is jockeying for number one (prior to the CAI/UCCEL merger) with Microsoft.

EXHIBIT III-6

**TEN LEADING INDEPENDENT  
SOFTWARE PRODUCTS VENDORS  
1986**

RANK	COMPANY	USER EXPENDITURES (\$ Millions)
1	Lotus	218
2	Computer Associates	159
3	Ashton-Tate	158
4	Microsoft	151
5	Management Science	145
6	Dun & Bradstreet	143
7	Cullinet Software	139
8	UCCEL	113
9	Applied Data Research	101
10	GEISCO	80

## 2. Systems Software

### a. Market Overview

- Systems Software provides the general operating and application development environment for the hardware platform to be utilized. This includes operating systems, compilers, tools to manage the environment and tools to develop applications.
- INPUT classifies spreadsheet graphics and wordprocessing tools as

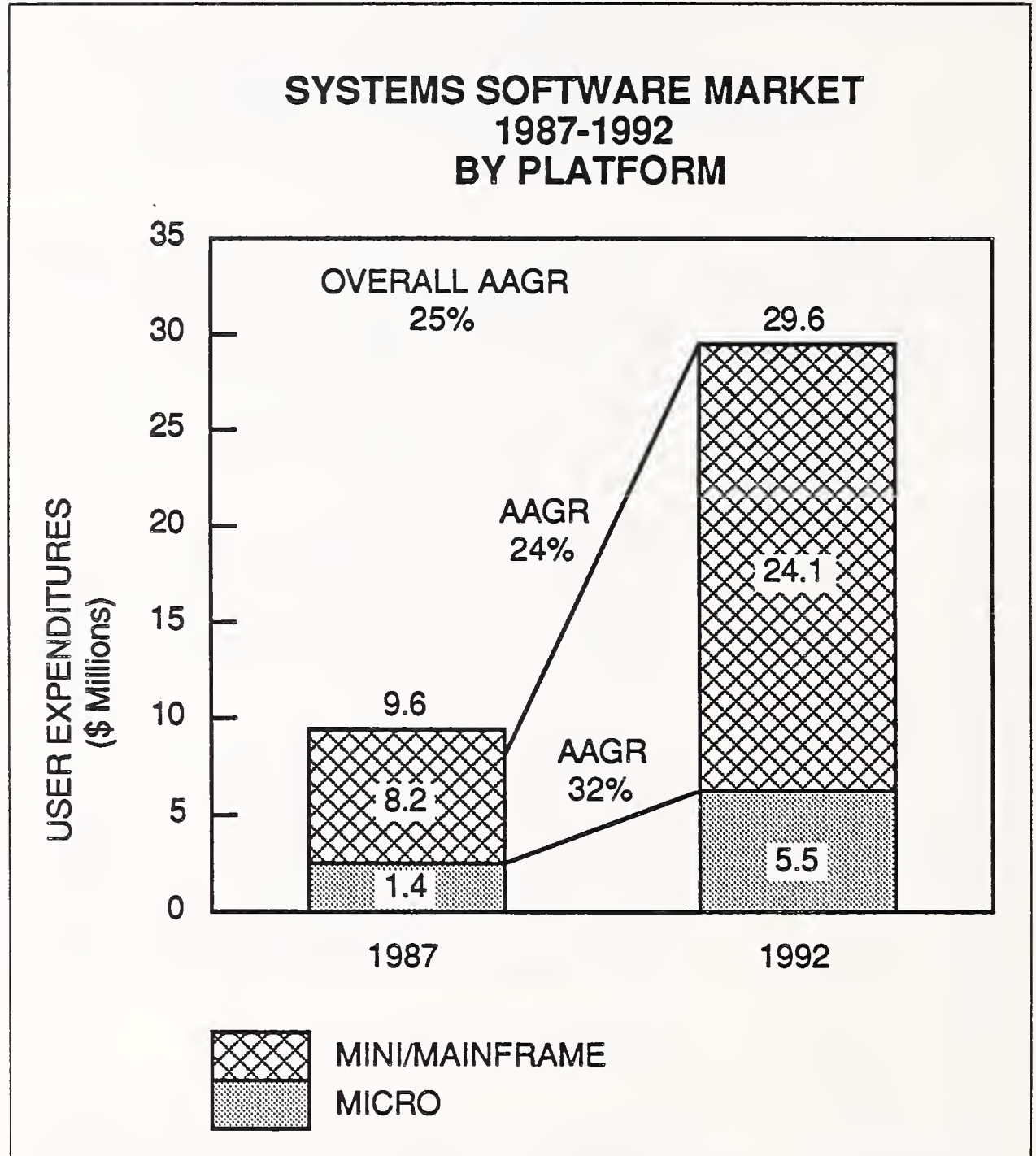
Cross-Industry Applications. As these tools become more and more integrated it becomes clear that the definitions will become harder to enforce. In this report the expenditures for Lotus are primarily in the Cross-Industry Sector whereas the expenditures for Microsoft and Ashton-Tate are primarily in the Systems Software Sector.

- Large end-user surveys have shown that Systems Software will be the leading area for software procurement over the next two years with Data Center Management Tools and Data Base Management Systems being the two most important products of interest. This correlates well with the previous INPUT report on Software Productivity December 1986, which indicated a keen user interest in improving productivity and performance of their computer systems.
- The System Software market accounted for \$7.6 billion in 1986. Exhibit III-7 shows the market for Systems Software growing from \$9.6 billion in 1987 to \$29.6 billion in 1992 representing a 25% AAGR. Exhibit III-7 also shows micro systems software growing at 32% and mini/mainframe systems software growing at 24%.
- The micro portion of the System Software market was 13% in 1986 and 14.5% in 1987. It will grow to 18.6% in 1992. This will occur in large measure due to the significant growth in memory capacity; storage capacity and communications connectivity of micro platforms. The overall magnitude of resources in what is called the micro platform in the 1990s will provide an environment to be managed to derive better performance. This will create increased demand for systems software.

#### b. Systems Control

- Systems Control Software is the software that provides life to the hardware, in essence creating the computer system. Exhibit III-8 shows the System Control market growing from \$3.9 billion to \$14.2 billion in the forecast period representing an AAGR of 29%.
  - The micro portion will grow from 15% of the total Systems Control market in 1987 to 18% of the total Systems Control market in 1992. Expenditures will grow from \$.6 billion to \$2.5 billion in the '87 to '92 period representing a 34% growth rate. As mentioned previously, this is due to the more powerful operating systems required to manage the increased hardware resources available in the late 1980s.
  - While the mini/mainframe portion will erode in relation to the growth of the micro environment, INPUT believes there will be above average growth in this category, due primarily to the continued needs of the departmental units continuing to procure mini and departmental hardware systems.

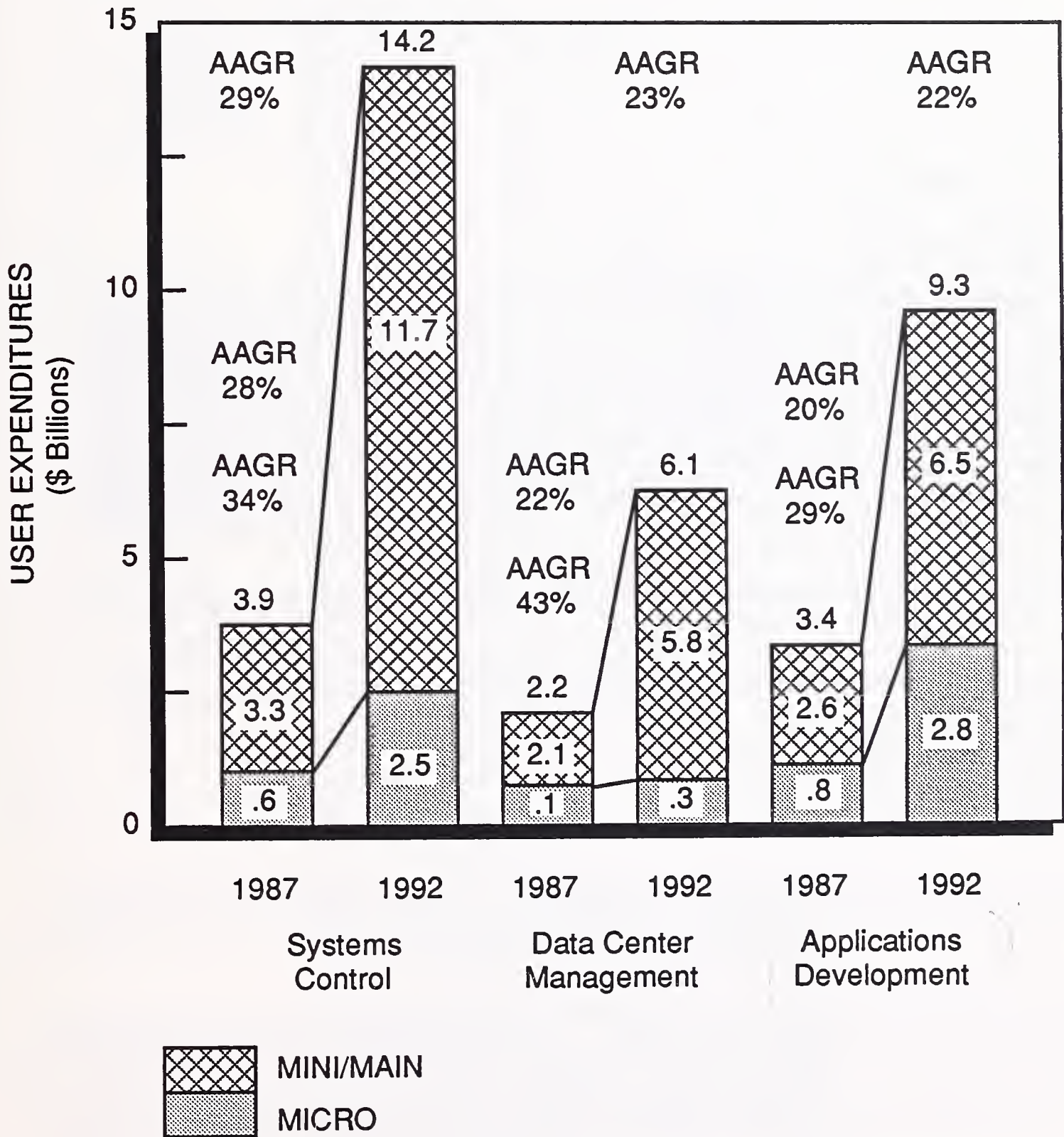
## EXHIBIT III-7



- In addition to the IBM communications strategy utilizing LU6.2 allowing peer-to-peer communications, they will support the use of mini and departmental systems. The shift of communications support will be less stringent for mainframe dominance, and has opened up to mid-range platform acceptance and viability.
- In this report on Departmental Systems and Software Directions, INPUT projected the growth of departmental systems computing capacity to be six fold in the 1986 to 1991 time frame. Exhibit III-9 shows the impact of mini/departmental systems (note: included are PC-based LANs and micros tied into mainframes on an active basis). The majority of the computing capacity increase will be from the mini/departmental system.

EXHIBIT III-8

### SYSTEMS SOFTWARE MARKET 1987-1992 BY SOFTWARE TYPE AND PLATFORM



## EXHIBIT III-9

### DEPARTMENTAL SYSTEMS' CAPACITY TO EXPAND SIXFOLD

TYPE	COMPUTING CAPACITY INDEX		
	1986	1991	AAGR (Percent)
Remote Mainframes			
Dumb Terminals	.25	.60	19
Micro Mainframes			
Dept. Mini or Supermicro	.25	1.50	43
PC-Based LAN			
Standalone Micro	.50	.90	12
Total MIPS Index	1.00	3.00	25



= DEPT. SYSTEMS

- This increase in departmental systems, which has accounted for a recent surge in growth by DEC, HP, Prime, etc., will drive software products increases across the board.
- Based on the success of DEC invading the mid-range commercial business environment, IBM announced the 9370 offering competitive price/performance and compatibility with the mainframe 30XX families. This had the effect of dulling the hardware migration path DEC and others had implicitly designed into their hardware evolution.
- Other factors contributing to the Systems Control Software market growth besides the quantity of computer systems and desire to have more connectivity are:



- The need to provide more system security, especially as the micro and mini platforms become an integral part of the distributed data base and computational power of the enterprise.
- The need to manage network resources in light of the considerable number of private networks using expensive and critical resources.
- Furthermore, in the micro environment the recent IBM PS/2 announcement has taken the FUD factor (Fear, Uncertainty, and Doubt) into account the next generation of micro is now known and can be dealt with. The new operating system being developed by Microsoft, OS/2, while not available commercially until 1988, will also stimulate the micro system control software market. Initial reactions to the IBM hardware/software announcement in April, 1987 have been favorably received. INPUT believes it is too early to tell if the initial success will be maintained as the OS/2 software has not been successfully delivered in quantity to end users. INPUT expects some delivery to occur by year-end 1987.
- Hardware vendors will continue to dominate the Systems Control environment.

#### c. Data Center Management

- Data Center Management tools have grown in importance and value in providing mechanisms to the operations personnel to obtain maximum performance from the hardware system. The initial tools managed the storage resources and helped schedule jobs.
- The tools available today are able to monitor and provide insight into how resources are being used and how to make better use of these resources. Furthermore, the new products provide insight and direction for planning the use of additional resources, configuration management and personnel needs.
- Data Center Management tools will grow from \$2.2 billion in 1987 to \$6.1 billion in 1992 an average growth rate of 23%. See Exhibit III-8.
  - The micro portion represents 2% in 1987 and will be 4% in 1992 (note: see Appendix). Data Center Management micro revenues will grow from \$.1 billion in 1987 to \$.3 billion in 1992, an AAGR of 43%. [Note: The revenue numbers have been rounded up. The AAGR is the correct growth rate based on the numbers in the forecast data base in the Appendix.]
- The need to use Data Center Management tools on micros becomes imperative as the micros are clustered into LAN configurations and, to

a lesser extent, as the micro footprint grows in resource capacity. Of course as micros become networked they become competitive with departmental systems. This makes hardware definition somewhat grey rather than black or white.

- There are no dominant data center management tools for the micro environment at this time. This represents a possible fertile area of opportunity for vendors to establish a business base.
- Data Center Management tools are becoming much more popular on mini and departmental systems as there are significantly more resources to manage and the systems have become integral to running the enterprise's function.
- In the mini/mainframe environment Data Center Management expenditures will grow from \$2.1 billion to \$5.8 billion in the forecast period, representing a 22% growth rate. Independent vendors have an opportunity to provide more useful tools than those available from the mini vendors. This is a replay of what has taken place in the mainframe environment where independent vendors provide more functionality and benefit than the hardware manufacturer itself.

#### d. Applications Development Tools

- Applications Development Tools consist of some very fast growing segments, such as relational data base management systems (RDBMS) and Computer Aided Software Engineering (CASE), as well as the more traditional languages/compilers (including FGL—Four, Five and Future), data dictionaries and retrieval systems.
- It should be noted that the CASE products are generally an integrated application development/maintenance system composed of application generation, automatic documentation, debugging aids, code generators, integrated dictionaries and maintenance modules designed around a programming methodology.

#### (i) Micro Applications Development Tools

- Exhibit III-8 shows the micro portion of applications development growing from \$.8 billion to \$2.8 billion representing a 29% growth rate.
- The micro environment growth will be based on the development of excellent prototyping environments that will allow the newly announced PS/2 to facilitate major system development. This will be a manifestation of IBM SAA environment (previously mentioned). The prototyping environment will provide for uploading code to be executed on the mainframe with live data sets.

- Mainframe-micro connections will continue to become more sophisticated and allow transparent use of data and other resources. The user will request the information and the system will locate it through “centralized” dictionaries and information banks. Access control and security checks to prevent unauthorized access to information will be part and parcel.
- An additional factor driving the micro applications development tools growth will be the computer resource potential of the environment itself. This means the micro environment will have the storage, memory and speed to provide significantly more performance, thereby making the environment capable of meeting application needs. This will increase demand pulling through software products.

#### (ii) Mini/Mainframe Applications Development Tools

- The mini/mainframe environment will be \$2.6 billion in 1987 and \$6.5 billion in 1992, representing a growth rate of 20%.
- This sector has countervailing marketing forces at play in that there is high hardware system growth in the mini (or departmental) environment and very modest growth in the mainframe environment. Even with the almost order-of-magnitude pricing difference of the mainframe versus the mini, the overall growth of this sector is above average for the information services industry.
- Looking at specific application development tools products such as DBMS, it is clear that IBM’s DB2 has continued to outsell its DBMS competitors and has somewhat stalled the significant growth previously observed in the mainframe environment. Simultaneously, DBMS products in the mini/departmental environment are selling significantly above average, with many of the leading DBMS vendors doubling their revenue in the past year in this environment.
- INPUT expects the IBM 9370 to continue the growth of the mid-range and have a significant impact itself, as well as stimulate continued interest in the mini/departmental environment.
- In addition, another fast-growing application development tool is the CASE system. While there is noticeable growth occurring in the mainframe environment, there is also considerable growth in the micro environment, allowing application development to be off-loaded to a PC-compatible system and uploaded for testing and final system integration.
- IBM’s announcement of System Application Architecture (SAA) will stimulate more applications development tools software products from a vendor and end user point of view. This will occur due to the desire to

have the same functionality across the hardware environments bringing economies of scale to both the vendor and user.

- SAA along with the 9370 may have the effect of slowing down the DEC departmental system encroachment of the mid-size commercial sector.

### 3. Applications Software

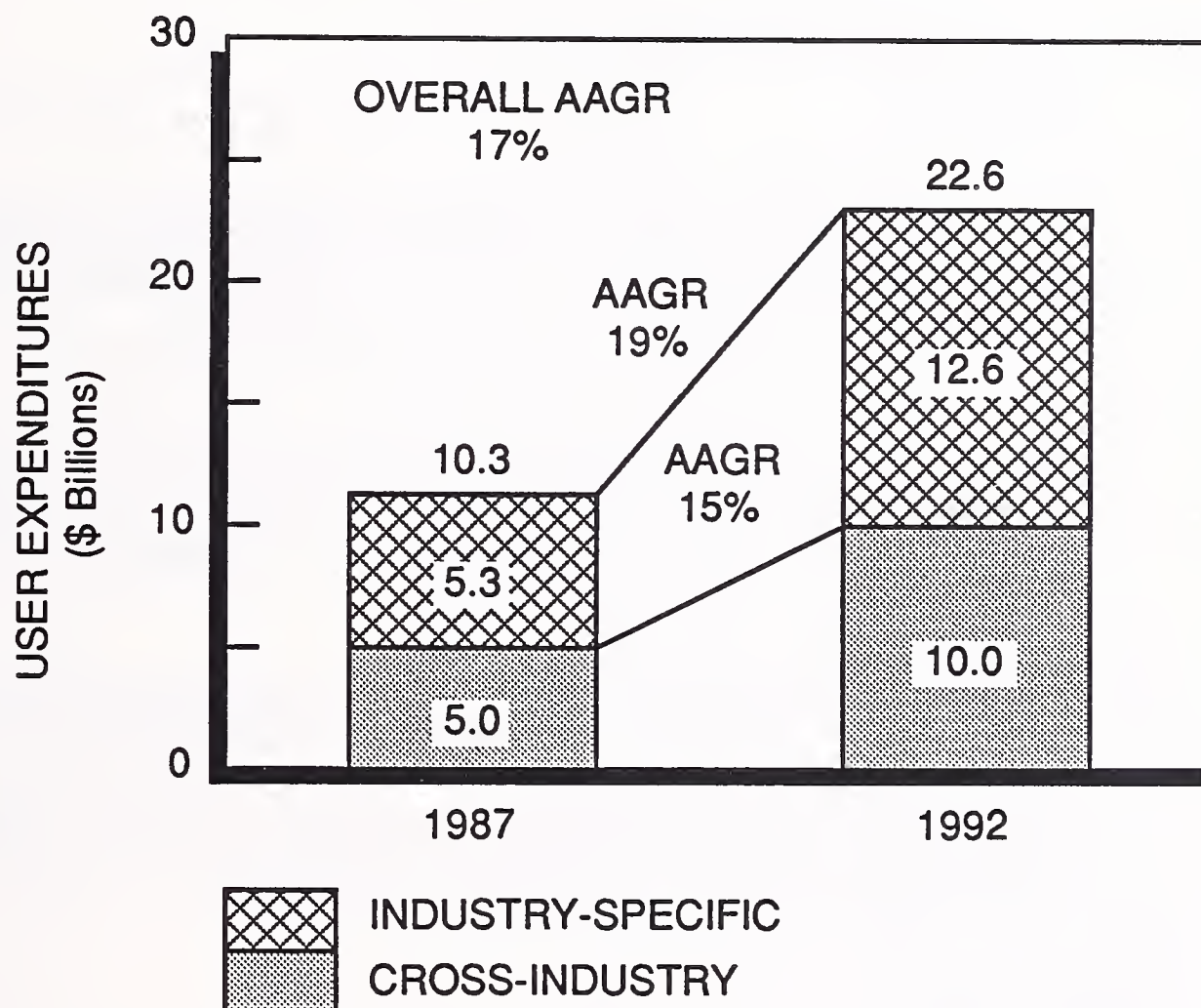
- Application software as mentioned previously consists of two main categories: Industry-Specific and Cross-Industry. Exhibit I-3 in Chapter I portrays the two segments and further breaks each down into meaningful areas of functionality.
- Exhibit III-10 shows the size of the applications software market in 1987 and 1992. The industry-specific expenditures are growing from \$5.3 billion in 1987 to \$12.6 billion in 1992, a 19% growth rate. The cross-industry segment is growing slower at 15% in the five-year forecast period starting at \$5 billion in 1987 and growing to \$10 billion in 1992. This is mainly due to corporate users developing specific applications to model the business having previously installed the accounting, human resources type applications.
- Overall applications software is growing slower than the systems software market because users are taking advantage of the software products that are allowing them to maximize their current operations and provide competitive advantage.

#### a. Vendor Analysis

- As in systems software there are two types of vendors: the hardware manufacturers and the independent vendors. Independent vendors have a larger market share in the applications segment versus the systems software segment, and an even larger percentage in industry-specific applications versus cross-industry.
- Most hardware vendors have active marketing programs to encourage software independents to develop applications (generally industry-specific) as a means to having more solutions or capabilities that would appeal to their prospects and/or customers. These vary from third party marketing co-op programs to joint marketing and sales programs and are covered in Chapter IV: Issues and Trends in the section on Alliances.
- Hardware vendors will generally provide Cross-Industry applications such as IBM's PROFS or DEC's All-In-1 that can easily be sold to all

EXHIBIT III-10

### TOTAL APPLICATIONS SOFTWARE PRODUCTS MARKET 1987-1992 BY SEGMENT



prospects and customers. Hardware vendors generally provide Application Development Tools (DBMS, Languages, etc.) as a means of letting the user develop their own applications. INPUT's market sizing does not include expenditures made internally for development for applications expensed within the enterprise.

- Independent vendors have generally provided applications software that has more functionality and performance characteristics than the hardware vendors comparable solution. A fundamental basis for this is the fact that the hardware vendors' main interest is to sell hardware. Thus there is no inherent benefit to do more than an acceptable job in providing the application capability. This, of course, provides a significant opportunity for the independent software vendors to offer incentives to users to procure their products.

- Hardware vendors have the advantage of being first to offer their application products as part of the sale which allows cautious or lazy IS managers to do one-stop shopping. The success of the independent vendors to sell applications suggests that most decision makers have sought out higher performance and, more functional applications from the independents.

## b. Industry-Specific Applications

### (i) Overall

- In 1986 the industry-specific segments accounted for 51% of the applications software market and 27% of the total software products market. This will change to 56% of the applications software market and 24% of the total software products market in 1992.
- This indicates that there will be faster growth in the industry-specific applications area relative to the growth in cross-industry applications. This is based on the pent-up demand to obtain applications that are mission critical and pertinent to the application or business activity of the enterprise.
- However, there is faster growth in the Systems Software segment, and over the forecast period, the percent of applications-specific software will decrease slightly. The Systems Software segment growth is being fueled by the growth of networking management, operating systems, data center management tools and data base management systems (especially the trend toward distributed DBMS).

### (ii) Growth

- The three fastest growing industry sectors in terms of annual growth rates are Telecommunications (31%), other Industry-Specific (24%) and Services (23%). This is shown in Exhibit III-11. A major factor contributing to this growth is the nature of the U.S. economy. That is, it is well reported that the U.S. economy has become very services oriented. Other Industry-Specific consists of the following markets: Agriculture, Forestry and Fishing, Construction, Real Estate, Hotels, Personal Services, Repair Services, and Membership Organizations, to name a few.
- Based on 1987 user expenditures the largest industry segments are Banking and Finance, Discrete Manufacturing, and Medical. Based on 1992 user expenditures the same order holds true. However Distribution is fairly close to Medical in the 1992 timeframe.

## EXHIBIT III-11

### INDUSTRY-SPECIFIC APPLICATIONS SOFTWARE MARKETS

INDUSTRY SECTOR	1987-1992 AAGR (Percent)	USER EXPENDITURES (\$ Millions)		GROWTH RATE RANK
		1987	1992	
Discrete Manufacturing	17	1,181	2,552	12
Process Manufacturing	9	152	234	14
Transportation	21	226	591	5
Utilities	20	156	381	8
Telecommunications	31	107	414	1
Distribution	21	515	1,335	4
Banking and Finance	17	1,376	3,035	11
Insurance	18	482	1,118	10
Medical	19	594	1,416	9
Education	15	105	213	13
Services	23	181	502	3
Federal Government	21	87	224	6
State and Local Government	20	68	168	7
Other Industry-Specific	24	134	392	2

- Banking and Finance industry segments have been growing as they add new services and programs to attract customers. The tax law changes have impacted this industry segment as investors search for ways to increase their capital. Furthermore, some major efforts to build comprehensive banking software systems are on the verge of realization and will have some market acceptance. American Express has contracted with Cullinet for a new banking system for its needs.

- Discrete Manufacturing applications revolve around having a fully integrated approach to running the manufacturing process in a smooth cost efficient manner. Consequently, CIM and MRP applications are continuing to be installed. Furthermore, CAD/CAM/CAE applications in the manufacturing sector continue to grow, adding to the significant size of this segment.
- The Medical Industry continues to face pressure to become more efficient due to the increasing government regulation and the decline of hospital activity. Applications software will be an effective way to monitor and contain costs. Laboratory, pharmacy and medical/dental office applications are an area of major demand as automation has been minimal in these segments to date.

### c. Cross-Industry

#### (i) Overall

- In 1986 the cross-industry applications accounted for 49% of the applications market and 26% of the total software products market. This will change to 44% of the applications software market and 19% of the total software market in 1992.
- This indicates that Cross-Industry will grow at a slower rate relative to the entire software market and at a slower rate relative to industry-specific applications software. This is due largely to the extent that cross-industry applications have already been installed. Since cross-industry applications are essentially generic in nature there are no extensive natural barriers to their acceptance and their ability to solve meaningful problems. For example, wordprocessing, spreadsheet, human resources, project management applications, accounting were/are natural applications to use.
- As previously mentioned, the large growth over the planning and forecast period of Systems Software accounts for the decrease in cross-industry applications software versus the total software.

#### (ii) Growth

- The three largest cross-industry segments in 1987 are: 1) Planning and Analysis 2) Accounting and 3) Other user expenditures of \$1631, \$1334, and \$981 million, respectively. The largest in 1992 will be 1) Other 2) Planning and Analysis and 3) Accounting. [Note: The "Other" cross-industry segment includes such applications as:
  - Word Processing
  - Business Graphics



- Sales and Marketing Applications
- Desktop Managers and
- Desktop Publishing.]
- Thus with the popularity of the applications in the Other sector it is understandable to see the segment growing at the forecast 24% AAGR. Specific applications are Aldus' Pagemaker, Xerox' Ventura and the numerous other micro products that constitute desktop publishing. Word processing packages are Micropro's Wordstar 2000, Wordperfect's Wordperfect, Microsoft's Word etc. Most important, however, are some of the new areas that have virtually been untapped in blending business graphics with desktop publishing.
- Exhibit III-12 shows the cross-industry segments and how they will change over the forecast period. It is likely that "Other" segment may be further broken down by INPUT in the future to reflect the impact of the new emerging applications.

EXHIBIT III-12

### CROSS-INDUSTRY SOFTWARE MARKETS

CROSS-INDUSTRY	1987-1992 AAGR (Percent)	USER EXPENDITURES (\$ Millions)		GROWTH RATE RANK
		1987	1992	
Planning and Analysis	12	1,631	2,819	4
Accounting	11	1,334	2,259	5
Human Resources	7	628	898	6
Engineering/Scientific	25	294	914	1
Education/Training	21	112	286	3
Other Cross-Industry	24	981	2,830	2





## Issues and Trends







## Issues and Trends

### A

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#### Technology Impact

- The technology continues to improve, with lower cost providing significant price performance. The cost of additional memory has gotten so low that user hardware expense for very large operating systems, application development tools and systems has remained reasonable or decreased.
- This technology improvement stimulates software sales and makes it cost effective to provide integrated functionality at all delivery points, i.e., micro, mini or mainframe. This cost effectiveness allows computerization of almost anything.

#### 1. Processors

- The Intel 80386 and Motorola 68020 have been introduced into numerous micros, and minis comprised of multimicros and workstation products. In addition the internal clocks of these micros have been increased to run at rates up to 20 MHz.
- This has stimulated intelligent hardware devices to drive a new wave of peripherals such as laser printers, streaming tape drives, intelligent scanners and image processors.

#### 2. Optical Memories

- CD-ROM systems with their large capacity and improved performance characteristics have been used to make available significant static data bases for information that changes slowly.

- Software products are needed to interact with the hardware mostly of the data retrieval and reporting variety.
- These applications will have a negative impact on the on-line data base delivery mode and the associated value-added network processing modes.
- In addition new uses of computers will become available that use large amounts of static data with a micro based system. An example would be a maintenance software system with full diagnostics and schematics that could be taken to a secure area for important maintenance situations.

### 3. Artificial Intelligence

- Much has been expected of artificial intelligence applications and their making computer usage more effective and easier. This has been an application area long in coming.
- The major AI applications that can add to software are:
  - Natural language front-ends.
  - Expert or learning systems.
  - Symbolic and logic programming.
- While these uses have increased, the dramatic growth expected has not quite materialized.
- AI is not something that a user buys off-the-shelf but rather adds to the environment to complement other software. Thus there are natural language front-ends to popular 4GLs or DBMS or DSS (Decision Support Systems) and new relationships are being constantly announced.
- Similarly, there are applications software systems that have expert front-end options or modules to make the application more productive.
- Examples of recent relationships are:
  - AION front-ending Boole and Babbages DBMS productivity measurement tools.
  - Microsoft investing \$1 million in Natural Language (Berkeley, CA).

- Relational Technology working with Natural Language to front-end Ingres.
- Execucom adding a natural language front-end from Carnegie to its DSS.

#### 4. Laser Printers

- The “desktop publishing” interest has given use to sophisticated document/page development systems that effectively provide the look of outside typesetting at low cost and high convenience.
- This has made it possible to develop very effective printed communications with different size type, different fonts and merged graphics from business letters to formal proposals. The quality of documents has never been better and has given rise to new companies such as Aldus (Seattle, WA) and Ventura Software (Morgan Hill, CA).
- Furthermore, the penchant for quality and the functionality of laser printers has given rise to additional interest in illustration tools and graphics add-ins for word processors new font development tools and most applications are adding software drives to accommodate laser printer output. With over 300,000 HP Laserjets and 75,000 Apple Laserwriters installed, it is an important capability to provide.

## B

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### IBM Impact

- IBM in general has a major impact on the Information Services market. However its impact will be especially noticeable due to the announcement of Systems Application Architecture (SAA) late last year and the announcement of the newly formed Application Software Division under its president Joseph Guglielmi, who in turn reports to Edward Lucente, IBM Vice President and Information Systems Group executive.
- The ASD group is chartered with development of both internal and external applications. The division’s 6000 plus employees will be making SAA a reality, as well as providing additional focus for applications software from IBM.
- ASD will look for applications external to the IBM Corporation, ala Hogan, to add to the IBM software products offering. Even IBM acknowledges that it can not possibly supply all the useful applications that sell computer systems.

- There is no doubt that IBM's recent lackluster growth and profits decline is registering with the corporate financial people. IBM has fallen off track and the last two years financial performance is not part of the plan.
- The new aggressiveness of IBM in announcing SAA, ASD, strategic partnering, marketing programs (remember the recent DB2 promotions) and formation of special marketing groups (such as the Commercial Systems Integration group) shows a company with well thought out plans to get back on track in terms of growth and profitability.
- Even though IBM is not known for software excellence and comprehensive functionality, software still accounts for more than 10% of its revenue. Think of what would be possible if it treated software products as a "real business." Look out, it is happening.
- INPUT believes IBM will look at additional strategic partnerships to bring in software that can give it a product to sell that people desire, as opposed to select, as part of the sales process.
- And it may be the case that IBM has figured out that the reason users purchased independent software was due to its overall price/performance. There has never been a reason for IBM to provide price/performance software because fundamentally it is a hardware company, and providing software was a means to that end. Providing price/performance software is contrary to selling more hardware and thus requiring more memory, more CPU and more disk storage with IBM's software products than needed with an independent software vendor's software products.
- INPUT believes IBM is willing to bite the bullet (perhaps it has been bitten for them) and start delivering price/performance software fully realizing that it will not pull through as much hardware. In the long run the hardware/software mix will change somewhat but IBM will make additional penetration with its hardware. After all, what would be so bad about selling very profitable software?

## C

### Partnering Market Strategies

#### 1. Acquisitions/Divestitures

- The number of acquisitions in 1986 continued to increase with many deals closing in the eleventh hour of the year, thus avoiding the less favorable implications of the new tax law.
- In addition, some companies made acquisitions to add complementary product lines or initiate programs to enter new markets to augment



declining revenues, or to obtain technology that would have been too expensive or take too long to develop internally.

- Finally, some companies divested of product lines or business segments that were unprofitable or no longer fit the strategic direction of the corporation. Most of these deals strengthened the two parties involved.
- Below are some examples of these actions.

#### a) Cullinet

- With its DBMS business stalled due to IBM's effective DB2 marketing, Cullinet's revenue and profit growth declined to the point of suffering losses. Management changed and the company embarked on a strategy to enter the industry-specific application market through Manufacturing and Banking software.
- Furthermore, Cullinet realized the DBMS world was faster growing in the mini and micro environment and acquired some technology to enter the VAX/VMS markets. This new product will have an extremely tough time against the mini leaders of Oracle and Relational Technology, not withstanding DEC itself.
- Companies acquired by Cullinet were:
  - ESVEL for its DBMS technology especially relational and SQL;
  - Planning Control International for its project management applications;
  - DMS, Inc. for its distribution management systems software;
  - and Computer Strategies for JIT and zero inventory applications.

#### b) Computer Associates International

- Computer Associates has been a marketing-oriented company since its inception and has made numerous acquisitions over the years and maintained an impressive growth posture.
- It has generally acquired organizations that had significant market share and presence. CAI then adjusted the new business to fit into the existing corporate structure and leveraged its corporate resources to market the new business more effectively.
- Companies acquired by CAI were:

- Integrated Software Systems ISSCO for its leading graphics packages in the IBM mainframe and DEC VAX environments;
- and Software International Division from GE for its general purpose accounting software.

c) UCCEL

- UCCEL embarked on an impressive divestiture/acquisition program that focused the company into fewer yet more profitable product lines.
- UCCEL divestitures were to rid itself of turnkey systems that were draining the company both in strategic direction and profits. In addition, it divested several other businesses, including a remote processing operation in Europe and a CIM tool vendor in Texas.
- On the other hand it acquired promising business that complemented its existing business by adding new functions or new leading edge applications. The companies/products acquired by UCCEL were:
  - ISS-THREE, a capacity management software capability;
  - MAZDAMON (from Graham Software), a network performance product;
  - California Software (Los Angeles, CA) for equipment ordering, charge-back and contract administration;
  - Triangle Software (San Jose, CA) for JCL checking, job scheduling and contingency planning;
  - SKK, Inc. (Chicago, Ill) for data security products;
  - and Cambridge Systems (Santa Clara, CA) for data security products.
- UCCEL divested itself of Digital Systems and Open Systems — turnkey systems vendors in a cash transaction to Convergent Technologies.

d) The Ultimate Merger: CAI and UCCEL

- Early in June 1987 the proposed merger of CAI and UCCEL was announced, representing the largest deal heretofore in the software products arena. The deal would create a \$450 million corporation (based on 1986 revenues) and would cost CAI approximately \$800 million in stock.

- While most analysts saw the deal as two staunch competitors combining and a deal that would cause prices to increase, INPUT's analysis has shown the deal to be quite different.
- INPUT believes there is good synergy and benefit for the combination in spite of a couple of Data Center Management segments being overlapped. There is significant "fill-in" available for the new corporation, and the user will benefit from the merger.
- While there may be some negative reaction from users because of fear of their specific software being discontinued or unsupported, the situation is no different from countless other mergers or acquisitions. In actuality, CAI, which will be the surviving company, has not undertaken a practice of streamlining product lines in previous acquisitions.
- The benefit to CAI is the acquisition of new product lines, increased customer base, and several emerging strategic products (that UCCEL itself had recently acquired).
- In any merger there is risk, and the risks for CAI are the assimilation and retention of the correct personnel to make the new organization hum. After all, there is acquisition digestion occurring in each merger participant from the acquisition made late in 1986 as well as the digestion required to make this merger a success.

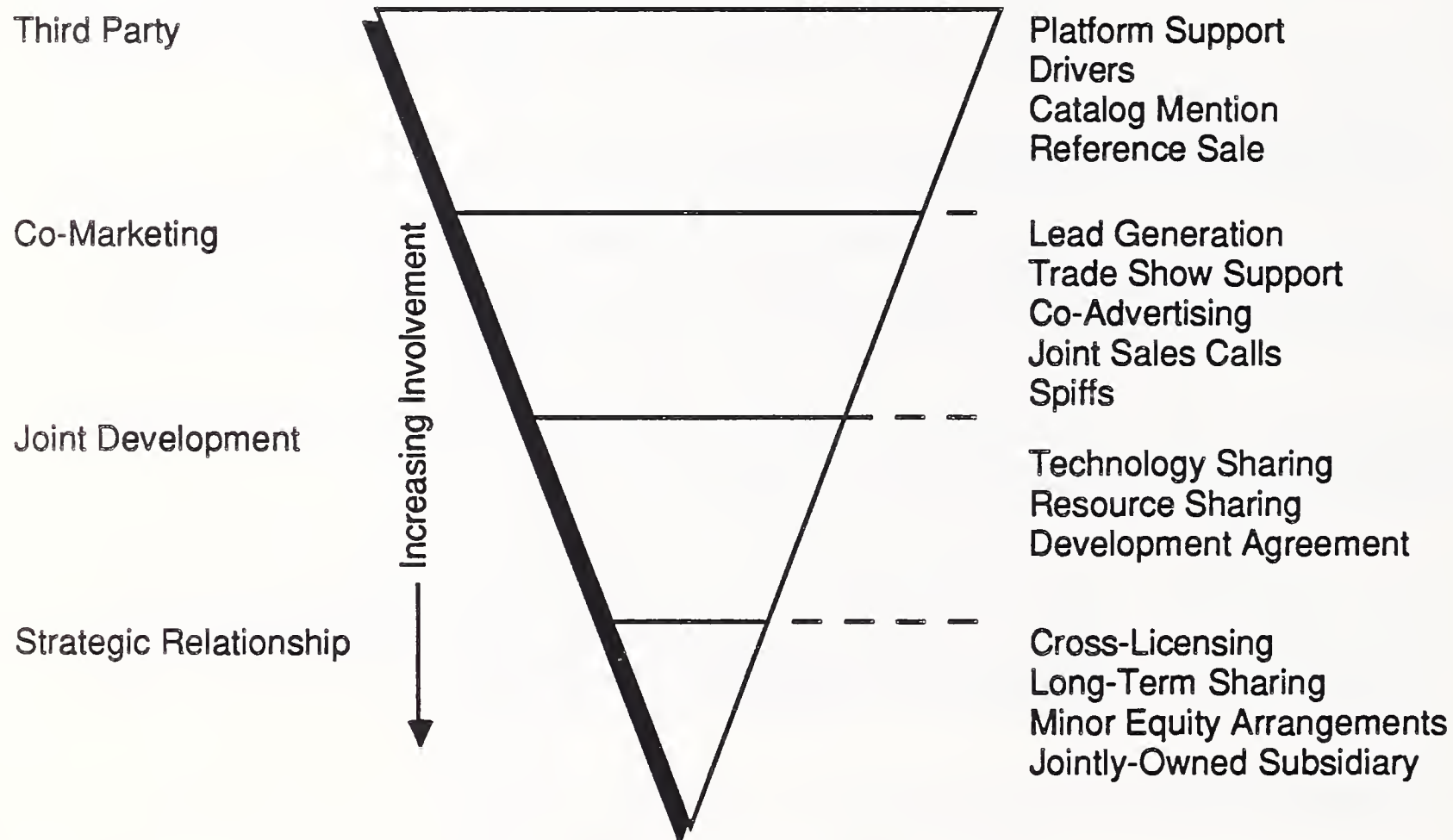
## 2. Alliances

- In addition to acquisition, companies have undertaken strategic or partnering relationships wherein two companies agree to work together in some fashion to effect a sale. This can be facilitated in several ways.
- Several types of alliance mechanisms are described in Exhibit IV-1. The inverted pyramid shows the most prevalent form of partnering to be what is called third party partnering. This is followed in the order of more intimate involvement by co-marketing, joint development and finally a strategic relationship.

### a) Third Party

In this relationship the software vendor develops the application to work on a specific hardware platform or with a specific software module. This may entail the need of a small amount of software to customize the application to the particular environment. When this occurs the two parties place the relationship in a catalog of such relationships to be used as a way to express the support.

## EXHIBIT IV-1

**ALLIANCE MECHANISMS**

In addition, both parties involved will encourage their respective sales forces to reference the working relationship. This is essentially an arm's length relationship and has a minimal commitment.

b) Co-Marketing

- This relationship strengthens the third party relationship by the amount of additional resource that each company expends to proactively help market each others' products.
- The type of activities used in this mode of partnering are:
  - lead generation
  - trade show support
  - co-advertising
  - joint sales calls
  - spiffs

- Co-marketing generally requires a sense by each participant that there is benefit in spending dollars or resources to promote the relationship.

c) Joint Development

- Joint development is used as a mechanism to create a capability using both participants' technology. This means that dollars and resources are budgeted and the budget to be created is mutually advantageous and probably available quicker than if it were attempted by either party on a separate basis.

d) Strategic Relationship

There are occasions when companies agree that it is in their best interests to work together over a long period of time, generally years. Resources are expended and the results of the efforts are shared and agreed upon up front.

A jointly-owned subsidiary or equity sharing arrangement using cross licensing is the technique that is generally employed.

- The relationships above are in the order of decreasing magnitude (i.e. the number of such arrangements) and increasing resource commitment or expenditure. In the Exhibit IV-2 some examples of the partnering relationship discussed are shown.

## EXHIBIT IV-2

**ALLIANCE EXAMPLES**

RELATIONSHIP TYPE	PARTIES INVOLVED	SOFTWARE
Third Party	Almost Any Hardware Manufacturer with Almost Any Software Vendor	All
Co-Marketing	Ashton-Tate, Cincom Interleaf, DEC Arthur Andersen, MSA DEC: SolutionSoftware IBM: SolutionPacs	DBMS Electronic Publishing Manufacturing Specific to the Situation Specific to the Situation
Joint Development	DEC, Cullinet Pyramid, Sybase UNISYS, Sterling MSA, AION AION, Boole & Babbage Natural Language, Relational Tech.	DBMS DBMS DBMS AI AI AI
Strategic Relationship	IBM, Lotus Microsoft, Natural Language Apple, Sybase	Spreadsheet, DBMS AI DBMS



# Recommendations









## Recommendations

There are several ways that Software Products vendors can improve their opportunities to increase their market share or increase their revenue. These activities can have a large pay-back when executed correctly and without expending considerable resource.

### A

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#### Evaluate IBM's System Application Architecture (SAA)

- All software vendors must evaluate SAA to see how they can benefit from making their software compatible with this new IBM software direction. Several organizations have already announced their support without even seeing the multi-volume documentation guide due out in the fourth quarter of 1987.
- As mentioned previously, the SAA concept, when properly implemented will provide for an application to run across all platforms. This suggests that software vendors utilizing all the SAA guidelines are, in effect, writing software for all IBM platforms. INPUT cannot think of an easier way to make a vendor's software more available to the market.
- In conjunction with this recommendation software vendors should contact the newly formed Application Systems Division to determine how they can be included as a third party vendor. IBM has made it clear that it is anxious to encourage vendors to adopt SAA. INPUT would not be surprised if IBM is becoming very proactive in establishing these relationships.

### B

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#### Follow the Technology

- Vendors are encouraged to keep an eye out for new technology that can leverage their software. While no doubt this is a fundamental concept

and all companies are ostensibly doing this, it is quite interesting to note that it is much easier said than done.

- For example, a major piece of the relational data base management theory was finished by IBM in the early 1970s, but the first implementation was not until 1976 by Tymshare. Oracle did not complete its relational and SQL development until 1979.
- Or Computer Aided Software Engineering did not become an emerging market for almost a decade after most of the methodologies had been “invented.” Certainly the micro has had an impact here but micros have been around for more than six years.
- The point is that technology can lie around for sometime before there is a mad dash to implement it. Following the technology and implementing it is definitely a “window of opportunity” scenario.

## C

### Sensitize to Customer Satisfaction

- This motherhood and apple pie axiom is almost always overlooked. Everyone seems to pay lip service to what is the key marketing concept of all time. Know thy customer!
- Vendors should implement company plans for ensuring that customer satisfaction is understood by all employees. Obviously the customer pays the way, and customer satisfaction has an immense bearing on follow-on business and new business. Customers do talk to each other. And one unhappy customer is equal to ten happy customers.
- INPUT has observed that many of its clients have installed a customer satisfaction study (claiming it will be an annual undertaking) to stay close to the desires of their customers. Without being self-serving, INPUT recommends the study be conducted by an outside organization to provide the maximum candor, comfort and communication.
- INPUT recommends that vendors evaluate their plans and programs, trying to view the plan/program points as ones that would be received by the vendor from one of its customers. If an open, objective view is taken it is indeed possible to assess the acceptance of the plan/program and anticipate customer reaction. What you provide as a vendor should be something the customer desires.
- It is INPUT's experience that the “role reversal” can provide valuable insight to customer satisfaction and gauge acceptance. Vendors must invoke the business equivalent of the Golden Rule. Customer satisfaction cannot be over-stressed.

## D

### Integration with Complementary Products

- Most software products can feed or accept information from other complementary products/modules. With this in mind, INPUT recommends that software vendors execute a strategy of identifying those key complementary modules and developing the appropriate interface.
- This realization of the software products surroundings or environment will enhance the value of the specific product and perhaps justify a higher price and thereby margin.
- Many times the ability to have an open architecture shows application utility and flexibility, and while the user is not in need of the integration facility, its potential is a strong factor in the sale.
- Furthermore, the open architecture approach provides connectivity with others (that make logical sense) that may be looking for integration capability from their perspective. This invariably leads to a third party relationship or potential co-marketing possibilities—both important factors in developing product viability.

## E

### Develop Alliances/ Relationships

- Software Product Vendors are encouraged to evaluate, initiate, and execute as many third party channel relationships, co-marketing relationships, and other synergistic modes of cooperation to enhance their product's success.
- Most companies (vendors) are realizing that they can develop just so much expertise and technology in providing product functionality. This leads to a cooperative mode and partnering relationships to add complementary functions and/or new platform focus.
- Software Product vendors need to establish relationships with the hardware manufacturers to ensure maximum exposure of their software to the manufacturer's sales force and the manufacturer's prospects. All manufacturers have some form of third-party software catalog to lend assistance to the sales process.
- The third-party software catalog establishes a symbiotic relationship that benefits both the manufacturer and the independent software vendor. The user needs to know what software is available to meet the needs of the environment. The manufacturer makes its livelihood through selling its hardware and understands that it needs to provide useful software. However, manufacturers also realize they can not easily keep up with the diverse software needs of its customers and prospects, thereby creating an opportunity for independent software vendors.

- By virtue of the third-party relationship the software vendor is generally afforded a reasonable opportunity to be kept informed of functionality improvements or changes in advance of customers. In many instances, the more popular software vendors are afforded early release software to assist in the quality control process of the hardware manufacturer. This is especially true of operating system and run time library modifications or enhancements.
- Third-party relationships in many instances lead to more direct relationships involving formal marketing arrangements. An example would be the IBM-Hogan relationship which turned around the growth and profitability of Hogan.

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## F

### Evaluate Commercial Systems Integration Potential

- INPUT has recently performed some primary research in the area of Commercial Systems Integration which is discussed in the report **Commercial Systems Integration, 1986-1991**. In summary, the report discusses the large program opportunities that are being specified and let in the commercial arena analagous to the major awards that have previously occurred in the Federal Government arena.
- The systems integrator, i.e. the company that takes total responsibility for implementing the CSI project, will need to supply the hardware, software, communications and whatever else is necessary to meet the needs of the system. The companies fulfilling this role will need to establish on-going relationships with software vendors that can supply systems software, applications enabling tools, and in some instances industry-specific applications software.

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## G

### Follow Standards

- In some instances Software Products vendors accrue significant benefits and revenue from tracking "standards" and participating with standard committees.
- The ability to be early in adopting a "standard" can provide a headstart in obtaining market share and penetration. For example, in the DBMS software products arena, those vendors that jumped on the SQL bandwagon have grown significantly, compared to others who have not yet embraced SQL. INPUT acknowledges this is by no means the only factor.



# Conclusions







## Conclusions

- The Software Products delivery mode is the fastest growing delivery mode. It will be surpassing the Network/Processing Services delivery mode early in the forecast period.
- Software Products have come out of the slump from a year ago and still offer a significant opportunity to add value to hardware systems.
- Software is becoming more sophisticated and difficult to produce and maintain from both the vendor's development perspective and the user's system perspective. This is giving rise to software philosophies that include common functionality across hardware platforms both homogeneous and heterogeneous.
- Software is becoming more user friendly and easier for end-users to obtain advantage in either a development environment or applications environment.
- The bottom line is that independent software products vendors who use a focused approach to providing product functionality will be in a position to make considerable in-roads in developing a viable business.
- INPUT forecasts exciting growth and potential for many existing firms and new entrants. Software products is the area of opportunity in the Information Services Industry. It is also a market segment that does not require extensive capital requirements and a immense overhead to get started.











