U.S. PROCESSING / NETWORK SERVICES MARKET, 1985 - 1990

INPUT

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ABSTRACT

This report is the annual analysis and forecast of the U.S. market for information services in the processing/network services segment.

The forecast period is 1985 to 1990 and includes breakouts and analyses for on-line data bases, electronic data interchange, value-added networks, and processing services facilities management. Included for each of these segments are trends, forecasts, and the competitive environment.

Also included in the report are the forecasts for industry-specific and cross-industry expenditures as well as an analysis of future trends.

This report contains 92 pages, including 29 exhibits.

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1985-1990

CONTENTS

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1985-1990

EXHIBITS

1 INTRODUCTION

I INTRODUCTION

- This report is produced as one of a series of reports in INPUT's Processing and Systems Program module of the Market Analysis and Planning Service (MAPS). The report is provided to assist executives and management of Information Services companies in analyzing the trends and market developments that affect processing services, network services, and processing facilities management in the U.S.

A. PURPOSE OF THIS REPORT

- This report analyzes the following components of the processing/network services market:
  - Processing services (remote computing and batch services).
  - On-line data base services.
  - Value-added networks (VAN) and electronic data interchange (EDI).
  - Processing facilities management.

- The report aims at assisting vendors active in these markets in:

  - Identifying new market opportunities.

  - Isolating high-growth areas.

  - Allocating marketing and operational resources.

  - Maximizing profitability.

B. SCOPE

- This report assesses the market size of each of the foregoing market components in terms of user expenditures on noncaptive services (i.e., services that are not provided by the buyer's own corporation or a subsidiary at preferential rates and without competition).

- The report is organized as follows:

  - Section II is an Executive Summary in presentation format--one page of script for each exhibit.

  - Section II examines the total processing/network services market and its principal component: processing services.

  - Sections IV through VII examine the markets for the smaller markets, some of which are emerging (on-line data base services, EDI, VANs) and others which are established (processing FM).

  - The appendices contain the definitions of terms used and the data base of forecasts for each of the markets.

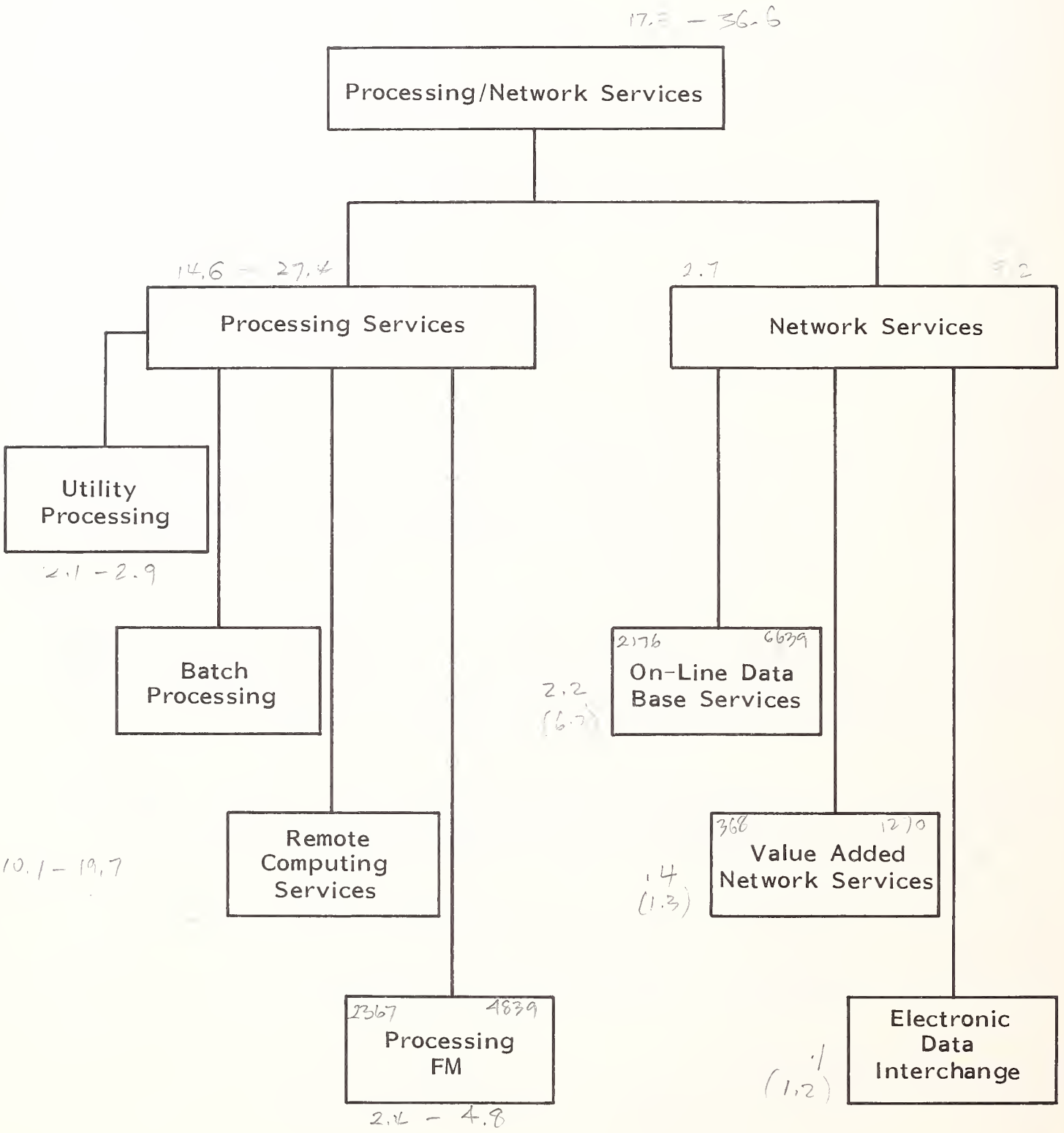
- Exhibit I-1 provides the classification system used by INPUT to structure the forecasts.

C. METHODOLOGY

- INPUT's process of forecasting is a continuous one. Two fundamental and complementary approaches are used:
  - Formal and informal interviews with decision makers of companies who are purchasers of processing/network services in each of the industries surveyed.
  - Ongoing census monitoring of all processing/network services vendors whose revenues exceed $7 million. Stratified random sampling techniques are employed to estimate the size and charge of companies smaller than $7 million.
- With the data base of results and trends of the previous year in hand and the census and random sample data of the current year updates, the forecasts are generated for the next five years.
- All of the forecast numbers presented are in current dollars (i.e., each year's forecast is in dollars of that year). Inflation assumptions are as follows:
  - 1985: 3%.
  - 1986: 4%.
  - 1987: 5%.

EXHIBIT I-1

PROCESSING/NETWORK SERVICES MARKETS



- 1988: 6%.
- 1989: 6%.
- 1990: 6%.

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

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

- This year the markets included in the processing services industry have been reclassified in order to place emphasis on those areas that are rapidly emerging opportunities. For this reason, INPUT has named the global processing services marketplace "Processing/Network Services."

- This was done not only to highlight the growing importance of network services, but also to begin to delineate new growth areas such as EDI.

- The following pages are organized as a summary presentation of the entire report's contents with a page of text or script on the left describing the salient aspects of an exhibit or chart on the right. The Executive Summary extracts which accompany this volume are for distribution within the client's corporation.

- Just as some processing services markets begin to experience difficulties in growth (e.g., processing FM), new network services markets are emerging to take their place. Nevertheless the processing/network services market is beginning to experience difficulty in keeping up with the growth of other areas in the information services arena such as software (25% AAGR through 1990), professional services (20%), and even turnkey systems (19%).

A. PROCESSING/NETWORK SERVICES GROWTH WILL LAG THE INDUSTRY

- The processing/network services market grew 14% in 1985 to reach $17.3 billion, largely as a result of solid growth in the fundamental industry sectors.
  - Banking and finance - 18%.
  - Discrete manufacturing - 17%.
  - Medical - 15%.
- In addition, on-line data bases began a period of substantial growth that will lead to the tripling of the 1985 market by 1990.
- At the same time, utility processing, worth over $1.9 billion in 1985, grew barely above inflation and will continue to stagnate through 1990. With such a big component of the market not performing, the overall market growth will suffer. It is expected that the processing/network services market will grow an average of 16% to 1990.
- During the same period, the information services market will grow 20% and some markets will grow by as much as 30% per annum. Clearly, it is more necessary than ever to be precise in selecting market targets to maximize exploitation of available opportunities.

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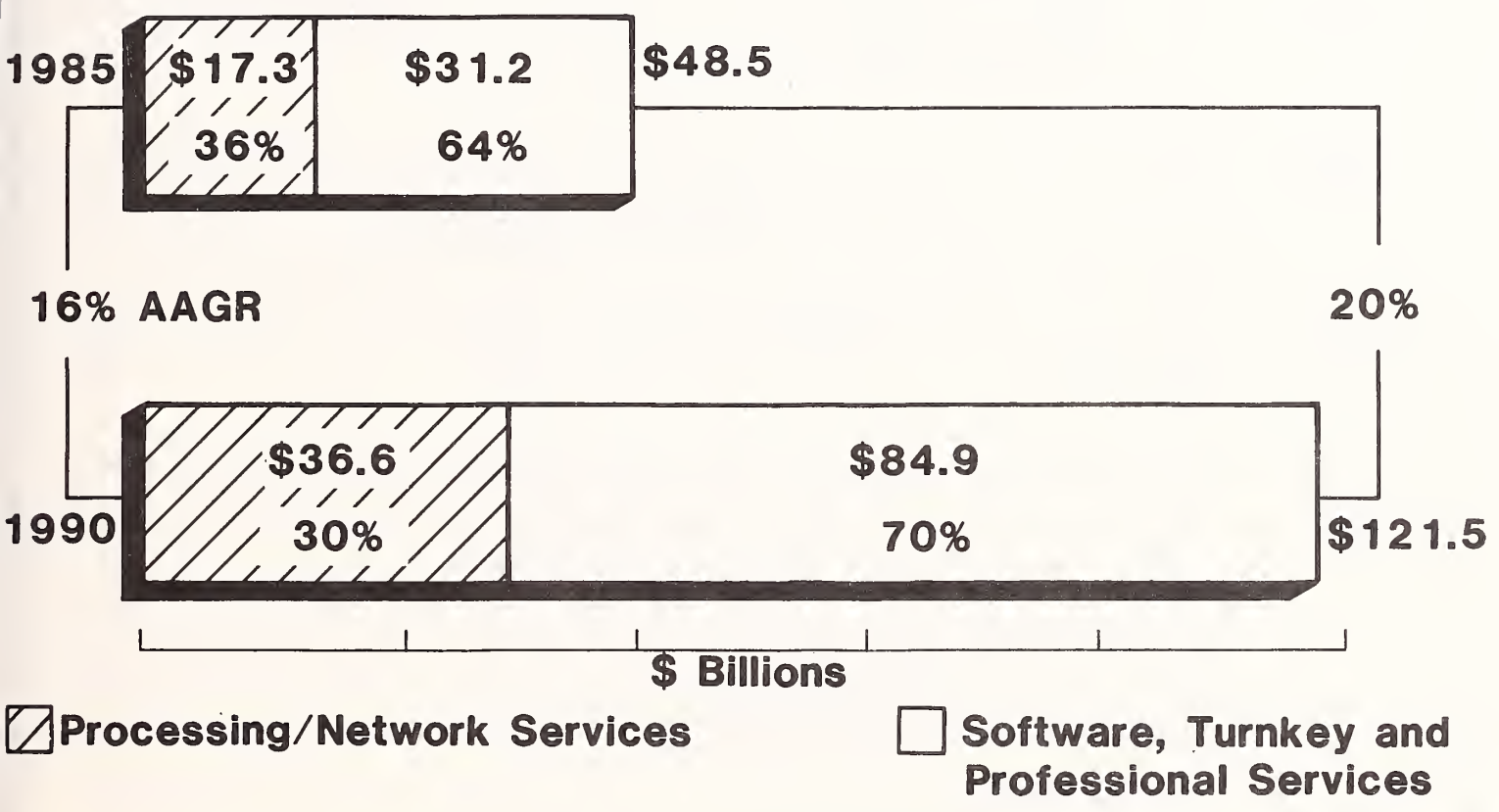
PROCESSING/NETWORK SERVICES GROWTH WILL LAG THE INDUSTRY



B. NETWORK SERVICES WILL CONTRIBUTE OVER 25% OF 1990 MARKET

- Among the examples of high-growth, high-potential opportunities developing over the next five years, network services are the most striking.

  - Electronic data interchange (EDI) will emerge from relative obscurity to produce almost as much yearly revenue as VANs by 1990.

  - Industry-specific on-line data bases will produce the lion's share of network services revenue, growing at a compound average annual growth rate of 25%.

- Electronic data interchange had a relatively small $100 million revenue base in 1985, but the explosive growth of this new media for communicating data, ideas, and results will produce over $1 billion in annual sales by 1990. This stems from a market experiencing almost 100% growth in each of the next five years.

- Industry-specific on-line data bases include stock quotation systems, precious metal data bases, and medical and chemical data bases, all of which have value for experts in narrow fields. While these vertical markets generally are quickly penetrated in terms of number of actual users versus total potential users, the ever-increasing frequency of user access to data and the increasing frequency of data revision guarantee steady growth in the revenue produced by each market.

- The combination of cheaper and more widely distributed access to a wider and wider variety of network services will expand the overall contribution of network services to 25% of the processing/network services market by 1990.

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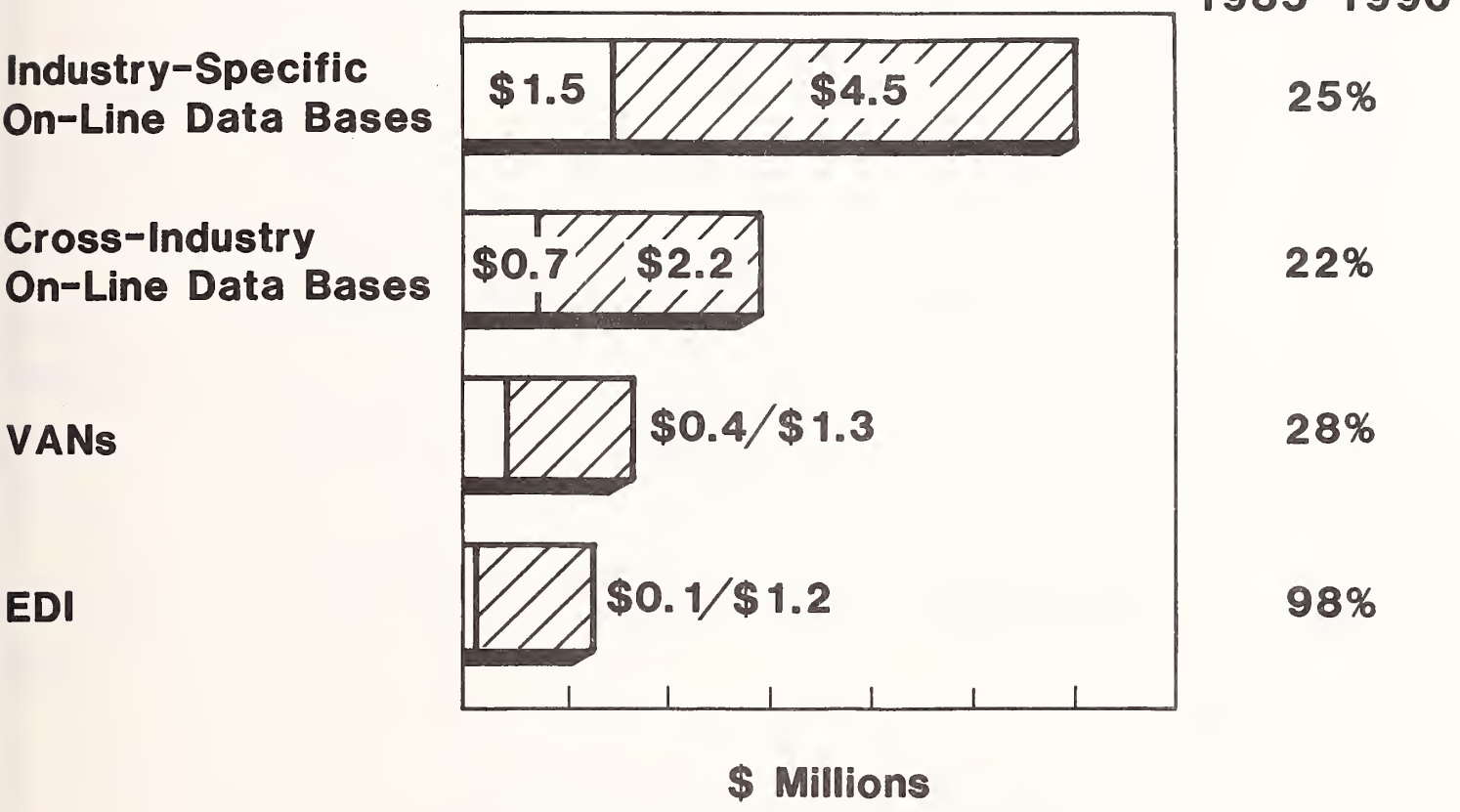
NETWORK SERVICES WILL CONTRIBUTE OVER 25% OF 1990 MARKET



C. ON-LINE DATA BASE SERVICES MAIN AREA OF GROWTH

- The main driving force behind network services are on-line data base services, which in 1985 grew 22% to reach $2.2 billion. These same services will triple in revenue over the next five years to reach over $6.6 billion of annual revenues in the U.S.

- One-third of the revenues are supplied by cross-industry services such as stock/bond/precious metals quotations, credit analysis and verification services, news data bases, etc. The remaining two-thirds are from industry-specific services, the top three of which are:

  - Banking and finance services, worth $279 million in 1985 and over $1 billion by 1990.

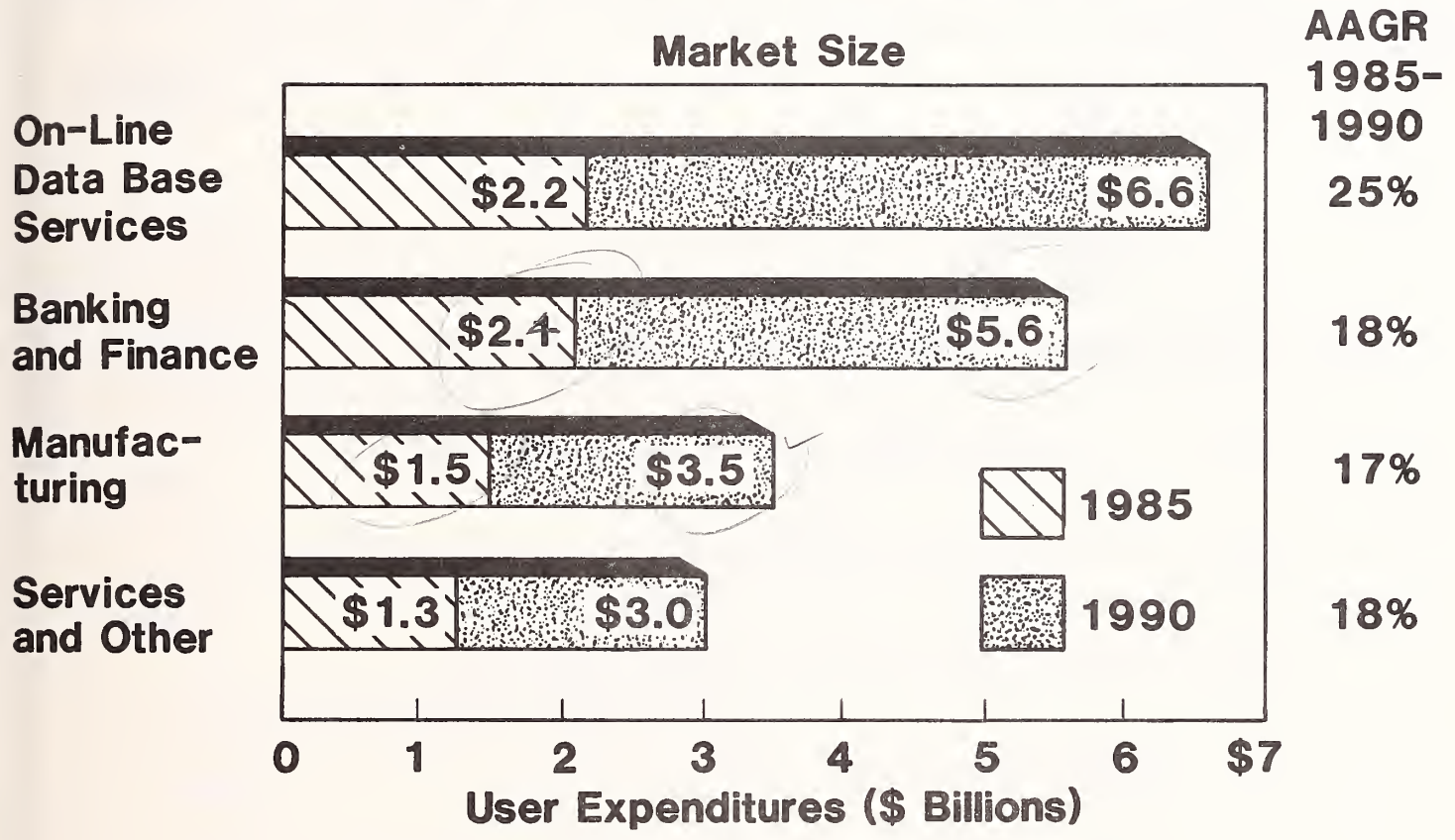
  - Services data bases (principally business services), worth $192 million in 1985 and $863 million in 1990.

  - Discrete manufacturing data bases, worth $173 million in 1985 and growing to $676 million by 1990.

- The current vendor activities in this arena have done little but scratch the surface of this vast opportunity. U.S. industry and the business and financial communities have become obsessed with information--its availability, speed of access, currency, and specificity. This will rapidly lead to a multitude of very specific, narrowly-focused data base services that cater for near-instant update of short-lived data, aimed at underpinning marketing thrusts in highly competitive markets.

- U.S. information services vendors are encouraged to seek out these high-sensitivity, high-competition arenas to maximize growth and margin.

ON-LINE DATA BASE SERVICES MAIN AREA OF GROWTH



D. ELECTRONIC DATA INTERCHANGE: EXPLOSIVE GROWTH

- Electronic data interchange is the electronic transfer of business information in a structured application environment. Typical examples include electronic purchasing, invoicing, and other routine business documents which have fixed formats and pre-established limits on the data contained.

- The cost advantage is evident--a manual document can cost as much as $50 for preparation and transmittal. EDI, on the other hand, can reduce this to $3-12. Moreover, this is the current cost level; it will rapidly decrease over the next five years.

- The advantages are not cost-related alone. Other advantages include faster response, better customer service, enhanced control, and fewer errors. The beneficiaries on the vendor side will be value-added network providers (such as GEISCO, CDC, AT&T, IBM's INS) and remote computing services vendors (such as Informatics General, TranSettlements, and Railinc).

- Exhibit II-4 shows how the market will evolve over the next five years.

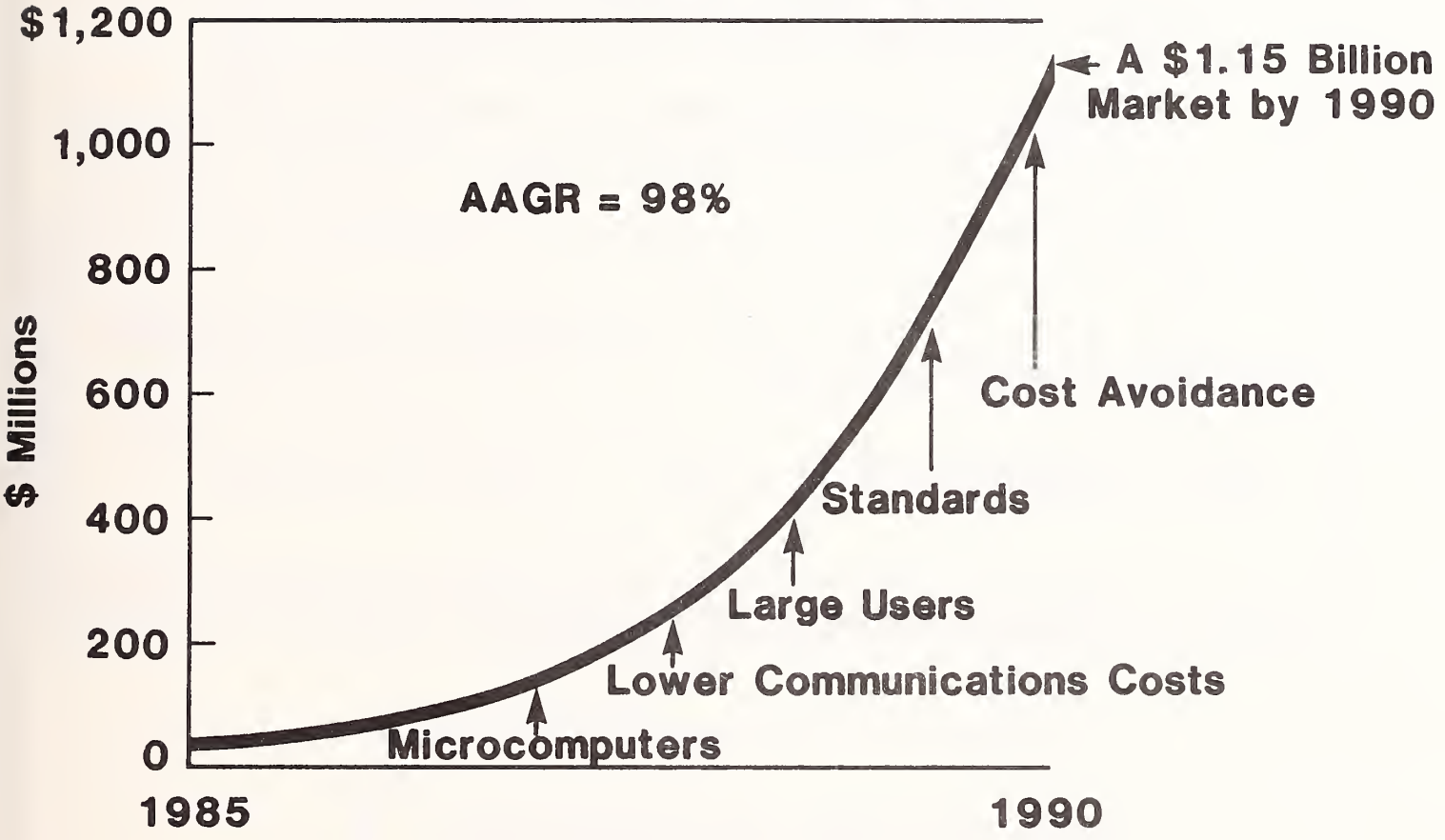
  - An astonishing 98% average annual growth rate.

  - A $1 billion plus market by 1990.

  - Transaction volume from 80 million in 1985 to 2.8 billion by 1990.

- This is a market that processing/network services vendors cannot afford to ignore--it is not often that a $1 billion opportunity this germane to mainstream operations and requiring relatively minor investment occurs. It should be capitalized on quickly.

ELECTRONIC DATA INTERCHANGE: EXPLOSIVE GROWTH



E. FOCUSED MARKETING A MUST

- Processing/network services' share of the information services market will decline from 35.7% in 1985 to 30.1% in 1990, even though many new and developing areas (particularly network services-related) will have strong growth. This is due to a strong user preference for in-house control of key applications and the continued competitive strength of turnkey systems based on more and more powerful minicomputers and microcomputers.

- The reaction of many processing services vendors has been to simply enter the competitive markets, particularly turnkey systems. The stronger response is to closely analyze the precise user needs, tailor application solutions for these needs, price them competitively with turnkey solutions, and market them to well-targeted prospect populations. All of the above call for specialized marketing incorporating:

  - Market analysis by applications.

  - Application analysis with the help of specialized consultants (preferably prospective end users of the solution).

  - Competitive analysis by application rather than by vendor.

  - Pricing by application.

  - Marketing and sales to selected vertical application prospects.

- In many instances, the knowledge required to respond to a specific applicational need may not be found in-house. External consulting from market experts must be tapped as a resource to guide the marketing program forward in these cases.

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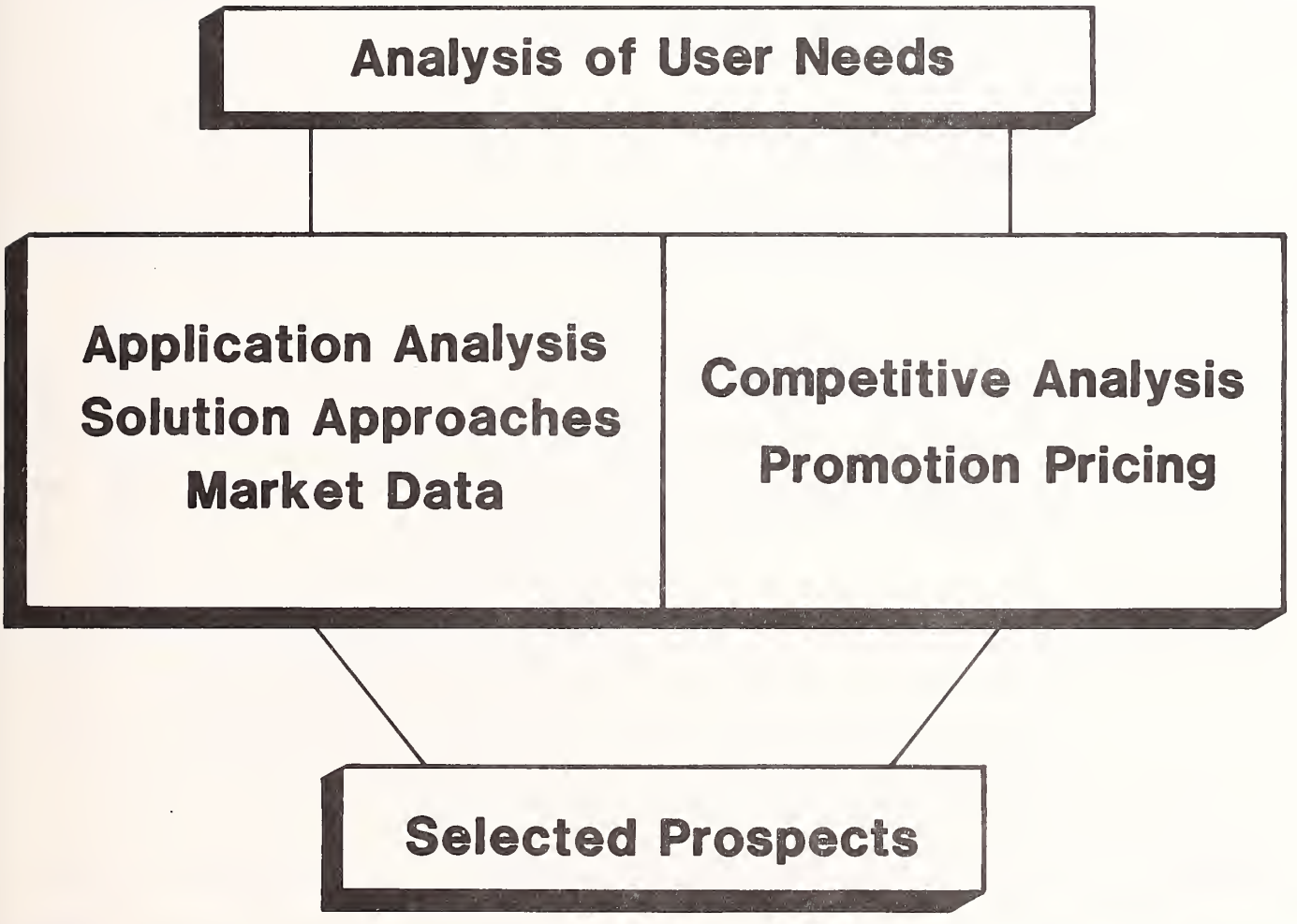
FOCUSED MARKETING A MUST



F. THE GROWING TRAINING/INTERFACE PROBLEM

- The most significant stumbling block to the rapid development of processing/network services vendors is the growing training problem; i.e., the ability of end users to absorb and implement the services offered at the speed at which vendors are capable of developing them.

- Exhibit II-6 graphically illustrates the problem:

  - Information-based services are directed to groups of experts and as such have restricted user group potential. Plus, they do not require substantial post-sales support because of the self-sufficiency of the end user.

  - Personal computing begins to open up the dialogue between vendors and unqualified or less knowledgeable end users. These users require substantial support at varying levels if the services are to be successful.

  - Network services go even further--they spread the availability of a broad variety of services to an even broader variety of end users. The principal problem here is that the vendor's control over the presentation of his services to a finite end-user type is lost.

  - The distributed systems and integrated service environment that will be in full development by 1990 will further exacerbate this training/interface problem, and those vendors who intend to be successful must address it since the rate of acceptance of their services (and therefore the growth rate of those same services) will be largely conditioned by the degree of difficulty the average end user has in using them.

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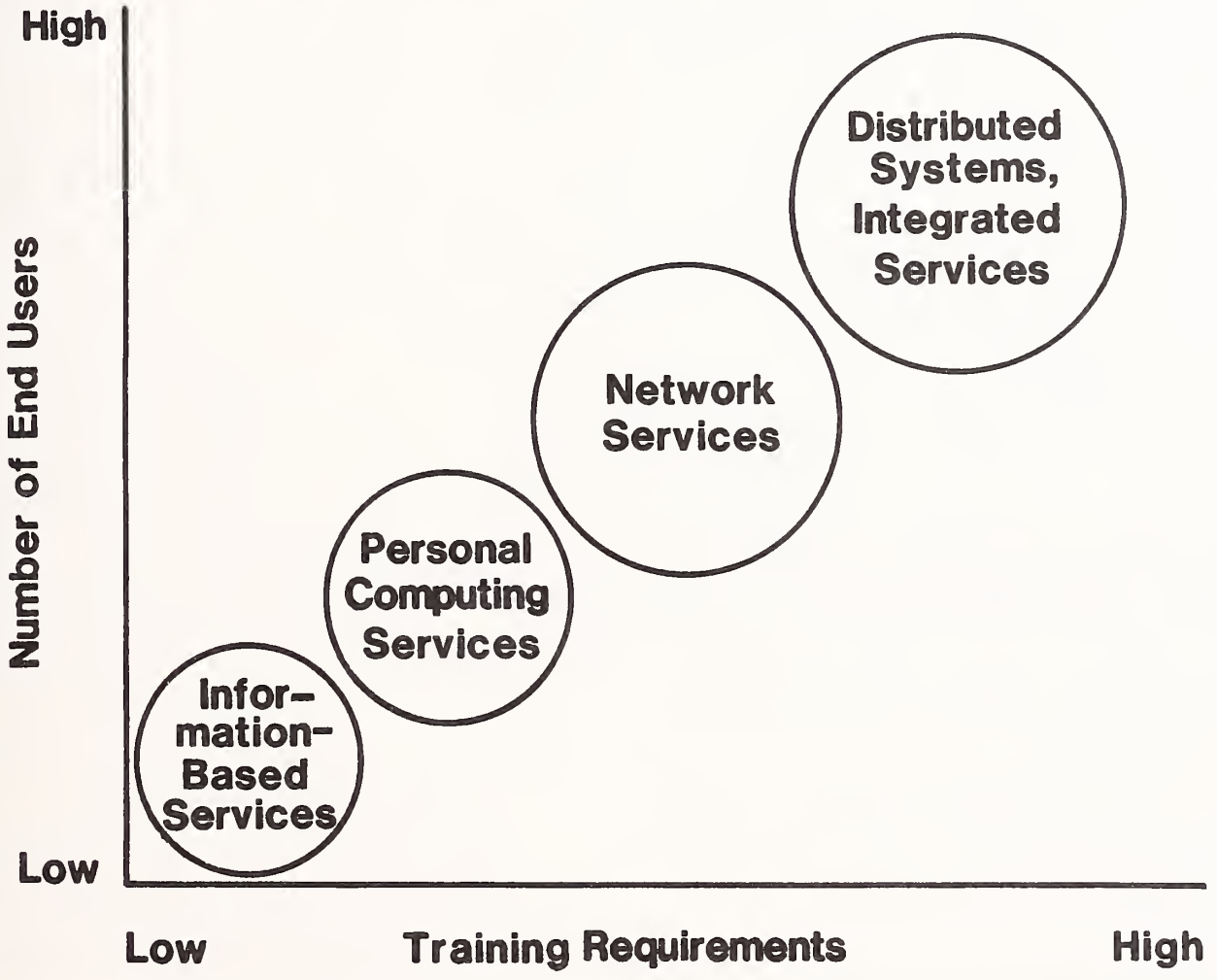
THE GROWING TRAINING/INTERFACE PROBLEM



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III PROCESSING/NETWORK SERVICES MARKET TRENDS AND GROWTH

III PROCESSING/NETWORK SERVICES MARKET TRENDS AND GROWTH

A. MARKET TRENDS OVERVIEW

- The economic backdrop for the processing/network services market has been one of uncertainty and change. First, the strong dollar had a negative impact on international sales growth for companies active outside the U.S. Within national borders, capital spending was sharply curtailed by users and spending on services suffered correspondingly.

- Whether it was a decision to purchase products or services, computer-related or not, the emphasis was the same--vendors had to demonstrate a positive impact on user profitability or productivity and the purchasing department had to demonstrate clear justification for the product or service to upper management.

- While the economy continued to expand, foreign products increased their share of the market, leaving U.S. manufacturers facing a lot of uncertainty and increased competition. As a result, 1985 was a hard year for many of the purchasers of services.

- The buying process itself became a more involved process--not only were more levels of the user corporation beginning to have a say in the decision, but more complex questions were being asked:

- How will the new service support tomorrow's organization?

- How will it integrate well with current systems and services?

- Are we certain that technological trends support the direction we are heading in or will the service be made obsolete by impending products?

- The technological issues became more complex in 1985:

  - Network products continued to offer partial solutions to basic needs and no single mainstream "norm" for common problems emerged (e.g., how should corporate PC users be integrated into existing DP systems?).

  - Manufacturers of hardware and software emphasized single-function products grouped into families rather than continuous, integrated solutions to complex problems.

  - Tentative offerings for key new areas emerged (e.g., artificial intelligence, voice/data integration, text/graphics integration) which did no more than scratch the surface of the possibilities.

- There were few breakthroughs and no clear guidelines for users to follow in the marketplace and so little progress was made and few major steps were taken. 1985 must be viewed as a transition year, a year of waiting for developments to shape the road ahead--not a year for heavy investment.

- The main problem facing users today is that there are so many options open, so many alternatives available for each problem, big or small. While the number of corporate users of processed information grows and grows, it is important to bear in mind that the investment in training required by each change in systems used also grows so that even minor changes in direction create a need for a "digestive pause," the size of which is directly proportional to the number of users affected by the change.

- For processing/network service vendors, the problem is similar: there are too many vendors offering too many products competing for the same market. Despite all of the products available, there is a scarcity of solutions. Across the board there is a lack of support infrastructure so that users find themselves on their own when it comes to installation, product use, and problem resolution.

- As if this was not enough, the distribution channels for many products are clogged by the abundance of products available so that even valid products have difficulty reaching the market.

- The implications for processing/network services are many and varied.

  - Services offered must be regularly reinforced with new features, capabilities, and price revisions because the speed of implementation and market penetration is being so slowed that the competitive posture of each service must be constantly revised.

  - The end-user training/support infrasturcture problem is essential to good market acceptance and market penetration. Each service will have its own peculiar needs which must be addressed.

  - With so much emphasis on specific solutions, product and service lines will rapidly become fragmented. It is the vendor's responsibility to find the points of commonality between the services so as to standardize hardware, interfaces, training, and documentation.

  - Product life cycles continue to contract, leading to the need for critical, ongoing management decisions on product obsolescence. It is important to be pragmatic in this regard, otherwise a backlog of out-of-date service lines can rapidly result.

B. PROCESSING/NETWORK SERVICES MARKETS, 1985-1990

- The current end-user environment into which processing/network services vendors sell is fragmented.
  - The central mainframes are relatively stable, as are the systems environments controlling them.
  - The terminals, microcomputers, and office automation environments that surround the mainframes are unstable--constantly changing in role, price, capabilities, and interconnection.
  - The network environments, both local and remote, are in a state of flux. The technology is not stable and the level of integration with on-site systems is extremely variable.
- The competitive environment is also unstable. The vendors who must be included in competitive evaluations have to be extended to nontraditional competitors. Markets which were sharply defined must now be more broadly encompassing because of:
  - Government deregulation (e.g., allowing nonbanking corporations into banking and financing markets).
  - New technology reducing costs and creating new products that challenge established service markets.
- More than ever, the objective is to deliver the right information to the right person at the right time, which many information systems managers equate with in-house, dedicated systems. The challenge for processing/network services vendors is to convince IS managers and IS users alike that the vendor's services satisfy this strategic purpose as well or better than in-house systems (e.g., by remaining competitive where in-house systems are not).

- The projections for processing/network services markets from 1985 to 1990 are provided in Exhibit III-1. The largest market (remote computing/batch services) will more than double to over $30 billion by 1990. The smallest market (value-added networks) will more than triple to $1.3 billion, achieving the greatest growth (28% average annual rate).

- Despite all of the problems, the outlook for processing/network services is good. Demand will remain relatively strong, but while some optimism is possible, not all players should be confident in their prospects. The next five years will not be a period of "business as usual."

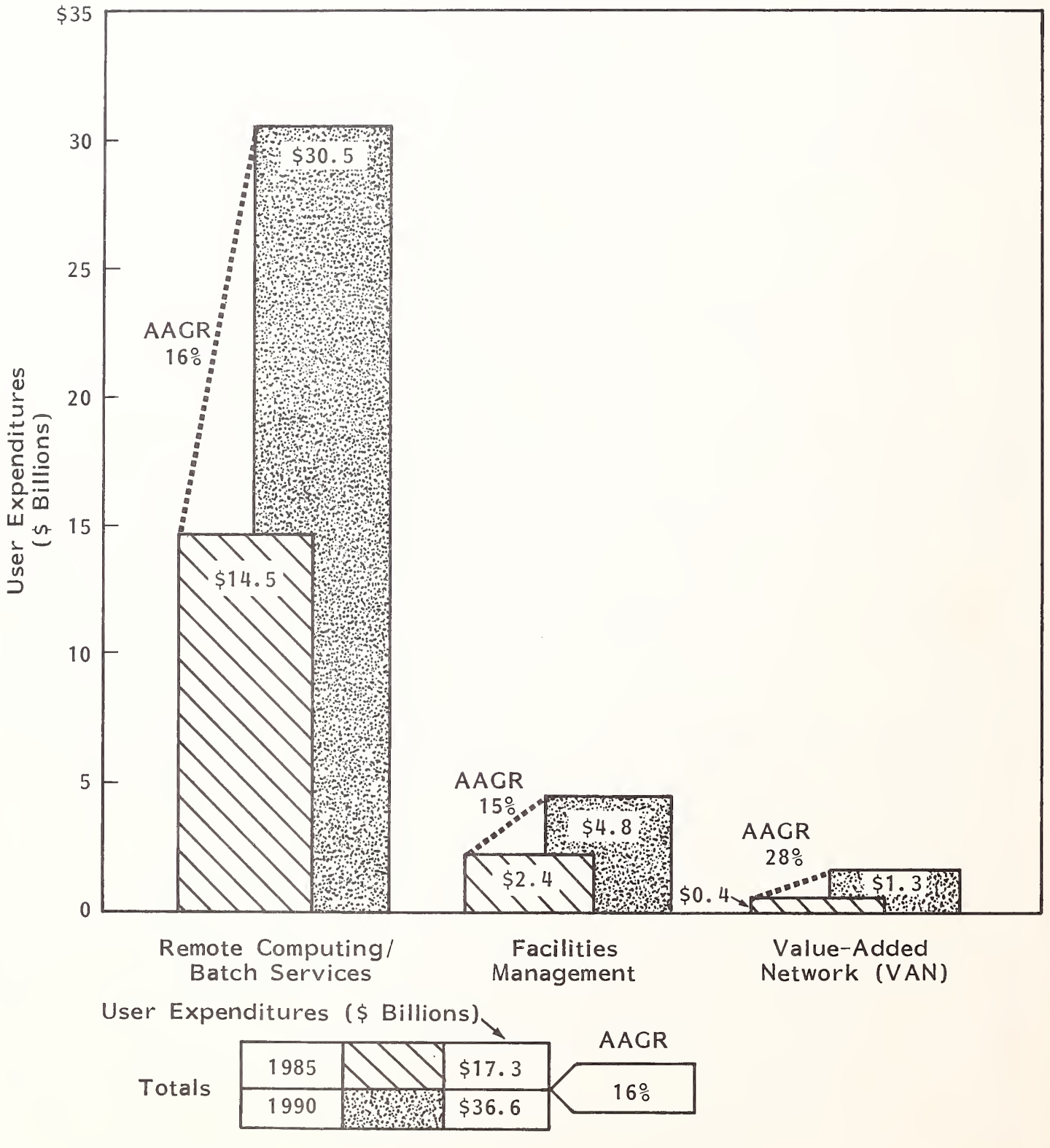
- In 1985, net income was severely impacted by a slow reaction by most vendors to a progressive deterioration in sales growth that started in 1984 and continued throughout 1985. This is not a good sign--quick, accurate reactions by processing/network services vendors management are mandatory for the future survival of any vendor.

- The combination of tackling new vertical markets, unconventional competition, rapid market evolution, and sudden technological innovation will demand very accurate planning, the ability to respond to change, and management that is capable of reversing their decisions if market conditions dictate. Only the most responsive will survive.

- The future information systems environment into which the processing/network services vendors must sell will also require connectivity planning--how do the services offered integrate themselves with the distributed information systems environment at the user site?

EXHIBIT III-1

PROCESSING/NETWORK SERVICES MARKETS, 1985-1990



C. PUBLICLY-HELD PROCESSING SERVICES GROWTH STARS

- In 1985, a number of public processing services vendors achieved the 20% double--20% or more growth in net income and 20% or more growth in revenue (see Exhibit III-2).

1. TSR INC.

- Shifting from its traditonal market of timesharing resources, TSR derived over 30% of its revenues from consulting services in 1985. Conscious of high growth opportunities, TSR already obtains 25% of its annual revenues from data base services.

- As an example of the need to concentrate on fast growth areas, TSR has successfully concentrated on the financial services marketplace. Its latest major contract, which will be a valuable contributor to future growth, was to manage the information processing of American Express' International Banking Corporation subsidiary.

2. TELERATE

- Telerate, from the beginning, has also concentrated exclusively on the financial services market and offers on-line data base services via its network of over 14,000 terminals that it has manufactured to its own specification.

- Data base services ranging from economic data to money market funds to precious metals to commodity futures and covering more than 25,000 pages of information are offered.

- Telerate is now seeking to leverage its data base offerings through agreements such as that with IMNET, a joint venture between IBM and Merrill Lynch offering communications services to the banking and financial services industry.

EXHIBIT III-2

PUBLICLY-HELD PROCESSING SERVICES GROWTH STARS

PUBLIC PROCESSING FIRMS	REVENUE GROWTH*	NET INCOME GROWTH*	1984 ANNUAL REVENUES ($ Millions)
TSR Inc.	23%	105%	$17.9
Telerate	49	28	$122.6
Cycare	40	32	40.1
Numerax	27	30	9.0

*Percentage increase for nine-month period ending September 1985, versus the same period a year earlier.

3. CYCARE

- Cycare provides information services and systems to medical centers, group practices, and HMOs. The company is the dominant supplier of processing services and turnkey systems to the ambulatory care marketplace and has consciously avoided the large hospital information services and systems marketplace.

- This market strategy has paid off, allowing Cycare to obtain substantial organized growth from existing markets. In addition, the company is pursuing a policy of acquiring regional competitors: DX and HRA, both serving physicians in New York state, and the medical division of Endata, serving physicians in Florida, were recently acquired.

- Cycare itself became sufficiently attractive to become the object of an acquisition attempt by Baxter Tavernol Laboratories which looks as though it will succeed.

4. NUMERAX

- Yet another example of specialized data base services is Numerax, which supplies tarriff information to carriers and shippers in the transportation industry. Over 30 million data items compose the data base. Going one step further than the Telerate approach, Numerax has not only provided an IBM PC-based "traffic workstation," but has integrated shipper/carrier brokerage services, private tarriff data base services, and electronic mail with the common item data base.

- Another great benefit to Numerax has been the deregulation of the transportation industry. This has put pressure on all participants in the industry to become very competitive, thereby increasing demand for on-line data base services.

D. ADP--ALL-TIME GROWTH AND REVENUE STAR

- The all-time growth and revenue gainer in the last five years has been ADP, which topped $1 billion in revenues in 1985. The company has emphasized its basic strength (payroll services) and developed services to the financial and banking community which are now producing 20% of the company's income.

- Acquisitions have been the basis for much of the growth in the past, but the company now has a substantial organic growth trend. The company has regularly delivered around 19% growth per annum to its shareholders despite its huge revenue base. Now ADP must deliver growth equivalent to a medium-sized services company each year, while retaining 90% or better of its customer base--a staggering requirement for any company.

- However, ADP is well situated to take advantage of the best growth areas in processing/network services over the next five years:

  - Commercial services: ADP has developed an array of cross-industry services such as payroll, personnel services, tax reporting services, etc. which account for over half of its revenues.

  - Network services: These include on-line dealer services to over 6,000 new car dealers, on-line estimating services to collision/repair estimators, and remote processing to the government to total over 20% of revenues.

  - Banking/financial services: Front-office and back-office services for futures/commodity brokers and batch/on-line services to over 300 commercial banks now account for 25% of revenues.

- All of these show areas of ADP organic growth potential plus the ability to penetrate related, relevant service areas that are natural adjuncts to existing

services. Some of the fastest growing new markets are natural opportunities for ADP, particularly information-based services and electronic data interchange. This should guarantee ADP growth in the region of 15% AAGR over the next five years, making the company a $2 billion plus concern by 1990.

E. PROCESSING/NETWORK SERVICES INDUSTRY-SPECIFIC AND CROSS-INDUSTRY MARKETS

- The growth rates from 1985 to 1990 of individual industry sectors vary considerably, from a low of 11% for education to a high of 22% for the state/local government. In terms of additional revenue added to the 1985 base, however, no sector matches banking and finance, which will add nearly $3.2 billion additional yearly revenues by 1990 to an already substantial $2.4 billion base.

- INPUT, in recognition of the vast potential of this marketplace, has just completed a major banking multiclient study on the enormous opportunities that can be found in this environment entitled Banking and Financial Services the Next Decade: 1985-1995.

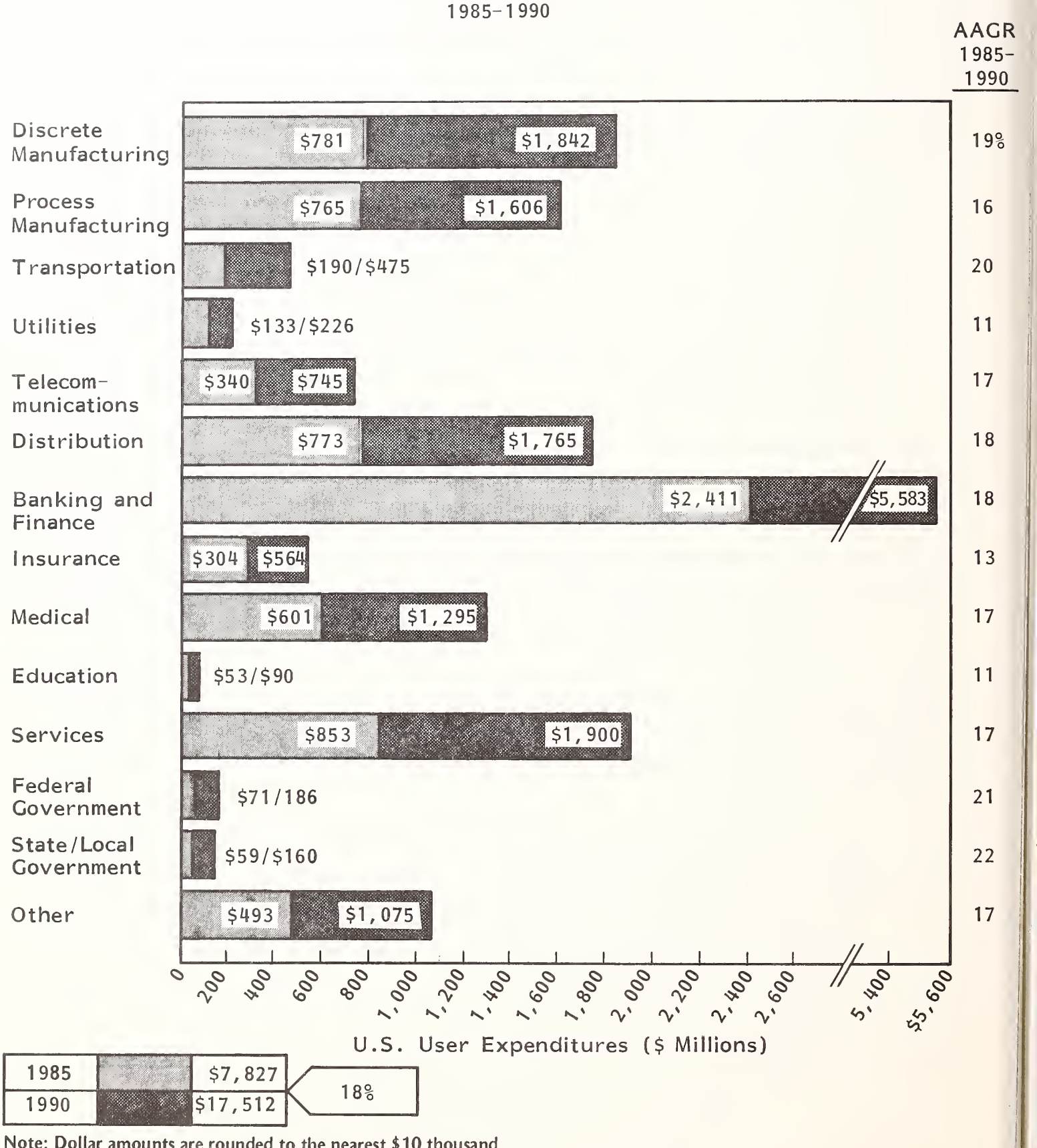
- Secondary markets of significant importance include discrete manufacturing, services, and distribution (see Exhibit III-3). Overall, industry-specific markets will grow 18% per annum between 1985 and 1990.

- Cross-industry applications markets are led by on-line data bases which show an expected 1985-1990 growth of 24% per annum. Alone, this market will add $1.4 billion of extra revenue per year by 1990. A close second are engineering and scientific services, growing at 18% per annum and which will add $1.2 billion per year by 1990.

EXHIBIT III-3

PROCESSING/NETWORK SERVICES INDUSTRY-SPECIFIC APPLICATIONS MARKETS

1985-1990



Note: Dollar amounts are rounded to the nearest $10 thousand.
Does not include on-line data base services.

- Exhibit III-4 details the other major cross-industry applications markets including the principal secondary markets of planning and analysis, accounting, and human resources. Overall, cross-industry markets will grow 17% per annum between 1985 and 1990.

F. INFORMATION-BASED SERVICES

- Not all of the information-based services have been successful: it not a panacea for market analysis and needs requirements evaluation. Even when the market need appears to be there, there is no guarantee the venture will succeed.

- In some cases, whole categories of information-based services have been unsuccessful.

  - Passive data bases that act more as storage/retrieval data bases for user-generated data than as information sources have been losers.

  - Medical data bases which may have been marketed too soon with too little specificity of purpose have also generally been unsuccessful.

- Where the information-based service is specific in purpose, success has generally followed:

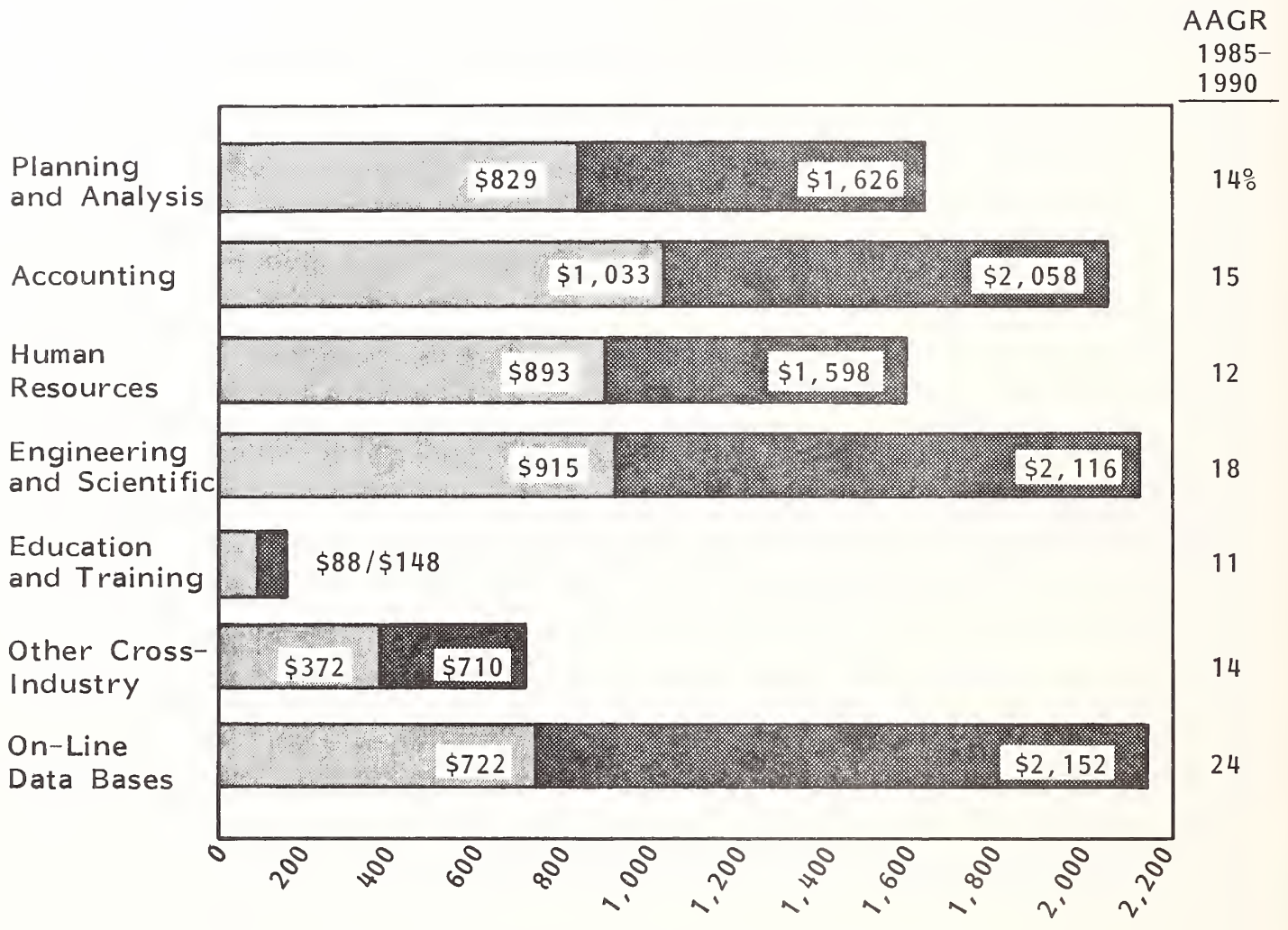
  - Quotron has established itself in the stock-quotation, transaction processing market and, despite attempts by others to unseat them, continues to progress in market share.

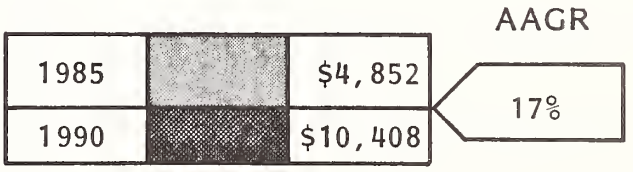
  - Telerate is also the market leader in its own field of commodity quotation, precious metals quotation, and futures quotation. It also continues to progress in market share.

EXHIBIT III-4

PROCESSING/NETWORK SERVICES CROSS-INDUSTRY APPLICATIONS MARKETS

1985-1990





- The key is not the network itself, which is only the delivery vehicle, but the uniqueness of the data and the specificity of the query capabilities. Growth is assured by organic growth and the addition of relevant, related information services.

G. FUTURE TRENDS

- The common characteristic of successful information-based services, in addition to their specific nature and the uniqueness of the data distributed, is their additive nature. That is to say, rather than attempting to replace the original information or its mode of distribution, information-based services add new insights.

- In addition, the information must be crucial to ongoing decisions and in need of constant updating. Also, if the end-user's usage of the data modifies or updates the information base in ways relevant and important to other users, a natural information-based service need has been identified.

- INPUT believes that in the future, vendors can expect to see a continued transfer of data in paper form to electronic media and of stored historical data from paper and/or electronic media to optical storage.

- Processing integration will continue. There are three types of processing: data base processing, information base processing, and knowledge base processing.

  - Data base processing is currently accomplished by mainframes and will gradually migrate to data base processors, minicomputers, and micros.

- Much of information base processing is still accomplished off-line but will gradually migrate to networks.

- Knowledge base processing is the most interactive and real time of all three types of processing and the most promising for future growth since it requires constant human interaction--the ideal usage driver.

IV ON-LINE DATA BASE SERVICES

IV ON-LINE DATA BASE SERVICES

A. MARKET TRENDS OVERVIEW

- On-line data base services reached $2.2 billion in revenues in 1985 or a 15% share of the remote computing/batch services market (see Exhibit IV-1). Since it is growing at 25% per annum, well in excess of the 16% growth of the remaining portion of the RC/BS market, the on-line data base services market will increase its share to 21% by 1990.

- The factors stimulating growth include:

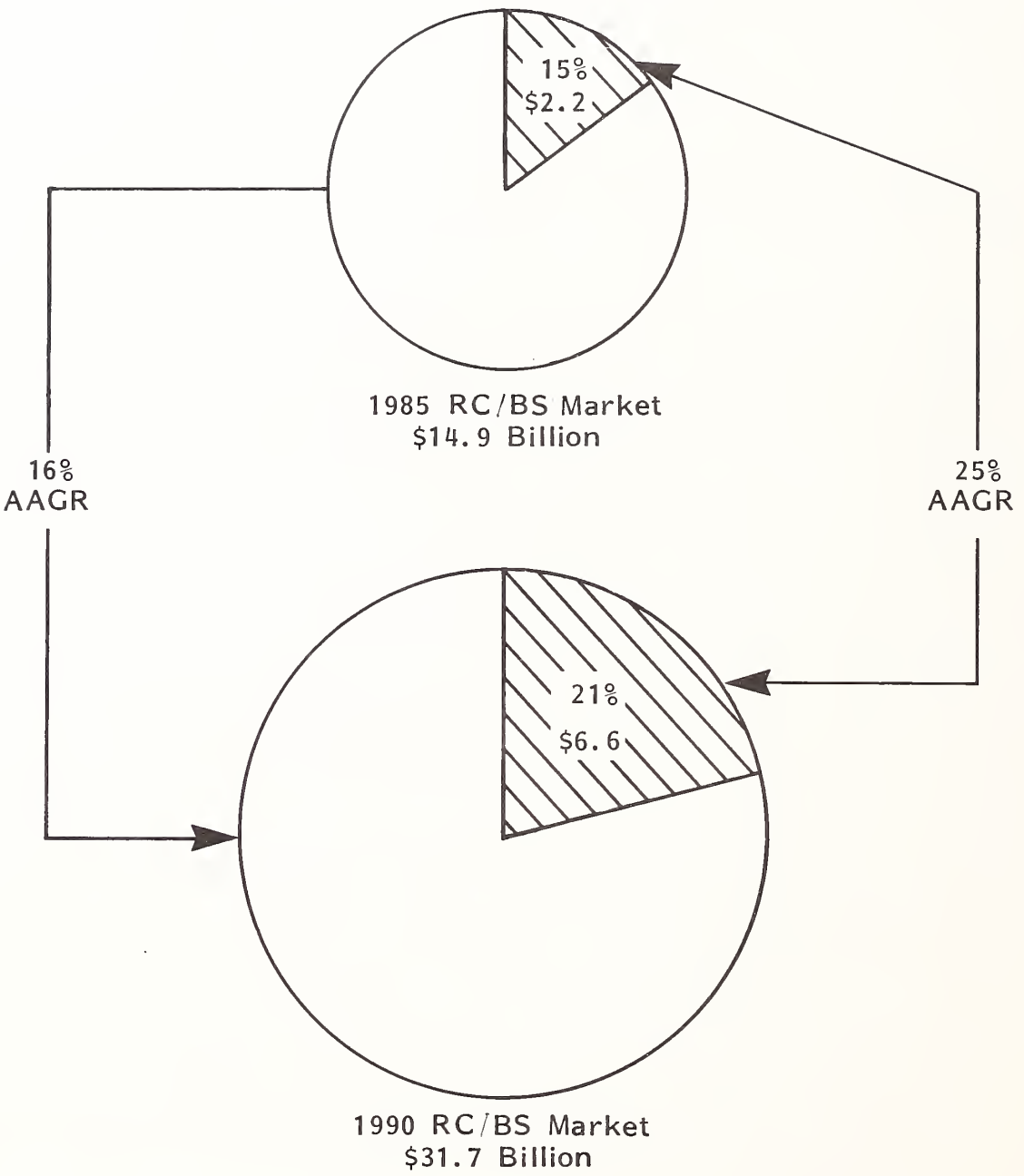
  - The rapid increase of the personal computers population, particularly those with on-line capabilities (hardware and software).

  - The aggressive thrust of data base vendors to reach and serve these personal computer users (e.g., Compuserv, Lockheed, Dun & Bradstreet).

  - The steady increase in the number of useful data bases to be accessed and their specific natures, which facilitates marketing. Text-oriented and information-oriented data bases are gradually being added to straight data-oriented data bases.

EXHIBIT IV-1

ON-LINE DATA BASE SERVICES MARKET SHARE
1985-1990



B. ON-LINE DATA BASE MARKETS, 1985-1990

- The last-mentioned factor is the most important. By matching real needs with real solutions, real markets are created and sustained. A selection of these markets is given in Exhibit IV-2, with a high number approaching $1 billion in yearly revenue by 1990.

- The largest to date has been the credit check/authorization services market which continues to grow steadily. However, these services will be rapidly overhauled by more recent data bases which are growing at faster rates including:

  - Securities and commodities bolstered by ever-increasing volume and new products such as currency futures. This market is growing at 22% per annum.

  - News data bases--the transfer of news from paper media to electronic media guarantees the growth of this market which currently is increasing at 30% per annum.

- The variety of news data bases emerging is enormous and cannot be covered here, but it is significant that the top three data base categories account for less than 50% of the total market.

- Newspaper, publishing, and communications companies are looking to carve a niche in consumer markets valued at over $10 billion by the end of the 1980s and see on-line data bases as one way to have access to this market.

  - Dow Jones is accelerating the distribution of its Dow Jones News/Retrieval Services and has already 260,000 members.

FORECAST OF USER EXPENDITURES FOR ON-LINE DATA BASE INFORMATION SERVICES BY DATA BASE TYPE
1985-1990

DATA BASE GROUP	DATA BASE TYPE	USER RCS EXPENDITURES ($ Millions)			AAGR 1985/1990 (Percent)
		1984	1985	1990	
Securities/ Financial	Securities and Commodities	$288	$360	$1,190	27%
	Financial/Economic	202	255	810	26
	Industry	70	90	280	27
	Subtotal	$560	$705	$2,280	26%
Credit	Credit	460	525	1,010	14%
Text/ Bibliographic	Bibliographic	105	123	260	16
	Legal/Accounting	125	157	480	25
	Subtotal	$230	$280	$ 740	21%
News	News	220	290	1,160	32
Other	Marketing	65	85	290	35
	Medical	25	35	190	40
	International	26	34	135	32
	Demographic	45	55	175	26
	Resources	39	50	200	28
	Real Estate	88	110	365	27
	Econometric	81	96	230	19
	Other	151	195	485	20
	Subtotal	$520	$660	$2,070	26%
Total	Total	$1,990	$2,460	$7,260	24%

- IBM, CBS, and Sears are attempting to bring video information services to consumer markets.

- Many banks are trying to develop personal banking services (so far with little success).

- On-line delivery of news/information services to the consumer is being tested by many newspaper chains.

- With the number of news data bases approaching 300, user expenditures will grow by a factor of four over the 1985-1990 period, easily outdistancing the consumer/corporate credit data base services (because such data already exists for 85% of U.S. households).

- Exhibit IV-3 shows which industry sectors hold the greatest promise. Surprisingly, the services sector will outperform the banking and finance sector, up until now the fastest growing sector.

- Legal data base services to lawyers, medical data base services to physicians and health care professionals, and real estate services to brokers are now in demand. All combine to make the services sector the most dynamic in the 1985-1990 period.

C. FORECAST OF USER EXPENDITURES FOR ON-LINE DATA BASE INFORMATION SERVICES BY INDUSTRY SECTOR

- The majority of industry sector markets show substantial growth from 1985 to 1990 (see Exhibit IV-4), but many require qualification. Those that are below $500 million must be considered suspect opportunities because all sectors are the summation of many smaller market needs so that by the time a single opportunity is isolated within that sector, it is unlikely to exceed $100 million in size by 1990.

EXHIBIT IV-3

SERVICES TO OVERTAKE BANKING AND FINANCE AS LARGEST INDUSTRY SECTOR

Forecast of On-line Data Base Information Services Markets by Industry Sector 1985-1990

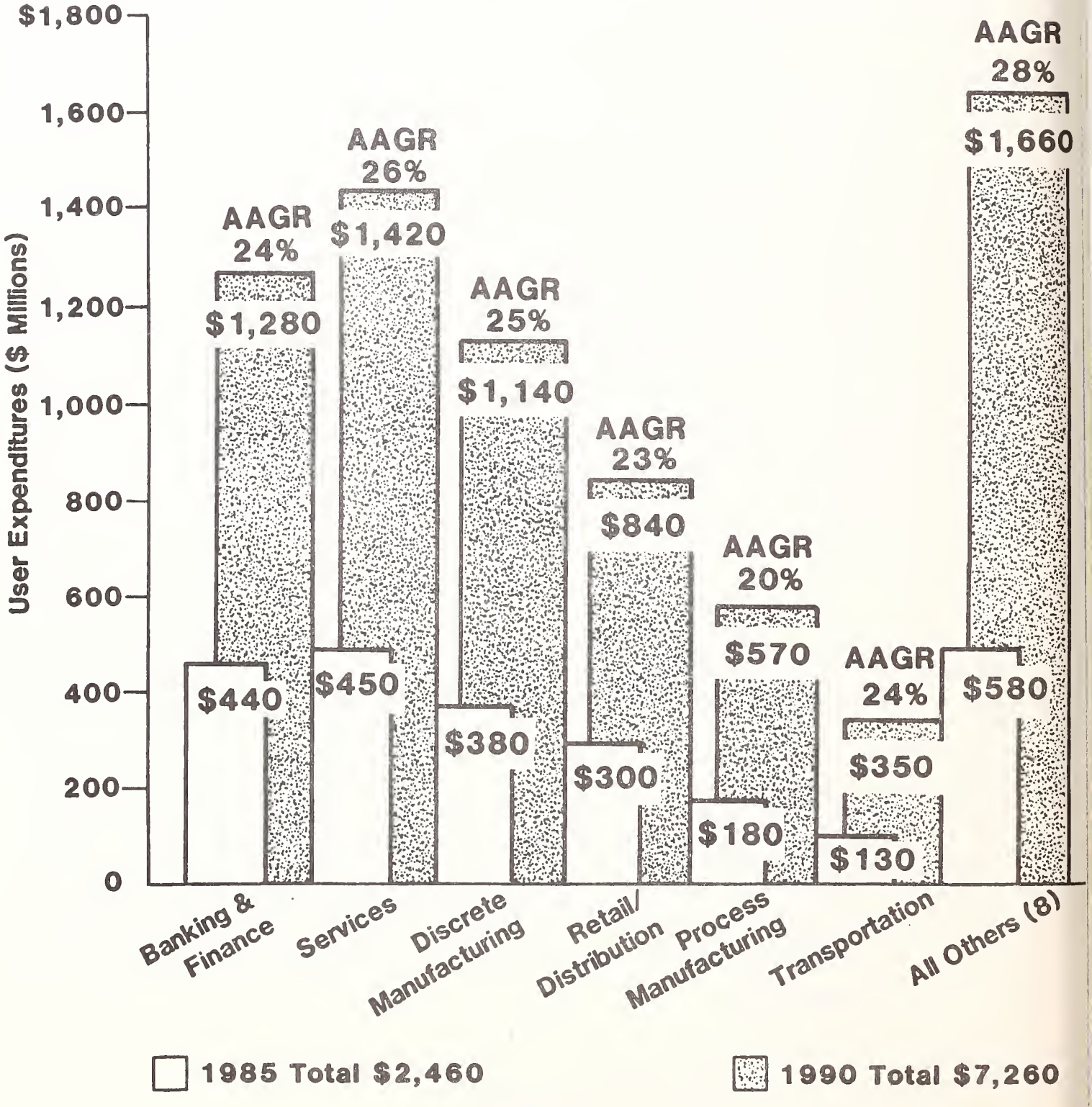


EXHIBIT IV-4

FORECAST OF USER EXPENDITURES FOR ON-LINE DATA BASE INFORMATION SERVICES BY INDUSTRY SECTOR 1985-1990

INDUSTRY SECTOR	USER RCS EXPENDITURES ($ Millions)			AAGR 1985/1990 (Percent)
	1984	1985	1990	
Banking and Finance	$ 360	$ 440	$1,280	24%
Services	356	450	1,420	26
Discrete Manufacturing	309	380	1,140	25
Retail/Distribution	242	300	840	23
Process Manufacturing	143	180	570	26
Transportation	110	130	350	22
Wholesale	81	105	310	24
Insurance	69	85	220	21
Federal Government	73	85	190	18
Medical	30	42	220	39
Education	41	48	100	16
Utilities	22	30	110	30
State/Local Government	16	20	50	20
Other	138	165	460	23
Total	$1,990	$2,460	$7,260	24%

- This eliminates many sectors from consideration, leaving only five as major targets:

  - Services, with over $1.4 billion in annual revenues by 1990 and growing at 26% in the 1985-1990 period.

  - Banking and finance, worth nearly $1.3 billion in 1990.

  - Discrete manufacturing, with nearly $1.2 billion in 1990.

  - Retail/distribution, with $840 million.

  - Process manufacturing, with $570 million.

- In each case, substantial marketing investment is needed to develop and promote a successful service targeted at a specific project group. While it is not impossible to find good opportunities outside of these five sectors, vendors must be cautious that they do not overestimate the market potential or underestimate the cost of reaching that market. A look at the distribution of the on-line data base services market amongst major vendors will demonstrate the point.

D. COMPETITIVE ENVIRONMENT

- A recent INPUT study of the on-line data base services competition shows the following:

  - Over 600 vendors active in the marketplace (far too many to survive).

  - No one vendor controls 10% of the market.

- While a vendor's total data base services revenue may total in the $50-150 million range, a single service rarely exceeds $10 million.

- Exhibit IV-5 breaks out the latest available market data by vendor and by type of data base service offered. The trends are common: most vendors are increasing the number of data bases, their size, and their complexity. User friendliness is often talked about, downward price revisions are increasing, and data base acquisitions are common as vendors attempt to secure a position in markets where entry is difficult.

- Simplification of tarriffs (as well as reductions) are frequent. The intent is to avoid discouraging users from accessing the service and to allow, where possible, easy estimates of what a particular transaction will cost before executing it.

- In the future it will be necessary to facilitate swapping from one data base to another in mid-transaction (ideally with a window holding the frozen page of the original data base while the secondary access is in progress). To date, most data bases freeze the user within the confines of one data base.

EXHIBIT IV-5

INFORMATION SERVICES VENDORS' SHARE OF ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES ($ Millions)	MARKET SHARE (Percent)
McGraw Hill/DRI/Monchik-Weber	Diversified	$ 90	
Chase/IDC	Diversified	90	
ADP	Diversified	65	
D&B/NCSS	Diversified	75	
CDC/BIS	Diversified	60	
GEISCO	Diversified	100	
NDC/Rapidata	Diversified	35	
	Subtotal	$515	25%
Quotron	Securities & Commodities	140	
ADP	Securities & Commodities	40	
Allied Information Systems	Securities & Commodities	60	
Dow Jones	Securities & Commodities	40	
	Subtotal	$280	14%
Mead Data Central	News	40	
Telerate	News	75	
Dow Jones,	News	60	
Reuters, Ltd.	News	40	
	Subtotal	$215	11%

(Continued)

EXHIBIT IV-5 (Cont.)

INFORMATION SERVICES VENDORS' SHARE OF ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES ($ Millions)	MARKET SHARE (Percent)
TRW Information Services	Credit	$ 62	
Trans Union Credit Co.	Credit	55	
EQUIFAX	Credit	63	
Telecredit	Credit	68	
Tymshare	Credit	25	
National Data Corporation	Credit	20	
Chilton Co.	Credit	30	
CSC Credit	Credit	17	
Dun & Bradstreet	Credit	115	
	Subtotal (460)	$455	22%
OCLC	Bibliographic	55	
Lockheed Information Services Company	Bibliographic	45	
SDC Information Services Co.	Bibliographic	20	
BRS	Bibliographic	12	
	Subtotal	$132	7%
Mead Data Central	Legal	95	
Westlaw Co.	Legal	35	
	Subtotal	$130	7%

(Continued)

INFORMATION SERVICES VENDORS' SHARE OF ON-LINE DATA BASE SERVICES MARKET IN 1984

DATA BASE VENDOR	DATA BASE OFFERINGS	1984 REVENUES ($ Millions)	MARKET SHARE (Percent)
Telmar Media Group	Marketing	$ 15	
Interactive Marketing	Marketing	12	
A.C. Nielsen	Marketing	30	
	Subtotal	$ 57	3%
Planning Research Corp.	Real Estate	42	
Realtron, Inc.	Real Estate	12	
Real Estate Data, Inc.	Real Estate	20	
	Subtotal	$ 74	4%
Others Diversified	Diversified	$ 135	7%
Total		$1,993	100%

V ELECTRONIC DATA INTERCHANGE

V ELECTRONIC DATA INTERCHANGE

A. MARKET TRENDS OVERVIEW

- Electronic data interchange (EDI) is defined as the electronic transfer of business information between organizations within the confines of a structured application. To date, EDI has been a limited opportunity, restricted to exchange between customers using the same remote computing service vendor. Very little cross-vendor access has been used so far.

- The growth of EDI in the processing services arena is tied to RCS vendors aggressively pursuing internetwork exchanges with appropriate hardware and software packages. Some value-added networks do offer gateways to international packet networks (e.g., X.75 standards) and IBM's Information Network Service does provide access to Telenet, but these are rare examples.

B. INTERNETWORKING - THE CLEARINGHOUSE CONCEPT

- The best example of what could develop into a network clearinghouse service is CDC's EDI service which allows users to access trading partners on other networks and services. This service, called Network Transfer Service (NTS), connects customers communicating at 2,400 to 9,600 bps.

- There are a few users so far. CDC's own Redinet (also marketed by AT&T's Accunet Packet Service) uses it, as does TransSettlements Inc. GEISCO is discussing a possible relationship which would enhance the value of the service and create a "critical mass" effect encouraging other vendors to join the group.

- Most RCS vendors so far view this possibility as undesirable because they have no wish to provide access to their users to competitors. However, as soon as the "critical mass" of network-connected users is created they will have little choice but to join the flow.

- However, if RCS vendors do not continue their efforts for the common good, they could be faced with an even more unpalatable alternative: large corporations setting up private EDI networks, aided by the Regional Bell Operating Companies and bypassing the RCS vendor community altogether.

- RCS vendors must compete for this rapidly expanding market by demonstrating the benefits of an expanding network outreach and the economies of their shared network versus the high cost of a private network. They must also be prepared to overcome the end user's concern for data security.

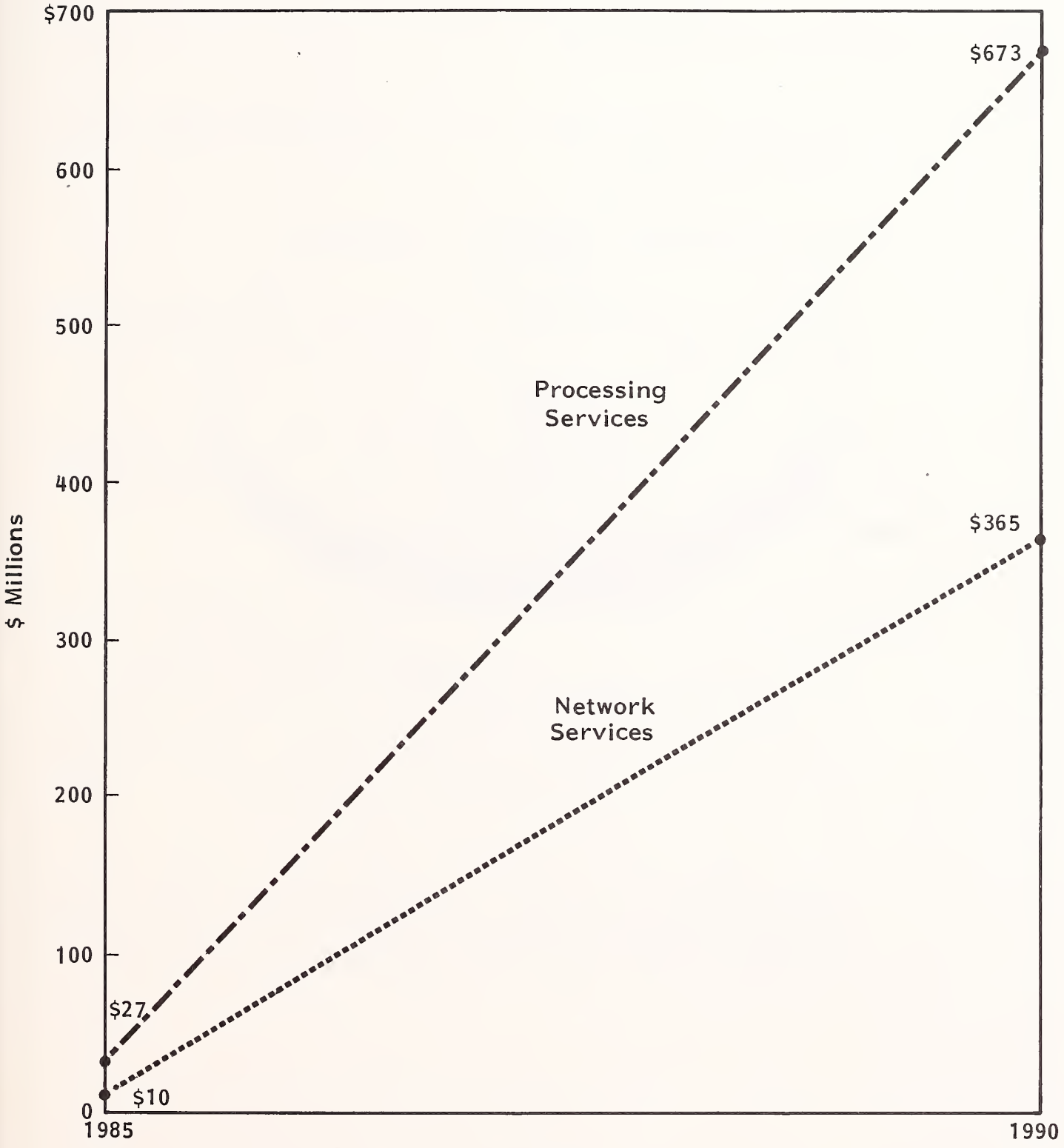
C. MARKET FORECAST, 1985-1990

- Processing/network services account for the vast majority of EDI revenues. In 1985, 96% of the tiny $38 million spent on these services were processing/network services-related, and by 1990 (when the EDI market will have grown to $1.19 billion) this percentage will remain above 90%, worth in excess of $1 billion.

- Exhibit V-1 divides the market forecast into processing services EDI and network services EDI.

EXHIBIT V-1

EDI PROCESSING/NETWORK SERVICES MARKET FORECAST
1985-1990



- Network services will grow from $10 million in 1985 to $365 million in 1990 at an annual growth rate of 105%.

- Processing services will grow from $27 million in 1985 to $673 million in 1990 at an average annual growth rate of 90%.

- Current market share leaders are:

  - Informatics General (with their Ordernet service), leading the EDI market with a 39% share.

  - GEISCO (with their EDI Express service) with 24%.

  - McDonnel Douglas (with their EDI-Net service) with a 1985 share of 20%.

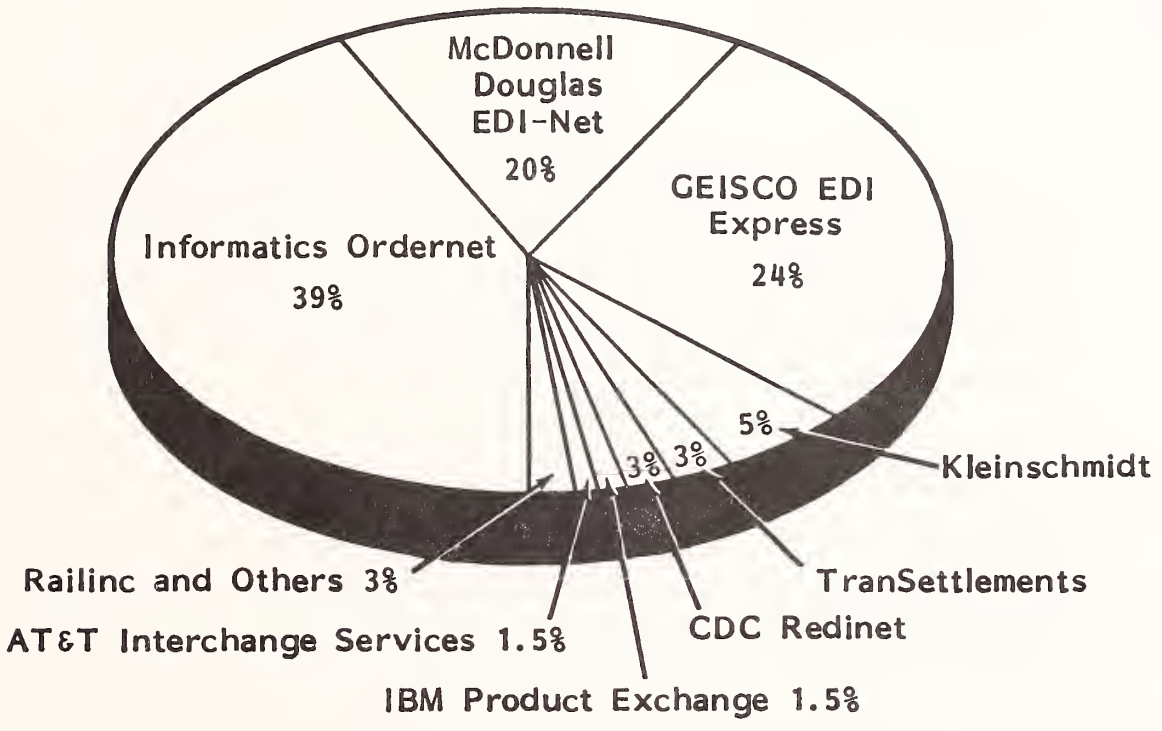
- Exhibit V-2 provides the breakdown of the current market share of major EDI market participants. The breakdown is by number of users rather than by revenue to eliminate the distortion of pricing differences.

- Opportunities for EDI abound, and many will emerge over the next five years.

  - The construction industry is an ideal example. It requires the scheduled convergence of a multiplicity of supplies from a vast array of vendors in order to create the final product. The construction industry is not currently served by a major EDI supplier.

  - Retail distribution is another vast arena where services such as automatic reordering, shipping, and invoicing could be handled via EDI, particularly in view of the current trend toward specialty stores.

CURRENT EDI MARKET SHARES BY NUMBER OF USERS



- Health care insurance processing is yet another market. The limits on Medicare/Medicaid benefits within the new, stricter guidelines imposed by the federal government offer a clear opportunity for EDI.

- As with other services, it is necessary for each processing/network services vendor to ask "Where do I fit in?" based on company skills, technical ability, and strategic goals. Such an examination should be executed forthwith because in two years time the main players will already be in place in the major markets.

D. FUTURE TRENDS

- EDI is now being implemented in a limited fashion by a number of first-tier processing/network services vendors such as GEISCO, Informatics General, McDonnell Douglas, CDC, and IBM. However, all of them are in the pre-launch stage, still defining the scope of what they want to achieve and how they will approach the market.

- The absence of internetworking is a crucial missing link for the unfettered development of the market and for encouraging users to use EDI in the same way as they use the telephone--without worrying too much about whose lines their transaction is utilizing.

- To a certain extent, EDI requires processing/network services vendors to lay their cards on the table for the competition to see. This is a difficult transition to accomplish in an industry that has flourished by being secretive, where vendors have been a success by being "first" in new markets with new services. EDI's success relies on the largest possible group of processing/network services vendors moving forward as a group, not in collusion but in open-handed interaction.

- Most of the potential of EDI can be aborted by vendors by not moving quickly enough into areas of need, thereby encouraging large users to implement private networks of their own. This will reduce the attractiveness of the market and create a standards problem which will be difficult to overcome.

VI VALUE-ADDED NETWORKS

VI VALUE-ADDED NETWORKS

A. MARKET TRENDS OVERVIEW

- The market for value-added network services has never looked stronger. Value-added network vendors such as TYMNET, Telenet, and Uninet offer on-line data base services to very large numbers of widely dispersed end users. Frequently, as many as 25,000 users are on line.

- Some vendors offer their VAN services as distribution vehicles to data base vendors. AT&T and IBM are becoming primary distribution channels for these vendors, as are GEISCO (Marknet) and ADP (Autonet).

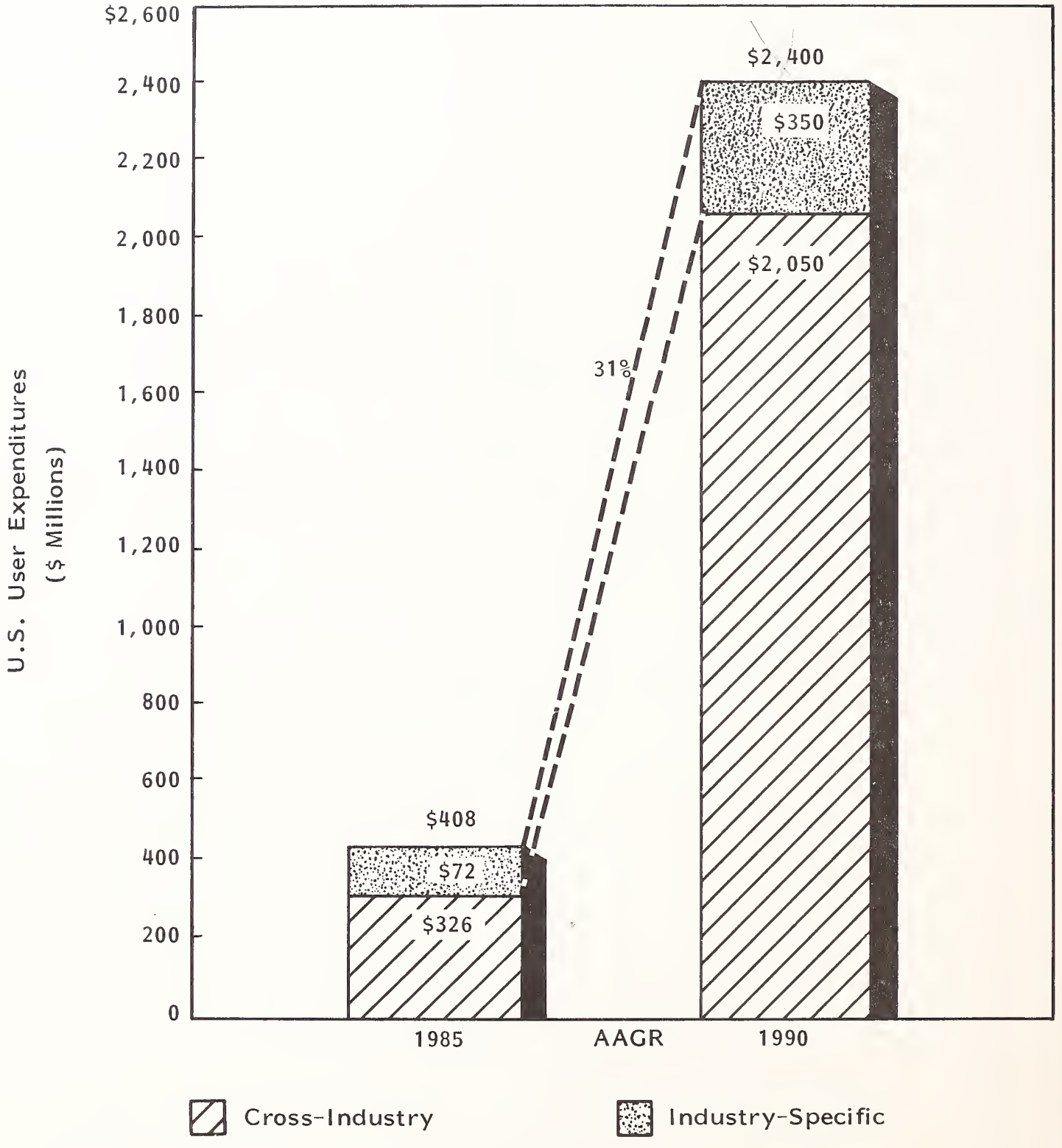
B. VAN MARKET FORECAST AND GROWTH, 1985-1990

- In 1985 the total VAN market was worth $408 million. By 1990 the market will grow to $2.4 billion, an average annual growth rate of 31% (see Exhibit VI-1).

- By far the largest share goes to cross-industry services; i.e., generic, resource/utility services serving many different industry segments. Over the next five years, the proportion of VAN services sold for industry-specific usage will contract further from 18% of the total market in 1985 to 15% in 1990.

EXHIBIT VI-1

VALUE-ADDED NETWORKS MARKET FORECAST
1985-1990



C. FUTURE TRENDS

- It is disturbing to see the VAN market tending toward nonspecific resource-oriented services. Despite enormous growth over the next five years, VAN services seem to be headed down the same path as utility batch services fifteen years ago--an initial boom to a period of gradually reduced margins to stagnant growth.

- Vendors active in VAN services would be well served to try to secure control over the source data that is transmitting over the networks. The leverage in margin terms is greatest for the data owner--the network owner will eventually be squeezed by alternate delivery methods and other network service vendors.

- Faced with a five-year period of strong growth, this may seem like a premature recommendation. However, it is advisable for VAN vendors to allocate some of the profits from the coming boom years to securing future control over the margin, rather than expecting good periods such as the 1985-1990 one to repeat themselves regularly.

VII PROCESSING SERVICES FACILITIES MANAGEMENT

VII PROCESSING SERVICES FACILITIES MANAGEMENT

A. MARKET TRENDS OVERVIEW

- The processing services facilities management market is still growing at a reasonable rate, but the market has cooled somewhat. There are several reasons for this:

  - The single largest market, banking and finance, has been severely impacted by deregulation and will continue to suffer major disruption over the forecast period. During this time of redefinition, merger, and consolidation, it will be difficult to develop major facilities management contracts.

  - The market is already a very substantial one. Growth on such a large base is difficult to achieve, not only for renewing major contracts as they come up for renewal, but for adding to them to any substantial degree.

- Nevertheless, the market for processing services facilities management is a solid one, dominated by substantial vendors well entrenched in industry-specific markets.

B. MARKET FORECAST AND GROWTH, 1985-1990

- Industry-specific markets dominate the FM market which was worth a total of $2.4 billion in 1985. Steady annual growth of 15% is expected through 1990, doubling the market's size to 4.8 billion by the end of the forecast period (see Exhibit VII-1).

C. INDUSTRY SECTOR MARKETS

- Within the largest submarket (industry-specific), four industry sectors are important.

  - Banking and finance, which is undergoing a period of dramatic change, heavy competition, and questionable profitability.

  - Medical, which is being substantially impacted by federal cutbacks and imposed limits on medical reimbursements.

  - Insurance, which is recovering from substantial losses in all sectors in 1985 and which itself will shortly be found with legislative restrictions as to the rate at which premiums can be increased.

  - Federal government, now entering a five-year austerity period as deficit reduction efforts cut expenditures in every corner of the federal government budget.

- The forecast by industry sector is given in Exhibit VII-2. None of these sectors is a boom market. Some growth will occur because it is unavoidable; some because the need to be competitive will drive end users in all major markets to implement cost-effective automation projects. But the outlook for the processing services facilities management market is one of caution.

EXHIBIT VII-1

PROCESSING SERVICES FACILITIES MANAGEMENT MARKET
1985-1990

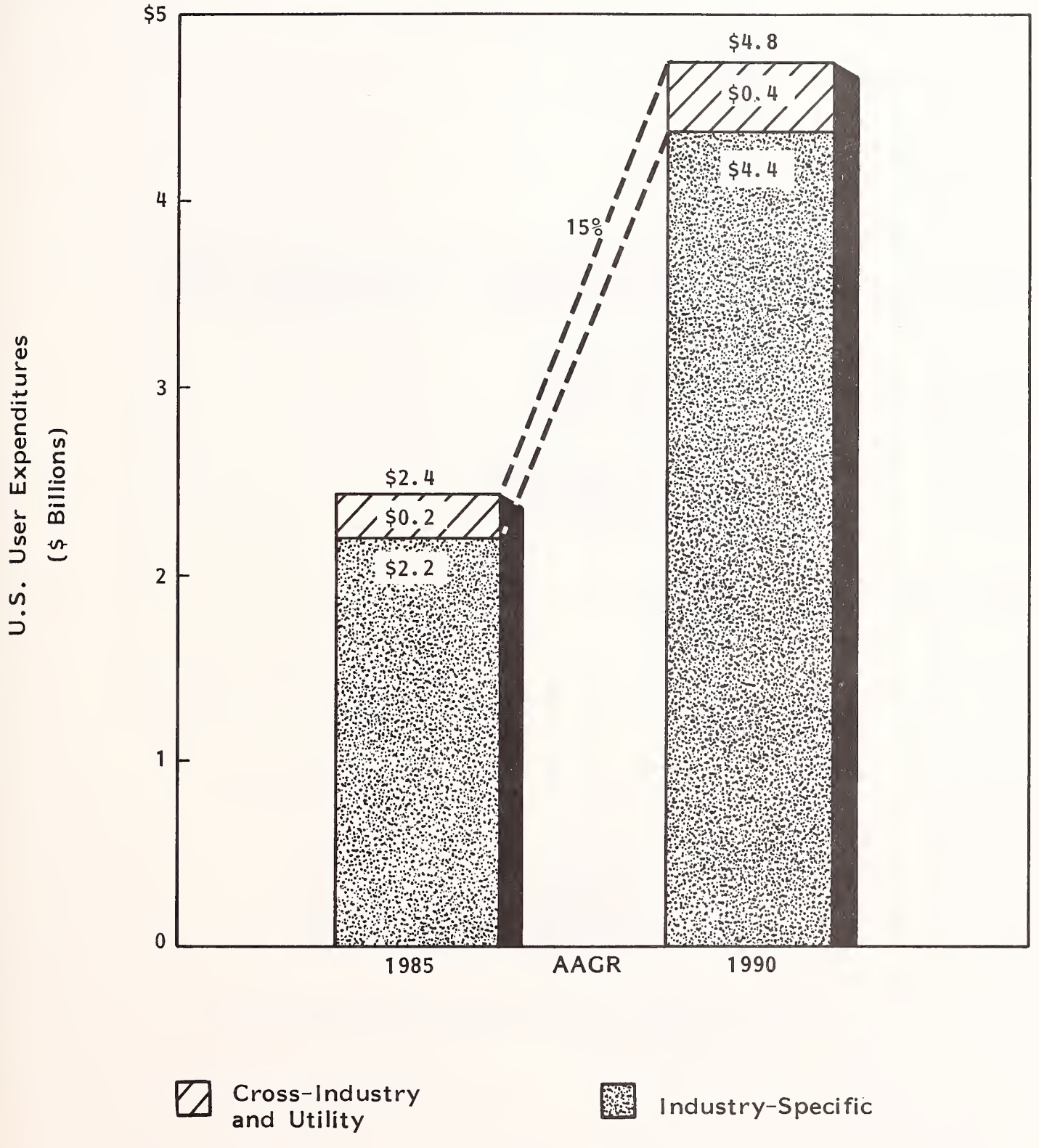
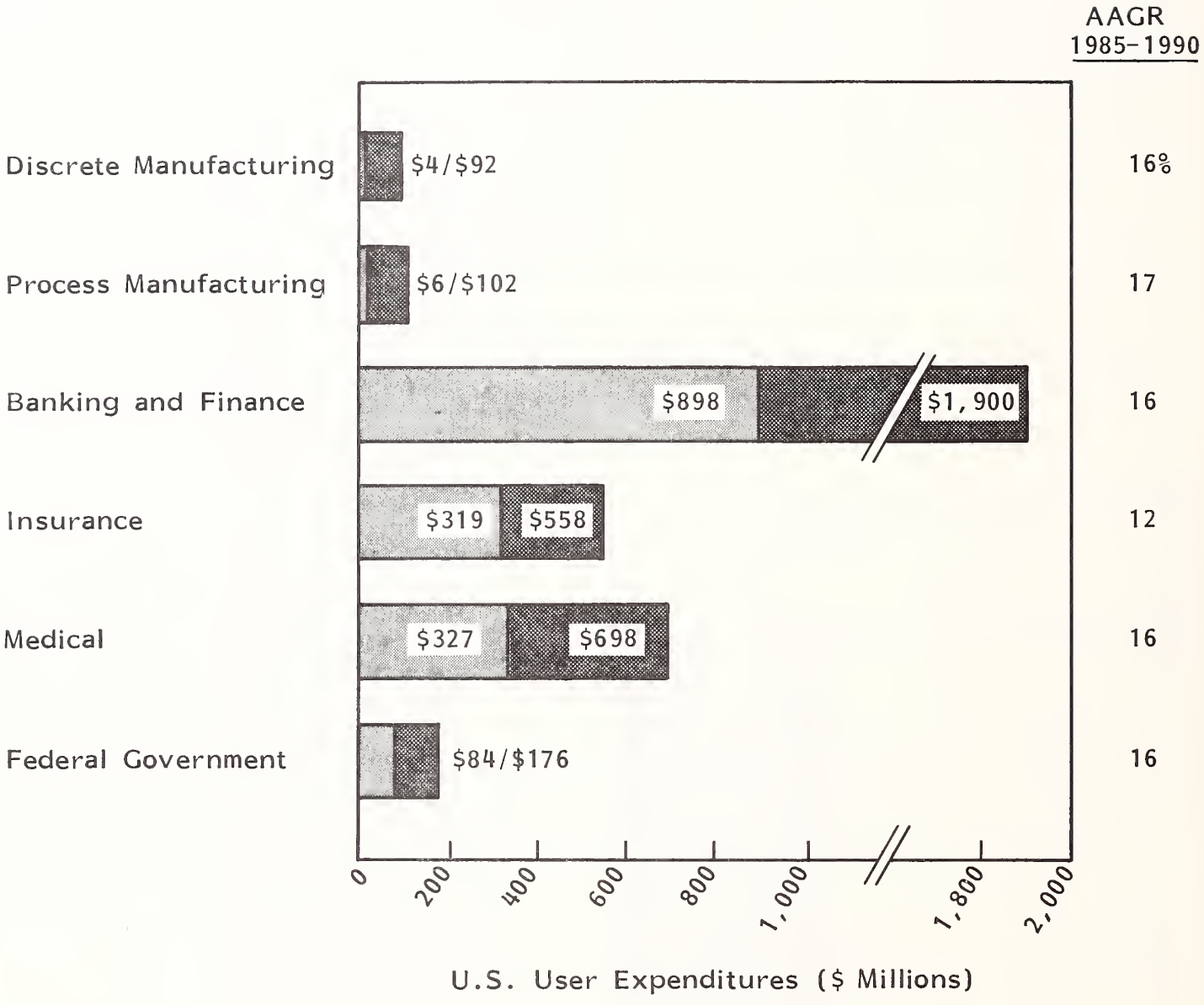
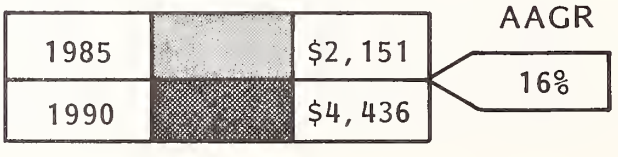


EXHIBIT VII-2

PROCESSING SERVICES FACILITIES MANAGEMENT
INDUSTRY SPECIFIC
1985-1990





Note: Dollar amounts are rounded to the nearest $10 thousand.

D. FUTURE TRENDS

- Like many other sectors of the processing/network services market, the biggest gains will be made by FM vendors who are able to seek out real needs and match them with real solutions. This requires intimate knowledge of the regulatory, operational, and competitive aspects of each of the industries that are open to FM services. Market research is therefore a key element to ongoing, rolling, five-year forecasts and plans.

- Marketing strength will determine the outcome for most vendors. It is not uncommon to see valid products failing in the market due to indifferent marketing, and it is also not uncommon to see average, unspectacular products achieving substantial market success through powerful marketing.

- The 1990 market leaders in the processing services facilities management market will be vendors who do their research homework, create knowledgeable solutions, and apply strong marketing pressure to well-selected prospect targets.

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 four 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 telecommunications 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-specific 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, communications 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 modes 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 CPU hardware and peripherals, packaged as a single applications solution. The value added by the vendor is primarily in the software and support. Most CAD/CAM/CAE 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.

  - Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors.

  - 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/CAE 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 separately 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 (reel, 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 - UHF (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/Quarying 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

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: INFORMATION SERVICES FORECAST DATA BASE

EXHIBIT B-1

TOTAL INFORMATION SERVICES MARKET FORECAST BY DELIVERY MODE, 1985-1990

SEGMENTATION BY DELIVERY MODE	($M) 1984	84-85 GROWTH	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	AAGR 85-90
REMOTE COMPUTING/BATCH									
INDUSTRY SPECIFIC	6787	15%	7827	9211	10843	12709	14943	17512	17%
CROSS INDUSTRY	4254	14%	4852	5614	6542	7659	8953	10408	16%
UTILITY PROCESSING	1789	6%	1896	2029	2171	2301	2416	2537	6%
SUBTOTAL	12830	14%	14575	16854	19556	22669	26312	30457	16%
FACILITIES MANAGEMENT									
INDUSTRY SPECIFIC	1864	15%	2151	2488	2890	3363	3865	4436	16%
CROSS INDUSTRY	57	5%	60	62	63	64	67	71	3%
UTILITY PROCESSING	142	10%	156	181	211	242	281	332	16%
SUBTOTAL	2063	15%	2367	2731	3164	3669	4213	4839	15%
TOTAL PROCESSING/NETWORK SERV.									
INDUSTRY SPECIFIC	8651	15%	9978	11699	13733	16072	18808	21948	17%
CROSS INDUSTRY	4311	14%	4912	5676	6605	7723	9020	10479	16%
UTILITY PROCESSING	1931	6%	2052	2210	2382	2543	2697	2869	7%
VANS	290	27%	368	467	595	762	982	1270	28%
TOTAL	15183	14%	17310	20052	23315	27100	31507	36566	16%
SOFTWARE PRODUCTS									
MAINFRAME/MINICOMPUTER									
INDUSTRY SPECIFIC	2248	22%	2751	3637	4810	6123	7820	9750	29%
CROSS INDUSTRY	1948	17%	2275	2808	3414	3994	4518	5087	17%
SUBTOTAL	4196	19%	5026	6445	8224	10117	12338	14837	23%
MICROCOMPUTER									
INDUSTRY SPECIFIC	352	34%	473	702	1049	1530	2125	3034	45%
CROSS INDUSTRY	1193	23%	1465	1868	2340	2786	3217	3679	20%
SUBTOTAL	1545	23%	1938	2570	3389	4316	5342	6713	32%
TOTAL APPLICATIONS SOFTWARE	5741	21%	6964	9015	11613	14433	17680	21550	25%
SYSTEMS SOFTWARE									
MAINFRAME/MINICOMPUTER	4685	19%	5569	7034	8985	11124	13284	15540	23%
MICROCOMPUTER	648	16%	753	979	1392	2034	2923	4111	40%
TOTAL SYSTEMS SOFTWARE	5333	19%	6322	8013	10377	13158	16207	19651	25%
TOTAL SOFTWARE	11074	20%	13286	17028	21990	27591	33887	41201	25%
PROFESSIONAL SERVICES									
SOFTWARE DEVELOPMENT	5307	17%	6233	7327	8723	10546	12817	15253	20%
CONSULTING	1425	20%	1717	2089	2542	3055	3676	4351	20%
EDUCATION	834	26%	1049	1329	1708	2173	2691	3352	26%
FACILITIES MANAGEMENT	660	11%	730	814	905	1000	1096	1197	10%
SYSTEMS INTEGRATION-FED	630	27%	800	984	1220	1489	1801	2162	22%
TOTAL PROFESSIONAL SERVICES	8856	19%	10529	12543	15098	18263	22081	26315	20%
TURNKEY SYSTEMS									
INDUSTRY SPECIFIC	4325	17%	5070	6017	7207	8724	10490	12646	20%
CROSS INDUSTRY	2055	13%	2327	2653	3063	3539	4135	4721	15%
TOTAL TURNKEY SYSTEMS	6380	16%	7397	8670	10270	12263	14625	17367	19%
GRAND TOTAL	41493	17%	48522	58293	70673	85217	102100	121449	20%

EXHIBIT B-2

TOTAL INFORMATION SERVICES USER EXPENDITURE FORECAST BY MARKET SECTOR, 1985-1990

SEGMENTATION	($M) 1984	84-85 GROWTH	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC SECTORS *									
DISCRETE MANUFACTURING	2573	17%	3023	3666	4458	5499	6682	7864	21%
PROCESS MANUFACTURING	1131	16%	1311	1571	1880	2265	2730	3215	20%
TRANSPORTATION	401	17%	471	581	736	937	1210	1576	27%
UTILITIES	190	11%	211	240	279	322	372	434	16%
TELECOMMUNICATIONS	508	19%	604	732	886	1068	1285	1545	21%
DISTRIBUTION	1358	16%	1579	1905	2323	2875	3551	4355	22%
BANKING AND FINANCE	4126	19%	4892	5942	7240	8612	10275	12422	20%
INSURANCE	952	13%	1073	1257	1499	1785	2090	2445	18%
MEDICAL	1456	20%	1740	2129	2603	3202	3959	4931	23%
EDUCATION	191	16%	221	264	315	375	448	534	19%
SERVICES	1126	18%	1324	1626	1996	2447	2984	3672	23%
FEDERAL GOVERNMENT	565	20%	678	794	963	1151	1367	1647	19%
STATE AND LOCAL GOVERNMENT	412	16%	476	560	662	792	943	1130	19%
OTHER INDUSTRY-SPECIFIC	587	14%	669	768	959	1119	1347	1608	19%
SUB-TOTAL	15576	17%	18272	22055	26799	32449	39243	47378	21%
PROF. SERVICES TO INDUSTRY	8856	19%	10529	12543	15098	18263	22081	26315	20%
TOTAL INDUSTRY EXPENDITURE	24432	18%	28801	34598	41897	50712	61324	73693	21%
CROSS-INDUSTRY SECTORS **									
PLANNING AND ANALYSIS	1980	19%	2360	2872	3430	3997	4573	5118	17%
ACCOUNTING	2248	15%	2588	3053	3602	4154	4688	5253	15%
HUMAN RESOURCES	1383	13%	1561	1768	2021	2285	2573	2887	13%
ENGINEERING/SCIENTIFIC	1178	17%	1377	1640	1975	2368	2809	3327	19%
EDUCATION/TRAINING	242	21%	294	363	458	578	715	904	25%
ON-LINE DATA BASES	607	19%	722	896	1120	1399	1734	2152	24%
OTHER CROSS-INDUSTRY	1869	11%	2077	2413	2816	3261	3798	4325	16%
SUB-TOTAL	9507	15%	10979	13005	15422	18042	20890	23966	17%
OTHER SECTORS									
UTILITY PROCESSING	1931	6%	2052	2210	2382	2543	2697	2869	7%
SYSTEMS SOFTWARE	5333	19%	6322	8013	10377	13158	16207	19651	25%
VANS	290	27%	368	467	595	762	982	1270	28%
GRAND TOTAL	41493	17%	48522	58293	70673	85217	102100	121449	20%

* Professional Services expenditures are included in the industry-specific category. The industry-specific detail forecast show these as seperate line items.

** Cross-industry Processing Facilities Management user expenditures are not broken down by application and are included in the 'other cross-industry' segment.

EXHIBIT B-3

TOTAL PROCESSING/NETWORK SERVICES USER EXPENDITURE FORECAST BY MARKET SECTOR

1985-1990

SEGMENTATION	($M) 1984	84-85 GROWTH	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC SECTORS									
DISCRETE MANUFACTURING	727	17%	825	977	1162	1393	1669	1934	19%
PROCESS MANUFACTURING	706	15%	811	955	1114	1306	1530	1708	16%
TRANSPORTATION	190	14%	216	248	293	348	421	508	19%
UTILITIES	132	10%	145	161	180	200	222	245	11%
TELECOMMUNICATIONS	304	18%	358	425	501	587	682	785	17%
DISTRIBUTION	725	13%	820	953	1118	1335	1605	1874	18%
BANKING AND FINANCE	2816	18%	3309	3921	4628	5428	6316	7452	19%
INSURANCE	566	10%	623	694	780	879	987	1128	12%
MEDICAL	807	15%	928	1087	1265	1464	1705	1993	17%
EDUCATION	67	7%	72	79	86	95	104	114	10%
SERVICES	739	16%	859	1027	1210	1418	1647	1912	17%
FEDERAL GOVERNMENT	136	14%	155	181	219	258	304	362	18%
STATE AND LOCAL GOVERNMENT	308	15%	355	414	486	579	686	819	18%
OTHER INDUSTRY-SPECIFIC	448	12%	502	577	691	782	930	1089	17%
SUB-TOTAL	8651	15%	9978	11699	13733	16072	18808	21948	17%
CROSS-INDUSTRY SECTORS									
PLANNING AND ANALYSIS	725	14%	829	957	1107	1281	1464	1626	14%
ACCOUNTING	922	12%	1033	1167	1330	1530	1775	2058	15%
HUMAN RESOURCES	799	12%	893	992	1111	1252	1420	1598	12%
ENGINEERING/SCIENTIFIC	790	16%	915	1084	1285	1524	1798	2116	18%
EDUCATION/TRAINING	79	11%	88	98	110	122	134	148	11%
ON-LINE DATA BASES	607	19%	722	896	1120	1399	1734	2152	24%
OTHER CROSS-INDUSTRY	389	12%	432	482	542	615	695	781	14%
SUB-TOTAL	4311	14%	4912	5676	6605	7723	9020	10479	16%
OTHER SECTORS									
UTILITY PROCESSING	1931	6%	2052	2210	2382	2543	2697	2869	7%
VALUE ADDED NETWORKS	290	27%	368	467	595	762	982	1270	28%
GRAND TOTAL	15183	14%	17310	20052	23315	27100	31507	36566	16%

EXHIBIT B-4

PROCESSING SERVICES USER EXPENDITURE FORECAST BY MARKET SECTOR
1985-1990

SEGMENTATION	($M) 1984	84-85 GROWTH	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC SECTORS									
DISCRETE MANUFACTURING	669	17%	781	926	1103	1324	1590	1842	19%
PROCESS MANUFACTURING	666	15%	765	901	1050	1231	1442	1606	16%
TRANSPORTATION	165	15%	190	221	265	318	390	475	20%
UTILITIES	121	10%	133	148	165	184	204	226	11%
TELECOMMUNICATIONS	288	18%	340	404	477	558	648	745	17%
DISTRIBUTION	685	13%	773	898	1052	1256	1511	1765	18%
BANKING AND FINANCE	2061	17%	2411	2865	3388	3978	4656	5583	18%
INSURANCE	273	11%	304	339	383	430	485	564	13%
MEDICAL	523	15%	601	708	822	945	1103	1295	17%
EDUCATION	49	8%	53	59	65	73	81	90	11%
SERVICES	734	16%	853	1020	1202	1409	1637	1902	17%
FEDERAL GOVERNMENT	62	15%	71	84	106	127	152	186	21%
STATE AND LOCAL GOVERNMENT	51	16%	59	71	85	106	127	160	22%
OTHER INDUSTRY-SPECIFIC	440	12%	493	567	680	770	917	1075	17%
SUB-TOTAL	6787	15%	7827	9211	10843	12709	14943	17512	17%
CROSS-INDUSTRY SECTORS									
PLANNING AND ANALYSIS	725	14%	829	957	1107	1281	1464	1626	14%
ACCOUNTING	922	12%	1033	1167	1330	1530	1775	2058	15%
HUMAN RESOURCES	799	12%	893	992	1111	1252	1420	1598	12%
ENGINEERING/SCIENTIFIC	790	16%	915	1084	1285	1524	1798	2116	18%
EDUCATION/TRAINING	79	11%	88	98	110	122	134	148	11%
ON-LINE DATA BASES	607	19%	722	896	1120	1399	1734	2152	24%
OTHER CROSS-INDUSTRY	332	12%	372	420	479	551	628	710	14%
SUB-TOTAL	4254	14%	4852	5614	6542	7659	8953	10408	16%
OTHER SECTORS									
UTILITY PROCESSING	1789	6%	1896	2029	2171	2301	2416	2537	6%
VALUE ADDED NETWORKS	290	27%	368	467	595	762	982	1270	28%
GRAND TOTAL	13120	14%	14943	17321	20151	23431	27294	31727	16%

EXHIBIT B-5

ON-LINE DATA BASE SERVICES USER EXPENDITURE FORECAST BY MARKET SECTOR 1985-1990

SEGMENTATION	($M) 1984	84-85 GROWTH	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC SECTORS									
DISCRETE MANUFACTURING	173	28%	221	281	354	443	549	676	25%
PROCESS MANUFACTURING	55	18%	65	92	124	161	199	245	30%
TRANSPORTATION	59	15%	68	79	92	109	127	147	17%
UTILITIES	18	17%	21	24	29	34	39	46	17%
TELECOMMUNICATIONS	104	29%	134	170	215	268	333	409	25%
DISTRIBUTION	154	23%	189	235	296	370	459	564	24%
BANKING AND FINANCE	279	24%	346	429	541	676	838	1031	24%
INSURANCE	42	29%	54	69	87	108	134	165	25%
MEDICAL	20	15%	23	27	31	37	43	50	17%
EDUCATION	19	11%	21	24	28	33	39	45	16%
SERVICES	192	20%	230	323	435	566	702	863	30%
FEDERAL GOVERNMENT	19	21%	23	29	36	45	56	69	25%
STATE AND LOCAL GOVERNMENT	6	17%	7	9	12	15	18	22	26%
OTHER INDUSTRY-SPECIFIC	43	21%	52	65	81	102	126	155	24%
SUB-TOTAL	1183	23%	1454	1856	2361	2967	3662	4487	25%
CROSS INDUSTRY SECTORS									
SECURITIES	124	24%	154	195	252	322	409	528	28%
CREDIT	192	23%	237	301	382	485	606	751	26%
TEXT/BIBLIOGRAPHY	73	12%	82	98	117	143	173	210	21%
NEWS	132	17%	154	191	239	296	364	452	24%
ECONOMIC/OTHER	86	10%	95	111	130	153	182	211	17%
SUB-TOTAL	607	19%	722	896	1120	1399	1734	2152	24%
GRAND TOTAL	1790	22%	2176	2752	3481	4366	5396	6639	25%

EXHIBIT B-6

PROCESSING FACILITIES MANAGEMENT SERVICES USER EXPENDITURE FORECAST BY MARKET SECTOR

1985-1990

SEGMENTATION	($M) 1984	84-85 GROWTH	($M) 1985	($M) 1986	($M) 1987	($M) 1988	($M) 1989	($M) 1990	AAGR 85-90
INDUSTRY-SPECIFIC SECTORS									
DISCRETE MANUFACTURING	38	16%	44	51	59	69	79	92	16%
PROCESS MANUFACTURING	40	15%	46	54	64	75	88	102	17%
TRANSPORTATION	25	4%	26	27	28	30	31	33	5%
UTILITIES	11	9%	12	13	15	16	18	19	10%
TELECOMMUNICATIONS	16	13%	18	21	24	29	34	40	17%
DISTRIBUTION	40	18%	47	55	66	79	94	109	18%
BANKING AND FINANCE	755	19%	898	1056	1240	1450	1660	1900	16%
INSURANCE	293	9%	319	355	397	449	502	558	12%
MEDICAL	284	15%	327	379	443	519	602	698	16%
EDUCATION	18	6%	19	20	21	22	23	24	5%
SERVICES	5	20%	6	7	8	9	10	12	15%
FEDERAL GOVERNMENT	74	14%	84	97	113	131	152	176	16%
STATE AND LOCAL GOVERNMENT	257	15%	296	343	401	473	559	659	17%
OTHER INDUSTRY-SPECIFIC	8	13%	9	10	11	12	13	14	9%
SUB-TOTAL	1864	15%	2151	2488	2890	3363	3865	4436	16%
CROSS INDUSTRY SECTORS	57	5%	60	62	63	64	67	71	3%
UTILITY PROCESSING SECTOR	142	10%	156	181	211	242	281	332	16%
GRAND TOTAL	2063	15%	2367	2731	3164	3669	4213	4839	15%

About INPUT

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.

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