U.S. SOFTWARE PRODUCTS AND PROFESSIONAL SERVICES MARKETS, 1984 - 1989

INPUT

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INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

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

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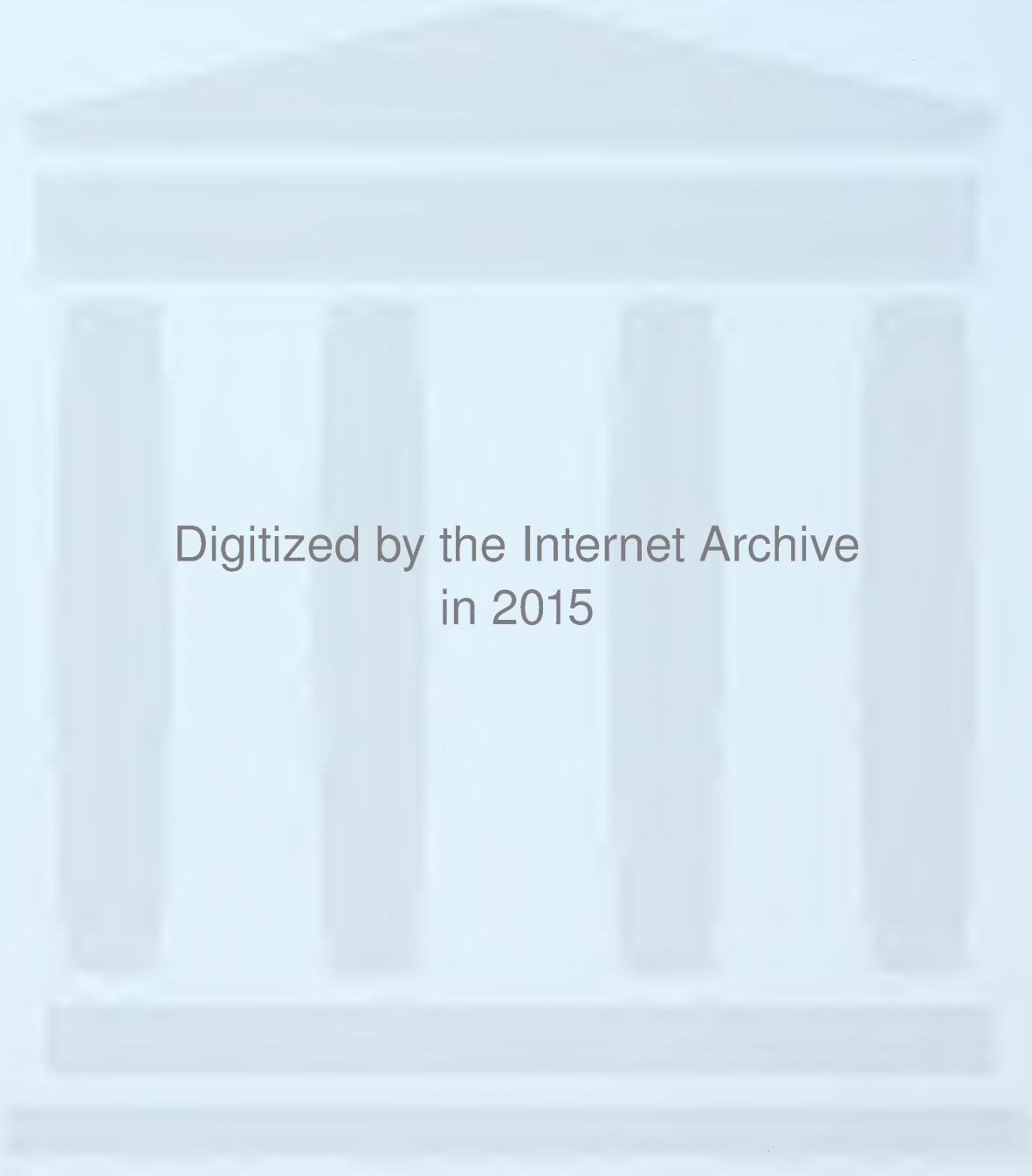
1 INTRODUCTION



I INTRODUCTION

- This report is produced as one of a series of reports in INPUT's Software Markets Program, which is part of the Market Analysis and Planning Service (MAPS) for the Information Services industry.

A. PURPOSE OF THIS REPORT

- This report reviews and analyzes two important modes of the software market:
  - Mainframe and minicomputer (mainframe/mini)-based software products.
  - Professional services, which includes software development related to all types and sizes of computers, as well as consulting, education/training, training, and professional services facilities management.
- This report is designed to assist vendors in:
  - Identifying new markets and product opportunities.
  - Assessing product and marketing risk exposure.

- Allocating R&D and operations resources.

- Obtaining insights into market-related developments that impact profitability.

- Market analysis and forecasts of other information systems modes may be found in the following companion reports:

  - Micro computer-based software products are examined in an INPUT volume entitled U.S. Personal Computer Software Product Markets, 1984-1989.

  - Processing services and turnkey systems are analyzed in a volume entitled U.S. Processing Services and Turnkey Systems Markets, 1984-1989.

- Market analysis and forecasts by industry segment may be found in these INPUT reports:

  - U.S. Information Systems Vertical Markets, 1984-1989.

  - U.S. Information Systems Cross-Industry Markets, 1984-1989.

B. SCOPE AND ORGANIZATION

- This report focuses on U.S. markets and analyzes user expenditures that are noncaptive (i.e., it deals with dollars spent on services and products provided by organizations outside of the buyer's own corporate structure.)

- This report is organized as follows:

  - Chapter II is an Executive Summary provided in presentation format, complete with script.

  - Chapter III forecasts and analyzes mainframe/mini-based software products in terms of opportunities, challenges, issues and events. Market sizes and growth rates for the 1984-1989 timeframe for over 30 different major industry-specific and cross-industry application software products market segments are provided together with data for systems software market segments.

  - Chapter IV provides market forecasts and analysis of the professional services marketplace for 1984-1989. Included are discussions of key issues and trends, plus market sizes and growth rates.

  - Appendix A contains a set of definitions relevant to this report.

  - Appendix B contains a complete data base of the market sizes and growth rates discussed in this report. It includes statistics for 1983 through 1989.

  - Appendix C lists other INPUT reports that are related to the software markets discussed in this report.

  - Exhibit I-1 on the following page profiles the classification scheme used by INPUT to structure the software products marketplace.

  - Exhibit I-2 shows the market structure for professional services.

EXHIBIT I-1

SOFTWARE MARKET STRUCTURE

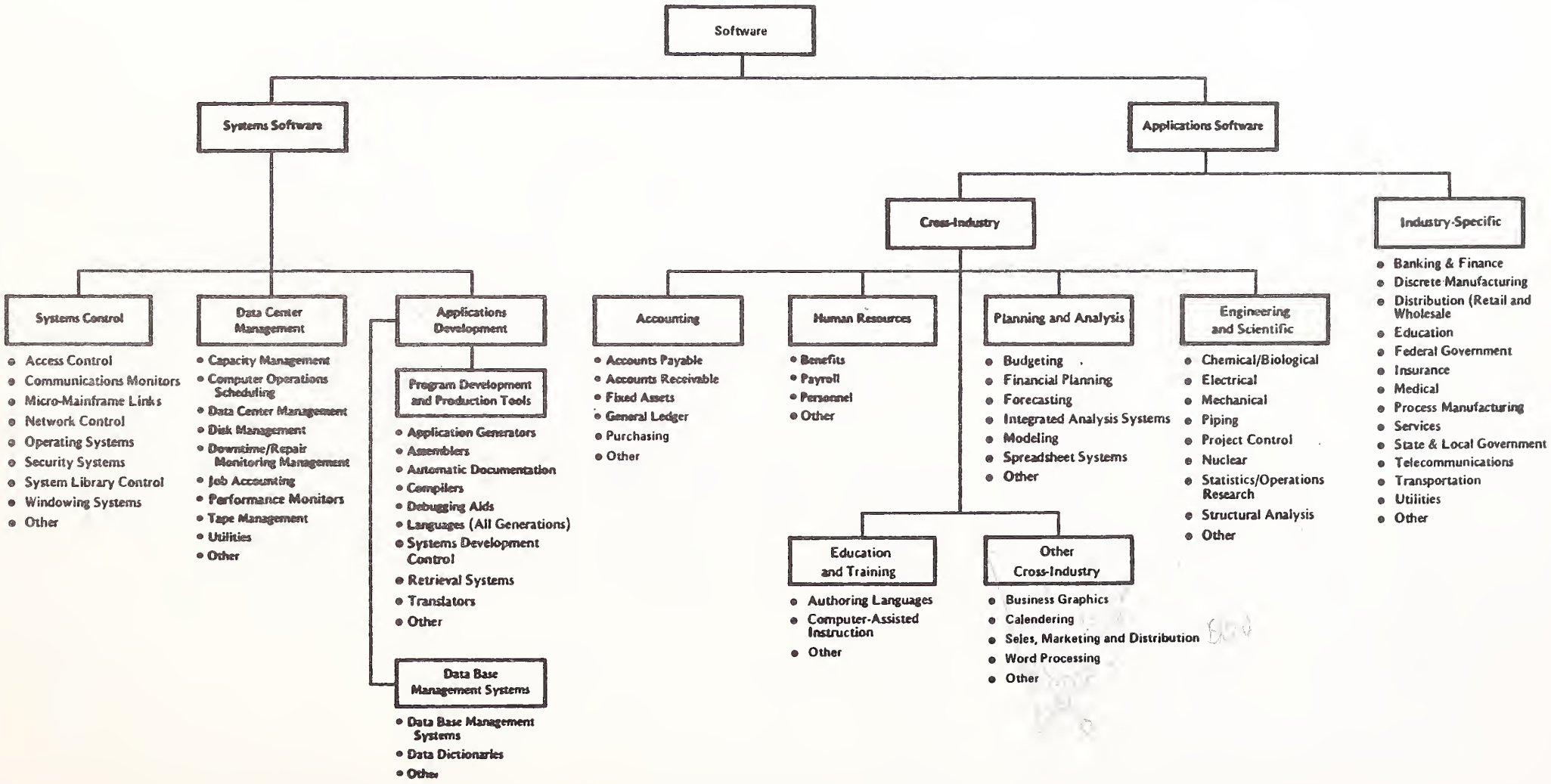
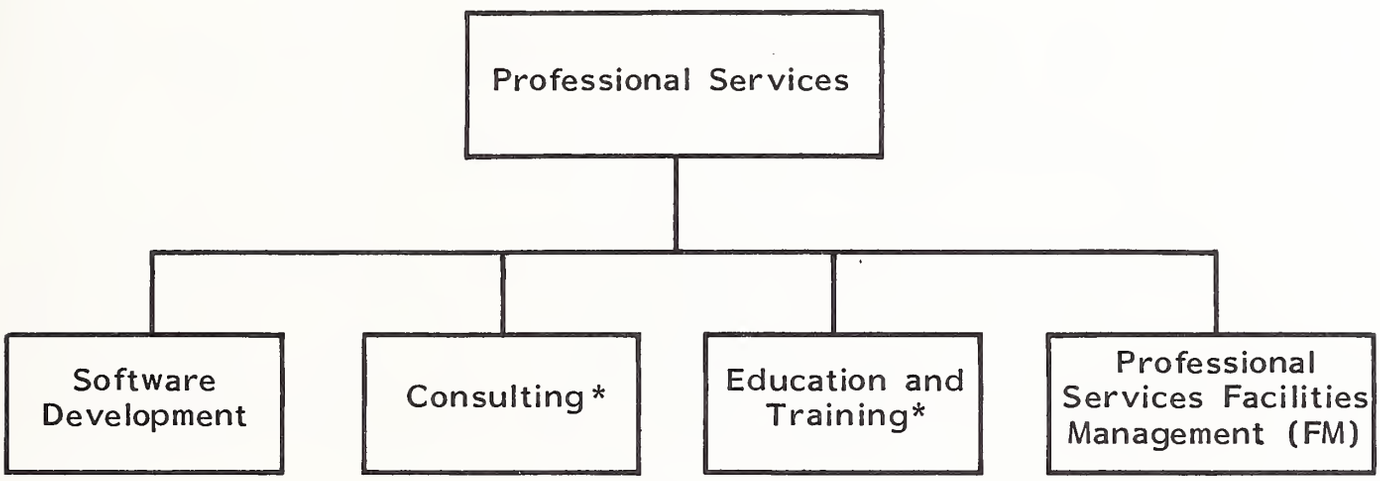


EXHIBIT I-2

PROFESSIONAL SERVICES MARKET STRUCTURE



- User Requirements Definition
- Systems Design
- Data Base Design
- Programming
- Testing
- System Modification
- Documentation
- Other

- Software Installation Planning
- Information Systems Audit
- Security Audit
- Personnel Planning
- Policies and Procedures Development (Other than related to Software Development)
- Other

- Computer Operations Training
- Management Training
- Analyst/Programmer Training
- Systems Usage Training
- Video Instruction (Related to Computer Topics)
- Other

- FM Using Customer-Owned Hardware

* All related to computer systems, topics or issues

C. METHODOLOGY

- The process of forecasting is a continuous one. This year's report represents the eighth year INPUT has studied the software industry. Two fundamental and complementary approaches are used to analyze the industry.

  - The first approach requires a constant interface, through formal and informal interviews and contacts, with buyers of software in each of the industries surveyed.

  - The second approach requires an ongoing monitoring of all software vendors with annual revenues greater than $10 million. Stratified random sampling techniques are employed to estimate the size and change in that portion of the industry represented by smaller firms.

  - At the convergence of these two processes, INPUT researchers analyze industry size, composition, change, direction, etc., to generate the forecasts included in this report.

- All forecast numbers presented are in current dollars (i.e., 1989 market sizes are in 1989 dollars.) Inflation is assumed to be an annual 6% for the same period.

- INPUT always welcomes comments, inquiries, and suggestions relating to report contents and structure.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

- This chapter summarizes key forecasts, issues, and trends that are discussed in more detail in the remainder of the report.

- This Executive Summary is prepared in a presentation format, i.e., the exhibits are set in larger type for ease of use with an overhead projector and the text is in script form. The script for each exhibit is contained on the left-hand page opposite the exhibit.

A. SOFTWARE PRODUCTS TO LEAD FIVE-YEAR GROWTH

- Software products is the growth star of the 1984-1989 information services marketplace. From a base of $10.6 billion in 1984, software products for all sizes and types of computers will outperform all other modes by expanding 31% annually. By 1989 it will emerge as a $40 billion opportunity, thus making software products larger than the entire information services market of 1984.

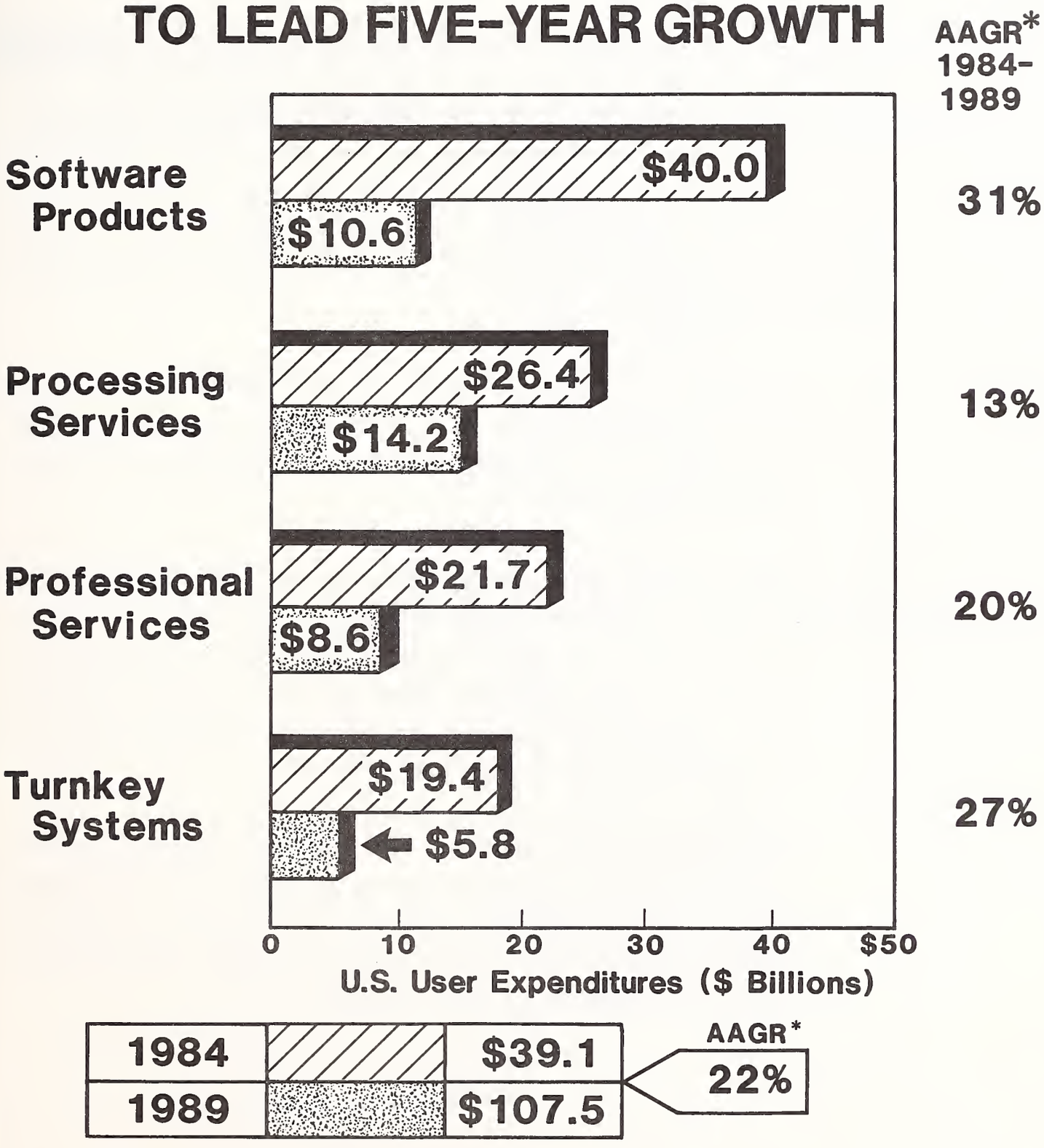
- Software products' share of the total information services market will increase from 27% in 1984 to 37% in 1989. Only one other major delivery mode (turnkey systems) will show an increased market share, and it will be much smaller (growing from 15% to 18%).

- Professional services will grow over two and one-half times in the 1984-1989 time period. Its 20% average annual growth rate will propel professional services from a 1984 base of $8.6 billion to a 1989 level of $21.7 billion, thus still edging out turnkey systems in terms of market size.

- This report will profile the mainframe and minicomputer-based software products market, as well as the professional services market.

EXHIBIT II-1

SOFTWARE PRODUCTS TO LEAD FIVE-YEAR GROWTH



*Average Annual Growth Rate

B. MAINFRAME/MINI SOFTWARE PRODUCTS EXPENDITURES TO TRIPLE BY 1989

- Software products for mainframe and mini computers will continue throughout the decade to comprise the bulk of the total software products market. These products will more than triple in the 1984-1989 timeframe. An average annual growth rate of 27% will boost user expenditures from a $8.9 billion base in 1984 to $29.5 billion five years later. Its share of the information services market will increase from 23% in 1984 to 27% by 1989. The mainframe/mini software market is benefiting from a number of fundamentally strong driving forces:

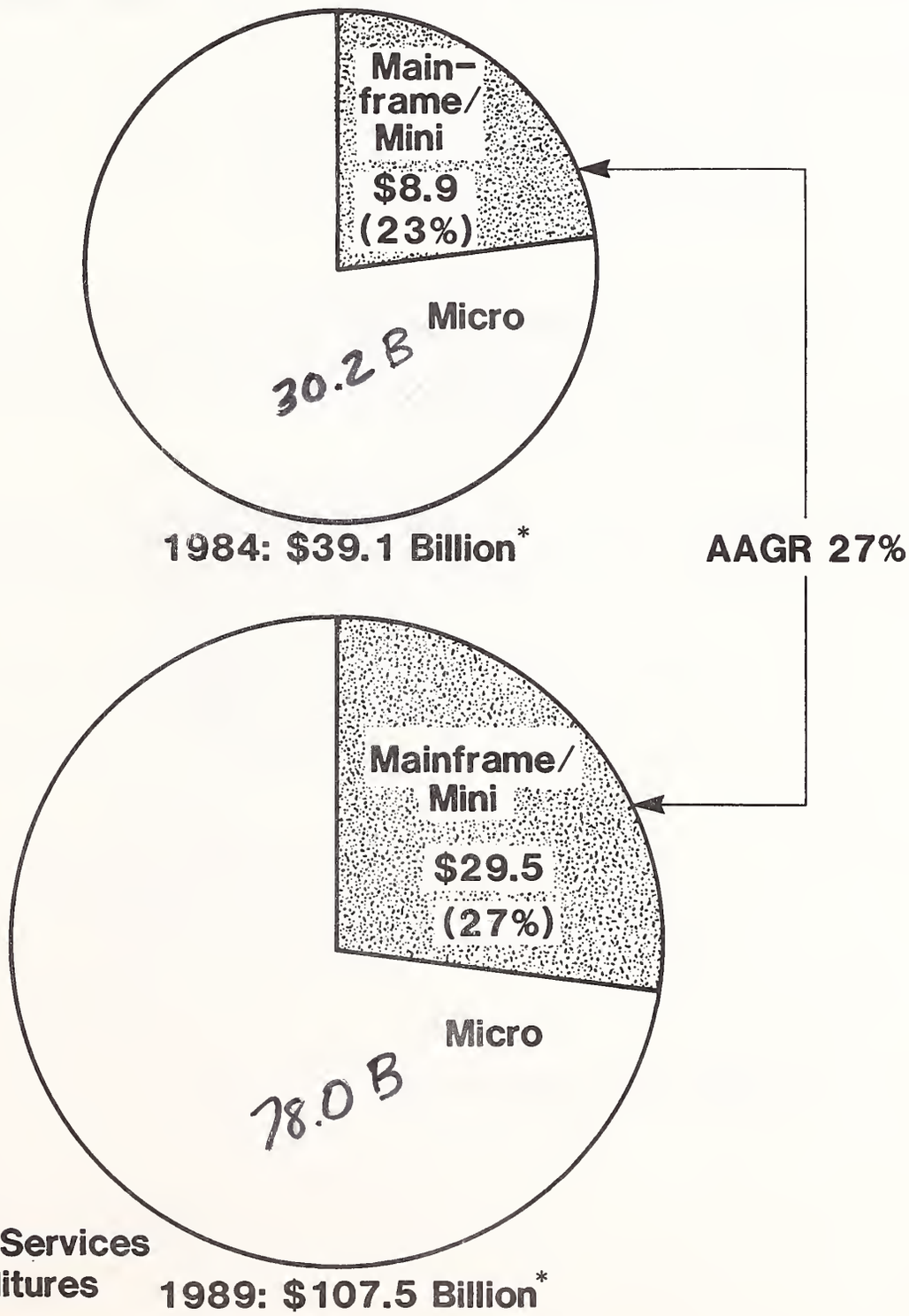
  - Emphasis on information systems as strategic weapons. This push by senior corporate management initiates demand for major systems solutions that are immediately available--a requirement that is tailor-made for software products.

  - Vendor business sophistication. Many software products vendors have successfully conducted business for over a dozen years. They have become skilled at financing, product development, marketing and customer service. Their customer bases are familiar corporate names. They inspire customer confidence, thus helping to lower the "not-invented-here" obstacle of earlier times.

  - Proliferation of microcomputers. The more than 23 million business-related micros that will be operational by 1989 will be a significant stimulus to mainframe/mini software products due to demand for micro-mainframe links and other distributed systems capabilities that make existing centralized systems obsolete.

EXHIBIT II-2

MAINFRAME/MINI SOFTWARE PRODUCTS EXPENDITURES TO TRIPLE BY 1989



*Total Information Services U.S. User Expenditures

C. TODAY'S LARGEST APPLICATIONS SOFTWARE PRODUCTS SEGMENTS TO RETAIN LEAD

- The five largest mainframe/mini software products markets in 1989 are also some of the largest markets for 1984. These segments are almost evenly divided between industry-specific and cross-industry applications.

- The banking and finance market for industry-specific software represents both one of the largest markets of 1984, and also one of the fastest growing (at 38% annually) for the next five years. Deregulation is making existing systems obsolete at a rapid rate.

- Accounting and planning/analysis markets are becoming increasingly intertwined as these applications become heavily integrated via DBMS linkages. The expanding complexities of the business environment provide an important stimulus to these applications.

- Discrete manufacturing and distribution (both wholesale and retail) are similar in size and rate of growth (37% and 36% respectively).

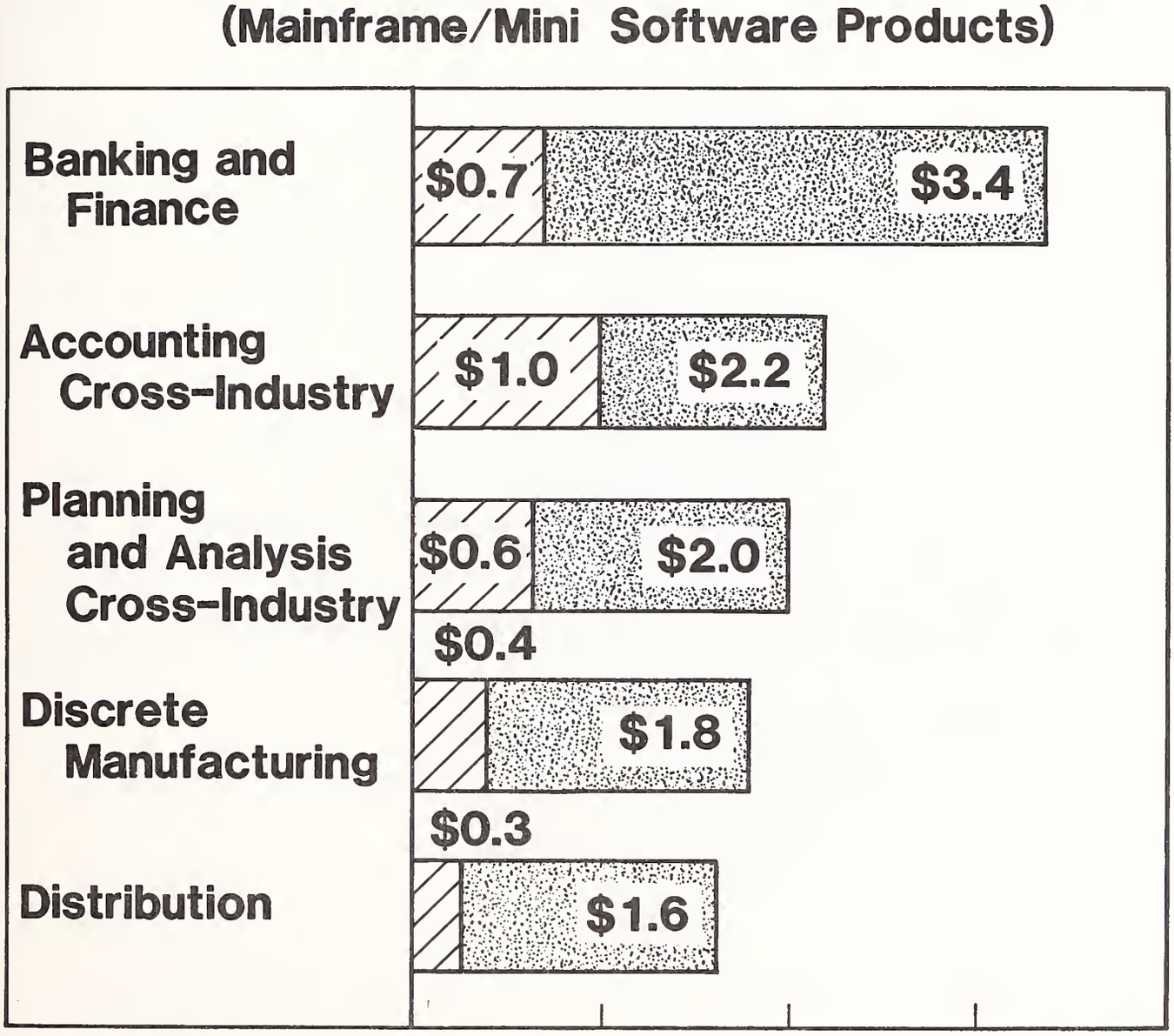
  - Discrete manufacturing is benefiting from management's commitment to improved productivity via automation as the key response to domestic and foreign competition.

  - The distribution segment is looking to large-scale software products implementation in order to meet the challenge of improved inventory control and customer service.

EXHIBIT II-3

TODAY'S LARGEST APPLICATIONS SOFTWARE PRODUCTS SEGMENTS TO RETAIN LEAD

(Mainframe/Mini Software Products)



*Average Annual Growth Rate

D. SOFTWARE PRODUCTS MAINTENANCE AND SUPPORT TO EXPAND SHARE

- An explosive market, and one that is already bearing fruit for software vendors, is that of software maintenance and support. Initially some vendors gave this service away to their clients but now many vendors are reaping as much as 30% of their annual revenues and 40% of their profit from this source.

- The market for these services is growing an impressive 31% annually. The 1984 market of $2.3 billion for mainframe, mini-, and micro-based software products maintenance and support will expand to $8.8 billion by 1989. Market share will increase from 22% to 27%. Users' increased reliance upon software systems as an essential business asset requires them to be assured of fast, accurate support of this type.

- Just as significant in terms of return are the long-term benefits in customer loyalty that occur to vendors that provide good service to their user base. This will help ensure continued sales of future products as they become available. Once again the importance of account penetration, control and customer satisfaction is clearly demonstrated. The successful vendor will satisfy user needs throughout the life cycle of that need.

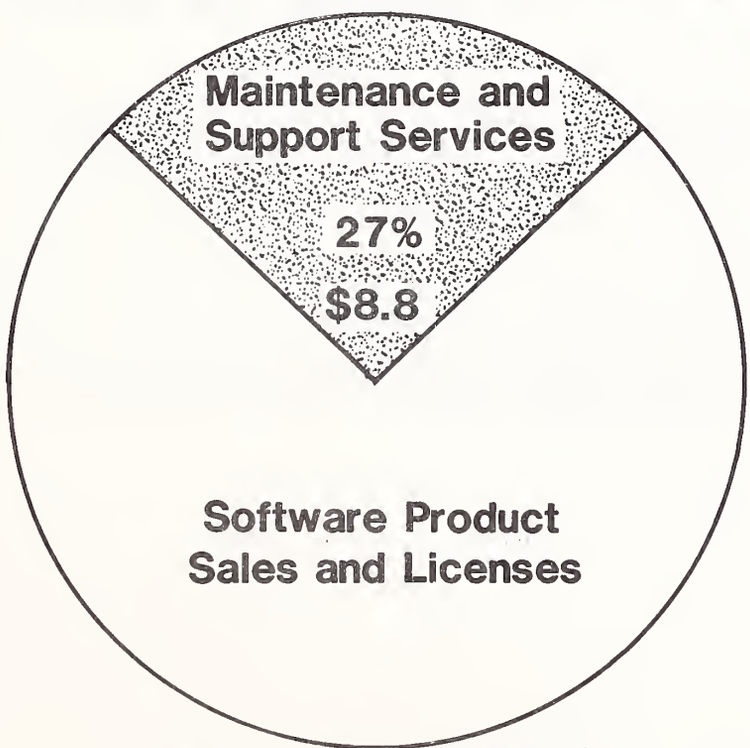
EXHIBIT II-4

SOFTWARE PRODUCTS MAINTENANCE AND SUPPORT TO EXPAND SHARE

1984: $10.6 Billion*

*Includes Mainframe, Mini- and Micro-Based Software Products

AAGR 31%



1989: $40.0 Billion*

E. SOFTWARE PRODUCT TRENDS TO WATCH

- During the next five years information services offerings by computer/communications hardware firms and subsidiaries of larger companies will go from 10% to 19% of the market. These organizations will bring financially deep pockets to the marketplace, and thus will force other vendors to place increased emphasis on sound, long-term financial strategies in order to remain competitive in terms of product development and market coverage.

- Overambitious commitments by several vendors to software product development are also impacting the market. When vendors such as Anacomp, IDA, and CUC fail to complete ambitious software development projects as promised, the entire software products industry becomes tainted.

- IBM will continue to influence the strategies of systems software vendors heavily. IBM software products revenues will increase four-fold by 1989, with systems software being the primary revenue source. IBM will fight hardest (and most successfully) for SNA, operating systems, and DBMS-related markets.

- In response to the search for markets that best leverage both their customer franchise and their competitive assets, aggressive vendors--such as Cullinet, Cincom and MSA--will continue to move into new applications software market segments. Each of the vendors mentioned above has moved into industry-specific markets from either a systems software (Cullinet and Cincom) or cross-industry (MSA) base. This type of boundary migration while difficult managerially, will become more common as vendors with ambitious growth plans look for new worlds to conquer.

EXHIBIT II-5

SOFTWARE PRODUCT TRENDS TO WATCH

- Deep Pocket Vendors to Increase Market Share
- Overambitious Commitments Tainting Vendor Reputations
- IBM Focus to be SNA, Operating Systems, and DBMS
- Aggressive Vendors Crossing Market Boundaries

F. KEY PROFESSIONAL SERVICES MODES HAVE HEALTHY OUTLOOK

- In the aggregate total professional services market growth will average 20% annually, thus raising user expenditures from $8.6 billion in 1984 to $21.7 billion by 1989.

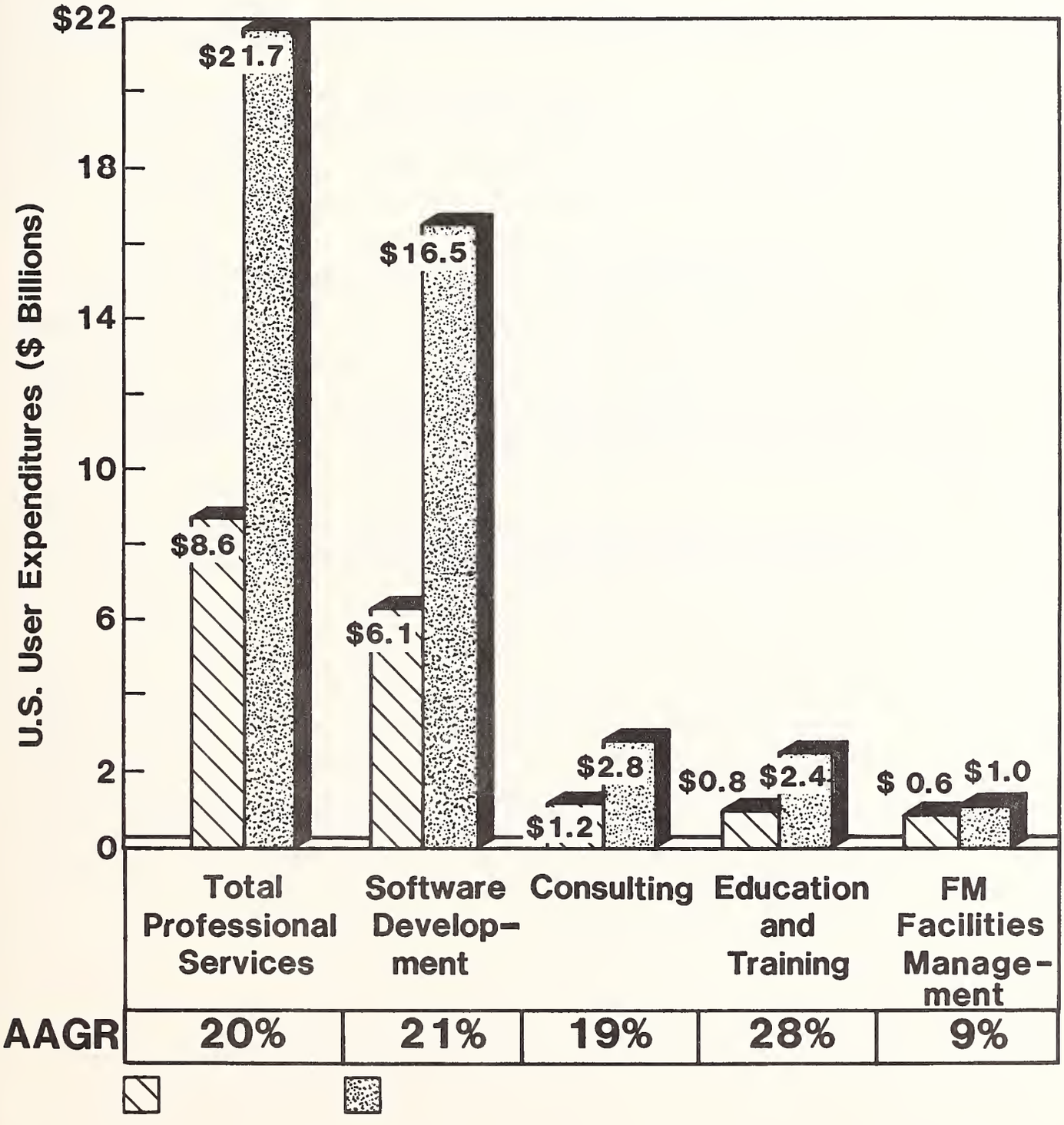
- The software development aspect of professional services will continue to comprise over 70% of the market for the remainder of the decade. From a base of $6.1 billion in 1984 this mode will grow 21% annually to emerge as a $16.5 billion opportunity by 1989. This growth is being stimulated by the trend towards larger, more complex systems which exceed the capabilities of the client's internal staff.

- The consulting mode will enjoy a 19% average annual increase to become a $2.8 billion market from a 1984 base of $1.2 billion. As the information systems activity absorbs a greater portion of an organization's budget, demand will be stimulated for outside "expert" resources to help plan and manage it in a more cost-effective manner.

- Education and training is the fastest growing component (28% annually) of professional services, and will reach $2.4 billion in 1989 from an $800 million level in 1984. A major driving force for this mode is the placement of over 20 million additional microcomputers on worker desktops during the next five years. These systems will increase demand for all types of systems-related education and training.

EXHIBIT II-6

KEY PROFESSIONAL SERVICES MODES HAVE HEALTHY OUTLOOK



G. NEW PROFESSIONAL SERVICES DIRECTIONS

- Professional services vendors are urged to adopt a variety of innovative business strategies such as:

  - Establish a national presence: a national (rather than regional or local) network of offices can give professional services vendors a competitive advantage via reference selling to a client's widely dispersed divisions.

  - Move to vertical specialization: increased client interest in complex, industry-specific systems will provide alert professional services vendors with a significant product differentiation opportunity.

  - Provide implementation services for software products: users want these services but software products vendors are reluctant to provide them due to lack of resources. Offering these services in close cooperation with software product vendors can be an excellent new revenue opportunity for professional services vendors.

  - Market software products: professional services vendors who can develop systems that can be offered later as a software product are leveraging their technical expertise two ways instead of one.

  - Provide systems integration services: the federal government is providing the demand but commercial organizations will be following. Large, complex systems integration requirements will provide opportunities for professional services vendors willing to offer not only software development services, but also integration of computing components.

EXHIBIT II-7

NEW PROFESSIONAL SERVICES DIRECTIONS

- A National Presence
- Move to Vertical Specialization
- Pursue Software Product Opportunities
  - Support (Implementation Sources)
  - Products
- Systems Integration

III SOFTWARE PRODUCTS

III SOFTWARE PRODUCTS

A. INDUSTRY STRUCTURE IMPLICATIONS

- The market structure of the entire information services industry will change significantly during the next five years. It is important that mainframe and mini software products vendors understand and respond to these changes. INPUT's forecast of the nature of this change is shown in Exhibit III-1.

- The largest change in market share will come from subsidiaries of larger companies. This category involves vendors with parents who are not participants in the information services marketplace. Subsidiaries' share will go from 10% in 1983 to 19% in 1989. This large increase is primarily the result of the financial attractiveness of the industry, combined with the need of vendors to have access to greater monetary and managerial resources in order to compete effectively.

- The next largest increase in market share will come from computer/communications hardware vendors. Not only IBM but many other mainframe and mini computer vendors, as well as numerous communications vendors, including AT&T, will become more actively involved. Reasons for this surge of interest include:

  - A desire to provide more "value-added" in order to offset the increasingly commodity-like hardware offerings.

EXHIBIT III-1

INFORMATION SERVICES MARKET STRUCTURE, 1983-1989

TYPE FIRM	SHARE OF MARKET	
	1983	1989
Independents	69%	59%
Computer/Communications Hardware	10	16
Subsidiaries	10	19
Other	11	6
Total	100%	100%

- A desire to maintain account control via software.

- A desire to participate in billion-dollar markets that offer financial returns potentially greater than available in hardware.

- Mainframe/mini software product vendors should reassess their business plans and marketing strategies in light of these changing structures. Implications include:

  - More opportunities will be available for vendors to establish distribution agreements with these larger, better financed firms.

  - Tougher competition in those segments can be executed where brand name recognition and/or other assets can make a substantial difference to the buyers.

  - More markets will be legitimized by the entry of these larger firms. This will benefit all participants.

- On balance, a larger share of the market to hardware and subsidiary organizations provides additional stability to the marketplace.

B. OTHER ISSUES

- A number of other issues are assuming increasing importance for software product vendors. These issues have been initially addressed by INPUT in our 1984 annual on-site presentation to subscribing clients. They will be discussed and analyzed in more detail during 1985. These issues include:

  - The role of IBM.

- Increasing use of partnerships to expand market penetration.

- Pricing directions.

C. MARKET ANALYSIS AND FORECASTS: APPLICATIONS SOFTWARE

- Exhibit III-2 profiles the structure of the applications software market.

- As shown in Exhibit III-3, the mainframe/mini portion of this market will continue to dominate the scene for the rest of the decade, although its market share will decrease somewhat. Because micro applications software is growing much faster (42% annually versus 28%) than mainframe/mini software, the latter's share will slip from 82% in 1984 ($4.9 billion) to 73% ($17.1 billion) in 1989.

- Applications software for mainframe/minis will outperform systems software during this five year period, although by just a small margin in terms of average annual growth rates (28% versus 25%)--see Exhibit III-4. Applications software's sustained lead is primarily due to users' time constraints. They would prefer to use applications development tools to build their own applications, but the urgency of implementation often prevents this.

- Applications software share of the software products market will increase from its current 55% to 58% by 1989.

- The following sections briefly profile both the cross-industry and industry-specific segments of numerous applications software markets. For a more comprehensive discussion of these industry segments, refer to INPUT reports entitled:

EXHIBIT III-2

APPLICATIONS SOFTWARE PRODUCTS MARKET STRUCTURE

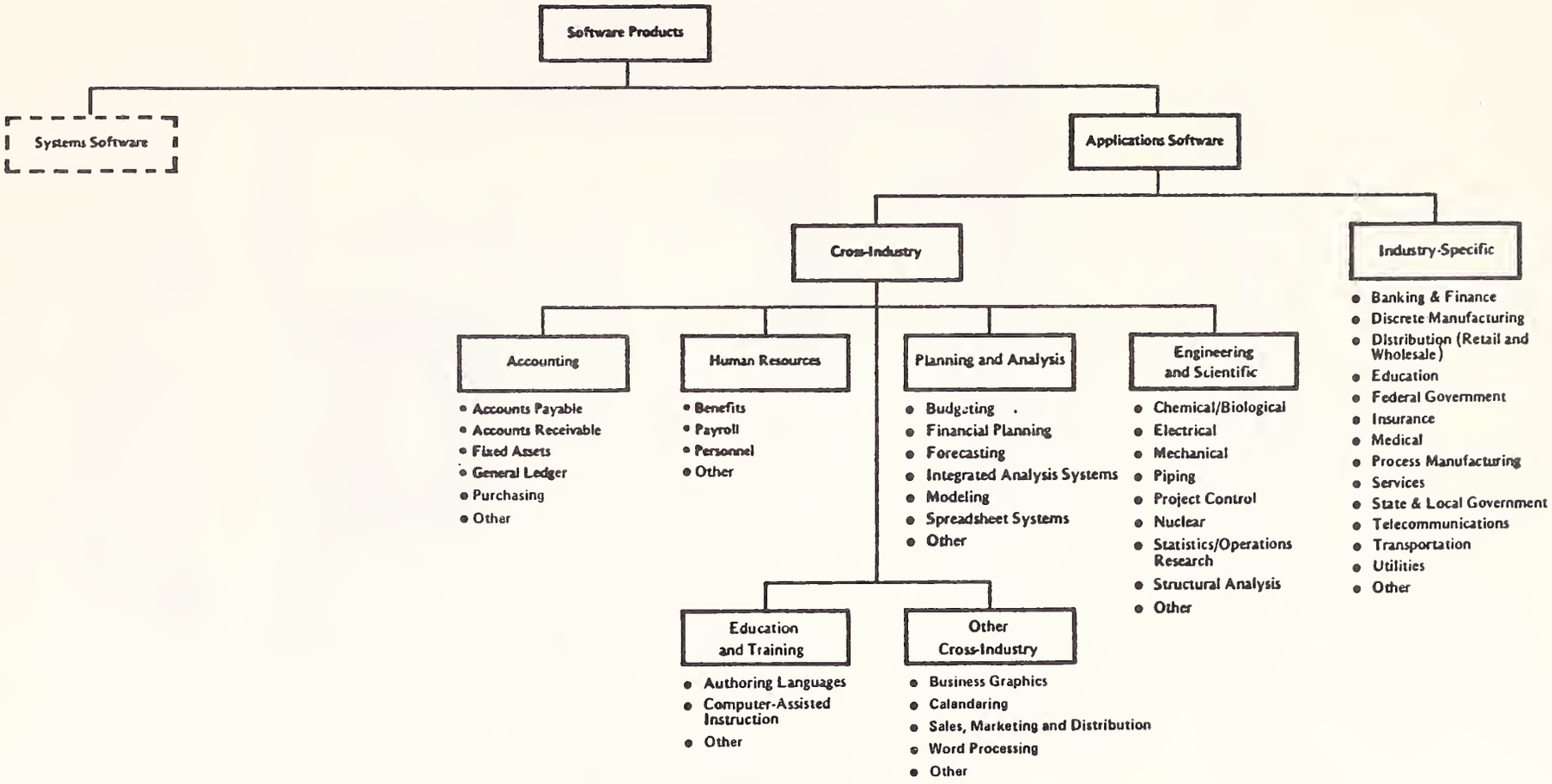
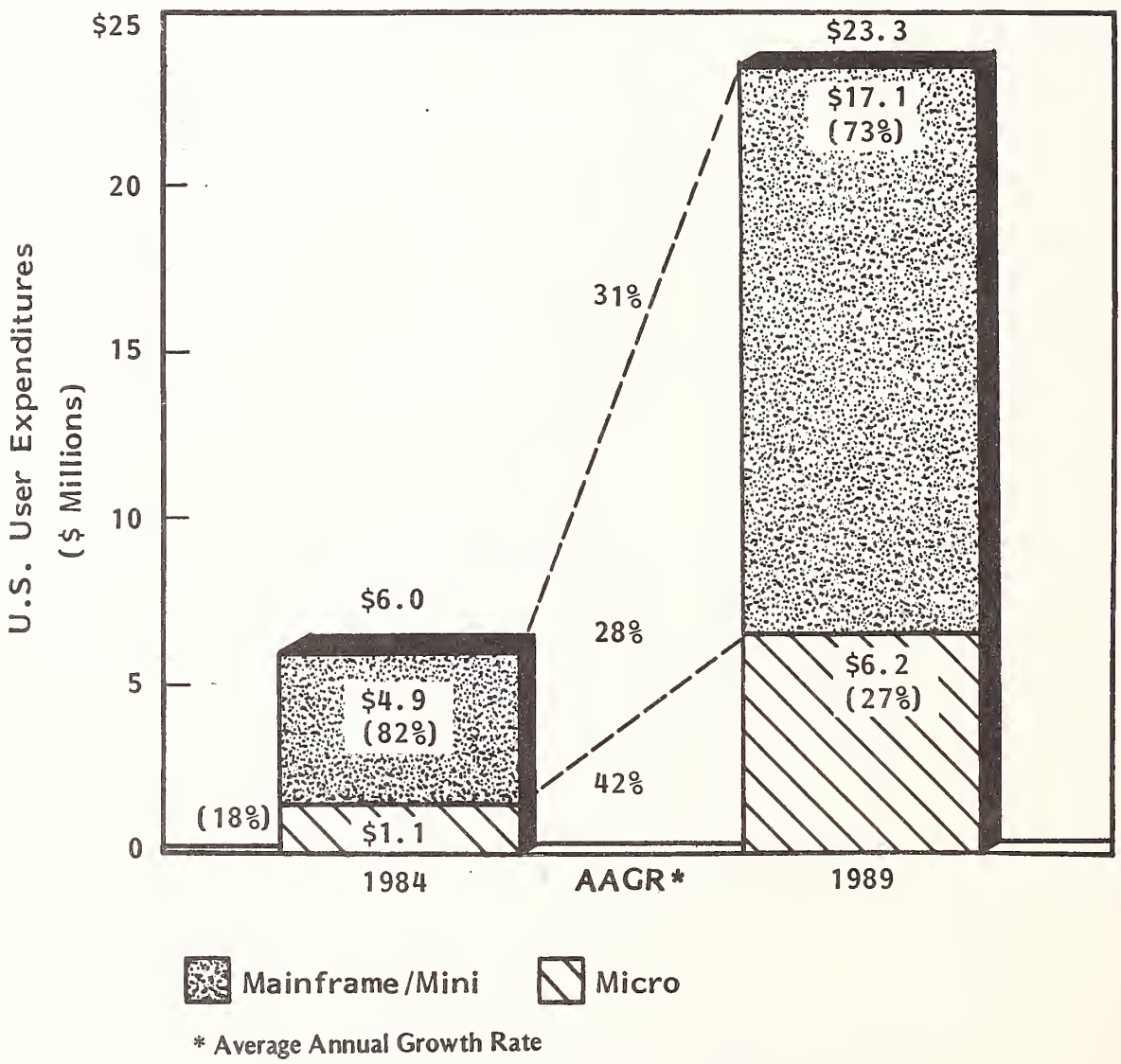


EXHIBIT III-3

APPLICATIONS SOFTWARE PRODUCTS MARKET, 1984-1989

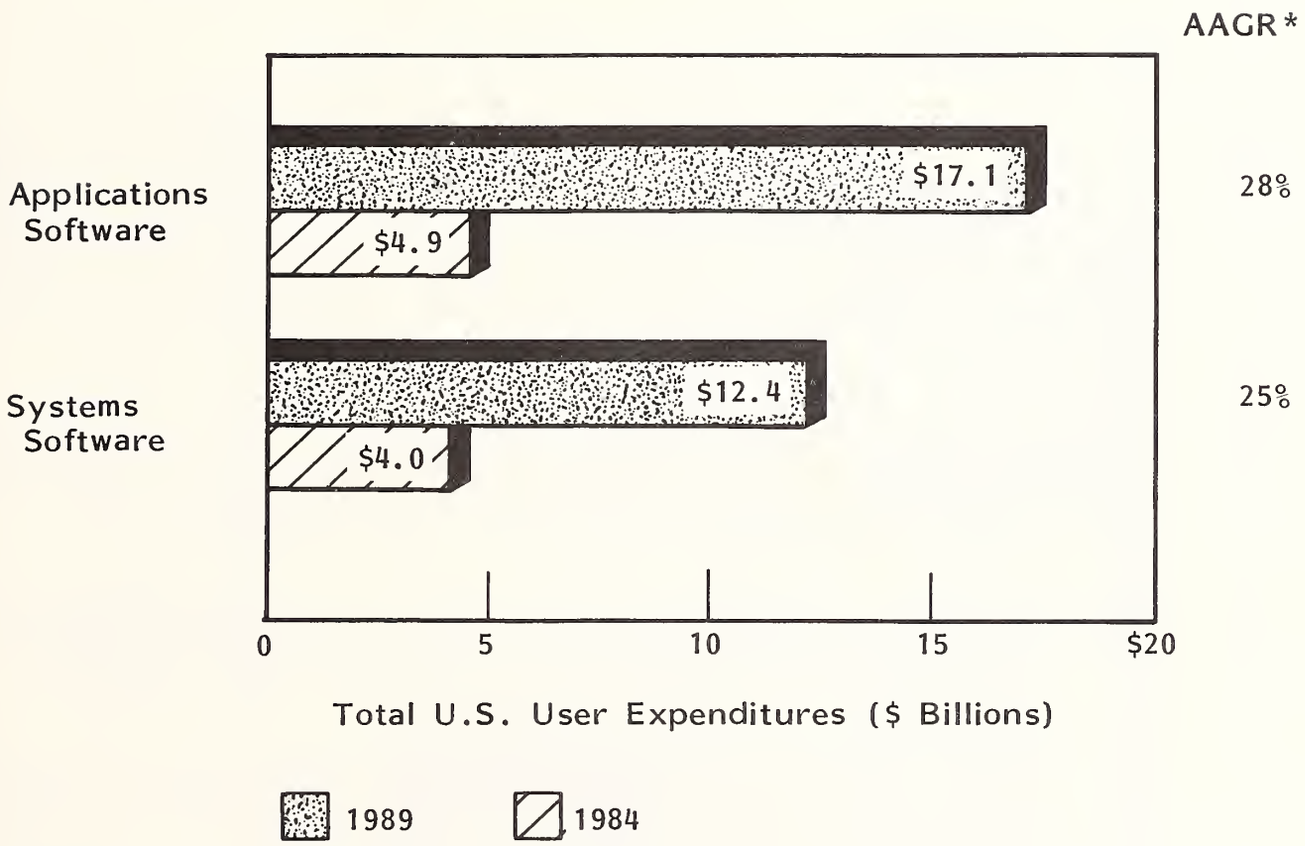


* Average Annual Growth Rate

EXHIBIT III-4

SOFTWARE PRODUCTS MARKET BY SOFTWARE TYPE, 1984-1989

(Mainframe/Mini)



* Average Annual Growth Rate

- U.S. Information Services Vertical Markets, 1984-1989.

- U.S. Information Services Cross-Industry Markets, 1984-1989.

I. CROSS-INDUSTRY APPLICATION SOFTWARE

a. Overview

- Cross-industry applications software products for mainframe/mini computers will grow 20% annually for the next five years, as shown in Exhibit III-5. From a 1984 base of $2.4 billion this market will grow to $6 billion by 1989. Its share of the applications software market will slip from 49% in 1984 to 35% in 1989.

- Cross-industry mainframe/mini applications software will grow much slower than its industry-specific counterpart (20% versus 35%) because:

  - Cross-industry applications were some of the earliest segments to migrate to software products, thus market penetration is greater.

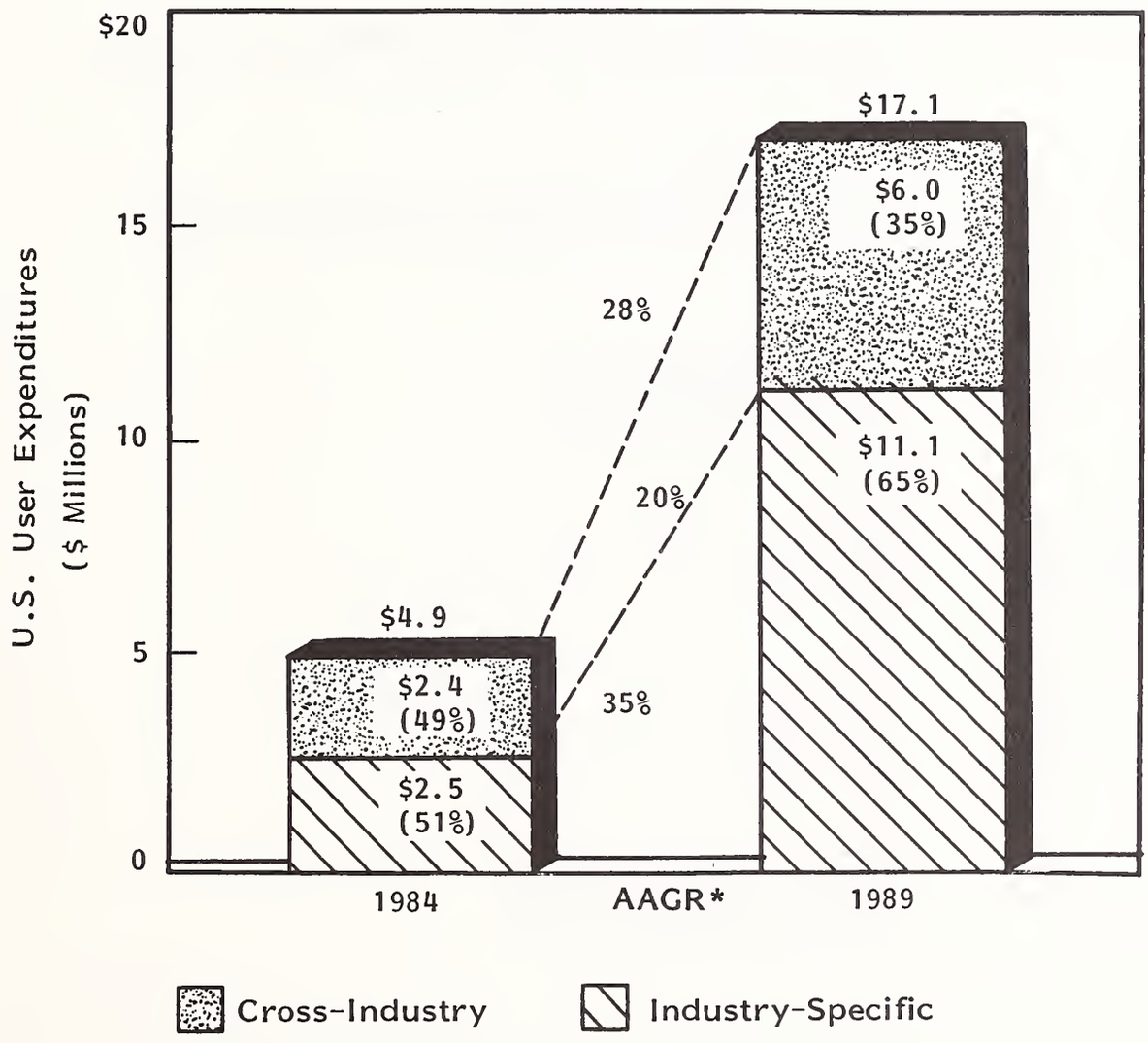
  - Users are becoming more sophisticated in their usage of software. They want the systems to reflect the uniqueness of their environment. Vendors, in an attempt to create product differentiation, respond to this need and in the process create industry-specific versions of what previously were cross-industry products.

  - Trend towards integrated software. Users want their systems to interface smoothly with one another. As cross-industry systems become more closely coupled with industry-specific applications, they tend to merge into an overall industry-specific system.

- Exhibit III-6 shows the six major cross-industry markets ranking by size.

EXHIBIT III-5

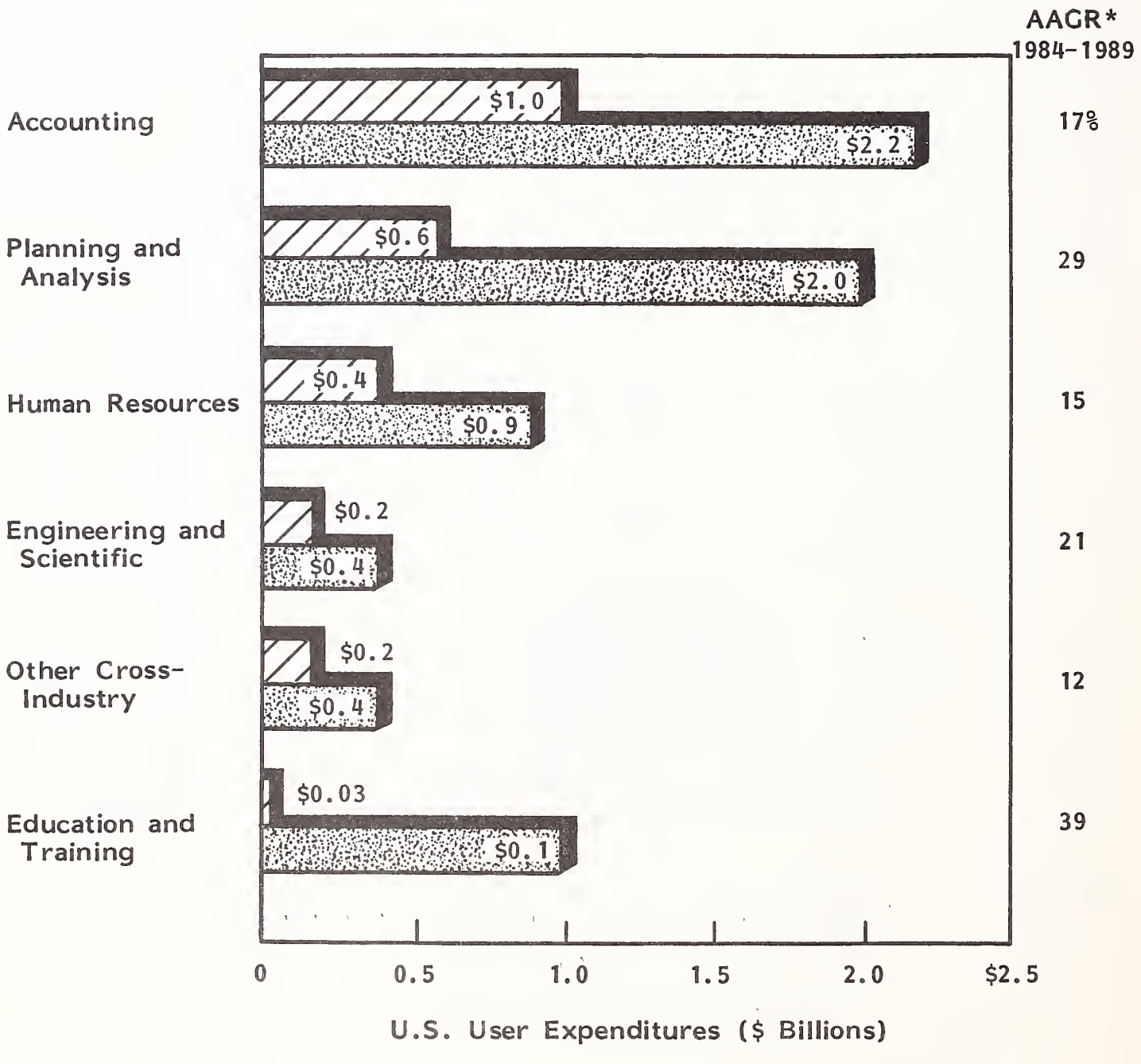
APPLICATIONS SOFTWARE PRODUCTS MARKET BY SEGMENT TYPE, 1984-1989
(Mainframe/Mini)

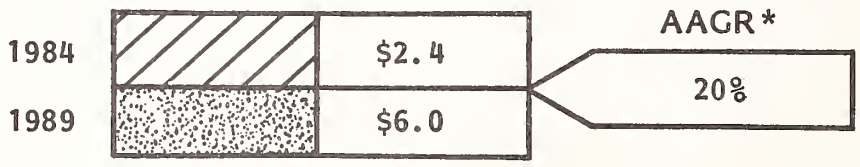


* Average Annual Growth Rate

EXHIBIT III-6

CROSS-INDUSTRY APPLICATIONS SOFTWARE MARKET, 1984-1989





* Average Annual Growth Rate

- Accounting and planning/analysis dominate this category with 67% of the entire market in 1984, increasing to 70% by 1989.

- While education and training is the smallest segment, it is the fastest growing at 39%.

- Each of these segments is discussed in the following sections.

b. Accounting

- Accounting is the largest cross-industry and second largest of the entire applications software market, as shown in Exhibit III-7. However, its growth rate places it near the bottom of the rankings list (17th out of 19th).

- Standalone mainframe/mini accounting software packages will decline in importance. In their place will be well-integrated systems developed around a data base environment.

- Vendors who will do well in the future in this market area will be those who, in addition to providing an effectively integrated system, will also provide useful inquiry and reporting facilities via natural language interfaces. Two of the well-established vendors specializing in accounting systems (i.e., MSA, and McCormack and Dodge) have established marketing and technical relationships with Applied Data Research in order to use the Datacom DBMS in conjunction with their application products.

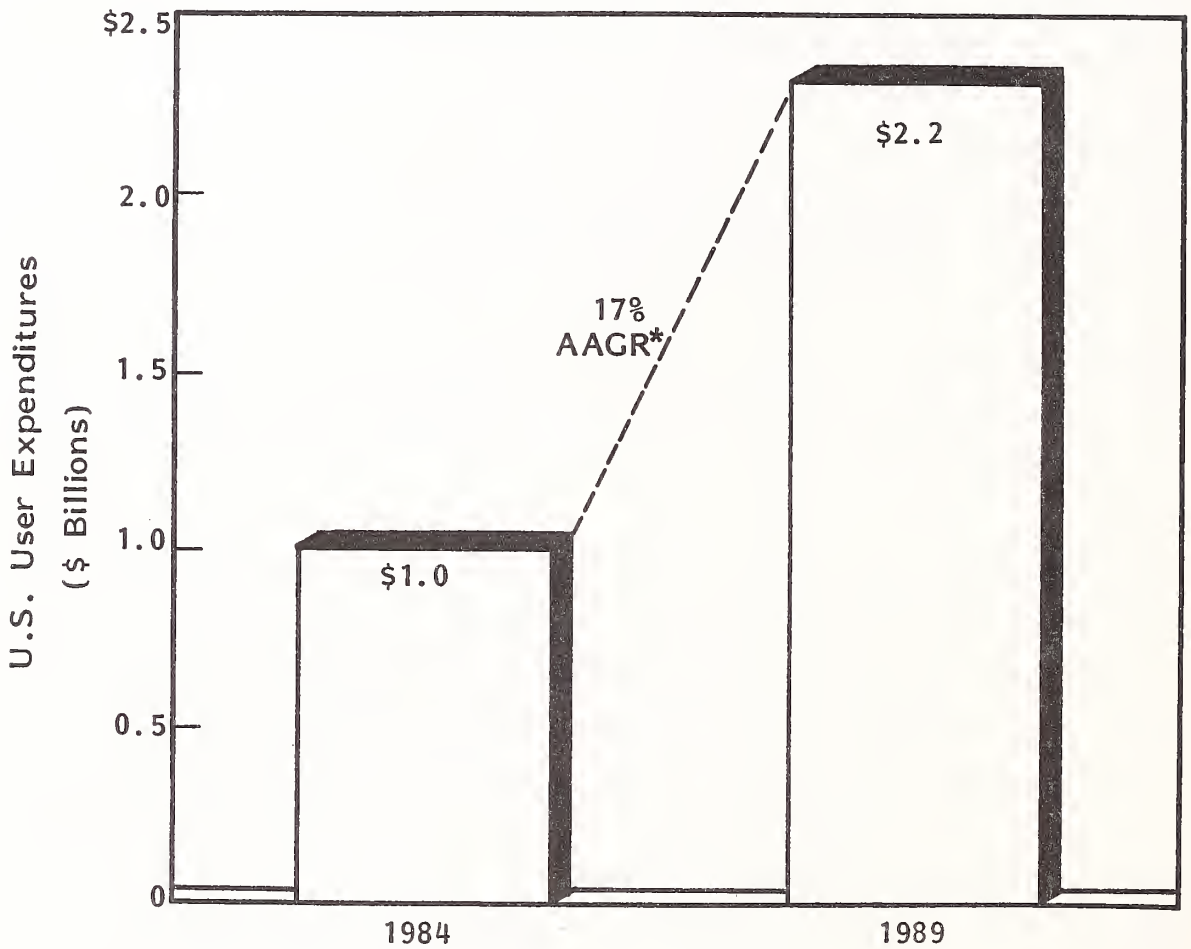
- Competition in this marketplace will heat up during the next few years as:

  - Industry-specific vendors look for ways to expand their product lines by offering accounting systems tied into their own applications.

  - Systems software vendors with DBMS market positions (e.g., Cullinet, and Cincom) expand into applications software offerings.

EXHIBIT III-7

ACCOUNTING APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Cross-Industry Products)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	1 (6)	2 (19)
Growth Rate Rank	4 (6)	17 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

- Because accounting is a fundamental business application alert vendors already established in the marketplace should look for ways to reach into new market areas. Providing an OEM service to well-positioned vertical market vendors is one such strategy.

c. Education and Training

- This segment covers software purchased by organizations to help individuals develop knowledge skills. This segment excludes software purchased by schools and colleges. This latter category is classified as education/industry-specific.

- The education and training segment includes both training users how to use computer systems, as well as using computers to train workers in all subjects, including noncomputer topics.

- The market for mainframe/mini applications software for education and training is the fastest growing of both cross-industry and industry-specific segments. However, it is growing from a very small base, as shown in Exhibit III-8.

- Growth in this marketplace is stimulated by a number of factors including:

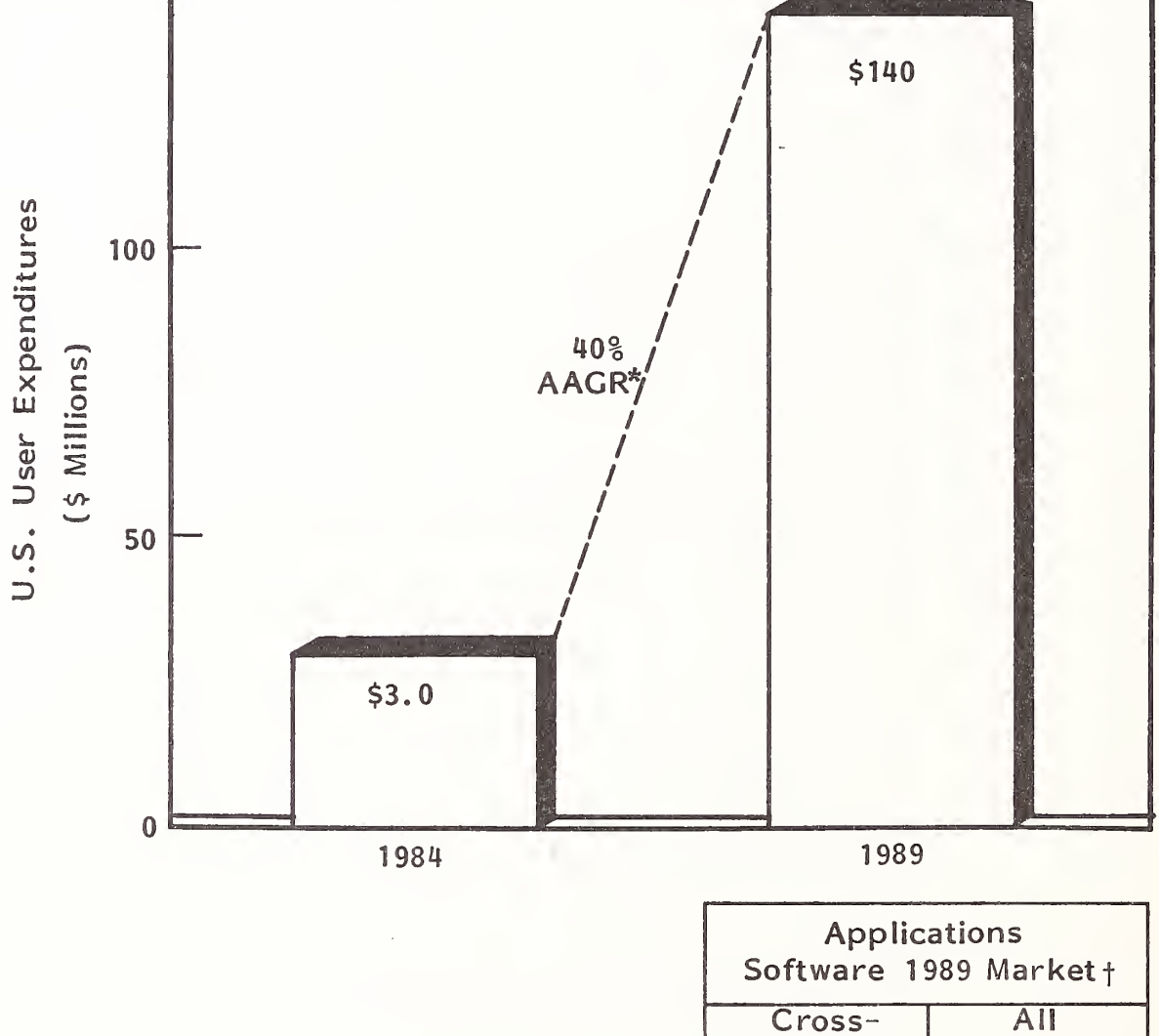
  - Increasing need for computer literacy. By 1989 over 30 million workers will need training in the use of computers.

  - Need for more effective training regarding tasks not computer-related.

- This segment is one of the few where microcomputer-based software markets are actually larger than the mainframe/mini ones.

EXHIBIT III-8

EDUCATION AND TRAINING APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Cross-Industry)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	6 (6)	14 (19)
Growth Rate Rank	1 (6)	1 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

d. Engineering and Scientific

- The market for engineering and scientific applications software that is mainframe- or mini-based will grow from a 1984 base of $160 million to a market of $410 million by 1989. The average annual growth rate will be 21%, as shown in Exhibit III-9.

- This segment ranks below average in terms of size and growth within the overall applications software market.

- A number of factors are impacting this marketplace with both positive and negative results. Examples are:

  - Downsizing to microcomputers. Many of the applications are being downsized to micros as this technology continues to become more powerful. This will draw some user expenditures away from mainframe/mini packages.

  - The popularity of micro-mainframe links. This will stimulate the market to the extent it tends to make systems without these capabilities obsolete. On the other hand it forces new development investments on vendors who otherwise would be less inclined to do so.

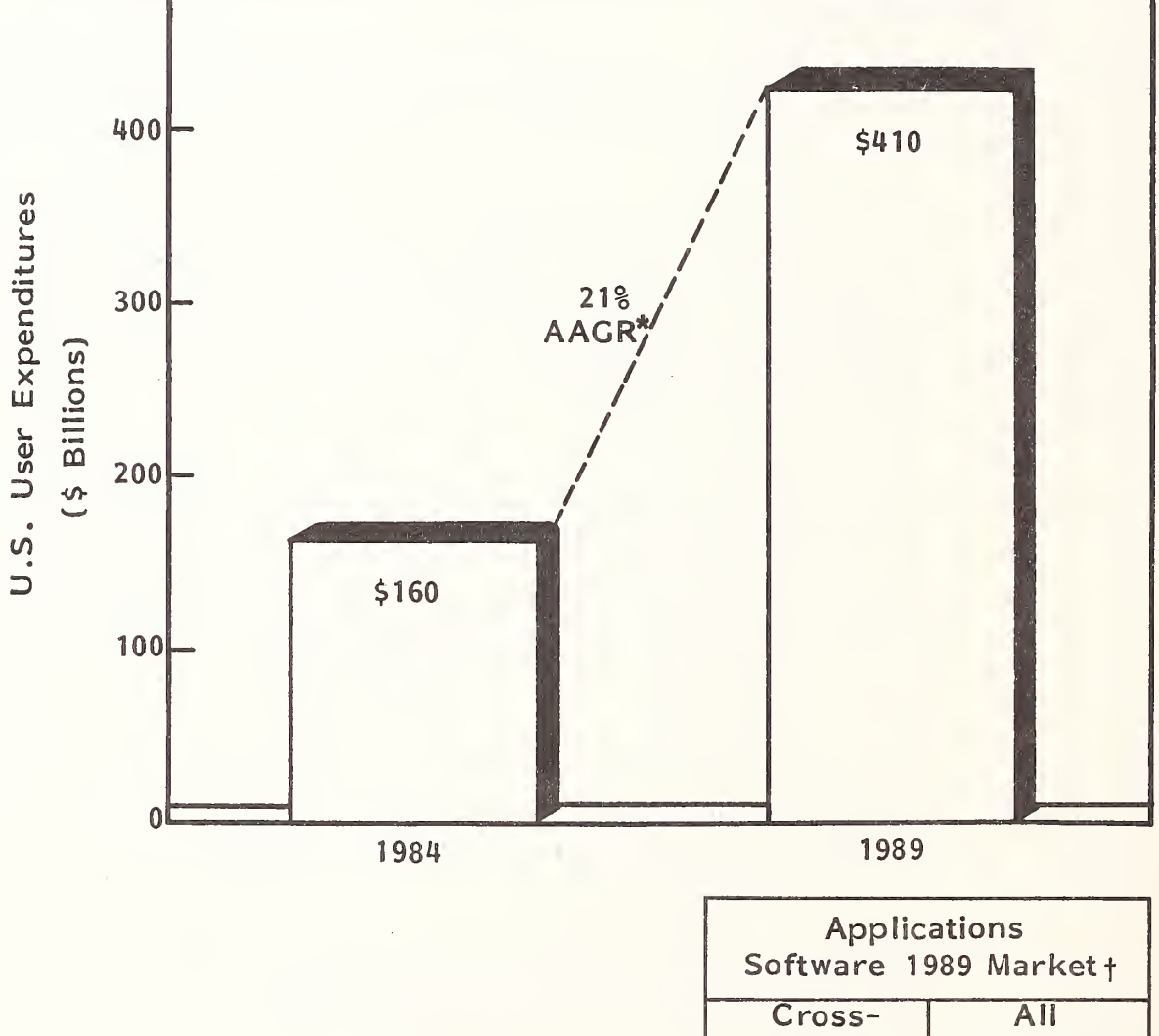
  - Movement toward integration. Users are especially interested in approaches that interface the engineering function with the manufacturing and administration activities of an organization.

  - Increased demand for computerized design and simulation tools in such areas as biological and genetic engineering.

  - The increased availability of turnkey systems that can be utilized for engineering and scientific applications on a departmental level. Once the hardware is in place, justification of additional software is much easier.

EXHIBIT III-9

ENGINEERING AND SCIENTIFIC APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	4 (6)	12 (19)
Growth Rate Rank	3 (6)	15 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

e. Human Resources

- Human resources software is comprised of one or more of the following functions: payroll, personnel, benefits administration and human resource management systems.

  The mainframe/mini applications software portion of this market is of average size, but has slower growth than most other segments analyzed in this report series, as shown in Exhibit III-10.

- Market factors that are impacting the growth rate of human resources application software include the following influences:

  - The range of benefits offerings will continue to increase as companies use them to attract and retain people. This approach increases demand for flexible software that can handle such complexity.

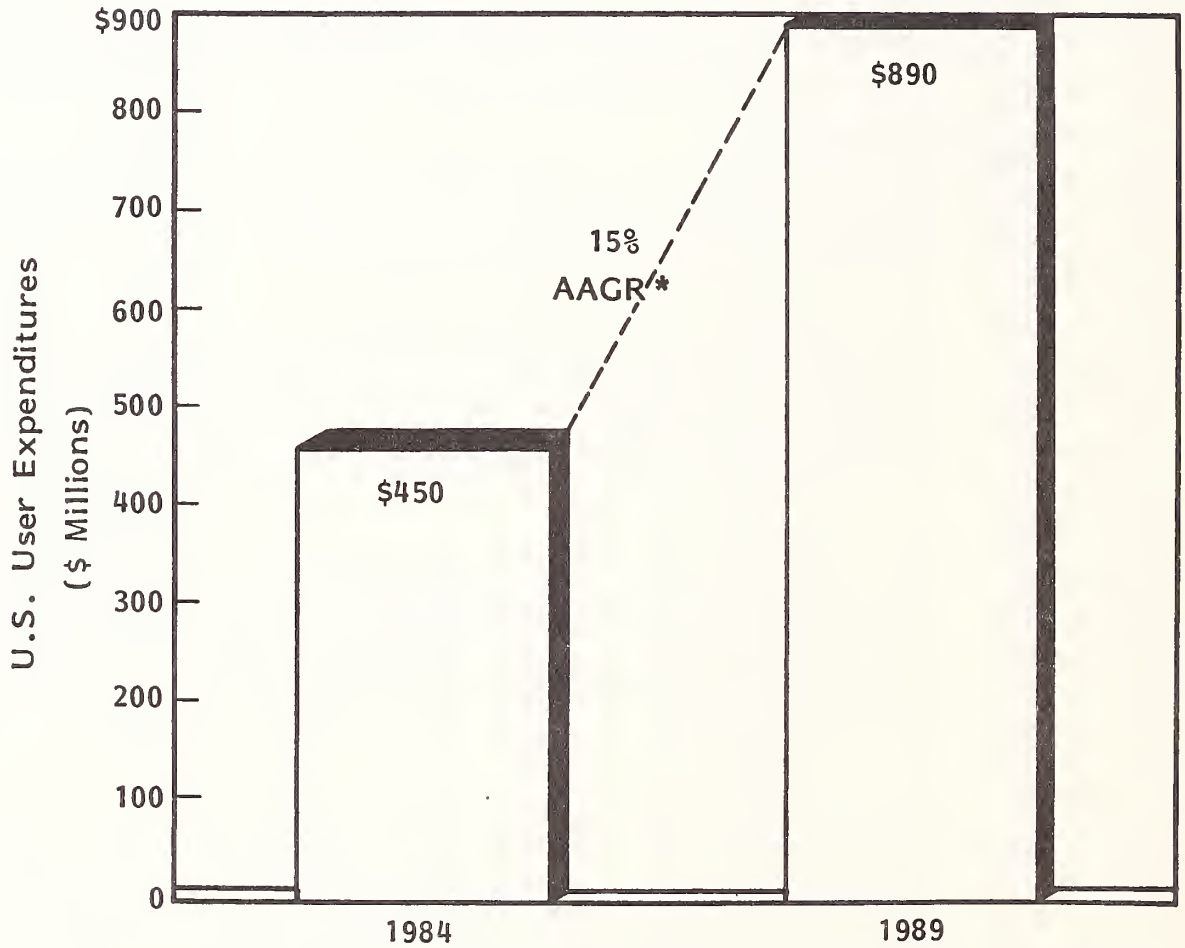
  - The proliferation of micros and thus micro-mainframe links will increase demand on larger machines as organizations attempt to coordinate human resource systems at the corporation, department and individual levels.

  - Payroll will remain a stronghold of processing services vendors due to the complexity of the tax and governmental reporting requirements. Thus the appeal of an in-house software approach, especially for other than giant corporations, will remain tempting for many firms.

  - Many of the historically more aggressive vendors (e.g., MSA, McCormack and Dodge, etc.) are eyeing other market segments and thus appear less dedicated to expanding this marketplace than they were in the past.

EXHIBIT III-10

HUMAN RESOURCES APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	3 (6)	8 (19)
Growth Rate Rank	5 (6)	18 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

f. Planning and Analysis

- Planning and analysis has become one of the major markets within the information services industry, both in terms of size and rate of growth, as shown in Exhibits III-6 and III-11.

- Mainframe/mini applications software packages represent the largest delivery mode within the planning and analysis segment with 33% of all information services revenues for 1984 and 34% for 1989.

- Applications within this segment will benefit from a number of environmental, technological, and market advances.

  - The increasing complexity of the U.S. industrial structure, including upswings in mergers and acqusitions, as well as regulation/deregulation swings, enhances the need for more thorough planning and analysis approaches.

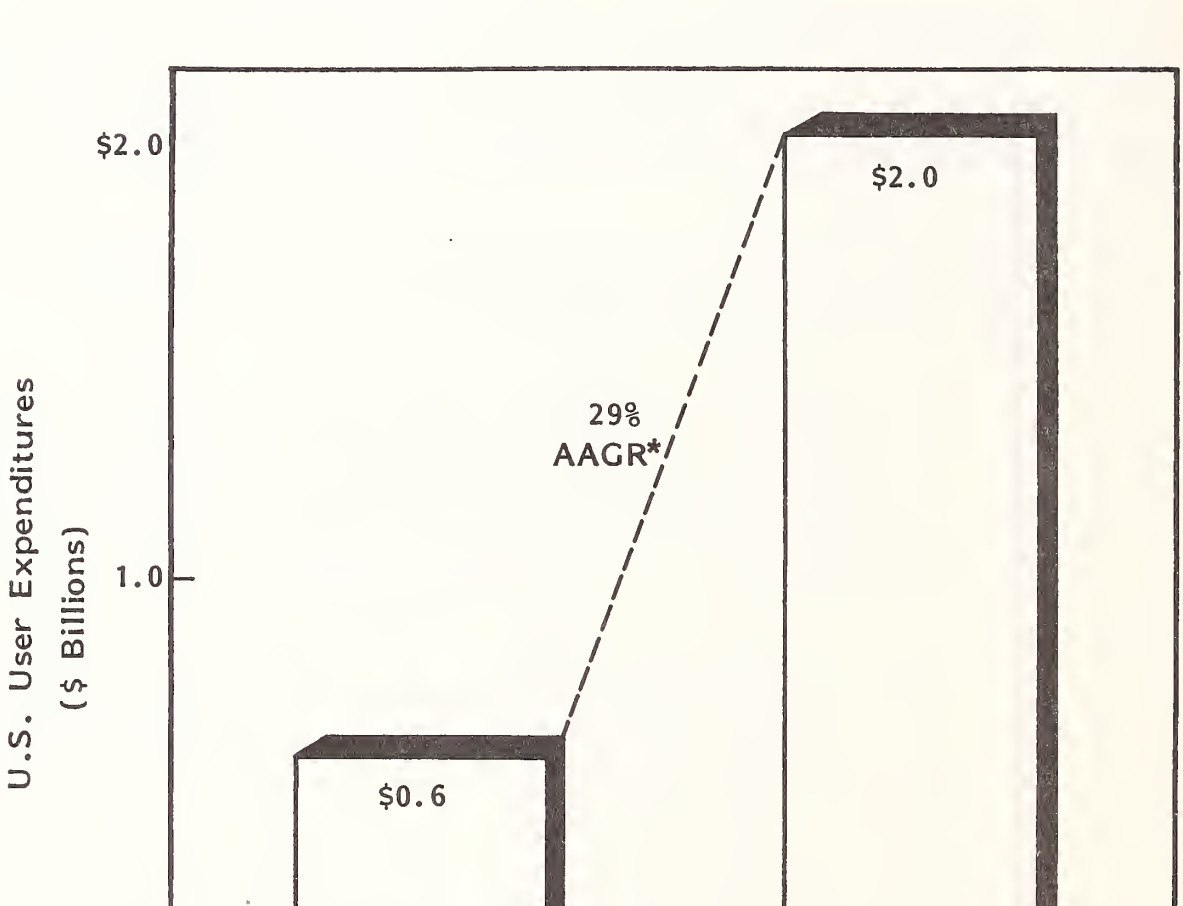
  - The increased acceptance of relational DBMS, natural language processing, and micro-mainframe links enhances the utility of software-based planning and analysis systems.

  - The availability of 23 million microcomputers on worker desktops during the next five years will also be a major stimulus. Widespread use of micro-based planning and analysis systems will whet the appetite of users for more powerful mini- and mainframe-based solutions.

  - Vendors actively pursuing industry-specific segments will seek out planning and analysis software to further enhance the appeal of their transaction-oriented systems.

EXHIBIT III-11

PLANNING AND ANALYSIS APPLICATION SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Cross-Industry)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	2 (6)	3 (19)
Growth Rate Rank	2 (6)	9 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

g. "Other" Cross-Industry

- "Other" cross-industry applications software encompasses systems not classified elsewhere. Included in this category are business graphics (provided they are not integrated with other applications), sales, marketing and distribution applications, word processing, project management (except those associated with engineering or scientific uses), and electronic mail.

- This segment will grow from $220 million in 1984 to $390 million by 1989, a 12% annual growth, as shown in Exhibit III-12. It is important to keep in mind that this growth rate does not include:

  - Applications which are becoming integrated with applications in other categories. For example:

    . Business graphics, which is integrated with other applications such as accounting systems and planning and analysis systems, is growing over 50% annually.

    . Sales analysis, order entry, and mail list applications integrated with industry-specific applications, such as customer information file (CIF) systems in banks, are growing in excess of 40% per year.

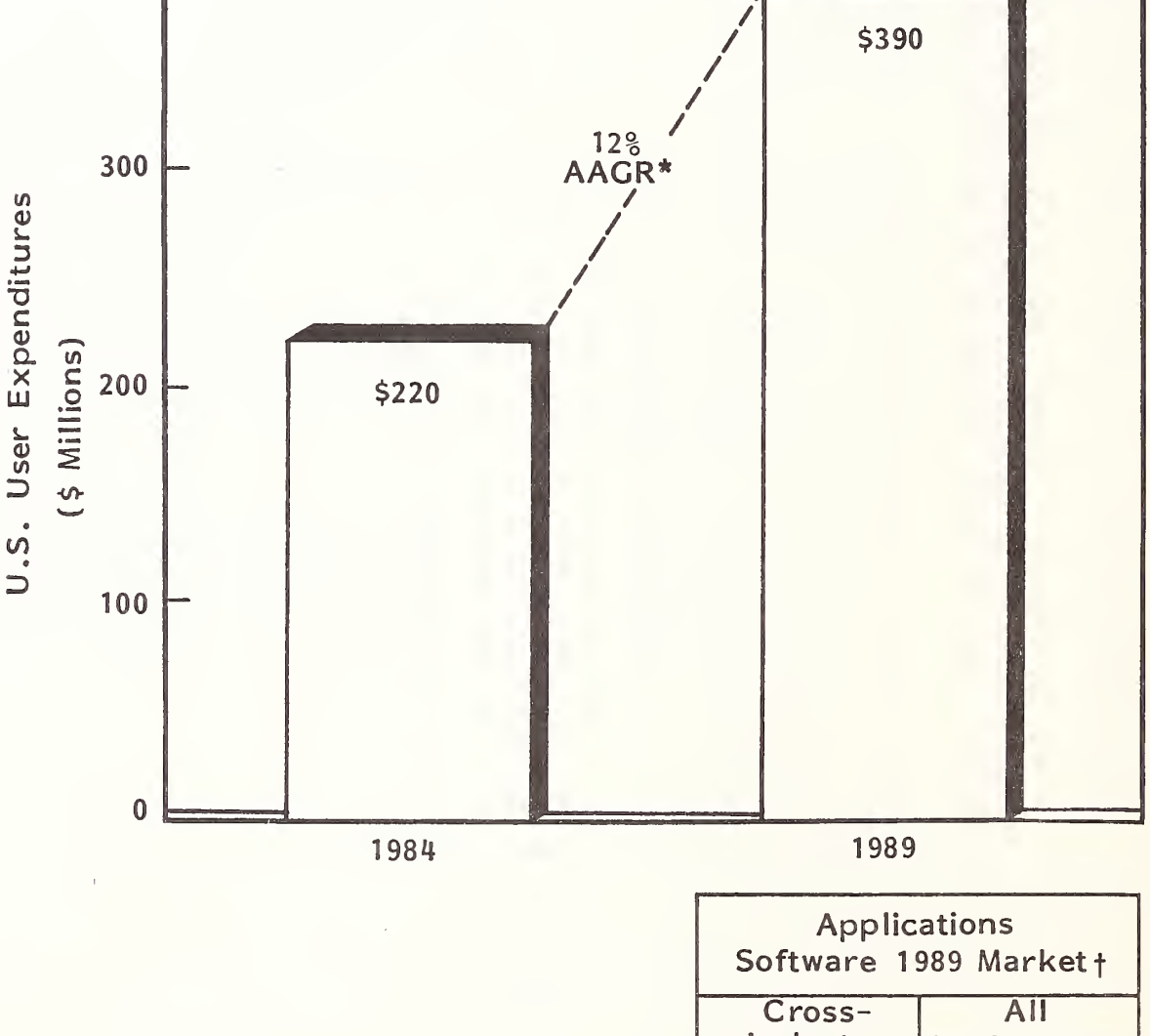
- Application areas within the "other" cross-industry segment that are doing considerably better than the 12% average annual growth include:

  - Project management software products. This application area will grow, on the average, 20% annually due to management's desire for better control within an environment that is increasingly competitive.

  - Electronic mail software products for mainframe and minis. This market is also growing more than 20% annually in response to the

EXHIBIT III-12

"OTHER" CROSS-INDUSTRY APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	5 (6)	13 (19)
Growth Rate Rank	6 (6)	19 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

growing availability of private and public networks, and the explosive increase in desktop microcomputers.

- Microcomputer-based versions of the applications included in this "other" cross-industry segment will grow, on the average, more than twice as fast (28% annually) as the mainframe-mini types discussed in this section.

2. INDUSTRY-SPECIFIC APPLICATIONS SOFTWARE

a. Overview

- Although the markets for both categories of applications software are almost equal in size in 1984 ($2.5 billion for industry-specific versus $2.4 billion for cross-industry), industry-specific software (with its 35% average annual increases) will be almost twice as large as cross-industry by 1989.

- Industry-specific markets for mainframe/mini software products will be especially strong for the remainder of the decade. Reasons include:

  - Impact of deregulation. Government efforts to reduce regulation in numerous industries has made major information systems unique to those environments obsolete. Deregulation impacts not only those industries to which it is targeted (e.g., airlines, railroads, bus lines, banks, thrifts, brokerage, and insurance companies), but also those industries that interface with them, such as manufacturers of products.

  - Impact of government-imposed policies. A prime example is the federal government's establishment of Diagnosis-Related Groups (DRG) for hospitals. This is causing major upheavals in the way these health care groups price, deliver and receive payment for their services.

  - Impact of foreign competition. Many firms, especially in the manufacturing area, are convinced that they must rely on automation to drive

down costs and boost output. General Motors' aggressiveness in automation-related activities is a prime example of this.

- Industry-specific markets for mainframe and mini-based applications software have widely varying market sizes and growth rates, as shown in Exhibit III-13.

  - User expenditures for 1989 range from a high of $3.4 billion (banking and finance) to a low of $50 million (education).

  - Average annual growth rates show a high of 40% (transportation) to a low of 20% (education).

  - The strength of the entire industry-specific market, however, is reflected in the fact that education's "low" growth rate of 20% is almost as large as the average growth rate of the entire $107 billion information services marketplace (22%).

- Each of the 14 industry-specific segments in Exhibit III-13 is discussed in more detail in the section which follows.

b. Banking and Finance

- In terms of size the banking and finance applications software market is the largest of all the cross-industry and industry-specific segments profiled by INPUT in this report series. From a 1984 base of $700 million banking and finance will grow at an aggressive 38% annually to emerge as a $3.4 billion market by 1989, as shown in Exhibit III-14.

- This segment's 38% average annual increase makes it the second fastest growing industry-specific segment for software products (transportation is the fastest at 40% annually).

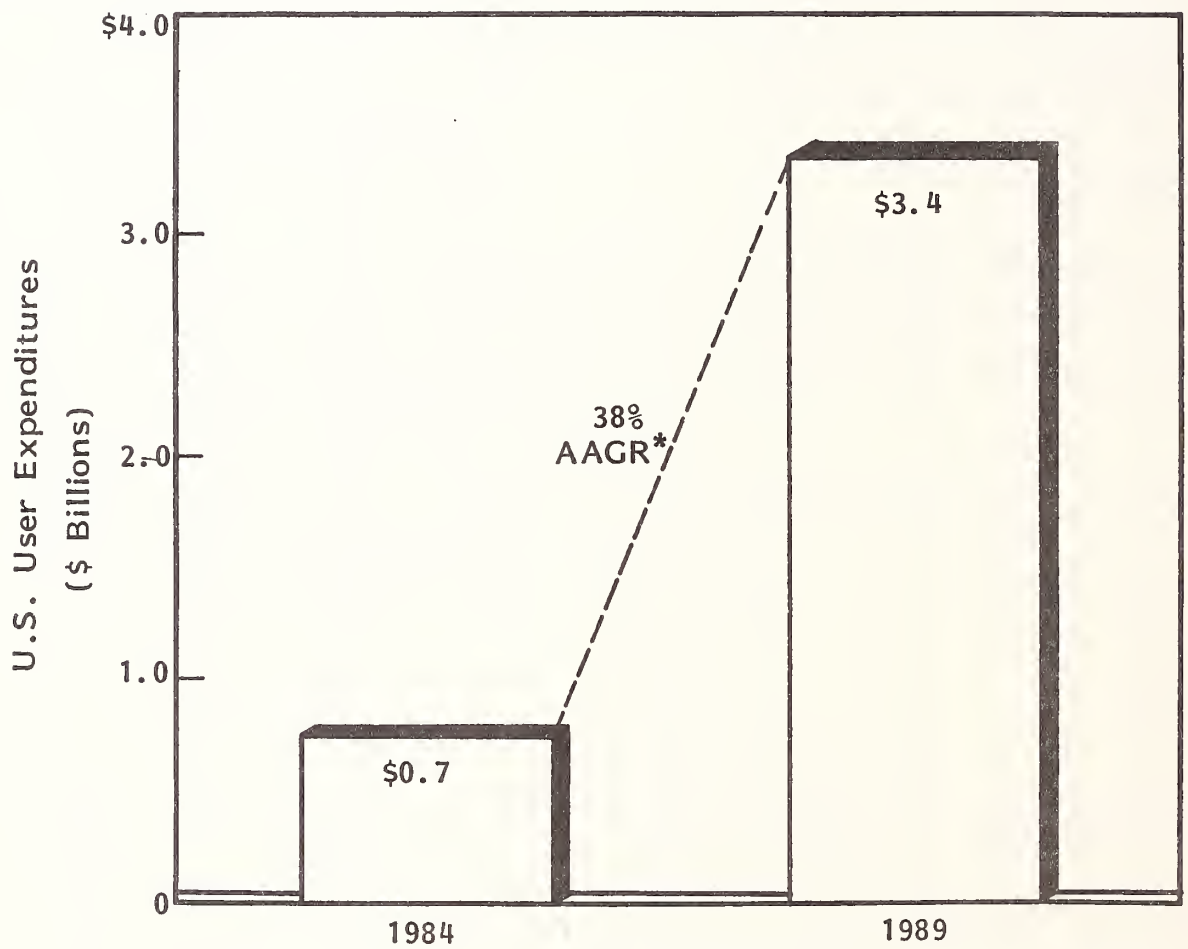
EXHIBIT III-13

INDUSTRY-SPECIFIC APPLICATIONS SOFTWARE MARKETS
RANKED BY 1989 MARKET SIZE (Mainframe/Mini)

INDUSTRY SECTOR	1984-1989 AAGR (Percent)	USER EXPENDITURES ($ Billions)		1984-1989 GROWTH RATE RANK
		1984	1989	
Banking and Finance	38%	$0.7	$3.4	2
Discrete Manufacturing	37	0.4	1.8	3
Distribution	36	0.3	1.6	5
Insurance	26	0.4	1.2	9
Medical	36	0.2	1.0	5
Transportation	40	0.1	0.6	8
Services and Other	30	0.2	0.7	7
Process Manufacturing	37	0.1	0.6	3
Telecommunications	29	0.03	0.13	8
State/Local Government	22	0.03	0.08	12
Utilities	24	0.03	0.07	10
Federal Government	23	0.02	0.05	11
Education	20	0.02	0.05	13

EXHIBIT III-14

BANKING AND FINANCE APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific Products)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	1 (13)	1 (19)
Growth Rate Rank	2 (13)	3 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

- Exhibit III-15 profiles the application software market in terms of four sectors that comprise the banking and finance segments.

- Commercial banks dominate this sector breakout with 77% of the user expenditures by 1989. This growth comes from an impressive 40% annual growth rate.

  - A major portion of these applications software expenditures come from very large banks. These firms have been converting their primary retail and corporate applications to the more sophisticated on-line, interactive mode. For example:

    . Retail banking software will grow 44% during the next five years to become a $1.1 billion market in 1989 from a base of $170 million in 1984.

    . Corporate banking will grow 43% per year during this same period, to emerge in 1989 as a $330 million opportunity.

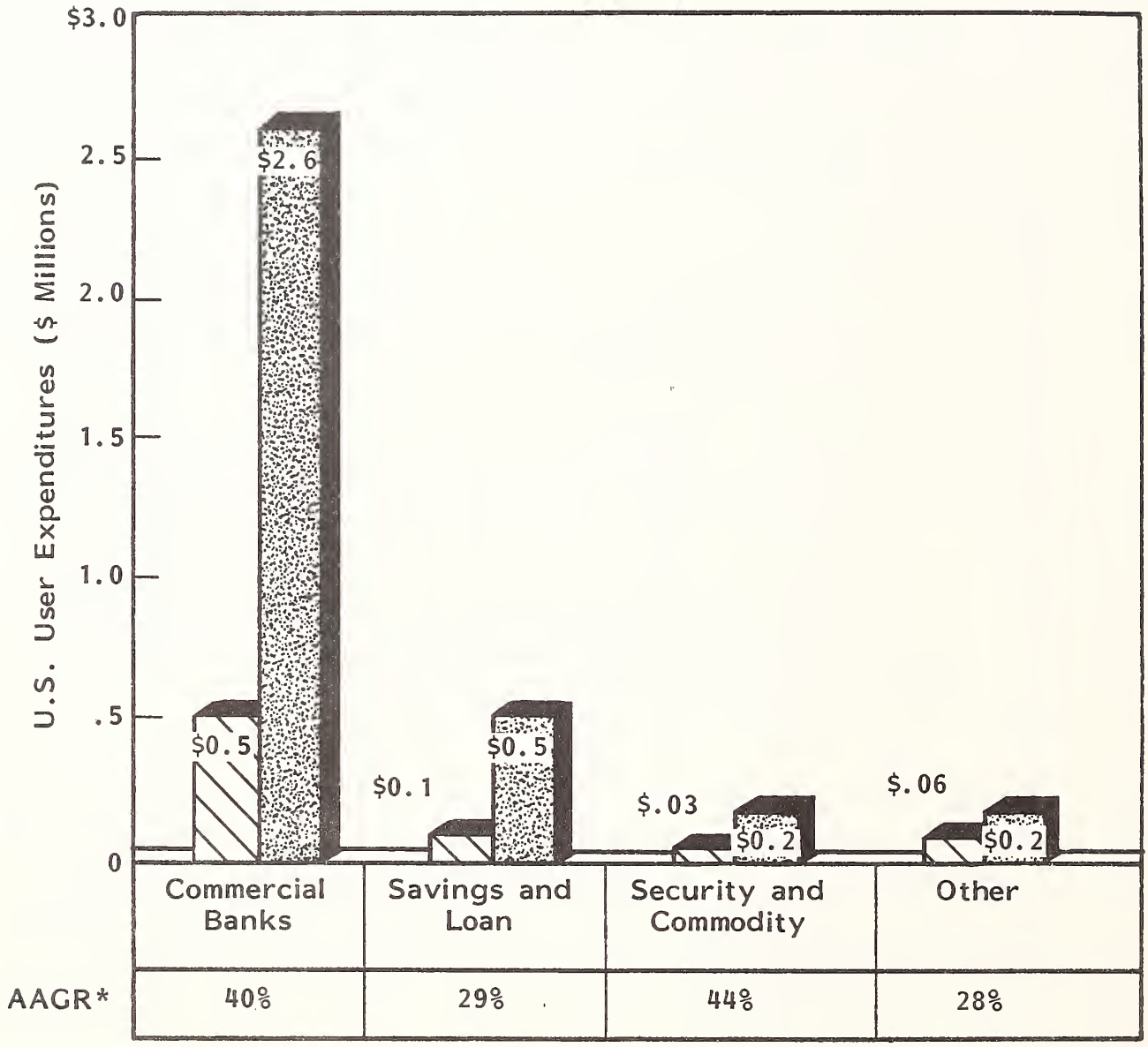
  - The blurring of industry boundaries between banks, brokerage, insurance, and other financial services will continue to make major systems throughout the forecast period obsolete.

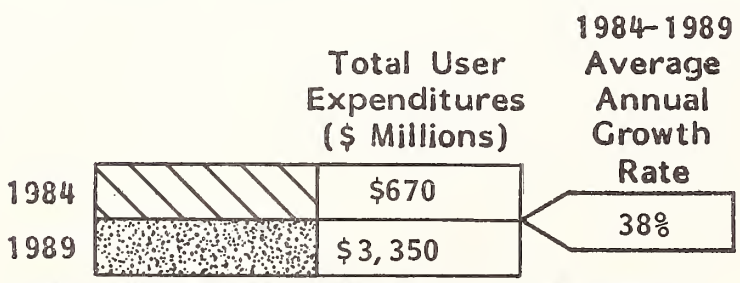
- An important applications software product opportunity in the next five years within the savings and loan sector is automated consumer services. This application will grow 46% annually from a 1984 base of $21 million and will reach $140 million by 1989, which is one-third of the entire S&L applications software market at that time.

- Opportunity areas in the securities and commodities sector include account processing and clearance software for back office functions as well as merger/acquisition, leveraged buy-out and investment analysis for employee benefit plans.

EXHIBIT III-15

BANKING AND FINANCE
APPLICATIONS SOFTWARE MARKET BY SECTOR, 1984-1989
(Mainframe/Mini, Industry-Specific)





Note: All dollars are rounded to the nearest $10 million.

* Average Annual Growth Rate

c. Discrete Manufacturing

- Discrete manufacturing is the second largest industry-specific applications software market, as shown in Exhibit III-16.

- While the mainframe/mini applications software market is only 53% of the size of the processing services market in 1984, its faster growth rate will result in its 1989 expenditures being 123% of the processing services market.

- Numerous factors are driving the software market growth including:

  - User demand for integrated solutions. In order to achieve company-wide productivity gains, manufacturing management now seeks software that integrates design, engineering, manufacturing, accounting and administration systems. Thus, older solutions now need replacement.

  - Economic health of key areas of the manufacturing industry. Areas such as machinery (SIC 35), electronics (SIC 36), transportation (SIC 37) and scientific control instrumentation (SIC 38) will experience vigorous growth that in turn will stimulate software product sales.

- Competition will continue to heat up in this segment. In addition to well-established software products vendors, new players are entering from other directions.

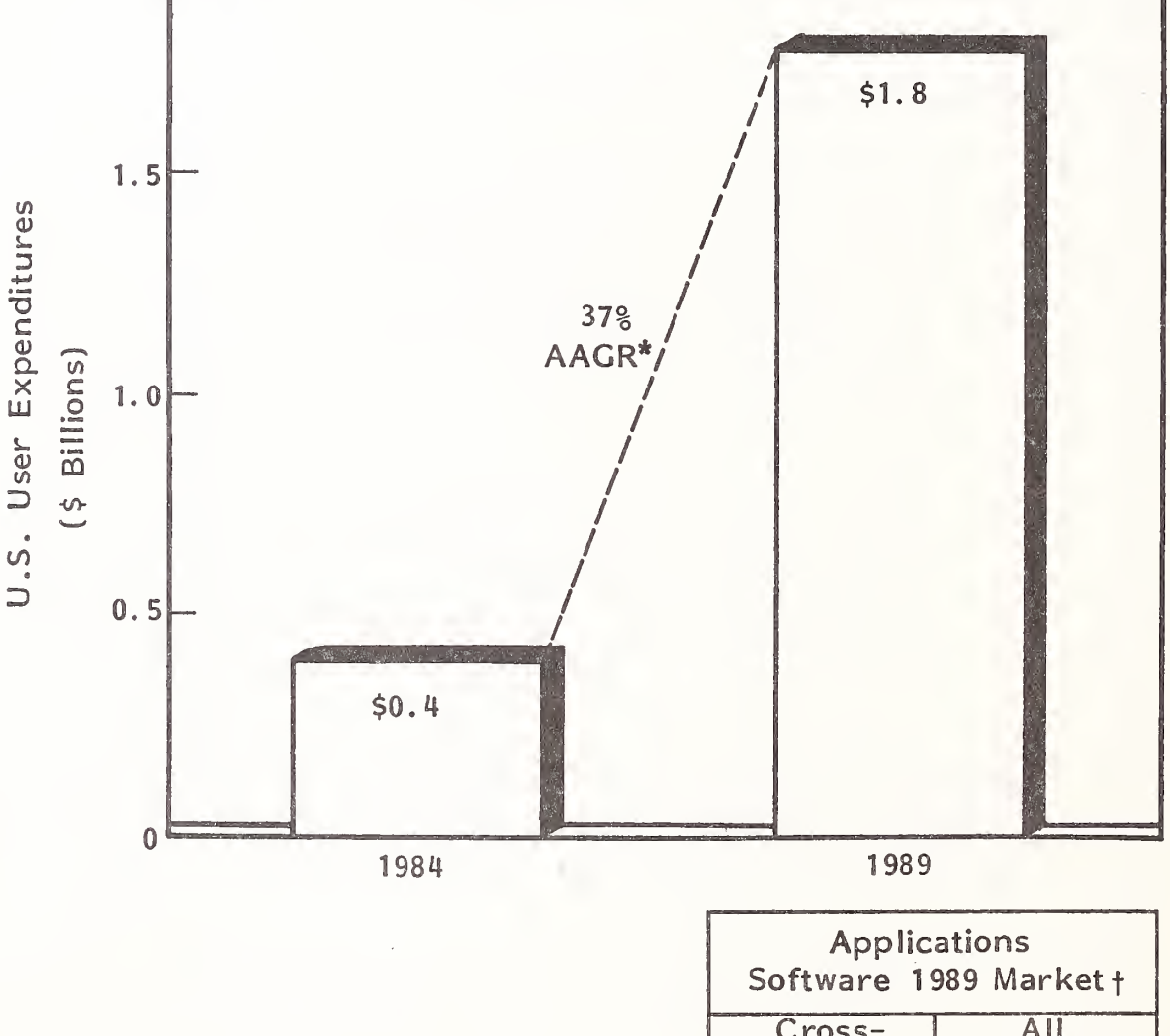
  - MSA, a cross-industry financial systems vendor historically, is now aggressively marketing industry-specific manufacturing software.

  - Cullinet has offerings that key off their IDMS data base products.

  - Cincom, a DBMS vendor, is also providing manufacturing software.

EXHIBIT III-16

DISCRETE MANUFACTURING APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	2 (13)	4 (19)
Growth Rate Rank	3 (13)	4 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

- Manufacturing resources planning (MRP II) software comprises about one-fourth of all software expenditures. Buyers are becoming increasingly sophisticated in their buying criteria for MRP II. Their most requested features include on-line, real-time operation, integration with popular DBMS packages, strong training and support, ability to upgrade systems smoothly and linkages to analytical systems with decision support characteristics.

- Application of MRP II systems include inventory stocking policy, differential analysis, shipping, scheduling, capacity planning, master production scheduling, material bid evaluation, and manufacturing equipment MTBF (mean time between failures) tracking and analysis. A major factor contributing to the strength of the MRP II market is the desire by users to compete in a more cost-effective manner in national and world markets by streamlining, via automation, the heart of their manufacturing processes.

- Users feel that computer-integrated manufacturing (CIM) is a "must" future capability for serious software vendors in the manufacturing marketplace. Much of the CIM activity is currently taking place in the small but fast-growing electronic and equipment manufacturing firms.

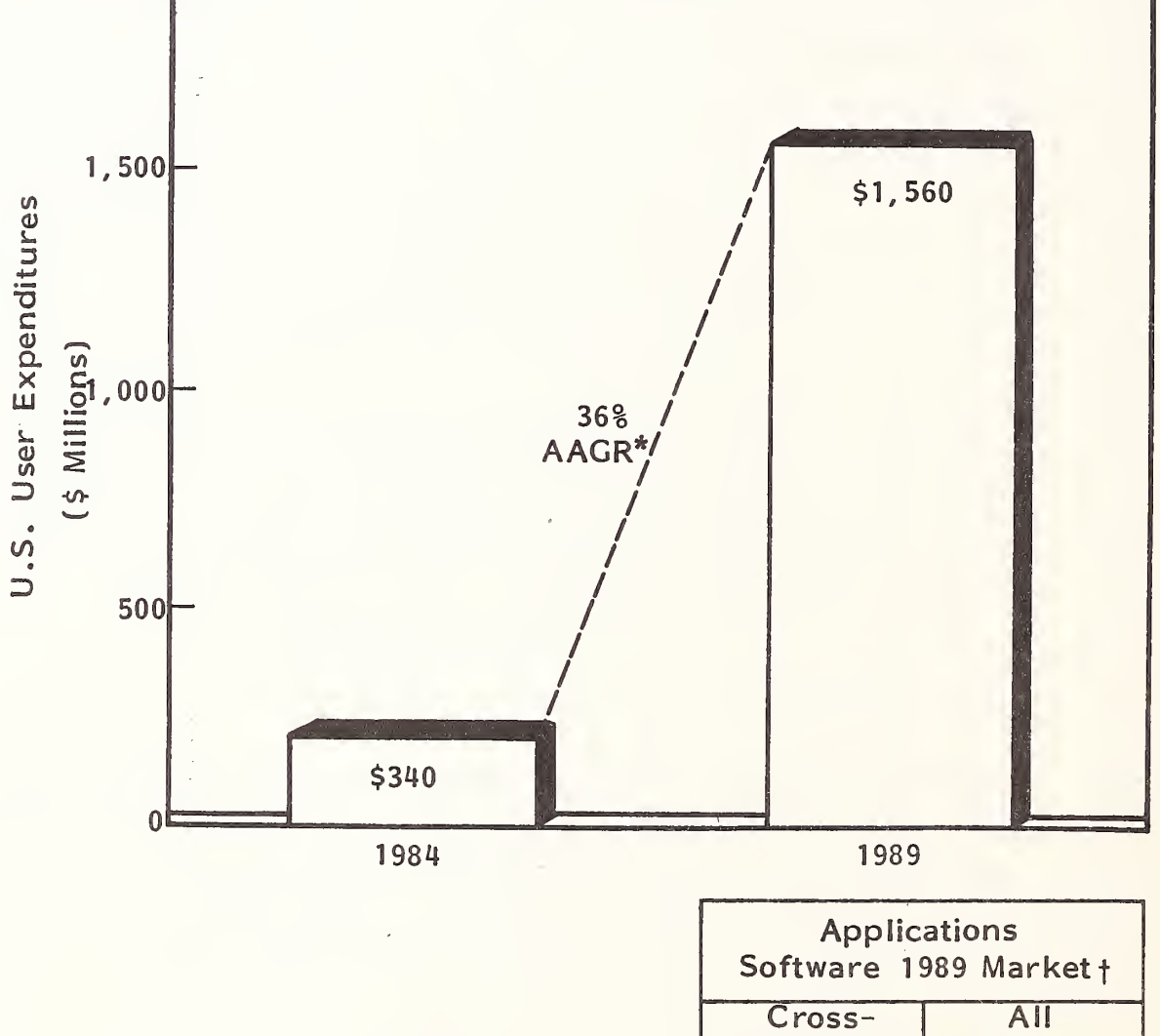
d. Distribution

- The distribution segment is comprised of retail and wholesale firms. It ranks near the upper third of all segments in terms of size and growth. User expenditures for 1984 are $340 million. A 36% annual growth rate will make this a $1.56 billion market by 1989, as shown in Exhibit III-17.

- Software is of high interest to this segment. INPUT's annual survey of information systems managers revealed a software interest level higher than two-thirds of all industries in the U.S.

EXHIBIT III-17

DISTRIBUTION INDUSTRY APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	3 (13)	5 (19)
Growth Rate Rank	5 (13)	6 (20)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

- Both the retail and the wholesale sector are reporting good software growth, as shown in Exhibit III-18.

  - Applications most in demand in the retail sector include point-of-sale, inventory control, stock replenishment and purchase order management. The retail industry sector is one of the largest sectors in the U.S. economy and has been relatively backward in its use of computer systems in the past.

  - Important applications in wholesale distribution include warehouse inventory control and stock forecasting systems.

e. Education

- The education (industry-specific) market segment encompasses academic and administrative applications used by educational institutions. Those education-oriented services provided to organizations other than educational institutions are covered in the segment entitled "Education and Training (Cross-Industry)."

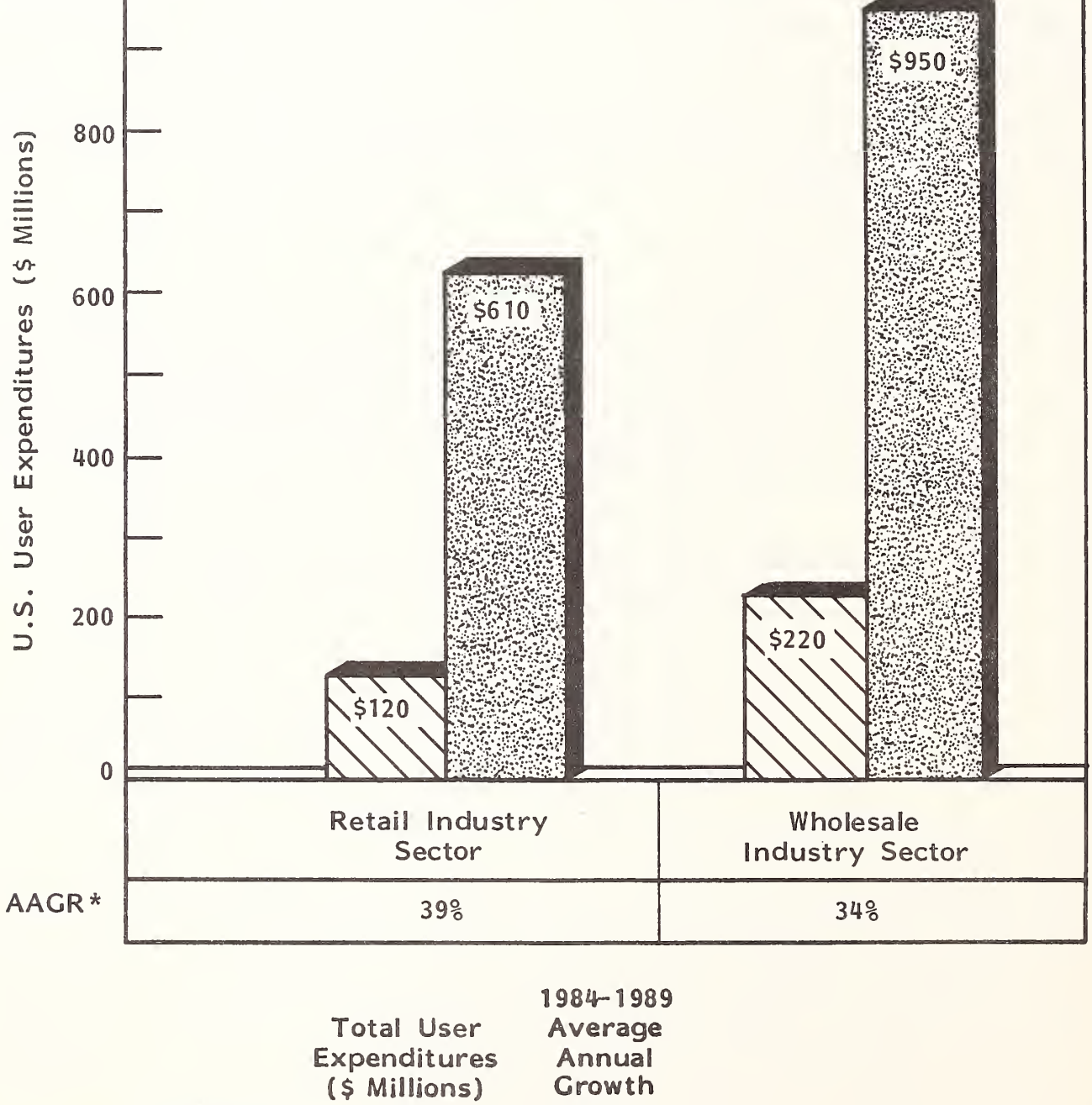
- Educational institutions included in the forecast are primary and secondary schools, colleges, universities, and vocational schools.

- The education (industry-specific) segment has the distinction of having one of the lowest growth ranks (20%) of all segments analyzed and also the smallest market size, as shown in Exhibit III-19. Nevertheless, even a "low" 20% growth rate enables the market to more than double in size by 1989.

- The "microfication" of the teaching side of school and colleges is stimulating interest in mainframe/mini software in both the academic and administration sectors. As students increase their use of personal computers for classroom activities, hesitation about automation in general among the teachers and administrators is beginning to soften.

EXHIBIT III-18

DISTRIBUTION INDUSTRY
APPLICATIONS SOFTWARE MARKET BY SECTOR, 1984-1989
(Mainframe/Mini, Industry-Specific)



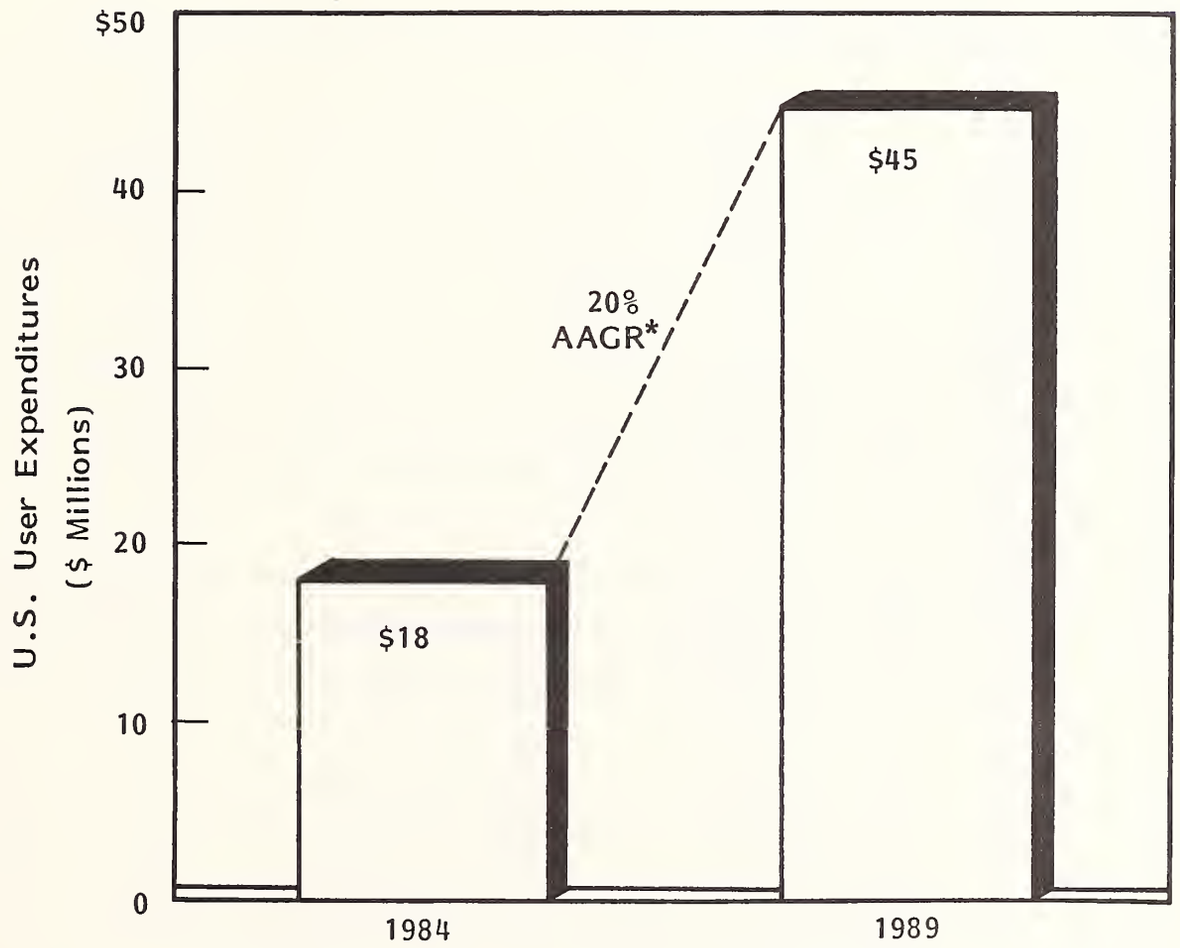
	Total User Expenditures ($ Millions)	1984-1989 Average Annual Growth Rate
1984	$340	36%
1989	$1,560	

Note: All dollars are rounded to the nearest $10 million.

* Average Annual Growth Rate

EXHIBIT III-19

EDUCATION INDUSTRY APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	13 (13)	18 (19)
Growth Rate Rank	13 (13)	16 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

- Another factor helping to stimulate a favorable environment toward applications software is the success of leading vendors. Information Associates, for example, has developed a blue chip customer list of colleges and universities using their integrated applications software for the administration sector. Widespread acceptance of their offerings helps establish vendor credibility throughout the market segment.

f. Insurance

- The insurance segment for mainframe/mini software packages ranks near the upper third in terms of size. However, its growth rate, while not bad by ordinary standards, is below the 35% average for all industry-specific applications software for mainframe/mini computers, as shown in Exhibit III-20.

- Exhibit III-21 profiles the market size and growth of the sectors of the insurance segment--life/health insurance, property/casualty, and "other" (includes title and surety insurance, pension, health, and welfare funds).

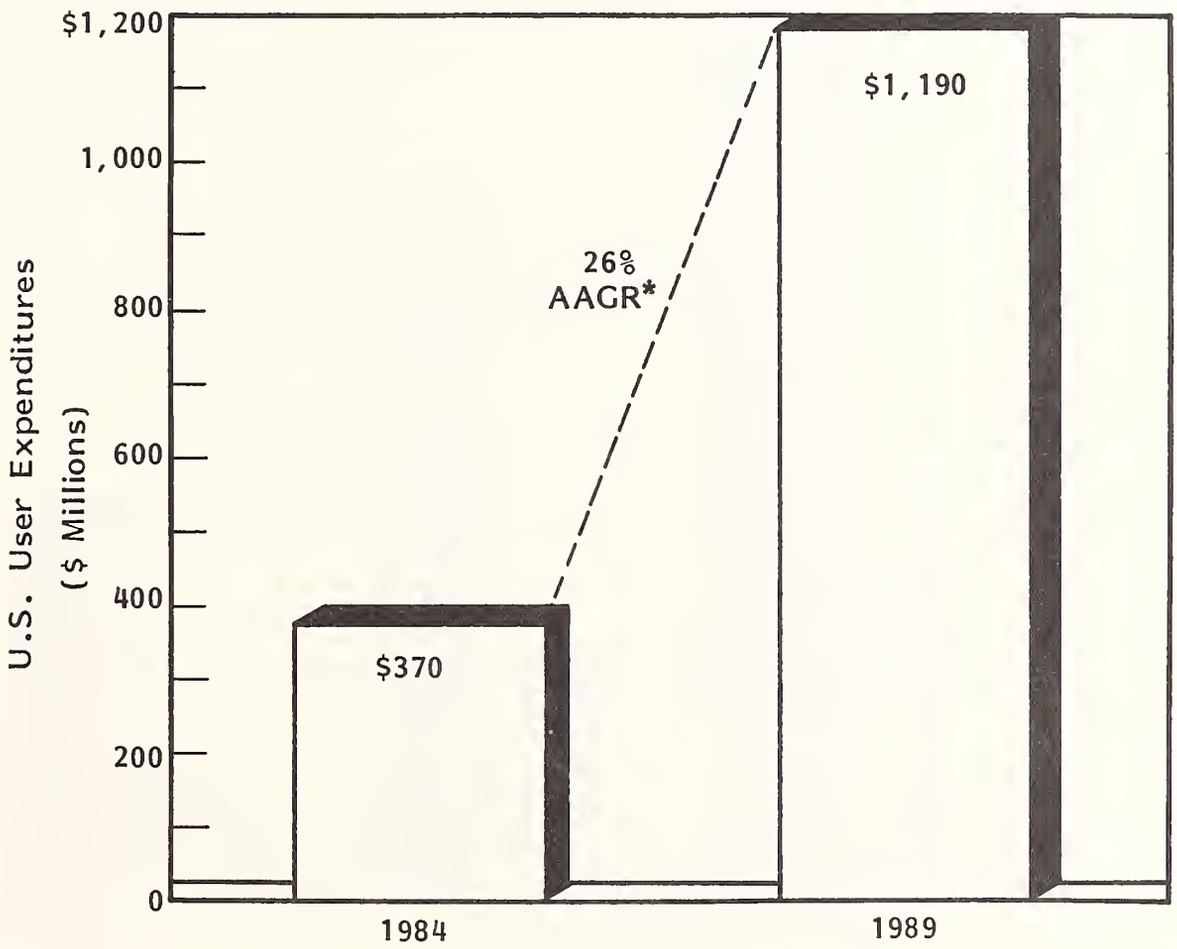
- The large-scale structural changes taking place in the industry as it struggles to establish its position in the emerging financial service world has both positive and negative consequences for applications product sales.

  - These upheavals make existing systems obsolete and create urgent demands for new ones. This enhances the attractiveness of applications software vendor offerings. Especially appealing will be systems addressing customer information. These systems tie together information about a particular customer's total activities with the firm.

  - However, the magnitude of this upheaval is such that it is causing short-term profitability problems, thus cutting back the money available to finance new systems.

EXHIBIT III-20

INSURANCE APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



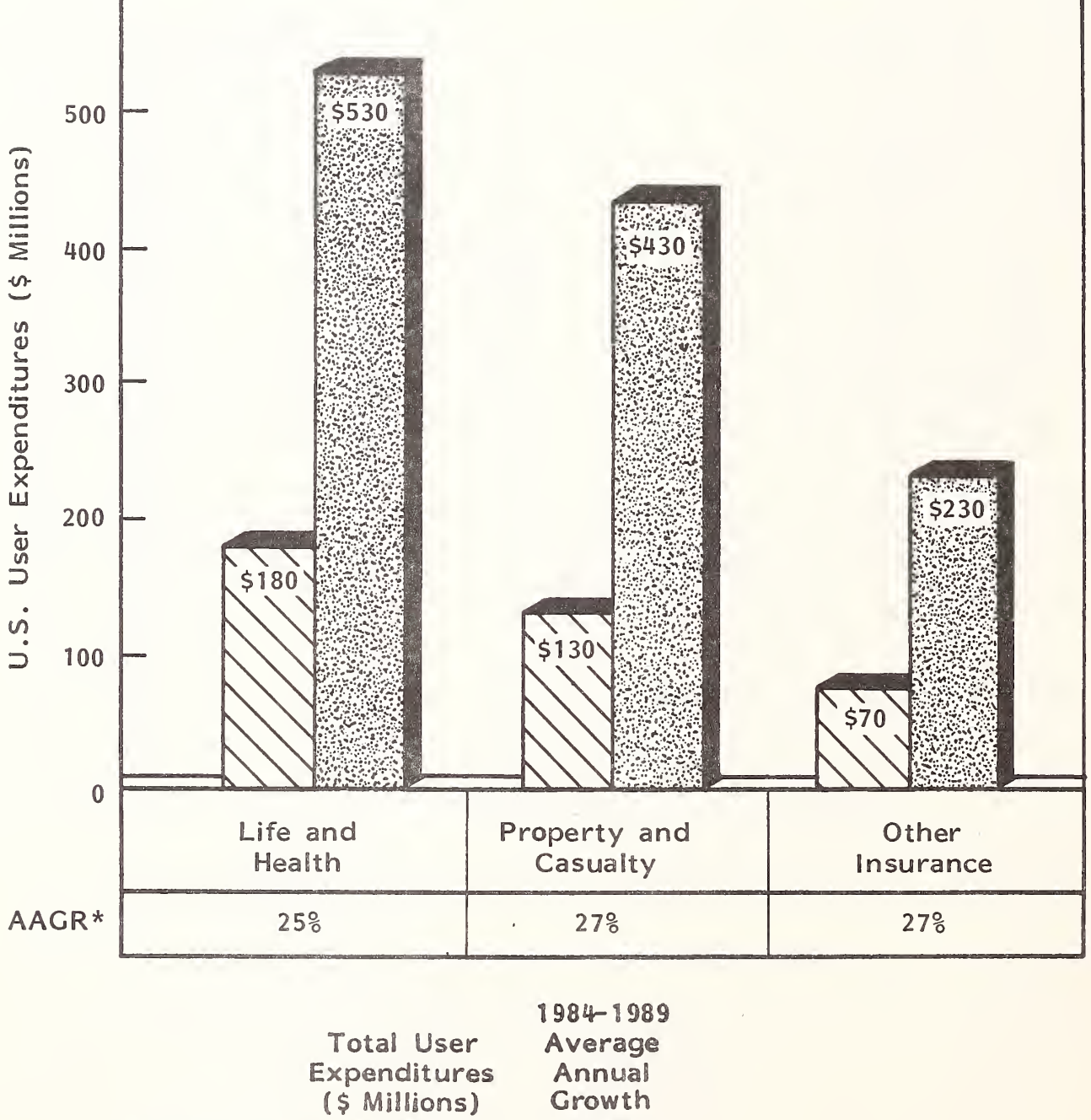
	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	4 (13)	6 (19)
Growth Rate Rank	9 (13)	11 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

EXHIBIT III-21

INSURANCE APPLICATIONS SOFTWARE MARKET BY SECTOR, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Total User Expenditures ($ Millions)	1984-1989 Average Annual Growth Rate
1984	$370	27%
1989	$1,190	

Note: All dollars are rounded to the nearest $10 million.

* Average Annual Growth Rate

g. Medical

- The market for industry-specific applications software for the medical industry segment is shown in Exhibit III-22. The hospital sector is by far the largest applications software market within the medical industry, as shown in Exhibit III-23.

  - Hospitals must make major strides in improving internal productivity if they are to survive the government's Prospective Payment System which sets limits on reimbursement levels. In addition nonprofit institutions are being challenged by for-profit hospital corporations that emphasize professional management. One of the major keys to success is better systems installed as soon as possible. Most organizations cannot tolerate the elapsed time required for internal development.

  - Information systems managers seem well atuned to this need. INPUT's annual survey of their problems and objectives revealed that "software" ranked higher as an objective than in any other industry sector studied.

  - Application areas that will increase in importance in the hospital sector include patient care, lab support and pharmacy operations.

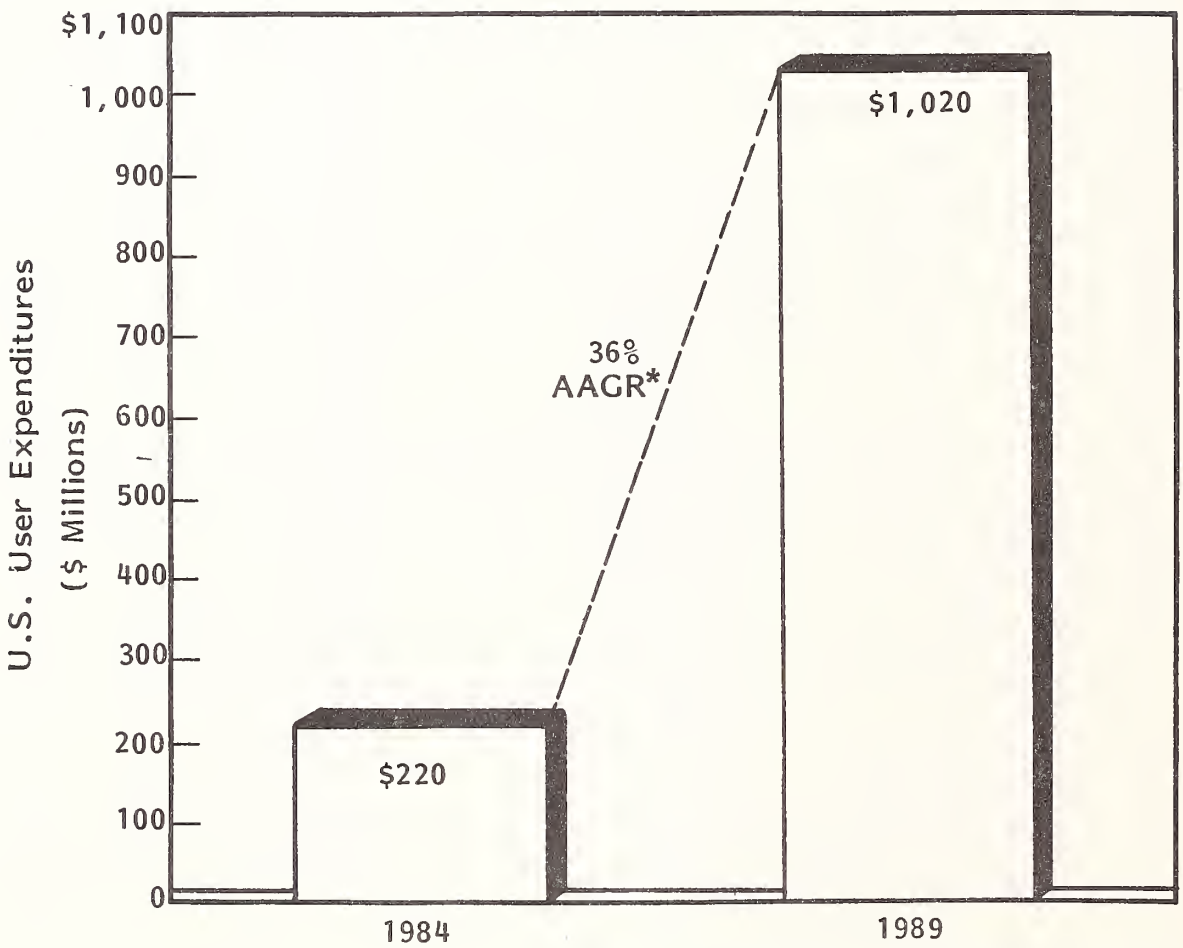
- Group practices (clinics) will be an important buyer in this sector as they often rely on a single data processing resource (often minicomputer-based) to serve the entire group of doctors.

h. Process Manufacturing

- The process manufacturing segment is a diverse collection of industries ranging from oil and gas extraction and refining, to chemicals, rubber, plastics, food, tobacco, lumber and primary metals. They all produce products that are usually bulk in nature.

EXHIBIT III-22

MEDICAL APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



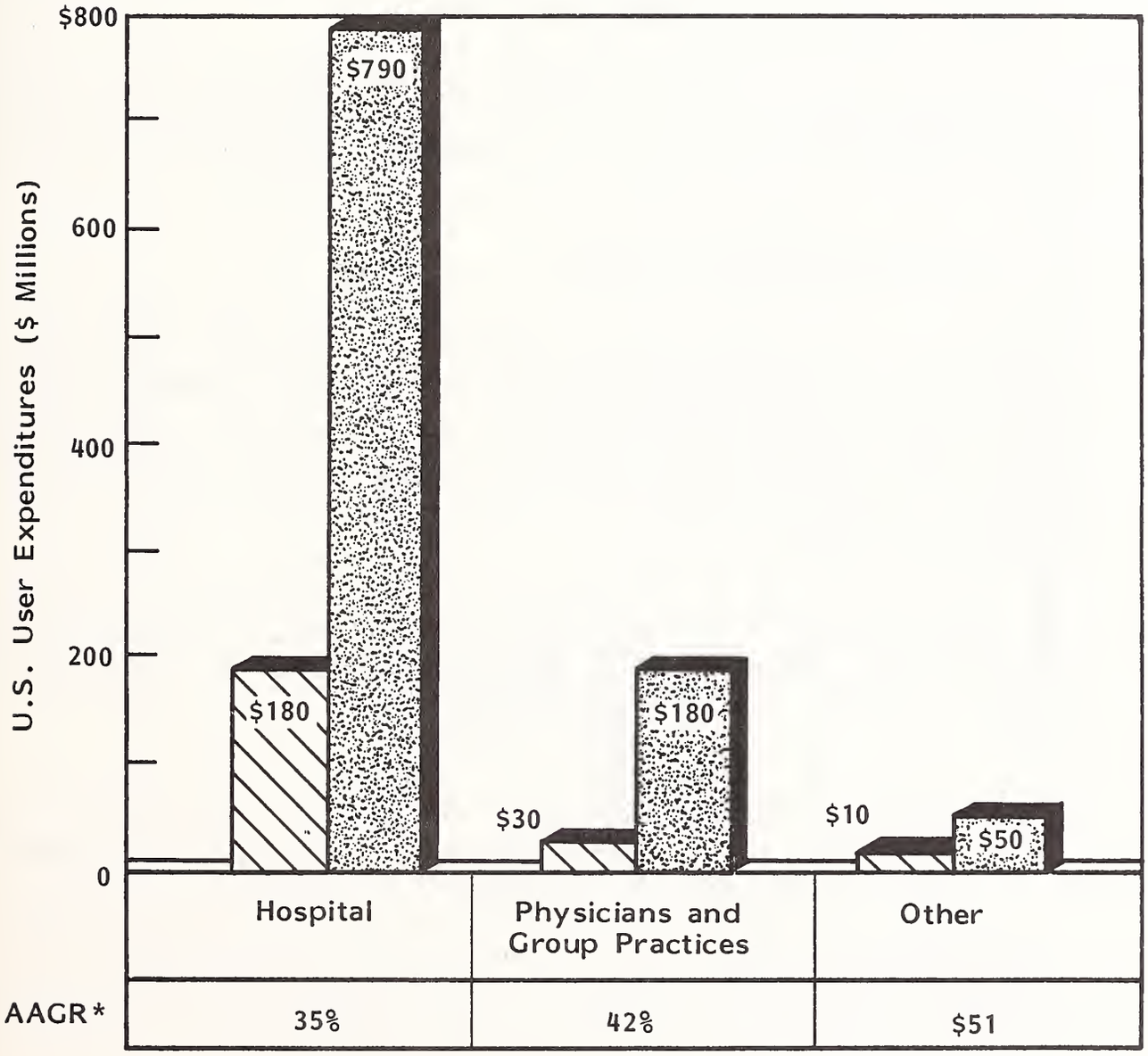
	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	5 (13)	7 (19)
Growth Rate Rank	5 (13)	6 (19)

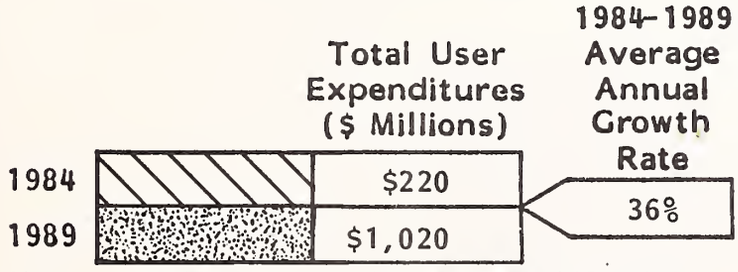
*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

EXHIBIT III-23

MEDICAL APPLICATIONS SOFTWARE MARKET BY SECTOR, 1984-1989
(Mainframe/Mini, Industry-Specific)





Note: All dollars are rounded to the nearest $10 million.

* Average Annual Growth Rate

- This segment is in the upper one-fifth of all U.S. industries analyzed by INPUT in terms of rate of growth, as shown in Exhibit III-24.

- Installation of software systems is a major objective of information systems managers in this segment. INPUT's annual survey of these individuals revealed that process manufacturing respondents had the second highest emphasis on software of all industries surveyed.

- Application areas especially receptive to software product solutions during the next few years include exploration analysis and raw material analysis.

i. Services and "Other" Industries

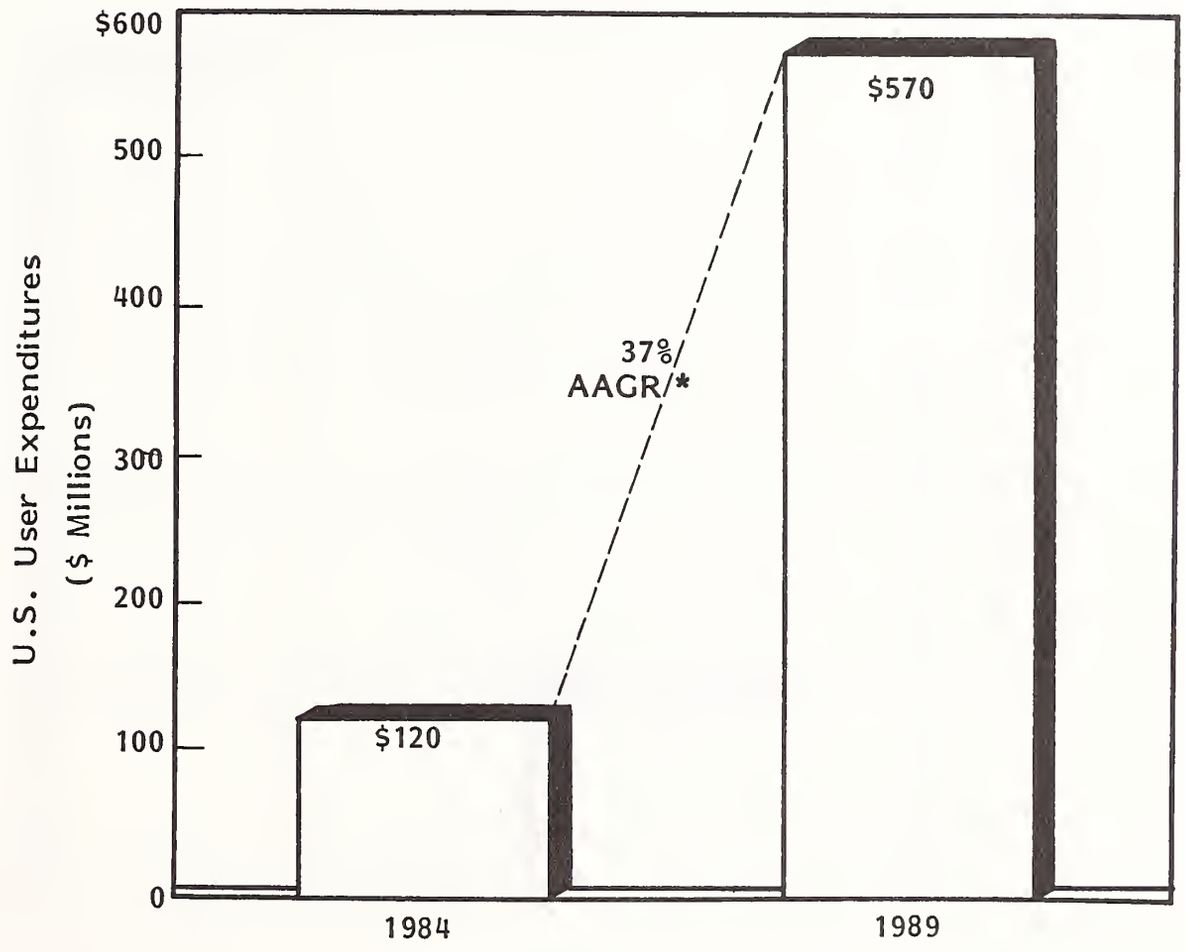
- The services and "other" industries segment contains a combination of different businesses ranging from accountants and lawyers to hotels, real estate firms, repair services and membership organizations. As our national economy continues its trend toward a more service-intensive structure, this segment will benefit.

- As shown in Exhibit III-25, applications software will increase from $170 million in 1984 to $650 million by 1989 on an annual average growth rate of 30%.

- This segment will see some significant consolidations during the next five years. Accounting, legal, real estate and other historically "small" sectors will undergo more active merger activity in order to form units of sufficient size to have more market control. This trend bodes well for mainframe/mini application software vendors since the larger organizations will have more complex needs that in turn require larger computers (i.e., mini or mainframe) and more powerful software.

EXHIBIT III-24

PROCESS MANUFACTURING APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



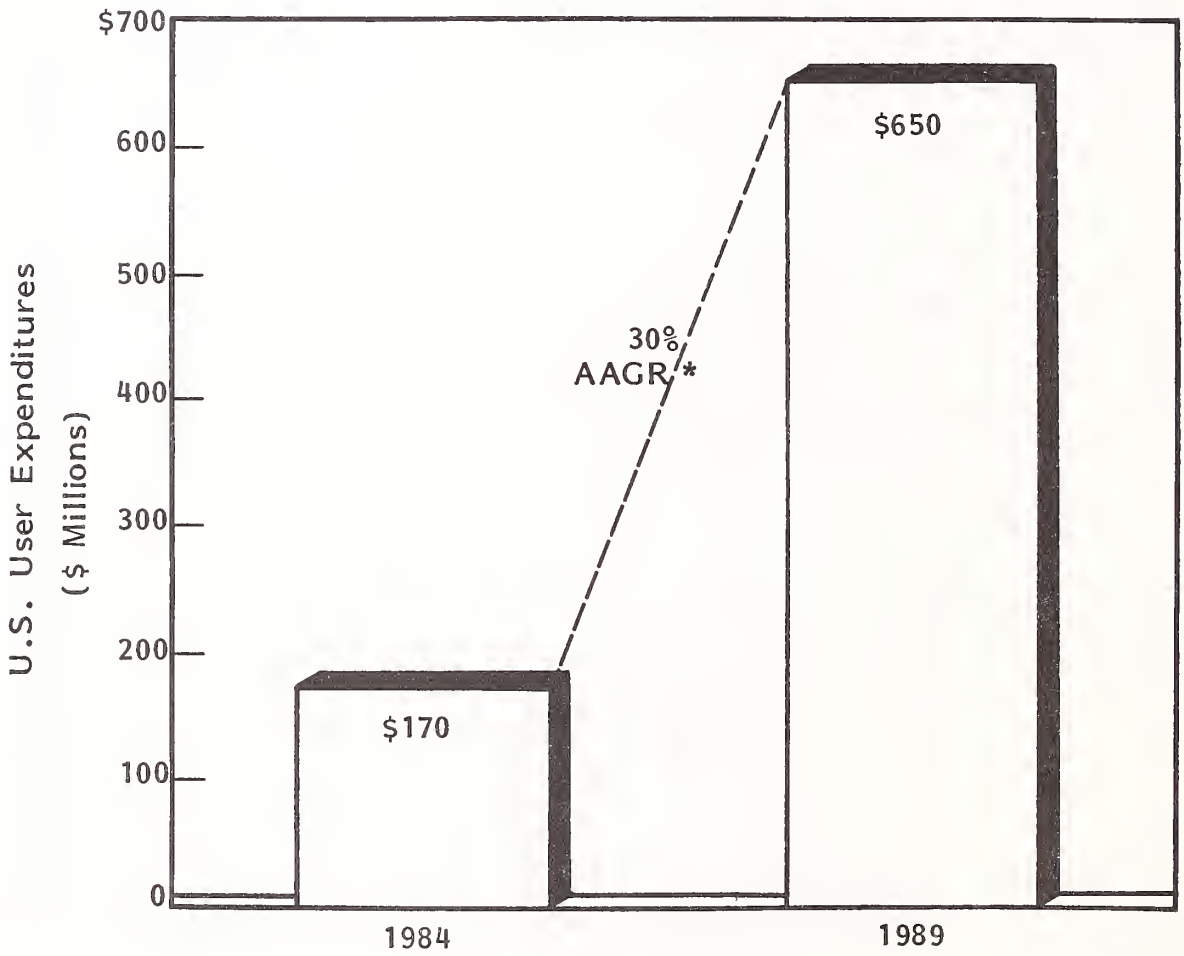
	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	7 (13)	10 (19)
Growth Rate Rank	3 (13)	4 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

EXHIBIT III-25

SERVICES AND OTHER APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	6 (13)	9 (19)
Growth Rate Rank	7 (13)	8 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

j. Transportation

- Transportation is tied with education as the fastest growing industry-specific segment for applications software. User expenditures will reach $650 million by 1989, as shown in Exhibit III-26.

- Deregulation is having an important impact on this market. As new markets and new competition confront transportation firms, they will increasingly rely on new software packages in their strategy for surviving and prospering.

- Minicomputer-based software will be especially important. INPUT's annual survey revealed average information systems hardware budget increases of 22% for 1985 for this size machine. This budget increase was one of the highest in the segments surveyed, thus helping to expand the hardware base for minicomputer software products.

- Application areas of importance during the next few years include fleet maintenance and route planning.

D. MARKET ANALYSIS AND FORECASTS: SYSTEMS SOFTWARE

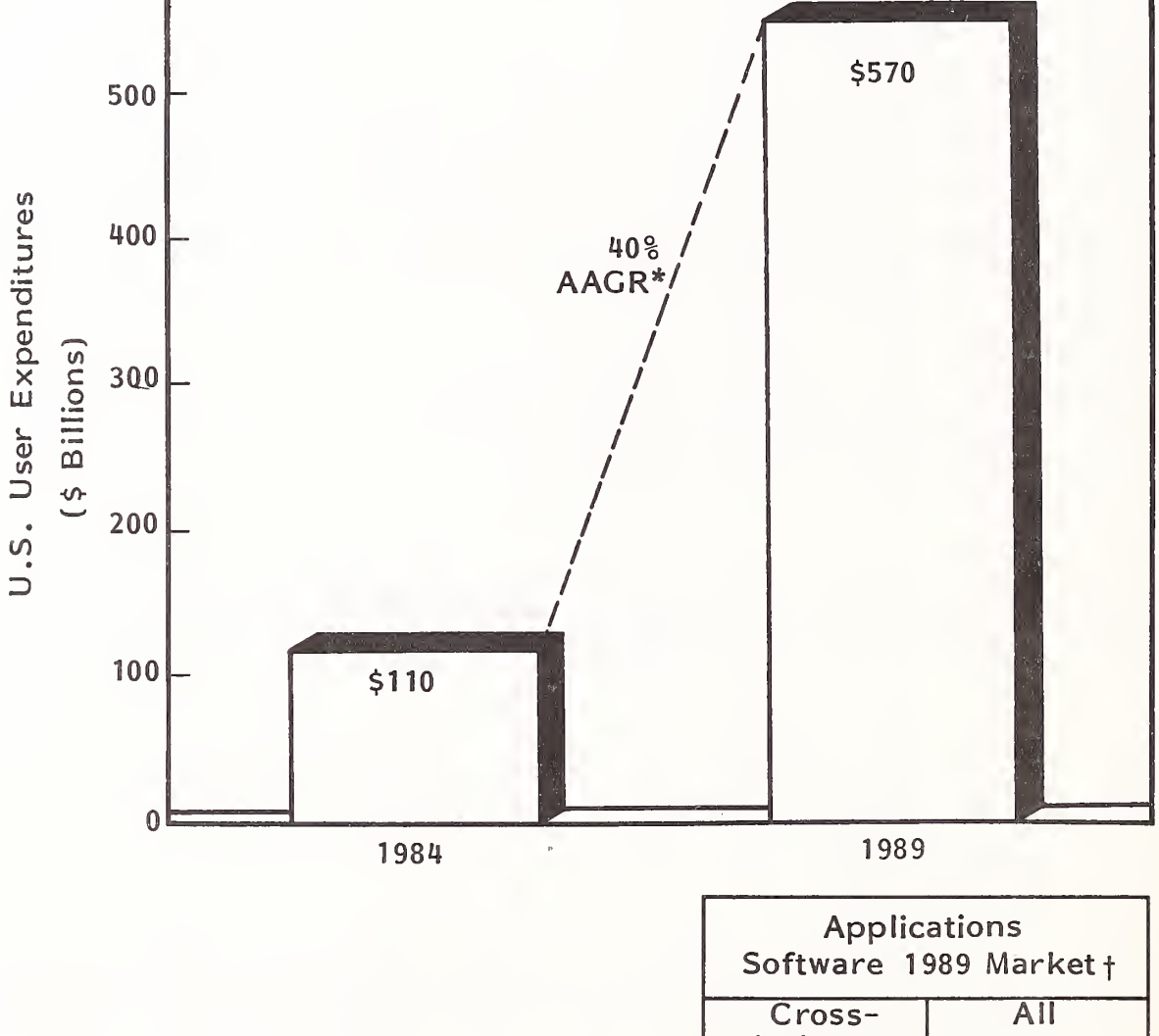
- The systems software marketplace is comprised of software that improves the productivity of computer resources. The structure of this mode is shown in Exhibit III-27.

- Mainframe/mini-based systems software will continue to be the largest aspect of the total systems software market throughout the rest of the decade, as shown in Exhibit III-28.

- During this same period micro-based systems software will double its market share from 13% to 26%. This large increase is primarily due to the six-fold expansion in the installed base of microcomputers during this timeframe.

EXHIBIT III-26

TRANSPORTATION APPLICATIONS SOFTWARE MARKET, 1984-1989
(Mainframe/Mini, Industry-Specific)



	Applications Software 1989 Market†	
	Cross-Industry Only	All Applications Software
Size Rank	8 (13)	11 (19)
Growth Rate Rank	1 (13)	1 (19)

*Average Annual Growth Rate

†Parenthesis shows the number of segments ranked.

EXHIBIT III-27

SYSTEMS SOFTWARE PRODUCTS
MARKET STRUCTURE

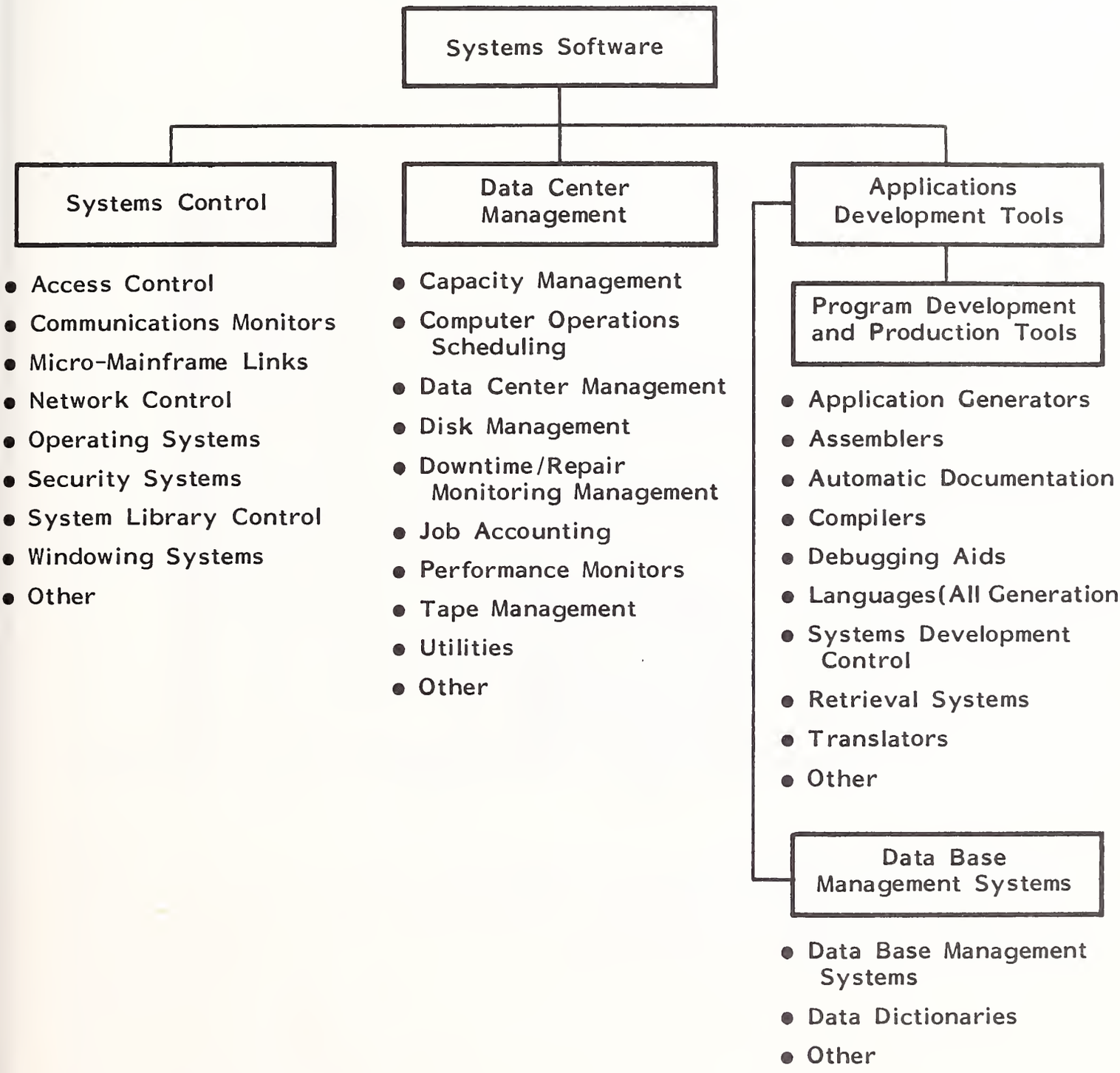
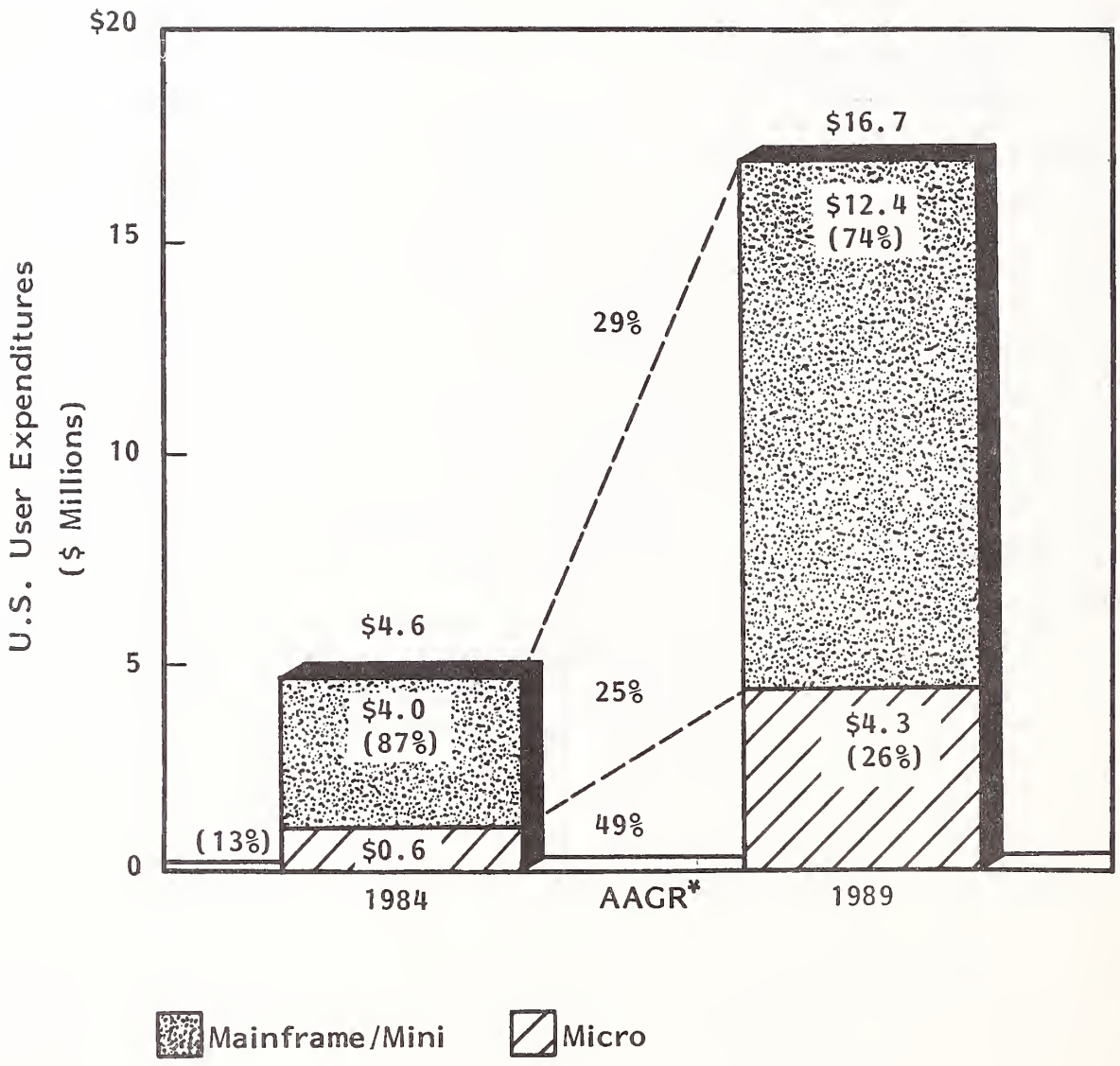


EXHIBIT III-28

SYSTEMS SOFTWARE MARKET, 1984-1989



*Average Annual Growth Rate

- Applications development tools is the fastest growing of the system software market segments, as shown in Exhibit III-29. It will be favorably impacted by a number of factors including:

  - The popularity of data base management systems (DBMS), especially those with orientation toward relational architectures, as well as text and image-handling capabilities.

  - Continued interest in natural languages and other software tools designed to help end users more easily extract information.

  - Expansion of information centers. INPUT forecasts a 2.5 times increase in these centers between now and 1989. These centers are either mini- or mainframe-based and rely upon end-user oriented software to help users develop their own systems.

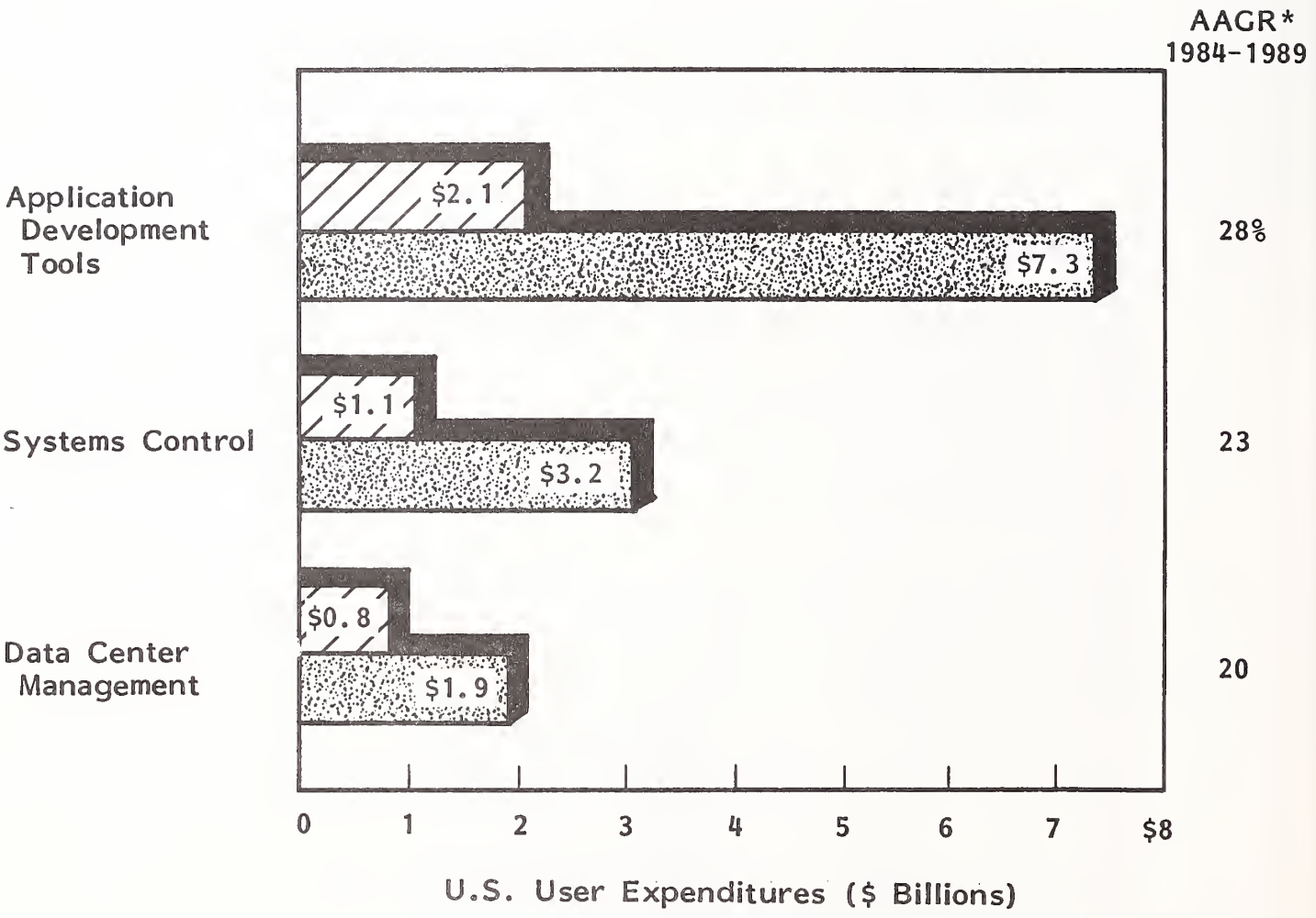
- The emergence of systems with increasingly complex network relationships will place expanded functionality demands on operating systems, and network control, as well as security systems software.

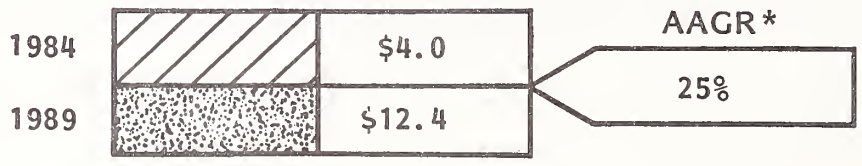
- The data center management sector will more than double during the next five years. Especially attractive areas within this sector are storage management systems, performance monitoring systems and scheduling systems. These systems address critical needs of tomorrow's highly complex data centers.

- For a more comprehensive discussion of the systems software marketplace, see INPUT's report U.S. Information Services Cross-Industry Markets, 1984-1989.

EXHIBIT III-29

SYSTEMS SOFTWARE MARKET BY SOFTWARE TYPE, 1984-1989





* Average Annual Growth Rate

IV PROFESSIONAL SERVICES

IV PROFESSIONAL SERVICES

A. MARKET SIZE AND GROWTH

- The professional services market will grow from a 1984 base of $8.6 billion go $21.7 billion by 1989, an average annual growth rate of 20%, as shown in Exhibit IV-1.

- Software development continues to account for the bulk of the professional services expenditures, as shown in Exhibit IV-2.

- This professional services marketplace has gathered important momentum during the past few years and has now emerged as a bright star within the information services arena.

- Reasons for the favorable outlook for professional services include:

  - The enhanced role of information systems as a competitive weapon. Top corporate management now recognizes the central role of well-designed and executed systems and is pushing information systems managers to install these applications without delay.

  - Scarcity of technical personnel. Highly paid and sought after technical professionals often cannot be recruited or retained by corporations in a cost-effective manner. Professional services vendors provide high challenge and project diversity to these key people.

EXHIBIT IV-1

PROFESSIONAL SERVICES MARKET, 1984-1989

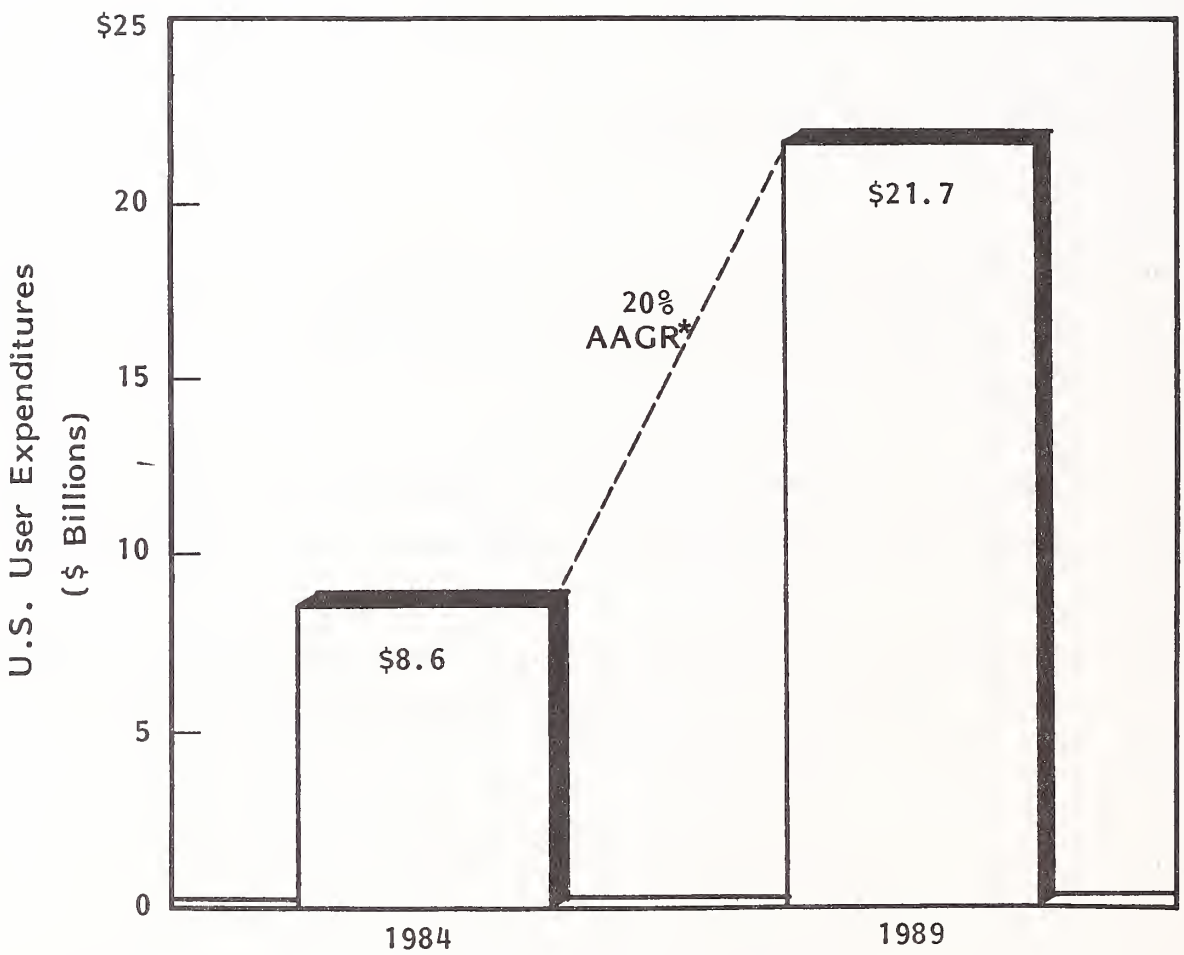
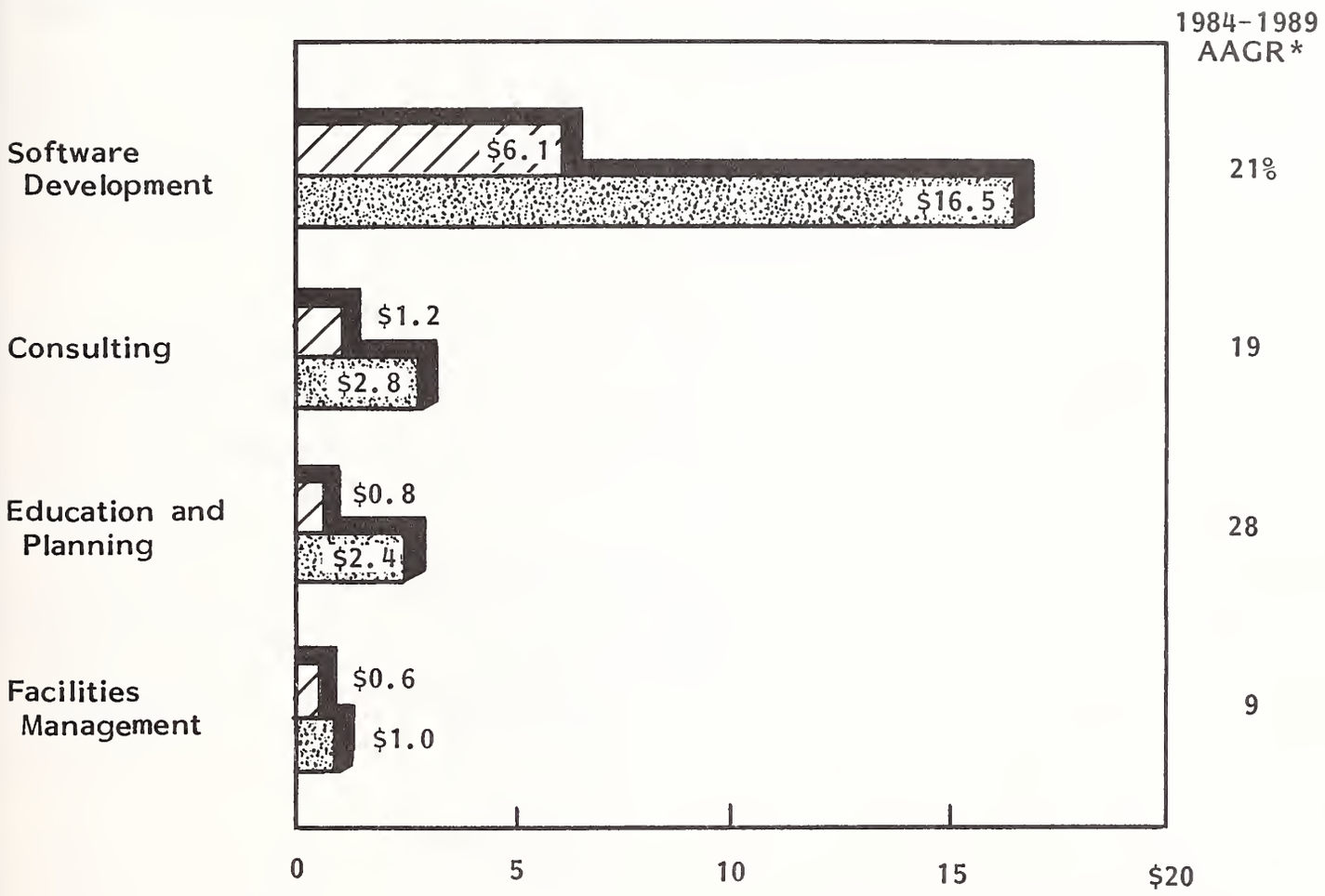
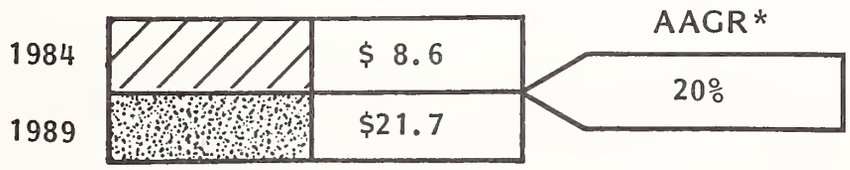


EXHIBIT IV-2

PROFESSIONAL SERVICES MARKET BY SERVICE TYPE, 1984-1989



U.S. User Expenditures ($ Billions)



* Average Annual Growth Rate

- Enhanced credibility of the vendors. Many professional services firms have over a decade of experience with a "blue chip" list of clients. They have proven they can deliver.

- Reduced client staffing levels. Budget freezes prevent many businesses from acquiring personnel to undertake critical systems developments. The professional services vendors fill this void.

- The list of the largest professional services vendors continues to be heavily impacted by firms engaged in other activities, as shown in Exhibit IV-3. Five of the top eight firms fall into this category.

- Big Eight accounting firms continue to be a major aspect of the professional services competitive picture. Recent efforts within the accounting profession to merge several of the larger firms warns of greater competition in the future.

- At the other end of the spectrum very small firms at the local level continue to thrive. By leveraging personal contacts and by competing primarily on a price basis, these vendors provide a significant challenge to the larger (but higher-priced) vendors.

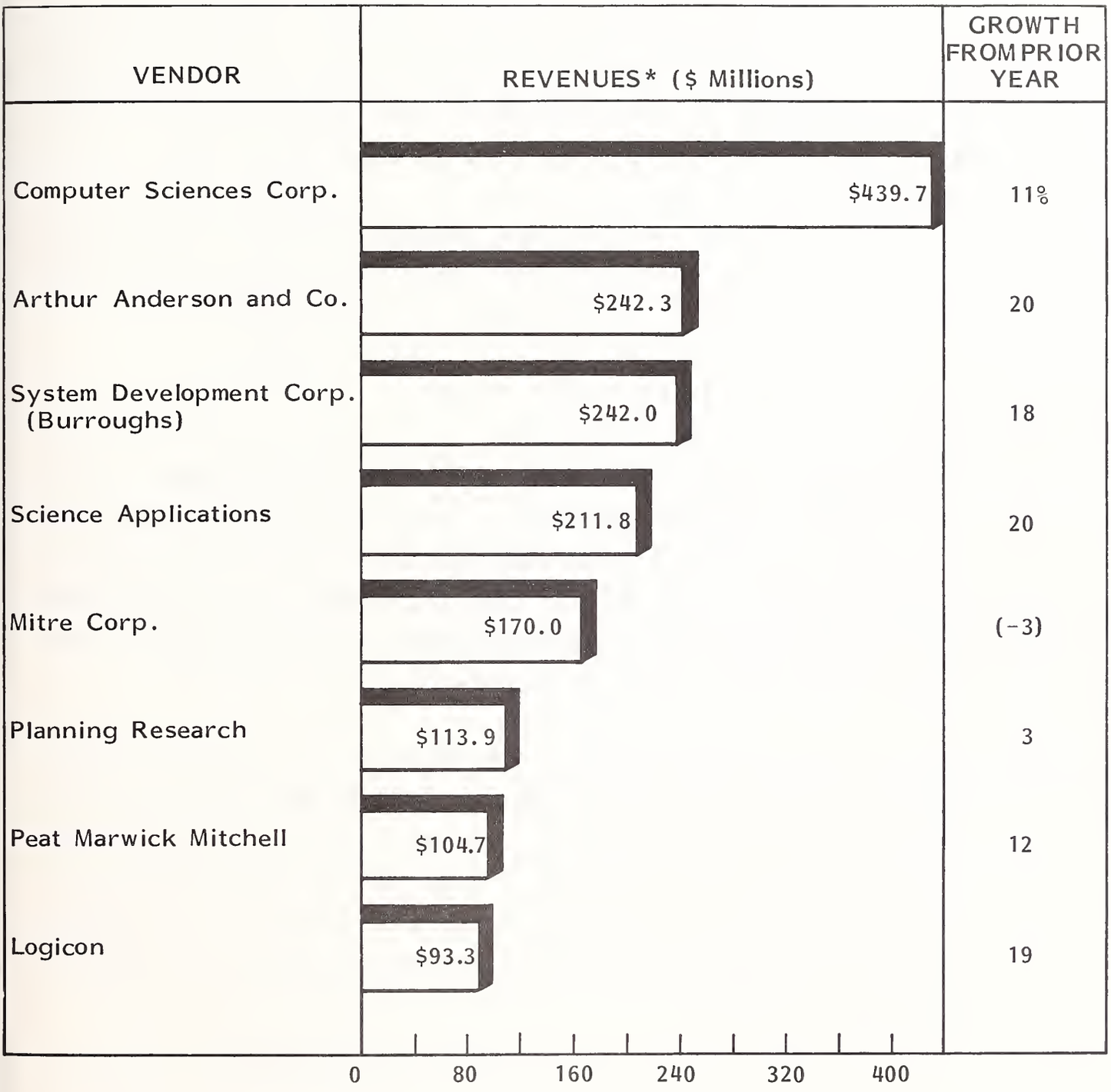
B. ISSUES AND TRENDS

1. MOVE TO VERTICAL SPECIALIZATION

- Historically a vast majority of the professional services firms have remained free of industry or project specialization. However, the proliferation of increasingly complex technology combined with the heightened interest in more industry-specific applications, has caused some vendors to rethink this approach.

EXHIBIT IV-3

LARGEST PROFESSIONAL SERVICES VENDORS



* 1983 Calendar Year, Includes INPUT Estimates.

- As a result, some of the greatest growth is now coming from professional services vendors who are specializing by industry. For example:

  - AGS Computers experienced increases of 92% in revenue and 87% in net income in a recent nine-month period. They have benefited significantly from their emphasis on telecommunications industry systems with special focus on AT&T and Unix-based solutions.

  - Computer Horizons had increases in revenue of 58% and net income of 67% in the nine-month period ending mid-1984. They specialize in the telecommunications, banking, and manufacturing industries.

2. EMERGENCE OF NATIONAL FIRMS

- One of the key trends within professional services is the emergence of independent firms with a national presence. Computer Task Group, for example, has been pursuing this strategy for the past several years via acquisition and internal expansion. As a result they are one of the first dedicated professional services vendors to have established a national organization with offices strategically located throughout the U.S.

- The key advantage of this type of national coverage is that vendors can better leverage their customer base. A project successfully done for a corporation with headquarters in New York gives the vendor a significant advantage when competing for a job at a West Coast division. Also, systems projects require multiple site installation. A national presence is required to be effective in this type of activity. Previously the accounting companies were the primary providers of this service.

3. NEW SERVICES AND DISTRIBUTION CHANNELS

- The delivery-mode boundaries that once sharply divided information services vendors are rapidly disappearing.

  - Processing services vendors are expanding into turnkey and professional services and software products.

  - Software products vendors are becoming more aggressive in professional services offerings.

  - Turnkey firms are getting more involved with processing services and software.

- This changing market structure will accelerate in the coming years, primarily because the key asset for vendors will become knowledge of their customers' needs, not knowledge of a particular delivery mode.

- A number of possibilities exist for professional services vendors when leveraging their market knowledge. These include providing new services and/or entering new distribution channels.

- Exhibit IV-4 summarizes numerous avenues available to professional services vendors. These include:

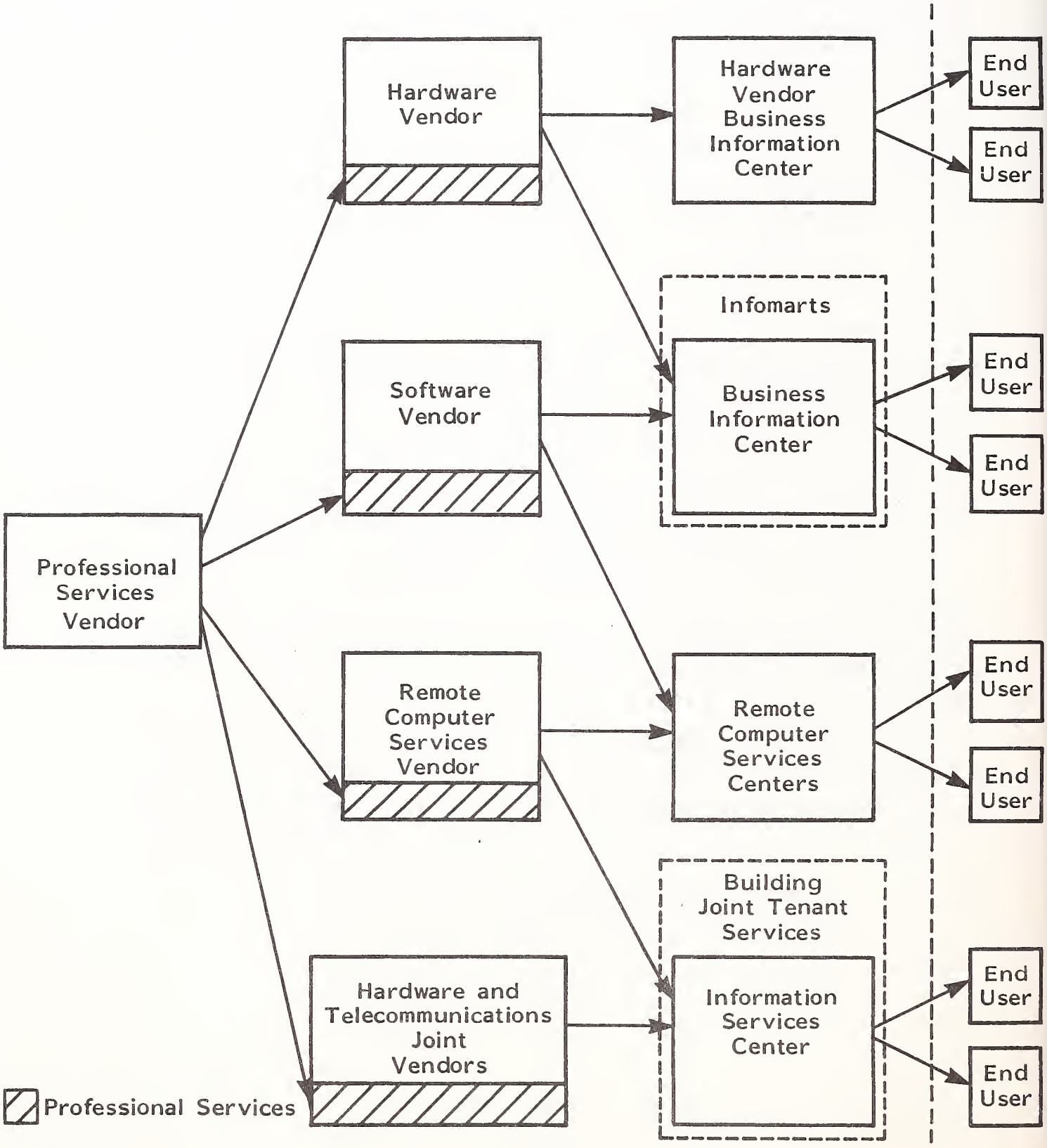
  - Systems integration.

  - Software product and implementation services.

  - Providing software products.

EXHIBIT IV-4

EMERGING PROFESSIONAL SERVICES DISTRIBUTION CHANNELS



a. Systems Integration

- Systems integration is one of the great professional services opportunities of the future. The role first emerged in the federal government as a direct response to problems with fragmented procurements and an increasingly complex system environment. The systems integration function that had been used successfully with military weapons systems began to appear several years ago in nonweapons systems. Project VIABLE (performed by EDS for the Department of the Army) is a logistics management contract of this type.

- The role is now being transferred to the commercial environment. It is being stimulated by computer companies, particularly IBM in the information systems area. IBM's Value-Added Integrator (VAI) program is an example of this trend.

- With the proliferation of different types and sizes of equipment and increasingly complicated software tasks, there is a growing void between the vendors and the buyers. Internal information system organizations are unable to fill this void completely. As a result external organizations, particularly professional services companies, have a major opportunity.

- The opportunity is perhaps greatest in the area of office systems because here many internal information systems organizations lack skills and experience. Systems implementation in the office environment requires knowledge of issues related to telecommunications, computers, office equipment, software, and people. Conversion, installation, documentation, education, and training are vital and require more extensive and different treatment from traditional data processing systems.

b. Software Product Implementation Services

- One of the major factors inhibiting growth of the software product market (and secondarily the hardware market) is the implementation problem. New

application software systems are not simple, standalone, batch-oriented applications that function primarily on the information system department central computers. Considerable effort and skill is required to implement these new applications effectively in the new distributed processing environment.

- This task requires professional services in the form of implementation services. Many product vendors will prefer to work with professional services organizations to provide their services rather than to provide them themselves. Furthermore, even if they do decide to pursue this opportunity, the requirements for implementation and support will probably outstrip their internal capabilities and they will thus be forced to work with third parties.

- INPUT expects the market for implementation services related to software products to grow at over 40% per year (i.e., faster than product sales themselves) to reach over $2.3 billion by 1989.

- INPUT's 1984 report Software Product-Related Opportunities for Professional Services Vendors elaborates on these opportunities and challenges in greater detail.

c. Software Products Marketing

- Being in the software products business is significantly different from being in the professional services business. Software products as a business requires a unique approach to product development, marketing, support, and personnel. However, there are similarities between these two businesses that can work to the advantage of the software product vendor:

  - The software itself performs fundamentally the same functions.

  - Customer installation and training are similar.

- Applications knowledge gained from product development and customer support is much alike.

- A number of professional services vendors have begun to get involved in software products. For example, AUXCO has signed an agreement with Southern New England Telephone to market the LUCAS software that AUXCO developed for the company. AUXCO also licensed AT&T to market software on an international basis.

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

- INFORMATION SERVICES--Computer-related services involving one or more of the following:

  - Processing of computer-based applications using vendor computers (called "processing services").

  - Services that assist users in performing functions on their own computers or vendor computers (called "software products" and/or "professional services").

  - Services that utilize a combination of hardware and software, integrated into a total system (called "turnkey systems").

A. USER EXPENDITURES

- All user expenditures reported are "available" (i.e., noncaptive, as defined below).

- NONCAPTIVE INFORMATION SERVICES USER EXPENDITURES - Expenditures paid for information services provided by a vendor that is not part of the same parent corporation as the user.

- CAPTIVE INFORMATION SERVICES USER EXPENDITURES - Expenditures received from users who are part of the same parent corporation as the vendor.

B. DELIVERY MODES

- PROCESSING SERVICES - This category includes remote computing services, batch services, processing facilities management, and value-added networks (VANs).

  - REMOTE COMPUTING SERVICES (RCS) - Providing computer processing to a user by means of terminal(s) at the user's site(s) connected by a data communications network to the vendor's central computer. There are five submodes of RCS, including:

    . Interactive - Characterized by the interaction of the user with the system, for the purpose of problem-solving, data entry, and/or transaction processing. The user is on-line to the program/files. Computer response is usually measured in seconds or fractions of a second.

    . Remote Batch - A service in which the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements. Computer response is usually measured in minutes or hours.

    . Data Base - Characterized by the retrieval and processing of information from a vendor-provided data base. The data base may be owned by the vendor or a third party.

- User Site Hardware Services (USHS) - Offerings provided by RCS vendors that place programmable hardware on the user's site (rather than in the vendor's computer center). USHS offers access to a communications network, access through the network to the RCS vendor's larger computers, and significant software as part of the service.

- BATCH SERVICES - This includes computer processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunication media) to and/or from those sites. Data entry and data output services, such as keypunching and computer output microfilm processing, are also included. Batch services include those expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing.

- PROCESSING FACILITIES MANAGEMENT (PFM) (also referred to as "resource management" or "systems management") - The management of all or a major part of a user's data processing functions under a long-term contract (more than one year). This would include both remote computing and batch services. To qualify as PFM, the contractor must directly plan, control, operate, and own the facility provided to the user, either on-site, through communications lines, or in a mixed mode.

- VALUE-ADDED NETWORKS (VANs) - VANs typically involve common carrier network transmission facilities that are augmented with computerized switching. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and TYMNET) employ packet-switching techniques. However, other added data service features such as store-and-forward message switching, terminal interfacing, error detection and correction, and host computer interfacing are of equal importance.

- Processing services are further differentiated as follows:

  - Cross-industry services involve the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but that cut across industry lines. Most general ledger, accounts receivable, payroll, and personnel applications fall into this category. Cross-industry data base services, for which the vendor supplies the data base and controls access to it (although it may be owned by a third party), are included in this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific (see below).

  - Industry-specific services provide processing for particular functions or problems unique to an industry or industry group. Specialty applications can be either business or scientific in orientation. Industry-specific data base services, for which the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry specialty applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

  - Utility services are those for which the vendor provides access to a computer and/or communications network with basic software that enables users to develop and/or process their own systems. These basic tools often include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

- SOFTWARE PRODUCTS - This category includes users' purchases of applications and/or systems software that is sold by vendors as standard products intended for use by different organizations. Included as user expenditures are lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package (when such fees are either bundled as part of the product price or offered on an annual subscription basis). Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself. There are several subcategories of software products, including:

  - APPLICATIONS SOFTWARE PRODUCTS - Software that performs a specific function directly related to solving a business or organizational need. Applications software provides information directly for use by the end user. Applications software products classifications are:

    . Cross-Industry Products - Used in multiple user industry sectors. Examples are payroll, inventory control, and financial planning.

    . Industry-Specific Products - Used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting, airline scheduling, and materials resource planning.

  - SYSTEMS SOFTWARE PRODUCTS - Software that enables the computer/communications system to perform basic functions, which are interim steps to providing the end user with "answers" sought. Systems software product classifications are:

    . Systems Control Products - These products function during applications program execution to manage the computer system

resource. Examples include operating systems, communication monitors, and emulators.

- Data Center Management Products - These products are used by operations personnel to manage the computer system resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.

- Application Development Products - These products are used to prepare applications for execution by assisting in design, programming, testing, and related functions. Examples include languages, sorts, productivity aids, data dictionaries, data base management systems, report writers, and retrieval systems.

- PROFESSIONAL SERVICES - This category is made up of services in the following categories:

  - SOFTWARE DEVELOPMENT - This service develops a software system on a custom basis. It includes one or more of the following: user requirements, system design, contract, and programming.

  - EDUCATION AND TRAINING SERVICES - These services help people acquire new skills, techniques or knowledge related to computers. This definition does not include services to educational institutions. (This latter market is included in the education (industry-specific) segment.)

  - CONSULTING SERVICES - Consultants advise clients on computer-related issues that are usually management oriented. Feasibility studies and computer audits are examples of services provided.

  - PROFESSIONAL SERVICES FACILITIES MANAGEMENT (PSFM) - This is counterpart to processing facilities management, except that in this

case the computers are owned by the client, not the vendor; the vendor provides human resources to operate and manage the client facility.

- TURNKEY SYSTEMS (also known as Integrated Systems) - A turnkey system is an integration of systems and applications software with hardware, packaged as a single entity. The value added by the vendor is primarily in the software. Most CAD/CAM systems and many small business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, or process control systems. Nor does it include Embedded Computer Resources for military applications. Turnkey systems are available either as custom or packaged systems.

  - Turnkey systems revenue is divided into two categories.

    - Industry-Specific systems--that is, systems that serve a specific function for a given industry sector such as automobile dealer parts inventory, CAD/CAM systems, or discrete manufacturing control systems.

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

  - Revenue includes hardware, software, and support functions.

- SYSTEMS INTEGRATION - Services associated with systems design, integration of computing components, installation and acceptance of computer/communication systems. Systems integration can include one or more of the major information services delivery modes--professional services, turnkey systems and software products. System components may be furnished by separate vendors (not as an integrated system by one vendor, called the prime contractor); services may be furnished by a vendor or by a not-for-profit

organization. Integration services may be provided with related engineering activities, such as SE&I (Systems Engineering and Integration) or SETA (Systems Engineering and Technical Assistance).

C. HARDWARE/HARDWARE SYSTEMS

- HARDWARE - Includes all computer communications equipment that can be separatedly acquired, with or without installation by the vendor, and not acquired as part of a system.

  - PERIPHERALS - Includes all input, output, communications, and storage devices, other than main memory, that can be locally connected to the main processor and generally cannot be included in other categories, such as terminals.

  - INPUT DEVICES - Includes keyboards, numeric pads, card records, bar-code readers, lightpens and trackballs, tape readers, position and motion sensors, and A-to-D (analog-to-dialog) converters.

  - OUTPUT DEVICES - Includes printers, CRTs, projection television screens, microfilm processors, digital graphics, and plotters.

  - COMMUNICATION DEVICES - Modems, encryption equipment, special interfaces, and error control.

  - STORAGE DEVICES - Includes magnetic tape (real, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories.

- TERMINALS - There are three types of terminals:

  - USER PROGRAMMABLE (also called "intelligent terminals"):

    . Single-station or standalone.

    . Multistation-shared processor.

    . Teleprinter.

    . Remote batch.

  - USER NONPROGRAMMABLE:

    . Single-station.

    . Multistation-shared processor.

    . Teleprinter.

  - LIMITED FUNCTION - Originally developed for specific needs, such as POS (point of sale), inventory data collection, controlled access, etc.

- HARDWARE SYSTEMS - Includes all processors, from microcomputers to super (scientific) computers. Hardware systems require type- or model-unique operating software to be functional, but the category excludes applications software and peripheral devices, other than main memory and processor or CPUs not provided as part of an integrated (turnkey) system.

  - MICROCOMPUTER (or personal computer or PC) - Combines all of the CPU, memory, and peripheral functions of an 8- or 16-bit computer on a chip, in the form of:

- Integrated circuit package.

- Plug-in board with more memory and peripheral circuits.

- Console--including keyboard and interfacing connectors.

- Personal computer with at least one external storage device directly addressable by CPU.

- MINICOMPUTER - Usually a 12-, 16- or 32-bit computer, which may be provided with limited applications software and support, and may represent a portion of a complete large system.

  - Personal business computer.

  - Small laboratory computer.

  - Nodal computer in a distributed data network, remote data collection network, connected to remote microcomputers.

- MAINFRAME - Typically a 32- or 64-bit computer, with extensive applications software and a number of peripherals in standalone or multiple CPU configurations for business (administrative, personnel, and logistics) applications, also called a General-Purpose Computer.

  - Large computer mainframes are presently centered around storage controllers but likely to become bus-oriented and to consist of multiple processors (CPUs) or parallel processors; they are intended for structured mathematical and signal processing, and are generally used with general-purpose von-Newmann-type processors for system control.

. Supercomputer mainframes are high-powered processors with numerical processing throughout that is significantly greater than the largest general-purpose computers, with capacities in the 10-50 MFLOPS (million floating point operations per second) range, in two categories:

- REAL TIME - Generally used for signal processing.

- NONREAL TIME - For scientific use, with maximum burst-mode (but sustained speed) capacities of up to 100 MFLOPS, in one of three configurations:

  . Parallel processors.

  . Pipeline processors.

  . Vector processors.

- Newer supercomputers--with burst modes approaching 300 MFLOPS, main storage size up to 10 million words, and on-line storage in the one-to-three gigabyte class--are also becoming more common.

- EMBEDDED COMPUTER - Dedicated computer system designed and implemented as an integral part of a weapon or weapon system, or platform, that is critical to a military or intelligence mission, such as command and control, cryptological activities, or intelligence activities. Characterized by MIL SPEC (military specification) appearance and operation, limited but reprogrammable applications software, and permanent or semipermanent interfaces. May vary in capacity from microcomputers to parallel-processor computer systems. Information services forecasts in this report do not include applications for this type of computer.

D. TELECOMMUNICATIONS

- NETWORKS - Interconnection services between computing resources. Provided on a leased basis by a vendor, to move data and/or textual information from one or more locations to one or more locations.

  - COMMON CARRIER NETWORK (CCN) - Provided via conventional voice-grade circuits and through regular switching facilities (dial-up calling) with leased or user-owned modems (to convert digital information to voice-grade tones) for transfer rates between 150 and 1,200 baud.

  - VALUE-ADDED NETWORK (VAN) - (See listing under Section B, Delivery Modes.)

  - LOCAL-AREA NETWORK (LAN) - Restricted limited-access network between computing resources in a relatively small (but not necessarily contiguous) area, such as a building, complex of buildings, or buildings distributed within a metropolitan area. One of the two types:

    . BASEBAND - Voice bandwidth at voice frequencies (same as telephone, teletype system) limited to a single sender at any given moment and limited to speeds of 75 to 1,200 baud, in serial mode.

    . BROADBAND - Employs multiplexing techniques to increase carrier frequency between terminals, to provide:

      - Multiple (simultaneous) channels via FDM (Frequency Division Multiplexing).

- Multiple (time-sequenced) channels via TDM (Time Division Multiplexing).

- High-speed data transfer rate via parallel mode at rates of up to 96,000 baud (or higher, depending on media).

- TRANSMISSION MEDIA - Varies with the supplier (vendor) and with the distribution of the network and its access mode to the individual computing resource location.

  - MODE - may be either:

    . ANALOG - Typified by the predominantly voice-grade network of AT&T's DDD (Direct Distance Dialing) and by operating telephone company distribution systems.

    . DIGITAL - Where voice, data, and/or text are digitized into a binary stream.

  - MEDIA varies with distance, availability, and connectivity:

    . WIRE - Varies from earlier single-line teletype networks, to two-wire standard telephone (twisted pair) and balanced line, to four-wire full-duplex balanced lines.

    . CARRIER - Multiplexed signals on two-wire and four-wire networks to increase capacity by FDM.

    . COAXIAL CABLE - HF (High Frequency) and VHF (Very High Frequency), single frequency, or carrier-based system that requires frequent reamplification (repeaters) to carry the signal any distance.

- MICROWAVE - UFH (Ultra High Frequency) multichannel, point-to-point, repeated radio transmission, also capable of wide frequency channels.

- OPTICAL FIBER - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers, and using TDM for multichannel applications.

- SATELLITES - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but requiring suitable groundstation facilities for up- and down-link operation.

- CELLULAR RADIO - Network of fixed, low-powered two-way radios that are linked by a computer system to track mobile phone/data set units; each radio serves a small area called a cell. The computer switches service connection to the mobile unit from cell to cell as the unit moves among the cells.

E. OTHER CONSIDERATIONS

- When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint. Expenditures are then categorized according to what users perceive they are buying.

- The standard industrial classification (SIC) codes are used to define the economic activity contained in generic sectors such as process manufacturing, insurance, or transportation.

- The specific industries (and their SIC codes) included under these generic industry sectors are detailed in Exhibit A-1.

EXHIBIT A-1

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Discrete Manufacturing	23	Apparel
	25	Furniture
	27	Printing
	31	Leather
	34	Metal
	35	Machinery
	36	Electronics
	37	Transportation
	38	Scientific and Control Instruments
	39	Miscellaneous Manufacturing
Process Manufacturing	10	Metal Mining
	11	Anthracite Mining
	12	Coal Mining
	13	Oil and Gas Extraction
	14	Mining/Quarrying of Non-Metallic Minerals, except Fuels
	20	Food Products
	21	Tobacco
	22	Textile Products
	24	Lumber and Wood Products
	26	Paper Products
	28	Chemicals
	29	Petroleum
	30	Rubber and Plastics
	32	Stone, Glass, Clay
	33	Primary Metals

Continued

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Transportation	40	Railroads
	41	Local Transit
	42	Motor Freight
	43	U.S. Postal Service
	44	Water Transportation
	45	Air
	46	Pipelines
	47	Transportation Services
Utilities	49	Electric, Gas, and Sanitary
Telecommunications	48	Communications
Wholesale Distribution	50	Durable Goods
	51	Nondurable Goods
Retail Distribution	52	Building Materials, Hardware
	53	General Merchandise
	54	Food
	55	Automotive and Gas Stations
	56	Apparel
	57	Furniture
	58	Eating and Drinking
	59	Miscellaneous Retail

Continued

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Banking and Finance	60	Banks
	61	Credit Agencies
	62	Security and Commodity Brokers
	67	Holding and Investment Offices
Insurance	63	Insurance (Life, Health, Etc.)
	64	Insurance Agents
Medical	80	Health Services
Education	82	Educational Services
Services	73	Business Services (excluding information services companies themselves)
	89	Miscellaneous Services
Federal Government	N/A	As Appropriate
State and Local Government	N/A	As Appropriate

Continued

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
Other Industries	01-09	Agriculture, Forestry, and Fishing
	15-17	Construction
	65	Real Estate
	66	Combinations of Real Estate, Insurance, Loans, Law Offices
	70	Hotels, Rooming Houses, Camps, and Other Lodging Places
	72	Personal Services
	75	Automotive Repair, Services, and Garages
	76	Miscellaneous Repair Services
	78	Motion Pictures
	79	Amusement and Recreation Services, Except Motion Pictures
	81	Legal Services
	83	Social Services
	84	Museums, Art Galleries, Botanical and Zoological Gardens
	86	Membership Organizations

APPENDIX B: FORECAST DATA BASE

EXHIBIT B-1

MAINFRAME/MINI APPLICATIONS SOFTWARE PRODUCTS MARKET BY SEGMENT, 1984-1989

APPLICATION SEGMENT	U.S. USER EXPENDITURES								
	($M) 1983	83-84 GROWTH	($M) 1984	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	84-89 AAGR
INDUSTRY-SPECIFIC SEGMENTS									
DISCRETE MANUFACTURING	269	41%	378	521	718	980	1336	1820	37%
PROCESS MANUFACTURING	84	41%	119	165	225	307	421	573	37%
TRANSPORTATION	70	52%	107	155	215	298	412	567	40%
UTILITIES	19	30%	25	32	40	49	60	73	24%
TELECOMMUNICATIONS	28	32%	37	48	62	79	102	132	29%
DISTRIBUTION	249	36%	338	446	574	742	966	1556	36%
BANKING AND FINANCE	528	27%	670	920	1300	1800	2478	3350	38%
INSURANCE	282	32%	373	491	620	780	968	1185	26%
MEDICAL	138	57%	216	320	447	597	786	1020	36%
EDUCATION	15	20%	18	22	26	31	37	45	20%
SERVICES	62	37%	85	114	148	192	249	300	29%
FEDERAL GOVERNMENT	13	35%	17	24	30	36	42	50	23%
STATE AND LOCAL GOVERNMENT	21	32%	28	35	44	53	63	75	22%
OTHER INDUSTRY-SPECIFIC	64	39%	89	121	159	209	273	354	32%
SUB-TOTAL	1842	36%	2500	3415	4608	6153	8195	11099	35%
CROSS-INDUSTRY SEGMENTS									
PLANNING AND ANALYSIS	403	40%	564	756	981	1257	1582	1978	29%
ACCOUNTING	784	27%	995	1223	1445	1682	1937	2215	17%
HUMAN RESOURCES	359	25%	447	536	623	710	797	887	15%
ENGINEERING/SCIENTIFIC	127	24%	157	191	232	279	338	406	21%
EDUCATION/TRAINING	18	49%	27	39	54	75	104	143	40%
OTHER CROSS-INDUSTRY	188	17%	220	250	282	315	351	388	12%
SUB-TOTAL	1880	28%	2411	2995	3518	4318	5108	6017	20%
TOTAL APPLICATIONS SOFTWARE	3722	32%	4910	6410	8226	10471	13304	17116	28%

EXHIBIT B-2

MAINFRAME/MINI SYSTEMS SOFTWARE PRODUCTS MARKETS BY SOFTWARE TYPE, 1984-1989

	($M) 1983	83-84 GROWTH	($M) 1984	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	84-89 AAGR
SYSTEMS SOFTWARE									
APPLICATION DEVELOPMENT TOOLS	1647	29%	2125	2754	3554	4560	5820	7308	28%
SYSTEMS CONTROLS	903	24%	1123	1403	1745	2159	2658	3220	23%
DATA CENTER MANAGEMENT	630	21%	762	925	1116	1337	1591	1858	20%
TOTAL SYSTEMS SOFTWARE	3180	26%	4010	5082	6415	8056	10070	12386	25%

EXHIBIT B-3

MAINFRAME/MINI SOFTWARE PRODUCTS MARKET SUMMARY BY MODE, 1984-1989

	($M) 1983	83-84 GROWTH	($M) 1984	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	84-89 AAGR
APPLICATION SOFTWARE									
INDUSTRY-SPECIFIC	1842	36%	2500	3415	4608	6153	8195	11099	35%
CROSS-INDUSTRY	1880	28%	2411	2995	3618	4318	5108	6017	20%
TOTAL APPLICATION SOFTWARE	3722	32%	4910	6410	8226	10471	13304	17116	28%
SYSTEMS SOFTWARE	3180	26%	4010	5082	6415	8056	10070	12386	25%
TOTAL	6902	29%	8920	11492	14641	18527	23374	29502	27%

EXHIBIT B-4

PROFESSIONAL SERVICES MARKET
BY SERVICE TYPE, 1984-1989

PROFESSIONAL SERVICES MARKET SERVICE TYPE	($M) 1983	83-84 GROWTH	($M) 1984	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	84-89 AAGR
SOFTWARE DEVELOPMENT	5063	20%	6075	7290	8748	10585	12808	15498	21%
CONSULTING	1004	17%	1175	1387	1636	1931	2298	2757	19%
EDUCATION AND TRAINING	538	30%	700	910	1173	1502	1922	2422	28%
FACILITIES MANAGEMENT	566	12%	634	704	775	844	912	976	9%
GRAND TOTAL	7171	20%	8584	10291	12332	14862	17940	21653	20%

EXHIBIT B-5

FEDERAL GOVERNMENT PROFESSIONAL SERVICES MARKET BY SERVICE TYPE*, 1984-1989

	($M) 1983	83-84 GROWTH	($M) 1984	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	84-89 AAGR
PROFESSIONAL SERVICES									
SOFTWARE DEVELOPEMENT	696	21%	842	1020	1230	1482	1787	2157	21%
CONSULTING	274	13%	310	351	398	455	518	590	14%
EDUCATION & TRAINING	167	25%	209	268	340	425	532	669	26%
FACILITIES MANAGEMENT	453	13%	512	578	650	732	826	933	13%
SYSTEMS INTEGRATION **	500	20%	600	720	864	1036	1244	1493	20%
TOTAL	2090	18%	2473	2937	3482	4130	4907	5842	19%

* This Data is Included in Exhibit B-4.

** This category is included in the four submodes in Exhibit B-4.

APPENDIX C: RELATED INPUT REPORTS

APPENDIX C: RELATED INPUT REPORTS

ANNUAL MARKET ANALYSES

- U.S. Information Services Vertical Markets, 1984-1989
- U.S Information Services Cross-Industry Markets, 1984-1989
- U.S. Personal Computer Software Products Markets, 1984-1989
- U.S. Processing Services and Turnkey Systems Markets, 1984-1989
- U.S. Information Services Markets, 1983-1988
  - Volume I - Industry-Specific Markets
  - Volume II - Cross-Industry Markets

INDUSTRY SURVEYS

- Eighteenth Annual ADAPSO Survey of the Computer Services Industry - 1984

1984 MAPS REPORTS

- Acquisition Strategies for Information Services Firms

PROCESSING AND TURNKEY SYSTEMS MARKET

- Processing and Turnkey Systems Markets: 1984-1989
- On-Line Data Base Markets, 1984-1989
- Strategies for New Telecommunications Opportunities
- Personal-Computer-to-Mainframe Market Opportunities

- Successful RCS Strategies for the 1980s
- Systems versus Services for Small Organizations: New Decision Criteria

SOFTWARE MARKETS

- Software Products and Professional Services Markets, 1984-1989
- Market Impacts of IBM Software Strategies
- Impact of New Software Productivity Techniques
- Integrated DBMS-Applications Software
- New Trends and Opportunities in Fourth-Generation Languages
- Professional Services Opportunities for Software Product Implementation

PERSONAL COMPUTER MARKETS

- Personal Computer Software Markets, 1984-1989
- Personal-Computer-to-Mainframe Market Opportunities
- Market Opportunities for Applications Transfer to Personal Computers
- Supporting Personal Computer Software Profitably
- Pricing and Distribution of Personal Computer Software
- Software and Services for the Home Computer

OTHER 1984 REPORTS

- Annual Information Systems Planning Report, 1984

CORPORATE SYSTEMS PLANNING

- Corporate Systems Annual Planning Report
- Integrating Information Systems with Corporate Strategic Planning
- Organizing the IS Department for End-User Computing
- Data Administration Experiences and Outlook
- Large-Scale Systems Directions
  - Residual Values, Peripherals
  - Residual Value, Mid-Year Update
  - Residual Values, Mainframes

END-USER SYSTEMS PLANNING

- Office Systems Annual Planning Report
- End-User Micro-Mainframe Needs
- Executive Workstation Acceptance
- Techniques for Training and Supporting End Users
- Update on Information Centers: Value and Future Directions
- Office Systems Implementation: Approaches That Work
- Organizing End-User Departments for Information Systems

SOFTWARE PLANNING

- Software Annual Planning Report
- New Opportunities for Software Productivity Improvements
- Integrated Software Systems: Experiences and Outlook
- Impacts and Challenges of Decision Support Systems (DSS)
- Protecting the Corporate Software Investment
- Future Skill Requirements for Software Development
- End-User Software Needs and Requirements

TELECOMMUNICATIONS PLANNING

- Telecommunications Annual Planning Report
- Micro-to-Mainframe: Telecommunications
- LAN/CBX Traditional Communications: Which Approach?
- Local Area Networks: Directions and Opportunities
- Strategic and Tactical Planning Methodologies for Telecommunications
- SNA Networks: Challenges and Opportunities
- Telecommunications Interfaces for the Mid-1980s

1983 ISIP REPORTS

- Personal Computer Opportunities for RCS Vendors
- Opportunities for Engineering and Scientific Remote Computing Services Vendors
- Trends in Processing Services and Integrated Systems Pricing
- Trends in Software Products and Professional Services Pricing
- Successful Marketing Methods That Boost Sales
- Opportunities in Sales, Marketing, and Distribution Applications

OTHER 1983 REPORTS

- End-User Experiences with Fourth-Generation Languages
- Relational Data Base Management Developments
- Intercompany Electronic Information Distribution
- Application and Use of Personal Computers in Offices

MULTICLIENT STUDIES

- Decision Support Systems and Beyond
- Third-Party Maintenance: Vendor Services and Markets: 1984-1989
- Opportunities in Financial Planning Systems Markets: 1982-1987

OTHER INPUT SUBSCRIPTION PROGRAMS

- Company Analysis and Monitoring Program (CAMP) for the Information Services Industry
- Customer Service Programs (FSP)
- Information Systems Planning (ISP)
- Federal Information Systems and Services Program (FISSP)