U.S. INFORMATION SERVICES MARKETS, 1981-1986

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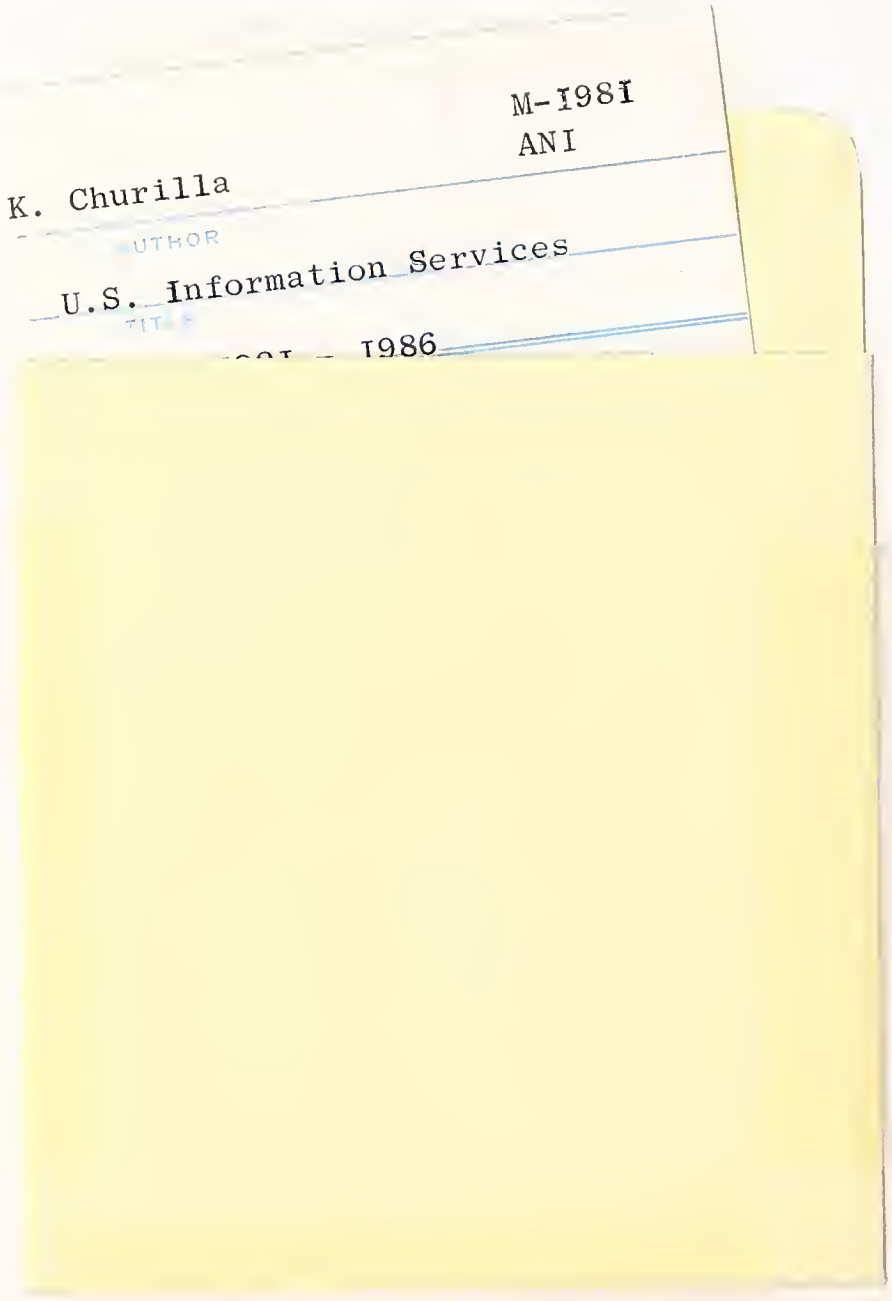
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CONTENTS

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EXHIBITS

1 INTRODUCTION

I INTRODUCTION

- This report is produced as part of the Information Services Industry Program.

- The purpose of the report is to present forecasts and analyses of user expenditures on Information Services (IS). User expenditures are presented in several ways.

- The principal presentation is by the following service modes:

  - Processing services.
    - Remote computing services (RCS).
    - Batch processing services.
    - Facilities management (PFM).
  - Software products.
    - Systems software.
    - Applications software.
  - Professional services.

. Standard services.

. Facilities management.

- The three submodes of processing services are also broken into these categories for analysis:

  - Function specific.

  - Industry specific.

  - Utility.

- The forecasts for each of the above are also presented by 14 major industry sectors.

  - Included with the Information Services industry forecast by industrial sector is a presentation of census and economic data on each industry sector drawn largely from government sources.

  - An estimate of each industrial sector size and a forecast of its growth are also included for the first time.

- The base year for forecasting is 1980. Forecasts are made for the years 1981 through 1986.

- Assumptions upon which the forecasts in part depend, such as inflation rates and economic growth, are presented and analyzed in the text.

  - The data were gathered from U.S. government and private sector sources and in some cases modified by INPUT based on its best judgement.

- These econometric forecasts may be modified to fit individual assessments of future economic conditions.

- Such forecasts are difficult in the best circumstances. In current conditions with the economic changes being conducted from Washington, the uncertainties are greater than usual.

- A major change has been made in the way the data are presented in this year's report.

  - The exhibits filled with tables of numbers that have been featured in prior editions of this report have all been placed in a data base section, Appendix B.

  - The information presented in this year's report is represented by bar or pie graphs in the exhibits.

  - INPUT hopes that the reader will find this change in presentation an improvement which is more informative.

- All data in the main body of the text have been rounded to the nearest $10 million. This has been done to reduce any implication of a degree of accuracy which is not present.

- The 1981 values for some bar graphs are not printed due to their small size and a lack of space on the exhibits. Their values are available in Appendix B, Data Base.

- Data in the data base are presented as originally estimated or calculated so as to be useful to the reader who wishes to perform his own analysis and tabulations.

- INPUT has further refined the means by which it produces the estimates and forecasts for the information services industry.

- A detailed discussion of this research and analysis methodology is presented in Appendix C.

- That appendix also contains a reconciliation of the current forecast with prior INPUT forecasts.

- The data presented in this report are based on thousands of interviews conducted during the past year with users of computers and information services as well as vendors and various industry experts. The information gathered has been analyzed and interpreted by INPUT's senior staff. The results are a distillation of that research and the expertise and experience of the staff who performed it.

- The scope of this report includes and is limited to U.S. user expenditures on noncaptive information services.

- INPUT welcomes any inquiries or comment from clients on the information presented, as well as suggestions for changes in the structure or contents of future editions of this report.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

A. MARKET SIZE AND GROWTH

- 1980 marks the beginning of a decade of dynamic growth and dramatic change in the Information Services (IS) Industry.

  - INPUT forecasts that the information services market will grow at a 24% average annual growth rate from 1981 to 1986, as shown in Exhibit II-1.

  - This growth will be the result of a demand driven marketplace.

  - The demand will come from end users seeking improvements in personal and corporate productivity.

- The primary problems the information services industry will face will be:

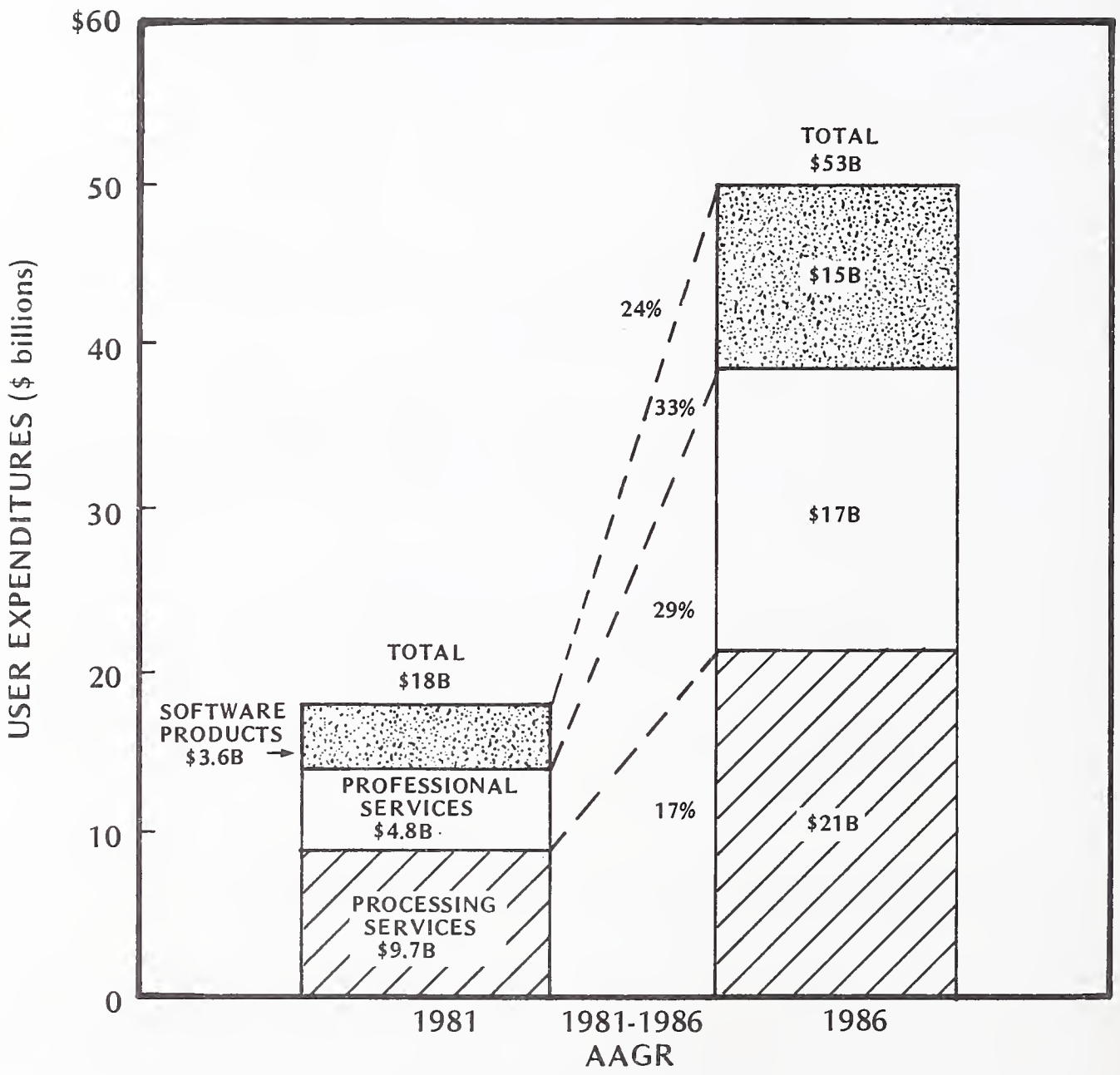
  - Increasing the number and the productivity of the skilled analysts, programmers, and other technical professionals on their staffs sufficiently to meet the demands for their services.

  - Addressing marketing issues, notably pricing methods.

  - Salesforce productivity and availability.

EXHIBIT II-1

U.S. INFORMATION SERVICES MARKET,
1981-1986



- IS companies will not only have to double the size of their professional staffs, but they will also have to double their real productivity per person by 1986.

- User expenditures will shift dramatically in the next five years among the types of information services.

  - Processing services' share of the market will decline from 54% in 1981 to 40% in 1986.

  - Software products' share will grow from 20% to 28% over the same period.

  - Professional services' share will rise from 27% to 32% at the same time.

- Professional services and software products companies, with relatively greater needs for skilled technicians than processing services companies, will have the greatest challenges in facing the productivity and personnel issues of the 1980s.

- Five years ago, in its Computer Services Industry 1976 Annual Report, INPUT, forecasting a high rate of growth through 1981, stated the following.

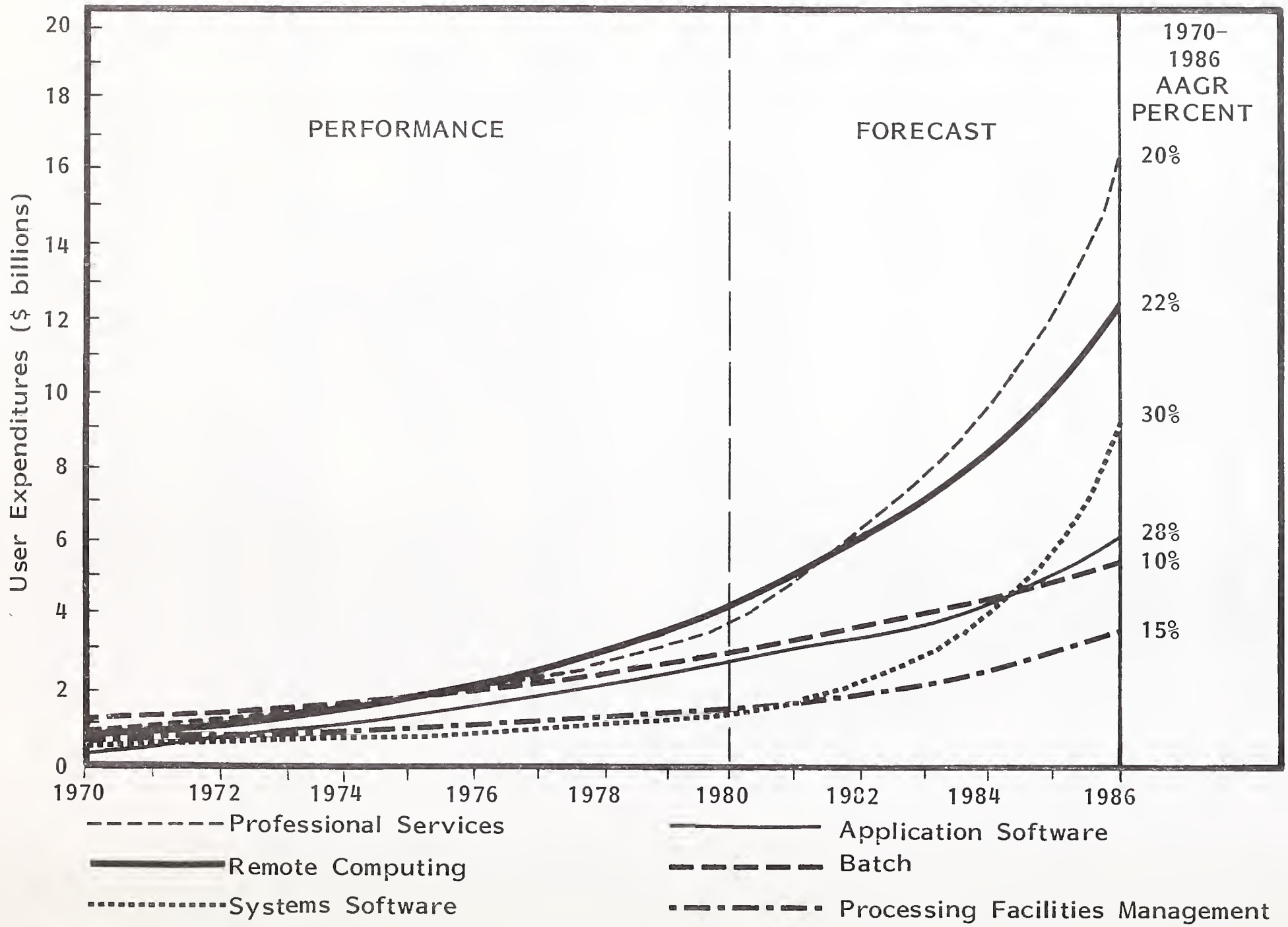
  - "The main limiting factor on the growth is the ability of vendors to acquire, train, and retain the skilled personnel needed to support the growth."

  - The IS industry was not impeded by that potential problem. INPUT predicts that the vendors in this industry will continue to meet the demands of the market in the next five years.

- Until 1980, user expenditures on systems and applications software products were lower than those for the three modes of processing services and for professional services, as shown in Exhibit II-2.

EXHIBIT II-2

INFORMATION SERVICES INDUSTRY YEARLY PERFORMANCES AND FORECAST GRAPH,
1970-1986



- In that year, systems software expenditures overtook processing facilities management (PFM) expenditures and by 1984 they will exceed batch processing expenditures.

- Applications software expenditures will follow the same track in 1981 and 1986.

- In 1980, user's highest expenditures were on remote computing services (RCS), but by 1982 more user funds will be expended on professional services.

- User expenditures will shift toward the labor intensive modes of information services (software product and professional services) and away from the capital intensive ones (processing services) in the next five years for several reasons.

  - The cost of computer hardware will decline at an accelerating rate.

  - Federal tax laws will continue to favor investments in capital equipment so users will find investing in in-house EDP equipment more attractive than in the past.

  - Unbundling of software products will provide users with more diverse options and alternatives than before.

  - The shortage of skilled programmers will cause users to buy professional services.

- But users will also find that hiring and maintaining professional staffs to program their equipment will be increasingly difficult and expensive.

  - Users will turn to packaged software products as an alternative to in-house development that is economical and productive.

- They will also turn to professional services companies for specialized software development as well as for training.

- Professional services companies will play a major role in helping companies develop new ways to utilize data processing.

  - End users will assume a larger responsibility for the implementation of systems and applications which serve their needs and reduce their dependence on in-house EDP professionals.

  - This will be possible through the use of software that is extremely user friendly.

  - The first major wave of this change is coming with the broad acceptance of the personal computer and associated software.

- Millions of businessmen, clerical persons, and professionals in the next five years will be exposed for the first time to the power and benefits of computers through direct experience with personal computers. This experience will be both happy and frustrating.

  - Happiness will arise from the relatively instant satisfaction of computerizing simple but time-consuming tasks.

  - Frustration will come from buying the wrong solution due to a lack of experience and education in the use of systems.

- An increased demand for professional services will result.

  - Major corporations will need assistance in selecting systems and software, and, more importantly, in training large numbers of people in diverse locations in the use of the systems.

- Small businesses will recognize that wrong systems decisions will be costly and the effects will be with them for a long time. Systems specification and implementation will require the expertise of professional services firms.

- In all but the smallest installations, personal computers will be installed in local networks tied to mass storage devices and high-speed printers.

  - Many of these local networks will communicate with larger systems through public and/or private networks.

  - Distributed data processing (DDP) will be accomplished from the end user back to the mainframe as often as the reverse.

  - Responsibility for systems definition and implementation will be shifted more frequently to the end user from the EDP or information systems department.

  - End users will know enough to be dangerous. They wield enough power in the organization that, along with their new found "expertise," they will insist on playing leading roles in solving their own information processing problems.

  - EDP management will have to exercise management control and quality assurance over these systems implementations to prevent inefficiencies at best and disasters at worst in their corporations.

- Systems options will multiply a thousandfold in the next few years.

  - Mass merchandising and distribution of both hardware and software will expose the end user to more options than EDP mangement can cope with.

- Professional services firms will help them sort through the mass of information on information systems.

- The information services industry will witness more change in the next five years than in the previous twenty.

  - IS companies must position themselves now and act quickly to move along the fastest and surest paths to increased revenues and profits.

  - More than ever it is important for IS firms to recognize the social and technological revolution that they are so much a part of in the Information Age.

  - Companies must continue to provide "services" not "products" even when computers are provided to customers at their locations.

- The greatest opportunities for information services firms will be in serving manufacturing (process and discrete), government (federal, state, and local), and the banking and finance sectors, as shown in Exhibit II-3.

  - The aforementioned industry sectors are ones which already support a large base of IS business.

  - Smaller but less competitive market opportunities are available in the transportation, wholesale, and retail sectors.

B. ISSUES AFFECTING INFORMATION SERVICES MARKETS

- User expenditures are forecasted to grow at an average annual growth rate (AAGR) of 24% to $53.2 billion in 1986, as shown by the middle line of the forecast range shown in Exhibit II-4.

EXHIBIT II-3

INCREMENTAL MARKET GROWTH BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	28%	5,850
Federal Government	26	5,160
Process Manufacturing	31	4,840
Banking and Finance	19	3,930
State and Local Government	27	2,880
Insurance	21	2,190
Retail	23	1,780
Wholesale	24	1,690
Medical	22	1,535
Services	20	1,530
Other	22	1,500
Utility	21	1,030
Transportation	28	990
Education	16	320

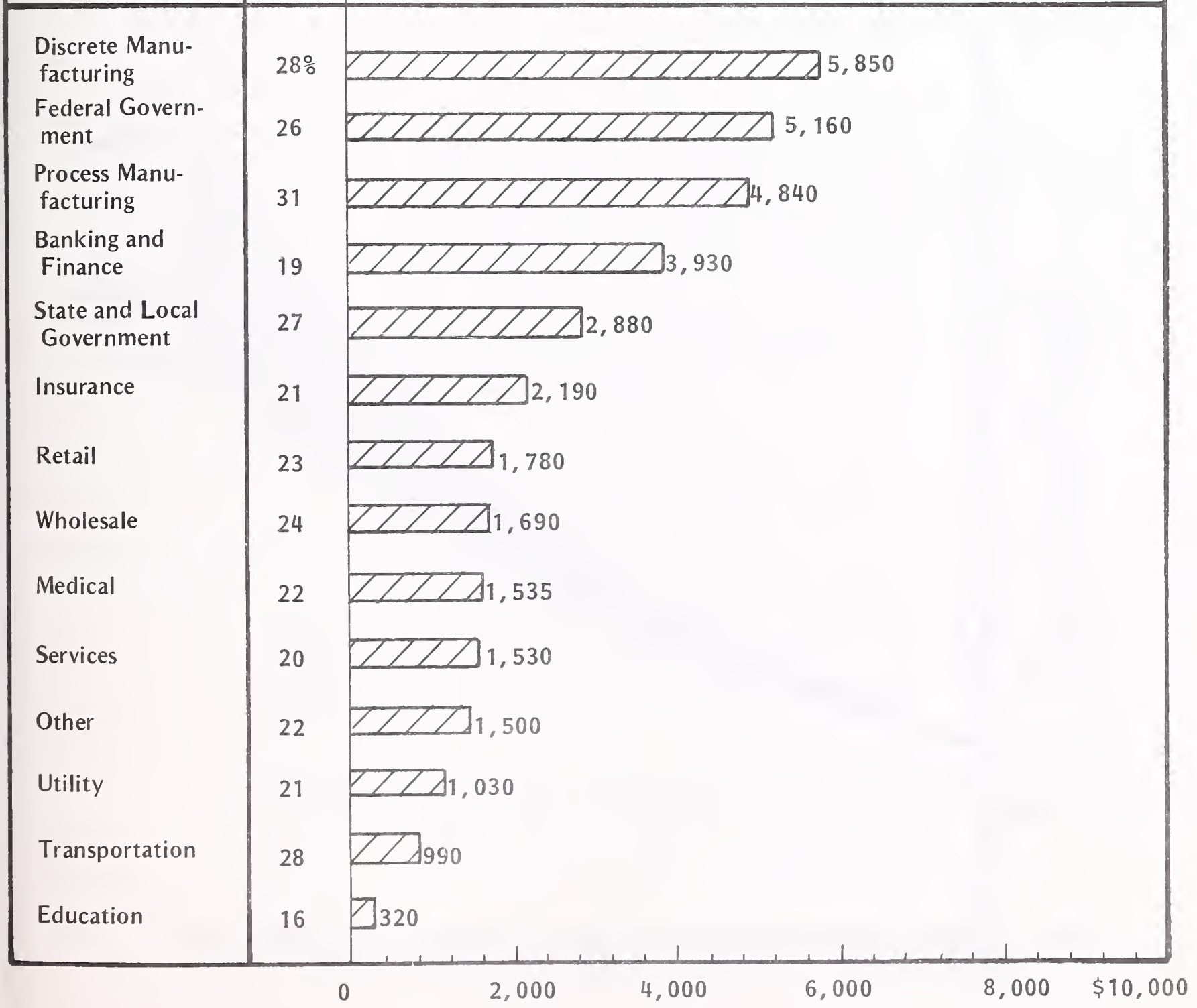
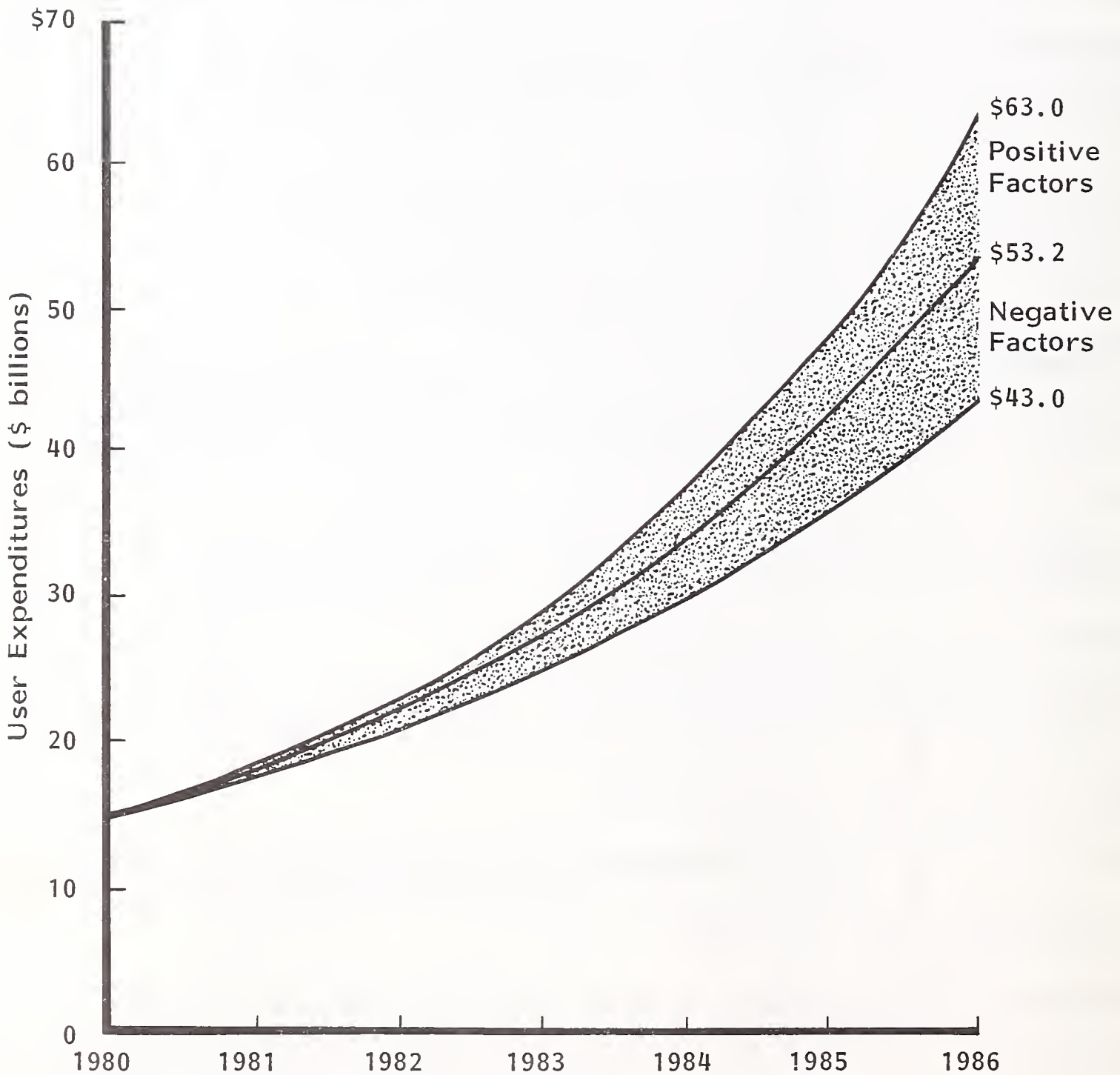


EXHIBIT II-4

INFORMATION SERVICES INDUSTRY FORECAST RANGE,
1980-1986



- The low range of the forecast, represented by the bottom line, yields an AAGR of 19%.

- The high range of the forecast, shown by the top line, represents an AAGR of 28%.

- A variety of positive and negative factors will affect the growth of user expenditures on computer services through 1986.

- The positive factors which will tend to push growth above the middle line include the following:

  - Increases in types and number of products offered by a proliferation of vendors coupled with increased pressure for automation will further create opportunities for IS companies to provide solutions.

  - The demand for on-line systems and the increase in costs and complexity of the resulting networks will stimulate RCS and professional services markets.

  - Computer manufacturers will continue to unbundle software products and professional services from hardware.

  - Many new small IS firms will enter the market. Low-cost small business computers and personal computers will stimulate many start-up software products and professional services firms.

  - Personal computers will increasingly have communications capabilities which will enable users to access remote computer services, particularly to use proprietary data bases.

  - Entry or further expansion into information services will be made by firms primarily engaged in other businesses. New offerings can be expected from the following industry sectors:

- Computer manufacturers. IBM and DEC along with most of the other mainframe and minicomputer manufacturers are likely to continue the unbundling of information services from their hardware offerings. Already major forces in the software products marketplace, many of these firms may be expected to push into professional services and processing services.

- Banking and finance. Chase Manhattan Bank and Citicorp are leading the way for other banks into the processing services markets. Ventures by financial conglomerates such as American Express and Merrill Lynch are also likely.

- CPA firms are a major force in the professional services marketplace. They are likely to follow other professionals such as lawyers and doctors, and aggressively advertise their services. They will probably start with information services. The proliferation of small business computers is likely to attract these firms to the applications software marketplace.

- Publishers. Dun and Bradstreet and McGraw-Hill have established a presence in the marketplace. "Software publishing" is the buzzword in many publishing firms today. Videotex, videodisk, and other means of electronic distribution are becoming a part of these firms' tactical plans.

- Telecommunications. AT&T will enter the arena sometime in the early 1980s. GTE is expected to expand its operations. CBS and other broadcasters see information services as a logical area for expansion.

- Oil companies have enormous amounts of capital to invest and they have been heavy consumers of information services for years. More are likely to follow Sun Oil and Schlumberger into information services. Exxon's activities in the microprocessor

and office products areas indicates that it is only a step away from IS.

. Retailers. Tandy Corporation made it into the INPUT Directory of Leading U.S. Information Services Firms this year through software sales. Sears Roebuck and other major retailers will be marketing software as well as personal computers. These companies have awesome distribution capability. Their experience in marketing and service will be additional strengths in selling information services. Tired of fighting in saturated markets, many of these firms are looking to diversify into new high-growth areas. Initial success in software products may lead them further into exploring information services opportunities.

- The continuing difficulty of in-house EDP departments to hire, train, and retain skilled personnel will be a positive factor in the growth of information services.

- Shortages of personnel and systems, and competitive pressures may force many companies to facilities management.

• A substantial influx of new vendors into the information services industry will not only increase the growth of the industry it will also increase competition.

- The consumer of IS will undoubtedly benefit when this occurs.

- Individual participants in the industry will have to fight harder than ever to maintain growth and profit margins in an already competitive industry.

- Effective corporate planning, market research, and competitive analysis will be more important than ever in the coming years.

- Although more negative than positive factors can affect the industries' growth, the overall impacts of the negative factors are likely to be less than the positive ones. The following are negative factors which can affect industry growth through 1986:

  - As mentioned above, future growth is dependent upon information services firms' continued success in recruiting, training, and keeping skilled personnel.

  - In the 1979-1980 timeframe, the economic recession has had a net positive effect on information services revenues, but current indications are that a number of individual companies are increasingly being hurt in their efforts to sell information services.

    . In the initial stages of a recession, information services companies benefit from a reluctance on the part of prospects to invest in in-house EDP spending.

    . In a persistent recession, discretionary funds dry up and no one benefits.

  - Some economists are predicting that more hard times are ahead. If this comes to pass, industry growth will be impeded along with the rest of the economy. INPUT's forecast does not anticipate a severe economic recession in the early 1980s.

  - Although the trend appears to be to the contrary, hardware manufacturers may turn to bundling software into hardware.

    . This is most likely to happen in firmware.

    . Microprocessors are currently being developed which have significant systems software burnt into them; they will be on the market within the forecast period.

  - . ROMs are on the market today which are a delivery vehicle for packaged software.

- Turnkey systems sold by OEMs and manufacturers may limit sales of application software by independent vendors.

- Reductions in government spending in the future could adversely affect industry revenues.

  - . President Reagan's administration has vowed to reduce federal expenditure. However, reduction in internal staffing and expenditures may increase services expenditures.

  - . State and local government spending, constrained by referundum laws to curb spending, may be limited.

- Information services vendors failing to respond to market changes and opportunities could restrain growth.

  - Vendors may burden themselves with too broad an array of products to sustain rapid growth.

  - In-house conversion of remote computing services to in-house systems may increase.

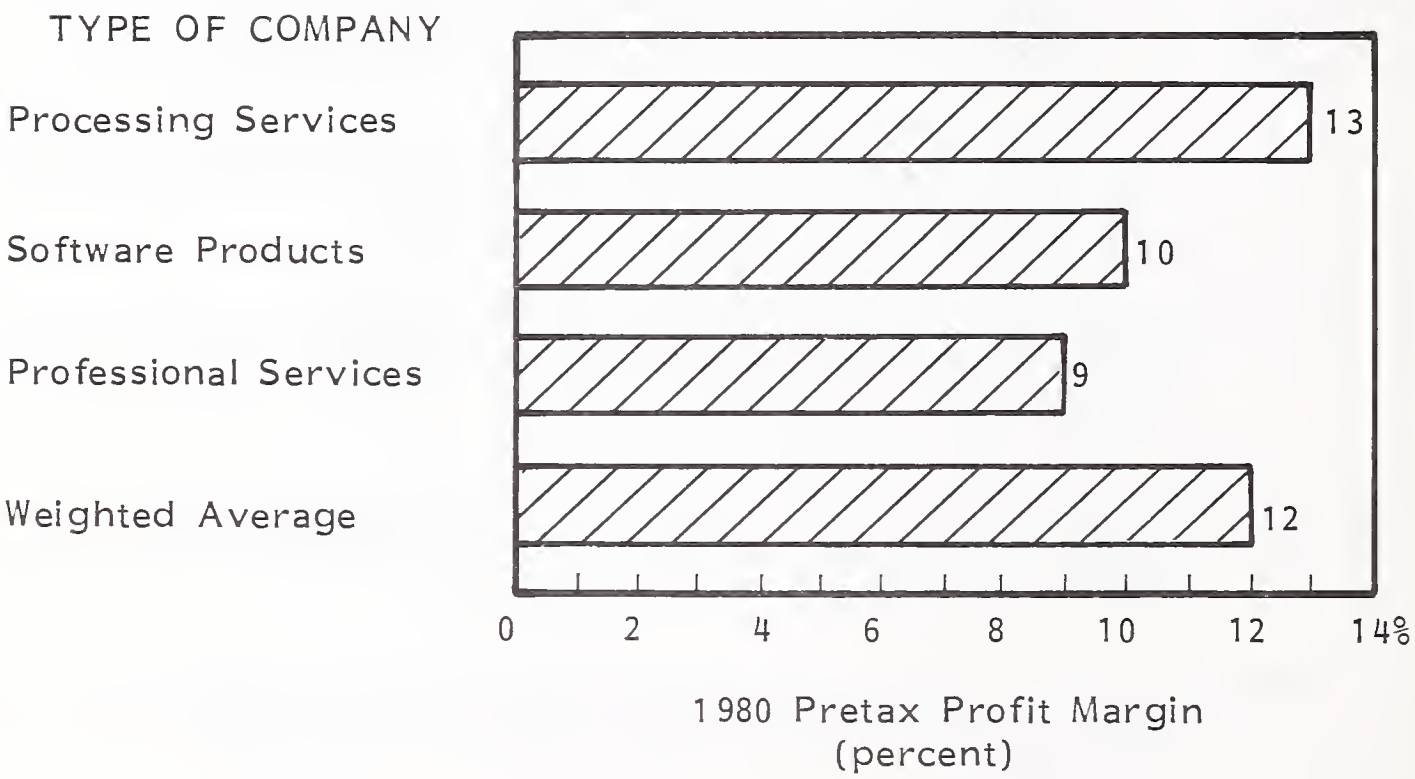
  - Conversion of timesharing applications to personal computers will adversely affect RCS vendors while benefiting software products firms.

- Information services pretax profits remained at the same level, 12%, as in the previous year despite a declining economy, as shown in Exhibit II-5.

  - Processing services margins declined a full percent from the previous year.

EXHIBIT II-5

1980 PUBLIC
COMPANY PROFIT PERFORMANCE



- Public software products companies' margins reportedly did not change.

- INPUT expects that processing companies will continue to have difficulty in maintaining their profit margins in the early 1980s because of expensive development and growth activities.

- Expanded consolidations through acquisitions among both software product companies and professional services companies are expected to help these companies increase their profit margins on much larger bases of revenues.

- Changes in information services companies' revenue productivity are shown in Exhibit II-6. All three major service modes showed increases in 1980 over 1979.

  - Some of the increase in revenue per employee was the result of price increases.

  - Many companies also held back on hiring in anticipation of a slowdown in revenue growth which did not materialize until this year.

  - A large portion of the increase was the result of real increases in output per employee which is at the heart of much of the success of the information services industry.

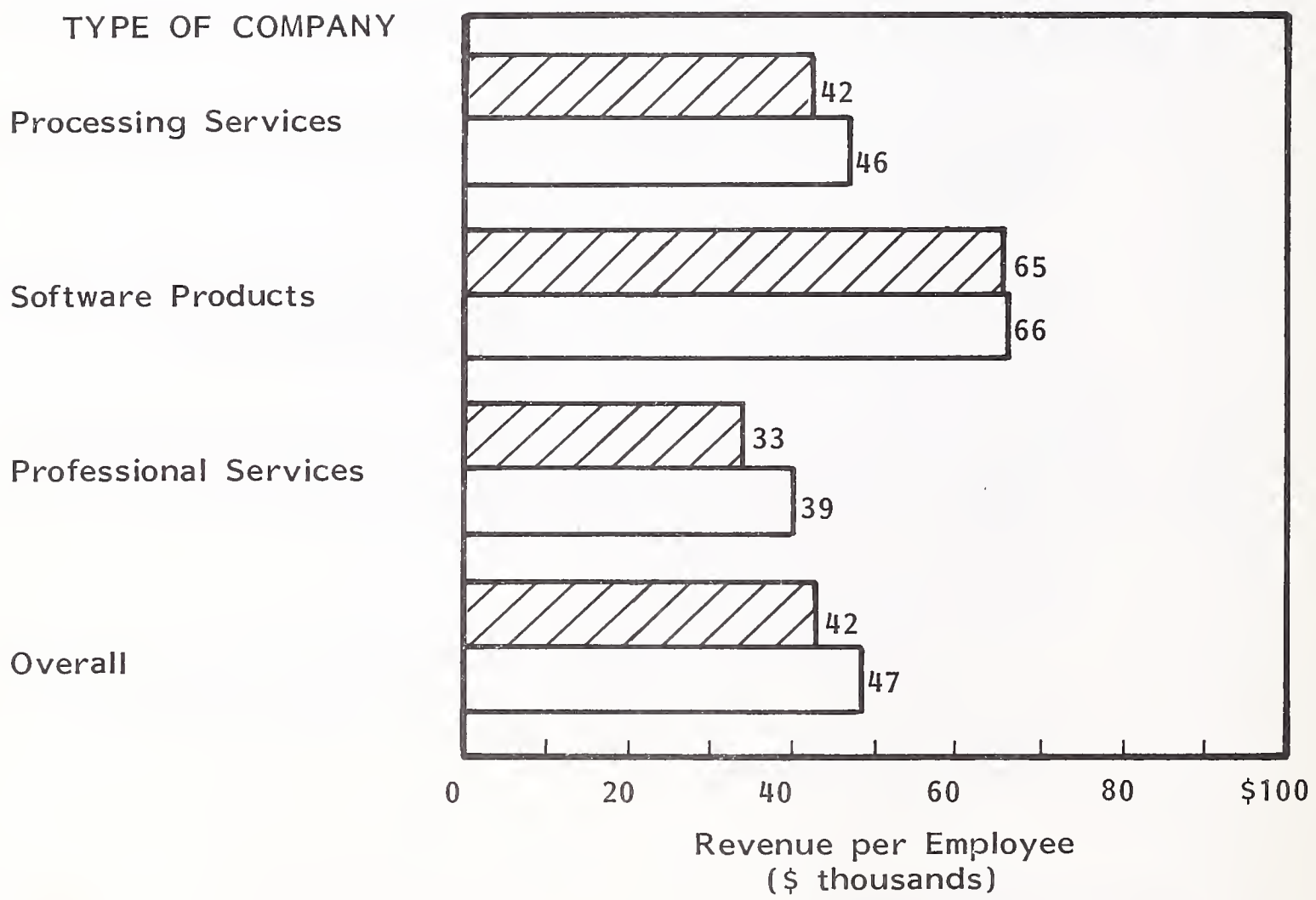
  - Larger increases in productivity are predicted for the industry over the next five years. Most of these will come through improvements in software development.

C. RECOMMENDATIONS

- Personal computer hardware and software growth of over 60% per year over the next five years must be addressed by IS vendors.

EXHIBIT II-6

INFORMATION SERVICES COMPANIES'
REVENUE PRODUCTIVITY, 1979-1980



- IS vendors should enter into distribution agreements with hardware manufacturing and sell these systems to their base of Fortune 1000/50 customers.

- IS vendors should also acquire through licenses the rights to personal computer software.

- RCS vendors should offer value added network services which interface with local networks. A major market will develop for these services in the 1980s.

- Companies should move rapidly into the current void in the ability of users to implement new telecommunications and office systems. Productivity in the office is obtained from changing office functions rather than automating current procedures.

- IS vendors should develop more marketing techniques to sell hardware services and software.

- Application generators; i.e., extremely user friendly and powerful system implementation tools, will offer tremendous growth opportunities to IS vendors. Very small computers will be an important delivery vehicle.

- Increasing productivity in the 1980s will be a driving force in information systems. Providing tools which increase productivity should be a part of IS vendor plans.

  - Major opportunities exist for processing services in the CAD/CAM market.

  - Computer aided instruction (CAI) software is in short supply while the demand for it is increasing.

- Business graphics, projected to grow at 44% through 1986, are in great demand for increasing productivity of management and professional personnel.

- Videotex services will not become a significant market until the late 1980s, if then. Some processing services companies are positioning themselves to address this market with low-cost terminals (less than $700).

- Information services companies must increase their research and development expenditures in order to remain competitive.

  - New tax legislation makes R&D investment more attractive than ever, so long as vendors can realize a good return on the investment.

  - Vendors must stay informed about hardware because the dramatic drops in its cost create new competition as well as opportunities.

- Software and professional services firms should look to mergers and acquisitions to expand.

  - Broader channels of distribution will be required to compete effectively against the giants entering the industry.

  - Investments required for product development will be too great for small firms to remain competitive.

  - Acquisition strategies should be based on a company's strengths more than on a desire for diversification.

- Specialty vendors must beware of saturating their markets. However, saturation in terms of initial penetration should then be followed by service expansion in depth in client accounts.

- The shortage of skilled people dictates that IS vendors must upgrade their management practices in dealing with people. Programs to attract, train, and retain skilled professionals should be one of the highest priorities of IS vendors' services management.

- IS vendors should position themselves in service modes and industry sectors which offer the fastest growth rates and/or largest incremental growth in revenues. The rest of this report presents information relevant to these goals.

III INFORMATION SERVICES INDUSTRY MARKET ANALYSIS

III INFORMATION SERVICES INDUSTRY MARKET ANALYSIS

A. FORECAST BY SERVICE MODE

- INPUT forecasts that the Information Services industry will grow at an average annual rate of 24% over the next five years. This growth rate, the fastest INPUT has ever forecasted for the industry, is based on several major factors.

  - The producers' price index is predicted to increase over that period at 9.8% annually. This will cause an upward pressure on prices.

  - Price increases due to inflation predicted for the service modes on an average annual basis are as follows.

    . Processing services will be at 6% per year.

    . Software products will be at 4% per year.

    . Professional services will be at 8% per year.

  - The differences between the price increase (inflation) rate for the service modes and the producer price index increase are due to real increases in productivity coming largely from technological advances within the information services industry.

- Price increases for software products are projected at a lower rate than previously forecasted due to anticipated increases in productivity in product development and maintenance, and sales and marketing.

- Price increases for processing and professional services will be at a slightly lower rate than previously forecasted because of greater competition.

  - American business and government will increasingly turn to IS companies for help in raising their own productivity levels.

- Systems software products and professional services will grow the fastest over this period.

- Systems software user expenditures are forecasted to grow at an AAGR of 38% through 1986, as shown in Exhibit III-1.

  - Revenues will be five times higher in 1986 than they will be in 1981.

  - By 1986, virtually all systems software will be unbundled by manufacturers.

  - Decision support systems software will be purchased for every machine.

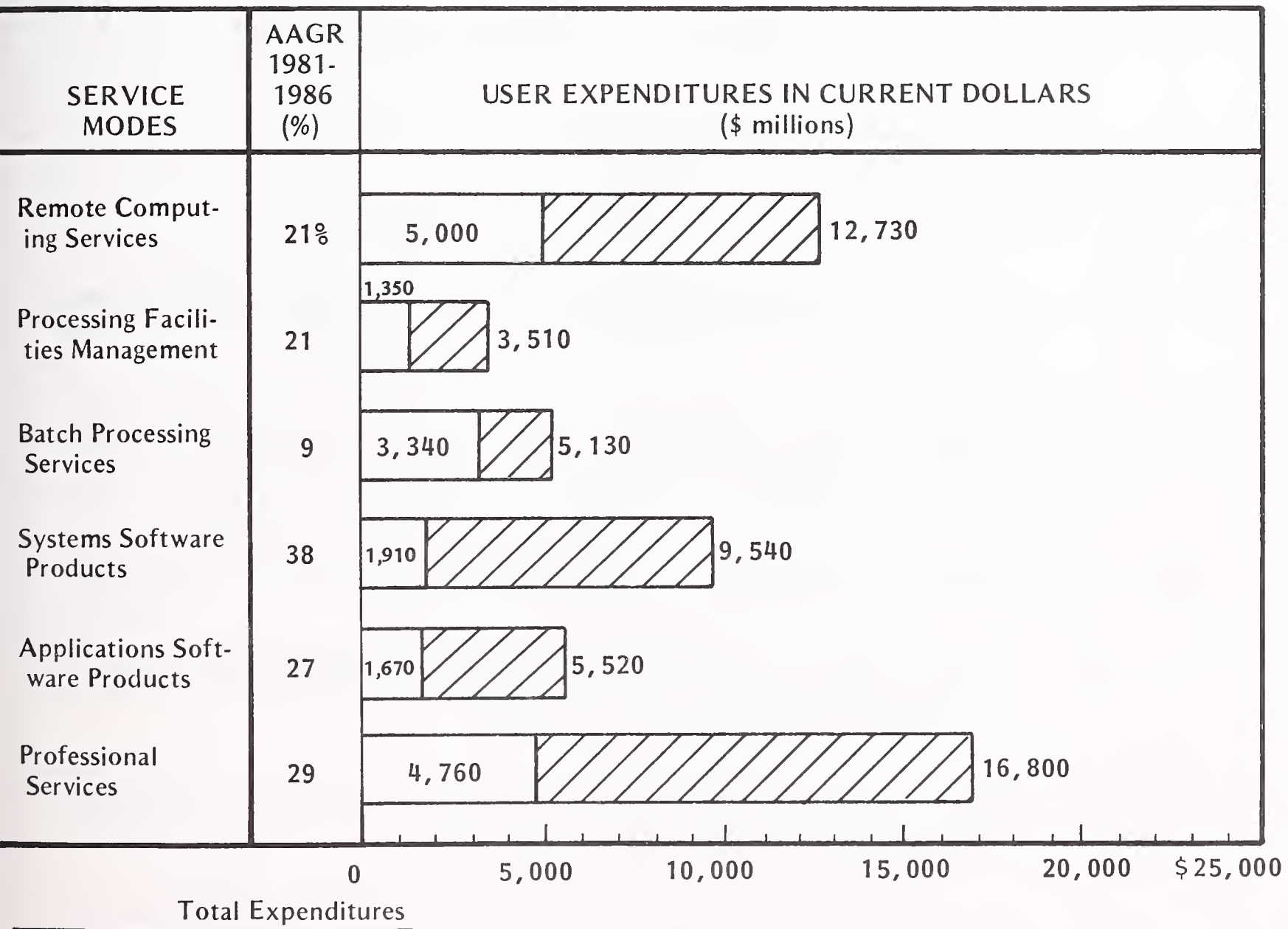
  - Millions of very small computers will be installed in the next five years, each one requiring systems software.

- Professional services user expenditures will exceed $16 billion by 1986 as a result of a 29% AAGR.

  - Much of this growth will be fueled by two factors, a shortage of skilled personnel and a demand for increased productivity from the personnel that is available.

EXHIBIT III-1

INFORMATION SERVICES FORECAST, 1981-1986



Total Expenditures

1981		$18,030 million
1986		$53,230 million

AAGR = 24%

- The shortage of skilled personnel is relative to the number of installed systems. The systems are being installed at a far greater rate than programmers are being created.

- User organizations will lose skilled personnel to professional services organizations for a variety of reasons:

  . A desire for a faster changing technological environment.

  . Higher compensation.

  . Opportunities for equity and profit sharing.

  . Greater opportunities for personal development.

- Applications software products will grow at 27% through 1986.

  - Much of this growth will be from the small business computer marketplace.

  - Nearly a fifth of the sales in 1986 will be to owners of very small computer systems.

- Remote computing services will continue to grow at a rapid rate (21% AAGR).

  - Lower cost very broadband network communications will begin to contribute to this growth by early 1983.

  - Entry by IBM into RCS, expected by mid-1982 by INPUT, will also add to the growth of the industry.

  - Videotex, business graphics, and database services will also be contributors to this growth.

- A substantial amount of RCS business is expected to be lost to personal computers and in-house EDP, but vendors are expected to more than offset these losses through the sale of the above plus larger scale decision support systems.

- Batch processing services will grow, but at a rate slightly lower than the rate of producer price increases, resulting in a decline in real terms. Slow growth is due to several factors:

  - Migration of applications to in-house EDP will continue.

  - Erosion of base from applications going to RCS and integrated systems will continue.

  - Very few areas, primarily highly industry specialized, will actually grow in real terms.

  - Changes in communications products which will benefit RCS will impede batch growth.

- Processing facilities management will grow in part from continued conversion of RCS and batch services to lower cost long-term contracts and in part from the growth of very specialized industry applications.

B. FORECAST BY INDUSTRY SECTORS

- User expenditures for information services will grow the fastest in the process manufacturing industry sector (31% AAGR), as shown in Exhibit III-2, primarily due to the growth of the domestic energy industry.

EXHIBIT III-2

MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	28%	2,460 → 8,310
Process Manufacturing	31	1,720 → 6,560
Transportation	28	→ 1,410
Utilities	21	670 → 1,700
Banking and Finance	19	2,880 → 6,800
Insurance	21	1,350 → 3,540
Medical	22	900 → 2,435
Education	16	→ 610
Retail	23	960 → 2,740
Wholesale	24	860 → 2,550
Federal Government	26	2,360 → 7,520
State and Local Government	27	1,280 → 4,160
Services	20	1,010 → 2,540
Other	22	870 → 2,360

0 2,000 4,000 6,000 8,000 $10,000

Total Expenditures

1981		$18,030 million
1986		$53,230 million

AAGR = 24%

- The largest incremental growth, nearly $6 billion, will occur in the discrete manufacturing sector. More than half of this growth will be from user expenditures on software products.

- Federal government expenditures are forecasted to grow at an above average rate due largely to anticipated increases in defense spending. Approximately half of all federal EDP expenditures are defense related.

- Banking and finance, the largest industry sector user of information services in 1981, will still increase IS expenditures by almost $4 billion per year by 1986.

  - The movement to in-house EDP is most pronounced in this industry sector as a result, in part, of many of the participants becoming information services vendors or increasing their services activities.

  - Although the underlying growth of this industry sector will be only slightly below average, profitability of banks will continue to be a problem that constrains expenditures on information services.

  - Some available revenues will also be converted to captive revenues as major companies in this sector expand their activities as information services vendors.

  - Rapid changes in the whole financial community are causing demands for new software and networks. New financial services in particular are creating opportunities.

- The transportation, wholesale, and retail sectors provide some of the most promising growth opportunities for information services outside of the government sectors.

  - The transportation sector will grow about 10% faster than the U.S. economy. Also, deregulation and increased competition will cause companies in this sector to seek productivity improvements through

computer services, particularly industry specialized applications software.

- Retail and wholesale companies will work on reducing the high cost of carrying their inventories (due to high interest cost) by implementing more advanced inventory control systems using software packages and professional services.

IV PROCESSING SERVICES MARKETS

IV PROCESSING SERVICES MARKETS

A. USER EXPENDITURES

- User expenditures for processing services will more than double between 1981 and 1986 to a total of more than $21 billion, as shown in Exhibit IV-1.

- Large vendors are a major force in this market.
  - In 1980, 56 firms had $10 million or more in processing services.
  - These firms accounted for 58% of all processing services revenues.

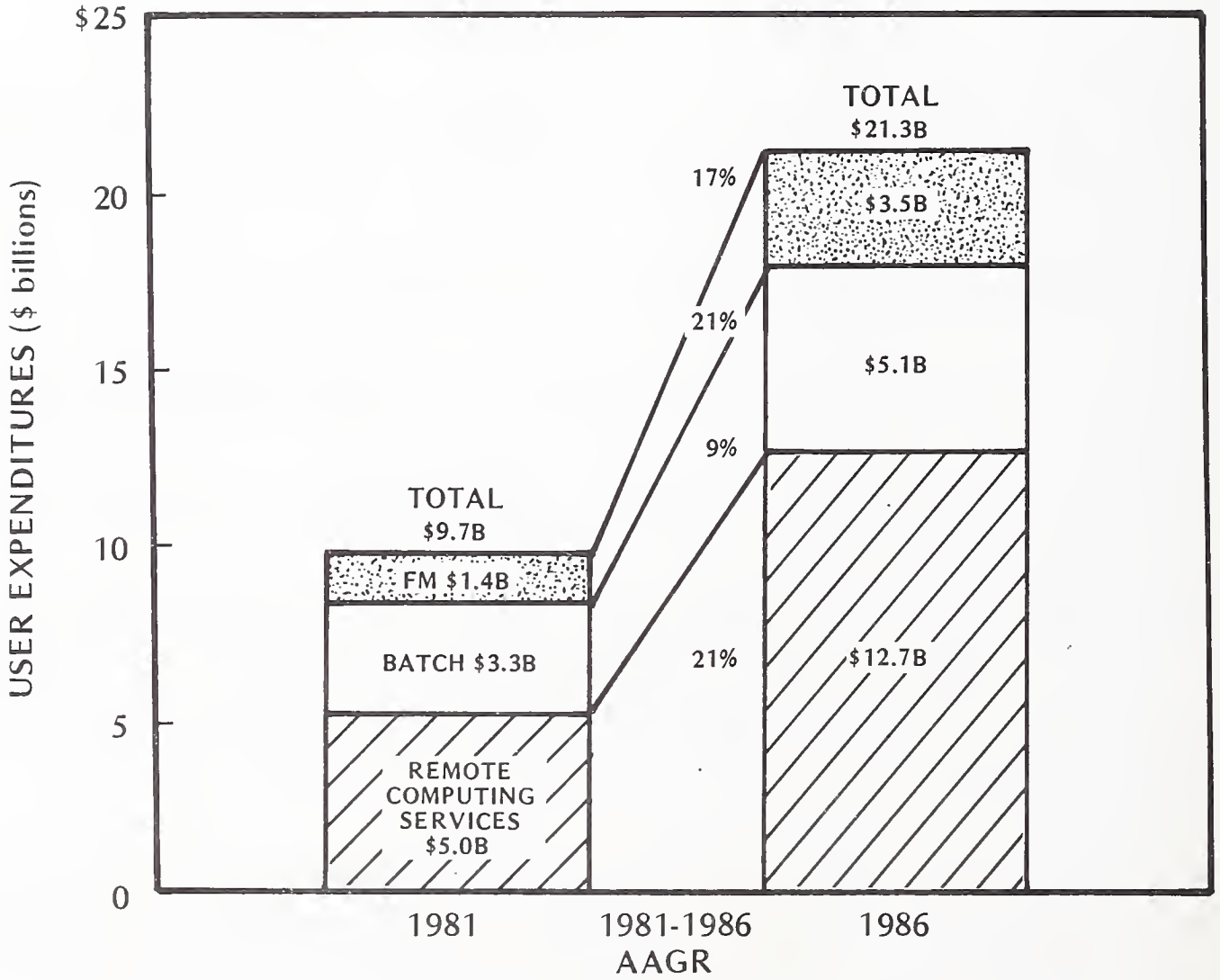
- Although only one company, Automatic Data Processing, is expected to exceed half a billion dollars in processing services revenues in 1981, at least half a dozen firms will be selling that much processing service by 1986 in the U.S. market.

- Large investments in software, much of it highly industry specialized, and in personnel development and training required to service the processing market favor the larger firms over the smaller ones.

- Many user applications will also be dependent on large proprietary data bases that require a technical and financial commitment beyond the capabilities of a small firm.

EXHIBIT IV-1

U.S. PROCESSING SERVICES MARKET,
1981-1986



- Large vendors are expected to continue to acquire small companies primarily as a means of obtaining expertise in industry specialty areas and applications.

- Small processing services firms will by no means disappear. In fact, they may proliferate more than ever.

  - Increased competition and technological advances will lower the cost of value added network services which will help the small RCS firms deliver services.

  - Lower cost hardware and licensed software will also assist the small processing firms in getting off the ground.

  - Small firms also seem to be most proficient in creating innovative solutions to end user needs.

- Industry specific processing services will grow fastest for RCS and FM services while function specific processing will be the fastest growing service for batch companies, as shown in Exhibit IV-2.

B. REMOTE COMPUTING SERVICES

1. USER EXPENDITURES

- User expenditures on remote computing services will grow from $5 billion in 1981 to $12.7 billion in 1986 with an AAGR of 21%, as shown in Exhibit IV-3.

- The largest incremental growth will come from the banking and finance sector which in 1981 is the single largest source of RCS revenues.

- Process manufacturing, fueled by the continued expansion of the U.S. energy industry, will grow the fastest, at 26% AAGR.

EXHIBIT IV-2

PROCESSING SERVICES FORECAST,
1981-1986

PROCESSING SERVICES MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
RCS		
Function Specific	19%	1,060 — 2,530
Industry Specific	22	2,850 — 7,730
Utility	18	1,080 — 2,470
FM		
Function Specific	12	90
Industry Specific	22	1,190 — 3,140
Utility	20	290
Batch		1,050
Function Specific	11	1,780
Industry Specific	9	1,840 — 2,840
Utility	3	510
Total Processing		
Function Specific	15	2,160 — 4,400
Industry Specific	18	5,880 — 13,700
Utility	15	1,650 — 3,270

Total Expenditures

0 | 3,000 | 6,000 | 9,000 | 12,000 | $15,000

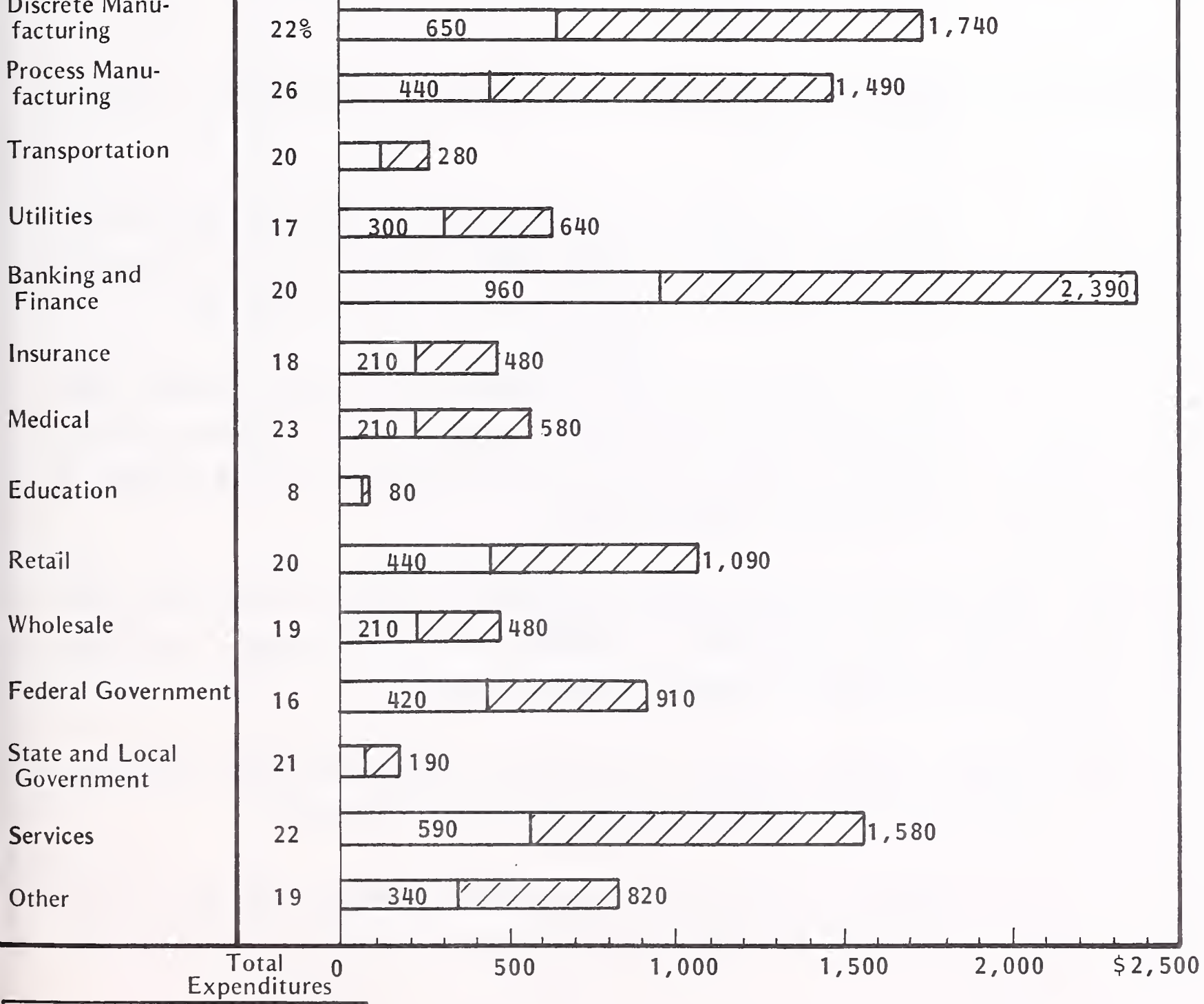
1981		$ 9,690 million
1986		$21,380 million

AAGR = 17%

EXHIBIT IV-3

REMOTE COMPUTING SERVICES
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	22%	650 / 1,740
Process Manufacturing	26	440 / 1,490
Transportation	20	280
Utilities	17	300 / 640
Banking and Finance	20	960 / 2,390
Insurance	18	210 / 480
Medical	23	210 / 580
Education	8	80
Retail	20	440 / 1,090
Wholesale	19	210 / 480
Federal Government	16	420 / 910
State and Local Government	21	190
Services	22	590 / 1,580
Other	19	340 / 820



1981		$ 5,000 million
1986		$12,730 million

AAGR = 21%

- The largest incremental growth for function specific RCS revenues will come from the process manufacturing industry sector, as shown in Exhibit IV-4.

  - User expenditures for these services are growing at a rate (32%) that is 60% higher than the average (19%).

  - Energy companies use a wide variety of scientific and engineering software, resident in RCS vendor libraries, available on a fee basis from specialist vendors, and applicable to a broad spectrum of functions across multiple industries.

  - Energy companies spend 28% of their RCS expenditures on function specific services.

  - Use of finite element structural analysis programs to design oil and natural gas pipelines, or process design simulation systems for unleaded gas refinery design are typical examples in engineering areas.

  - Use of data base oriented Management Information Systems (MIS) packages to develop and report energy production, or financial modeling systems to evaluate reserves or project profitability are examples in production and marketing areas.

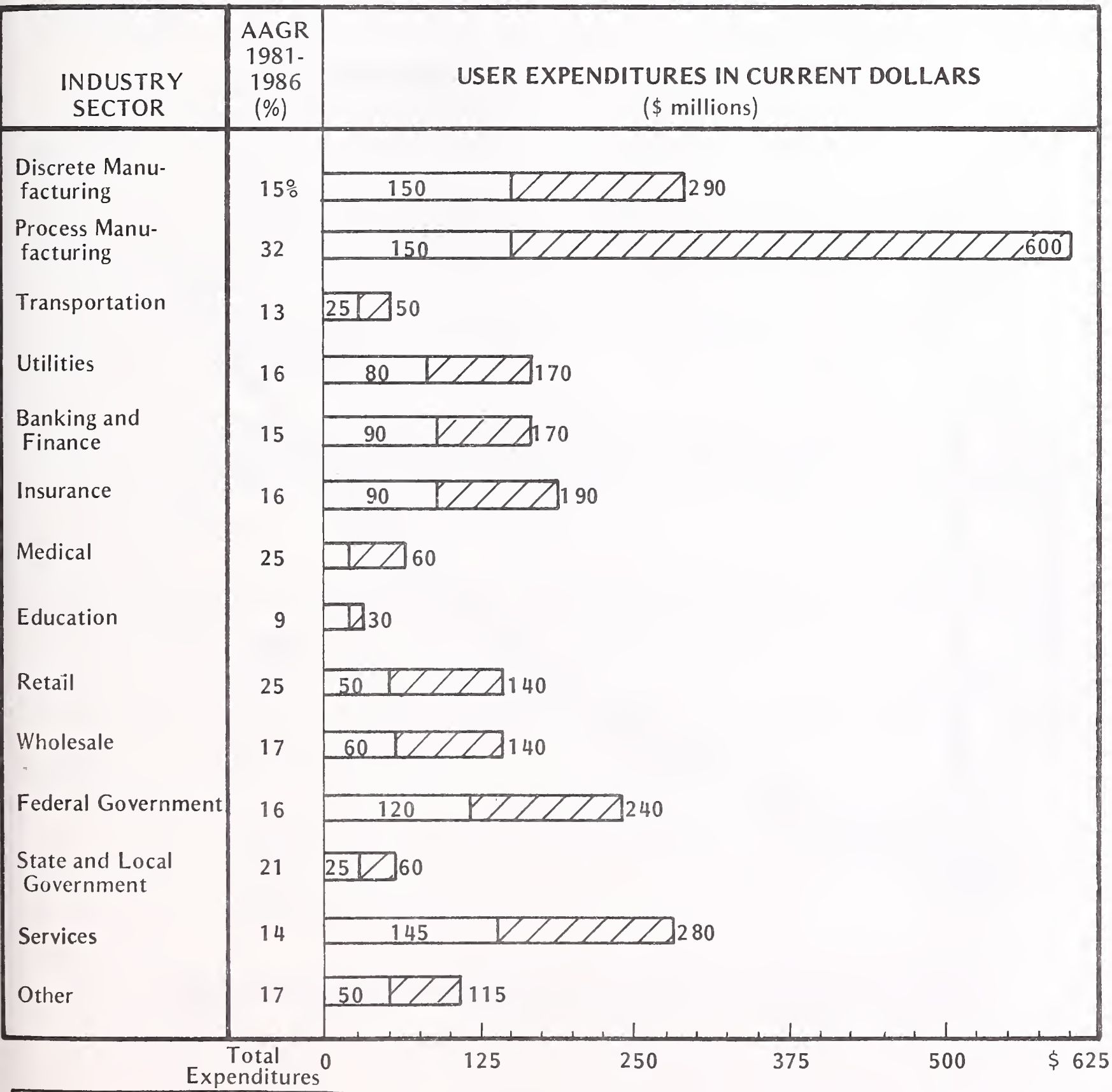
- The retail and medical sectors are growing well above average (25% AAGR) through user expenditures on general accounting services, particularly accounts receivable and general ledger services.

- Business graphics software will contribute much to the growth of function specific RCS with an AAGR of 44%, as shown in Exhibit IV-5.

  - Some of the user expenditures on business graphics will be on industry specific or utility RCS, but the largest portion will be function specific.

EXHIBIT IV-4

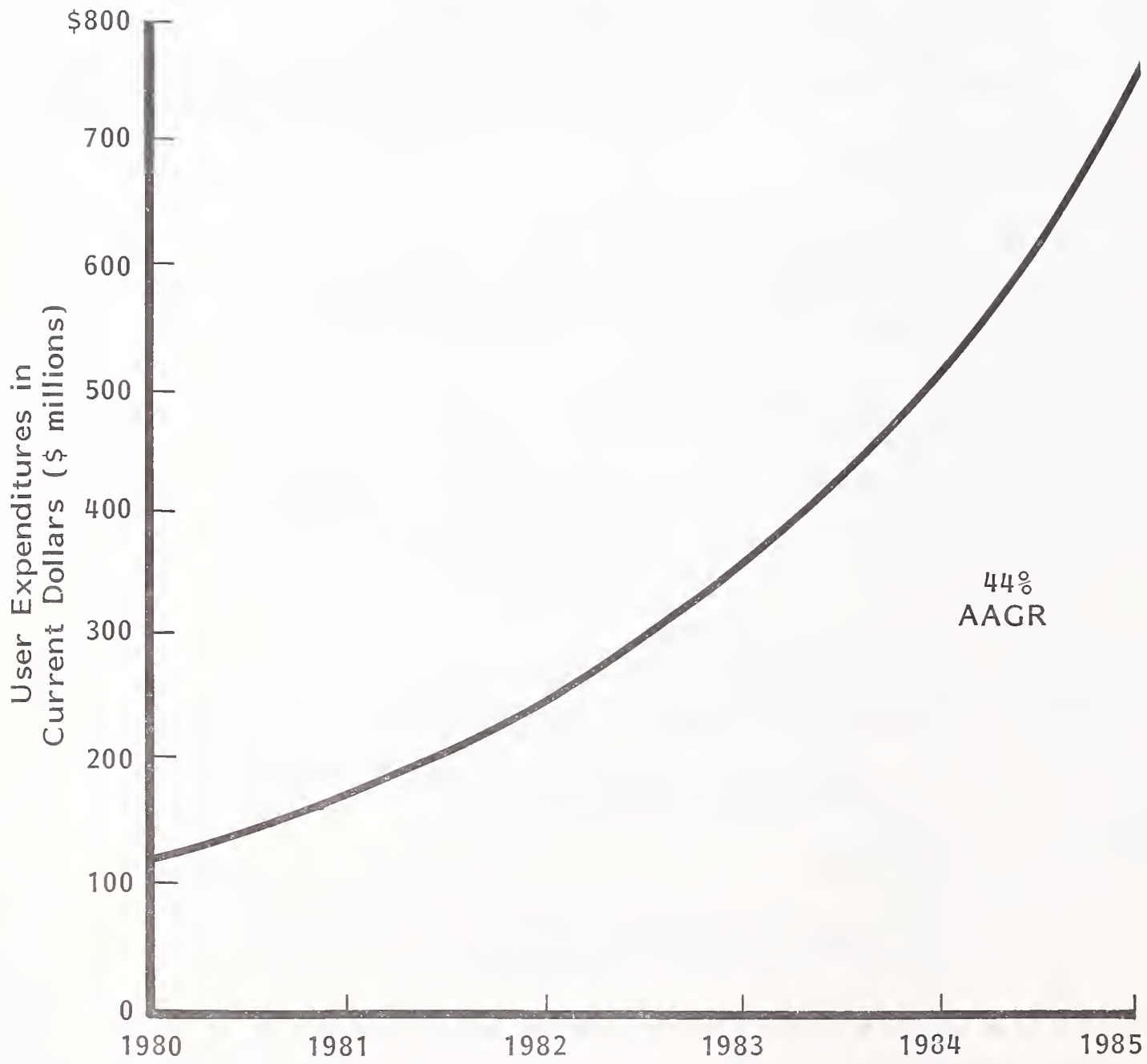
REMOTE COMPUTING SERVICES - FUNCTION SPECIFIC
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986



AAGR = 19%

EXHIBIT IV-5

BUSINESS GRAPHICS RCS REVENUES



- Approximately 20% of function specific RCS expenditures will be for business graphics by 1986.

- The largest incremental growth ($1.3 billion) for industry specific RCS will come from the banking and finance sectors, as shown in Exhibit IV-6.

  - Most of the projected growth will come from commercial banks' expenditures, which will be about 65% of 1981 expenditures on processing services in this sector.

  - Savings and loan associations and credit unions will contribute less to growth in the future due to severe profit problems.

  - This sector is served by many small specialized RCS firms as well as the major vendors.

- The discrete manufacturing and services sector present the most growth potential, with 25% and 24% growth projected through the period, respectively.

- Process manufacturers and the federal government will buy nearly half of all utility processing services in 1981, as shown in Exhibit IV-7.

  - Process manufacturing will demonstrate the most vigorous growth boosted by expansion in the energy sector.

  - Federal government expenditures will grow at a less than average rate because of lower prices associated with RCS services provided under GSA procurement regulations.

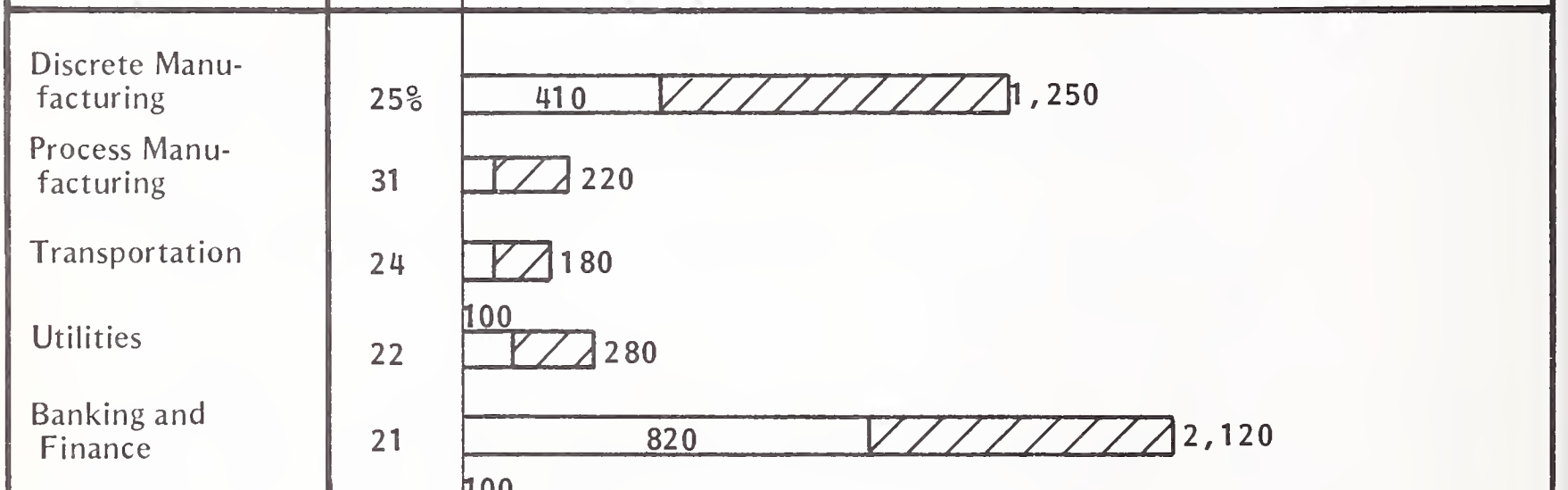
2. MAJOR RCS VENDOR ACTIVITY

- Control Data Corporation, the world's largest processing services vendor, reorganized the Service Bureau Company into three major groups:

EXHIBIT IV-6

REMOTE COMPUTING SERVICES - INDUSTRY SPECIFIC
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	25%	410 / 1,250
Process Manufacturing	31	220
Transportation	24	180
Utilities	22	100 / 280
Banking and Finance	21	820 / 2,120
Insurance	20	100 / 250
Medical	23	180 / 510
Education	10	20
Retail	19	360 / 860
Wholesale	20	115 / 290
Federal Government	21	90
State and Local Government	24	40
Services	24	380 / 1,100
Other	20	210 / 520



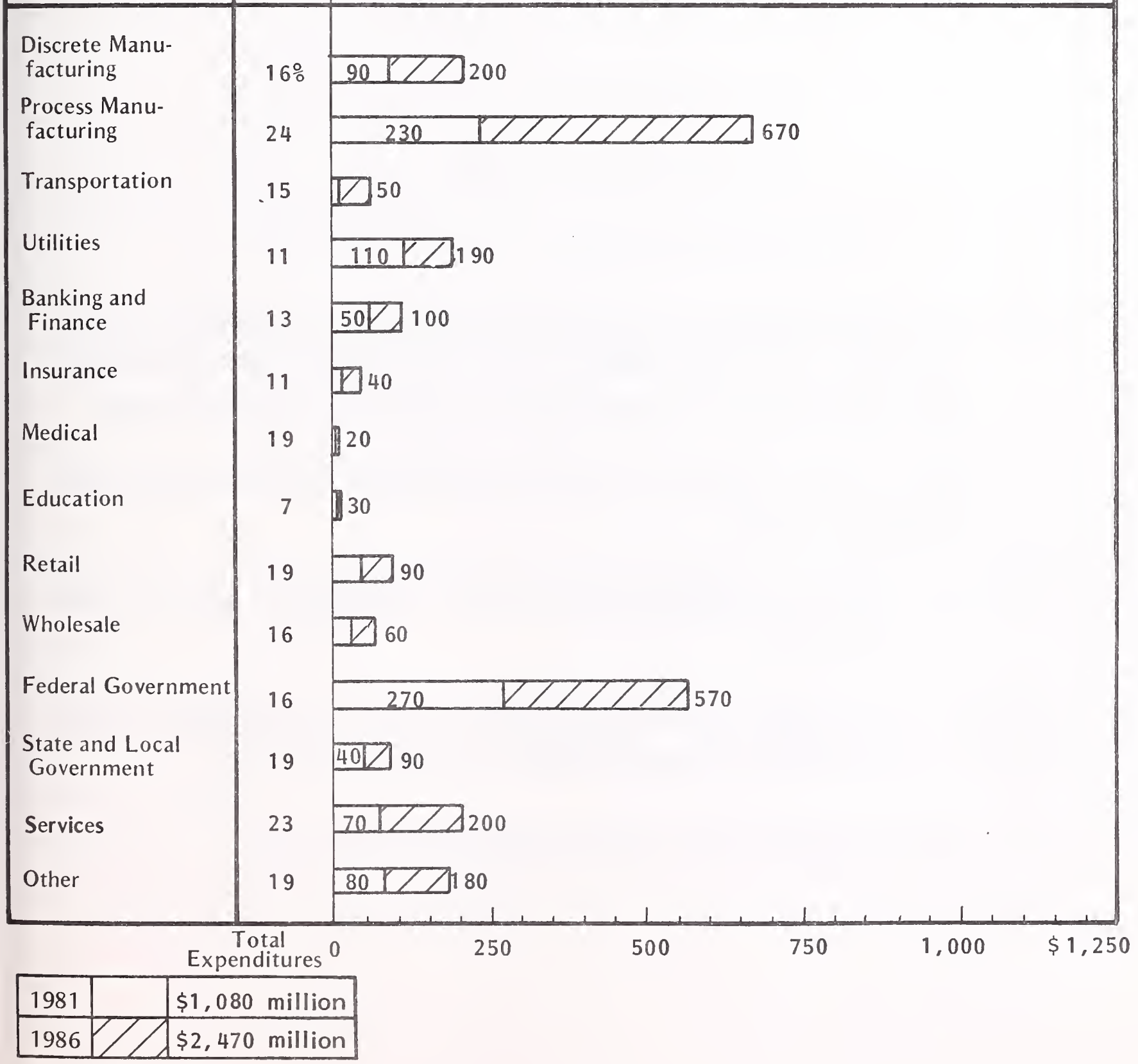
1981		$2,850 million
1986		$7,730 million

AAGR = 22%

EXHIBIT IV-7

REMOTE COMPUTING SERVICES - UTILITY
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	16%	90 / 200
Process Manufacturing	24	230 / 670
Transportation	15	50
Utilities	11	110 / 190
Banking and Finance	13	50 / 100
Insurance	11	40
Medical	19	20
Education	7	30
Retail	19	90
Wholesale	16	60
Federal Government	16	270 / 570
State and Local Government	19	40 / 90
Services	23	70 / 200
Other	19	80 / 180



1981		$1,080 million
1986		$2,470 million

AAGR = 18%

- Timesharing Services (formerly SBC Timesharing).

- Brokerage Transaction Services.

- Financial Services, a combination of the following:

  . Action Data Services.

  . EFT Data Services.

  . Banking Data Services.

  . Credit Union Industry Services.

  . Cybercredit Services.

- SBC's General Business Services (batch processing) was transferred to CDC's Commercial Credit organization. CDC's other data services organizations (Cybernet, Arbitron, and Ticketron) were not affected in the reorganization.

- SBC has begun marketing intelligent workstations to credit unions tied to its timesharing network.

  - The new hardware provides on-line processing of share and loan transactions.

  - It includes on-line inquiry, number account history, general ledger accounting, and extended capacity for report printing.

- Two new data base services have also been introduced by CDC:

- CDC has initiated development of a solar energy data base that can be accessed through the company's TECHNOTEC technology transfer service.

- CDC began marketing a national computer data base and telecommunications link for urban managers and local governments.

- General Electric Information Services Company (GEISCO) has also announced a new data base service.

  - The service was initially developed by Information Technology Corporation.

  - It is designed to help financial institutions' loan officers qualify automobile loans by estimating total purchase and operating cost.

- GEISCO has added to its Mark III Remote Computing Service a new modeling system for assessing the economic viability of mining coal deposits.

  - The product, Miner II, allows the user to build models involving multi-seam coal deposits.

  - Miner II is designed to give management the ability to evaluate accurately and continually the risk reward potential at all stages of production.

- Automatic Data Processing (ADP) and Townsend-Greenspan have added two European data bases to ECONANLYST, their joint economic computing service.

  - EUROPECTUS consists of 400 time series of economic indicators from six European countries.

- BANK contains monthly and quarterly figures on all significant United Kingdom financial time series.

- ADP also announced interactive access to the Conference Board's data base of almost 800 time series.

  - This data base includes summary projections of the effect of inflation and unemployment on the Gross National Product, indications of help wanted advertising volume, listings of automobile sales by ten-day periods, and capital appropriations by industry sectors.

- ADP has also been active in the banking and financial industry sector.

  - It recently formed a new division to provide automatic teller machine service to banks and thrift institutions in the U.S.

  - ADP acquired the Bank Services Division from NLT Computer Service and also Telephone Computing Services, a company which provides electronic funds transfer services for banks.

- United Computing Systems (UCS) enhanced its UCS/Cray Service.

  - The Cray-1 which UCS had used since 1978 was replaced in December 1980 by a Cray-1 Model S/1000.

  - The new system features over one million words of central memory and 2.4 billion bytes of mass storage.

  - UCS also extended access to its service by adding a Telenet interface to its own network, UNINET, which also interfaces with TYMNET.

C. PROCESSING FACILITIES MANAGEMENT

1. USER EXPENDITURES

- Processing Facilities Management (PFM) user expenditures are forecasted to grow at 21% AAGR through 1986, as shown in Exhibit IV-8.

  - Most of the incremental growth will be in three industry sectors:

    . Banking and finance.

    . Insurance.

    . Medical

  - This market is dominated by information services firms with over $10 million in revenues which have over 70% of the market.

- Growth in the other industry sectors except for governments will come largely from the conversion of existing RCS and batch services to long-term contracts.

- Eighty percent of user expenditures for function specific PFM services are by the federal government, as shown in Exhibit IV-9.

- Nearly 90% of PFM's revenue is industry specific. More than 80% of that revenue is concentrated in three industry sectors, as shown in Exhibit IV-10.

- Utility PFM is a small market in which more than half of these services are purchased by government organizations, as shown in Exhibit IV-11.

EXHIBIT IV-8

PROCESSING FACILITIES MANAGEMENT

MARKET FORECAST BY INDUSTRY SECTOR,

1981-1986

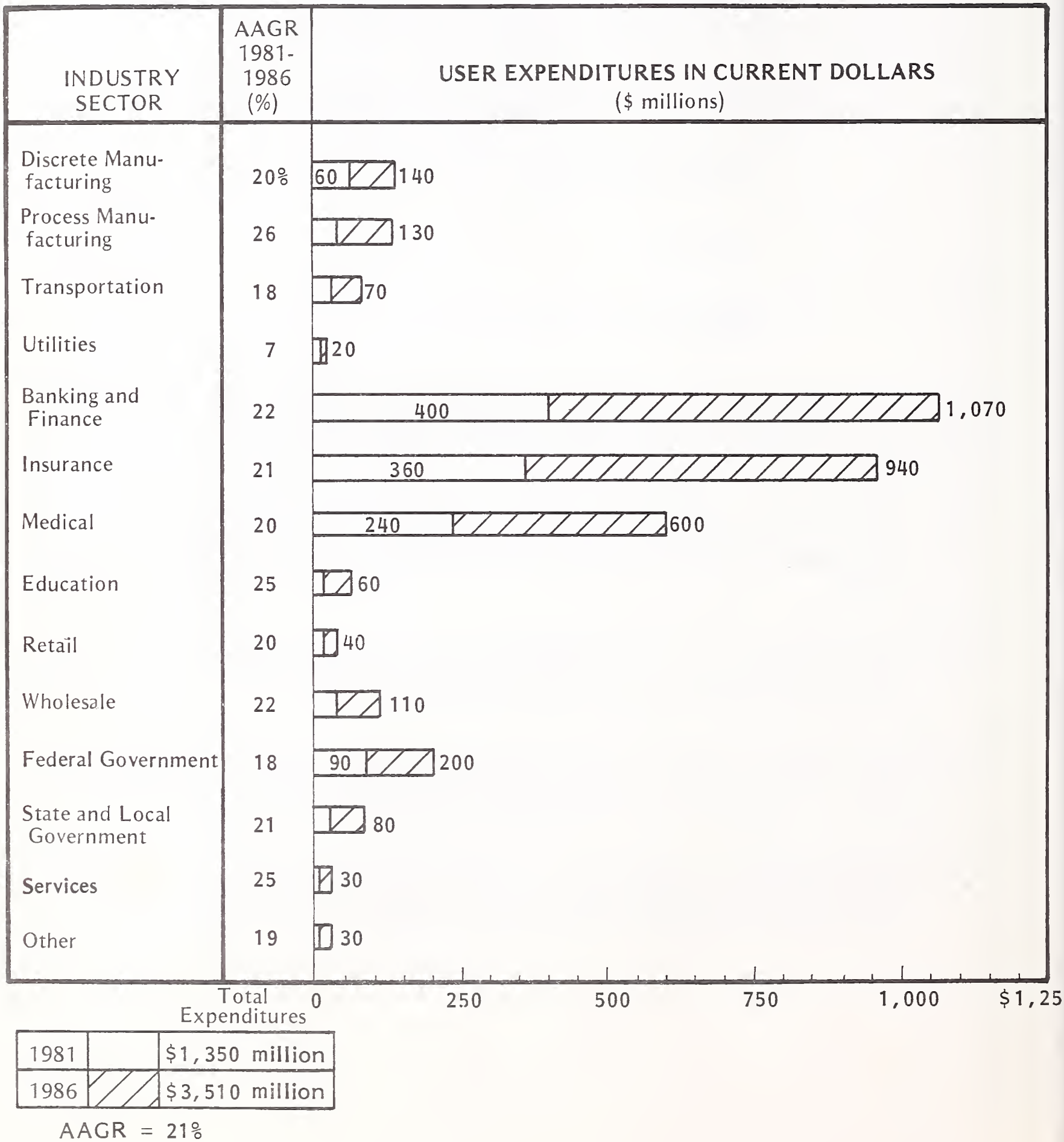


EXHIBIT IV-9

PROCESSING FACILITIES MANAGEMENT - FUNCTION SPECIFIC
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	14%	10
Process Manufacturing	20	10
Transportation	0	0
Utilities	0	2
Banking and Finance	0	0
Insurance	0	0
Medical	0	0
Education	0	0
Retail	0	0
Wholesale	0	0
Federal Government	12	40 / 70
State and Local Government	0	0
Services	0	0
Other	0	0

Total Expenditures: 0 | 25 | 50 | 75 | 100 | $125

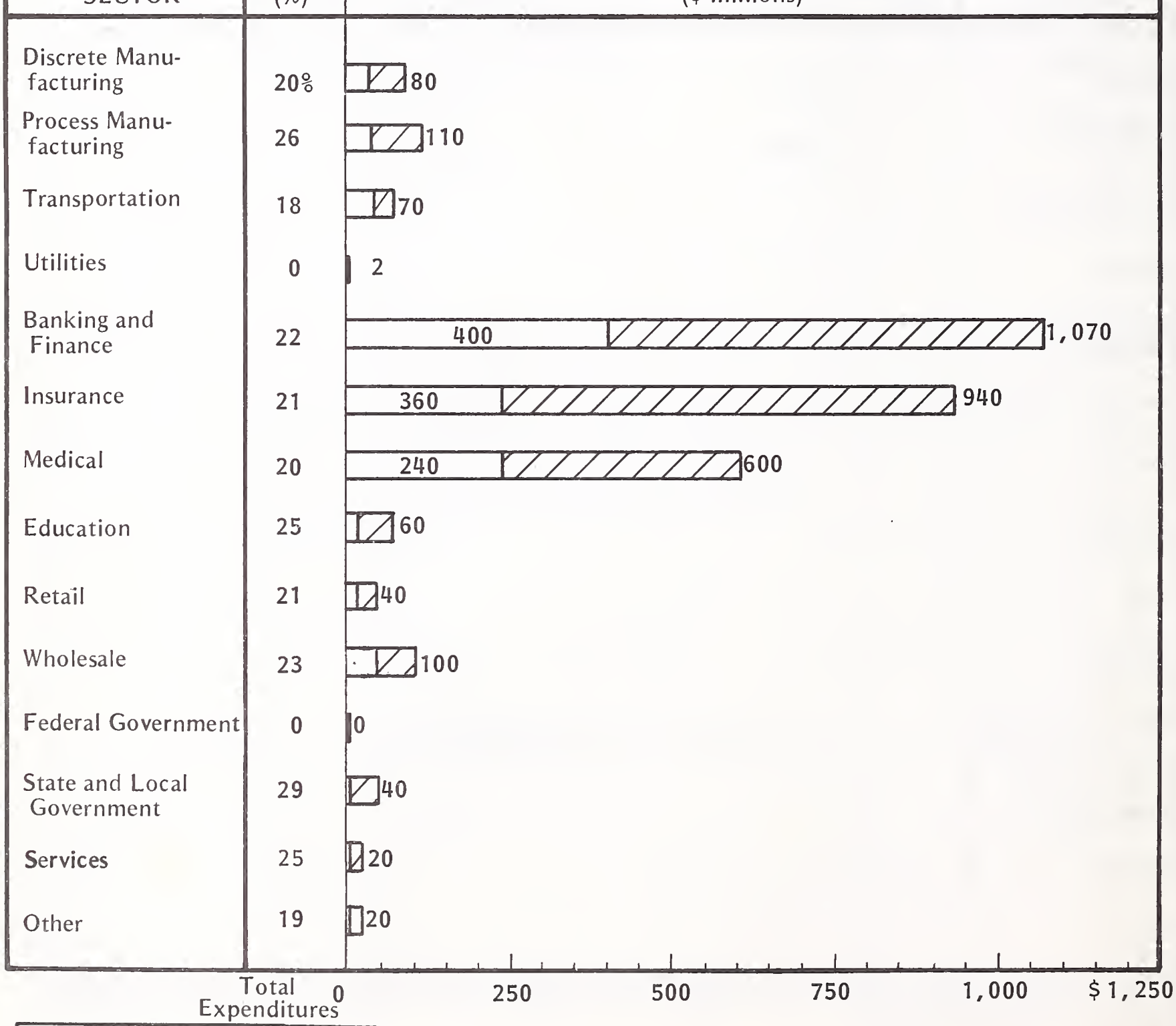
1981		$ 50 million
1986		$ 90 million

AAGR = 12%

EXHIBIT IV-10

PROCESSING FACILITIES MANAGEMENT - INDUSTRY SPECIFIC
MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	20%	80
Process Manufacturing	26	110
Transportation	18	70
Utilities	0	2
Banking and Finance	22	400 → 1,070
Insurance	21	360 → 940
Medical	20	240 → 600
Education	25	60
Retail	21	40
Wholesale	23	100
Federal Government	0	0
State and Local Government	29	40
Services	25	20
Other	19	20



1981		$1,190 million
1986		$3,140 million

AAGR = 22%

EXHIBIT IV-11

PROCESSING FACILITIES MANAGEMENT - UTILITY
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	22%	20 / 60
Process Manufacturing	26	20
Transportation	0	0
Utilities	11	10
Banking and Finance	0	0
Insurance	0	0
Medical	0	0
Education	0	0
Retail	0	0
Wholesale	17	10
Federal Government	23	50 / 130
State and Local Government	15	20 / 50
Services	0	0
Other	18	10

Total Expenditures: 0 | 50 | 100 | 150 | 200 | $ 250

1981		$110 million
1986		$290 million

AAGR = 20%

2. MAJOR PROCESSING FACILITIES MANAGEMENT VENDOR ACTIVITIES

- Electronic Data Systems (EDS) is expanding its efforts in marketing to the banking industry.

  - EDS acquired Application Programming Services which has been developing and installing comprehensive banking application systems based on minicomputers designed for small banks with no prior in-house computer experience.

  - EDS has also entered the shared automatic teller machine marketplace with a PFM service called Edslink.

    . It will be marketed to thrift institutions and credit unions in addition to commercial banks.

    . Edslink consists of ATM switch software developed by Quadstar, duplexed IBM Series I computers, and support personnel from EDS.

- Securities Information Automation Corporation (SIAC) has expanded its level of service by offering a number of new services.

  - The New York Stock Exchange Opening Automated Reporting Service (OARS) electronically stores small market orders prior to a stock's opening and generates instantaneous execution reports to subscribing member firms when the opening price is determined.

  - SIAC also is involved in developing, testing, and operating computer systems for the newly established New York Futures Exchange.

- Shared Medical Systems (SMS) has emphasized its efforts in the physician market by elevating its Physician Services Department to the divisional level. Staffing in that unit tripled in 1980.

- MCAUTO, a major medical PFM vendor, released a major new service for that market.

  - Called inter-ACT, the service involves a new processing technique that expedites the abstracting process in hospitals.

  - It includes minicomputers installed at hospitals which gather information that is then routed through MCAUTO's network to its Health Care Data Center.

D. BATCH PROCESSING SERVICES

1. USER EXPENDITURES

- Growth of all batch processing services (BPS) at 9%, shown in Exhibit IV-12, will lag the producer's price index by 0.8% resulting in a shrinkage in real terms over the forecasted period.

  - The only batch processing market which offers major opportunities for real growth in the next five years is the process manufacturing sector.

  - Batch services will continue to lose market share to RCS, PFM, and to low-cost very small computer systems.

- Fifty-five percent of user expenditures on BPS are for Industry Specific BPS which will amount to $1.8 billion in 1981, as shown in Exhibit IV-13.

  - The largest user expenditures are in the banking and finance sector where the single largest application is credit card processing.

  - Also large, and growing at the fastest rate (21%) of all BPS, is the process manufacturing sector.

EXHIBIT IV-12

BATCH SERVICES

MARKET FORECAST BY INDUSTRY SECTOR,

1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	6%	400 → 550
Process Manufacturing	19	530 → 1,250
Transportation	7	60 → 80
Utilities	5	70 → 90
Banking and Finance	5	740 → 950
Insurance	6	120 → 160
Medical	5	200 → 250
Education	6	60 → 80
Retail	7	210 → 290
Wholesale	9	290 → 440
Federal Government	1	60 → 60
State and Local Government	6	80 → 110
Services	8	280 → 410
Other	10	260 → 420

Total Expenditures

0 | 250 | 500 | 750 | 1,000 | $1,250

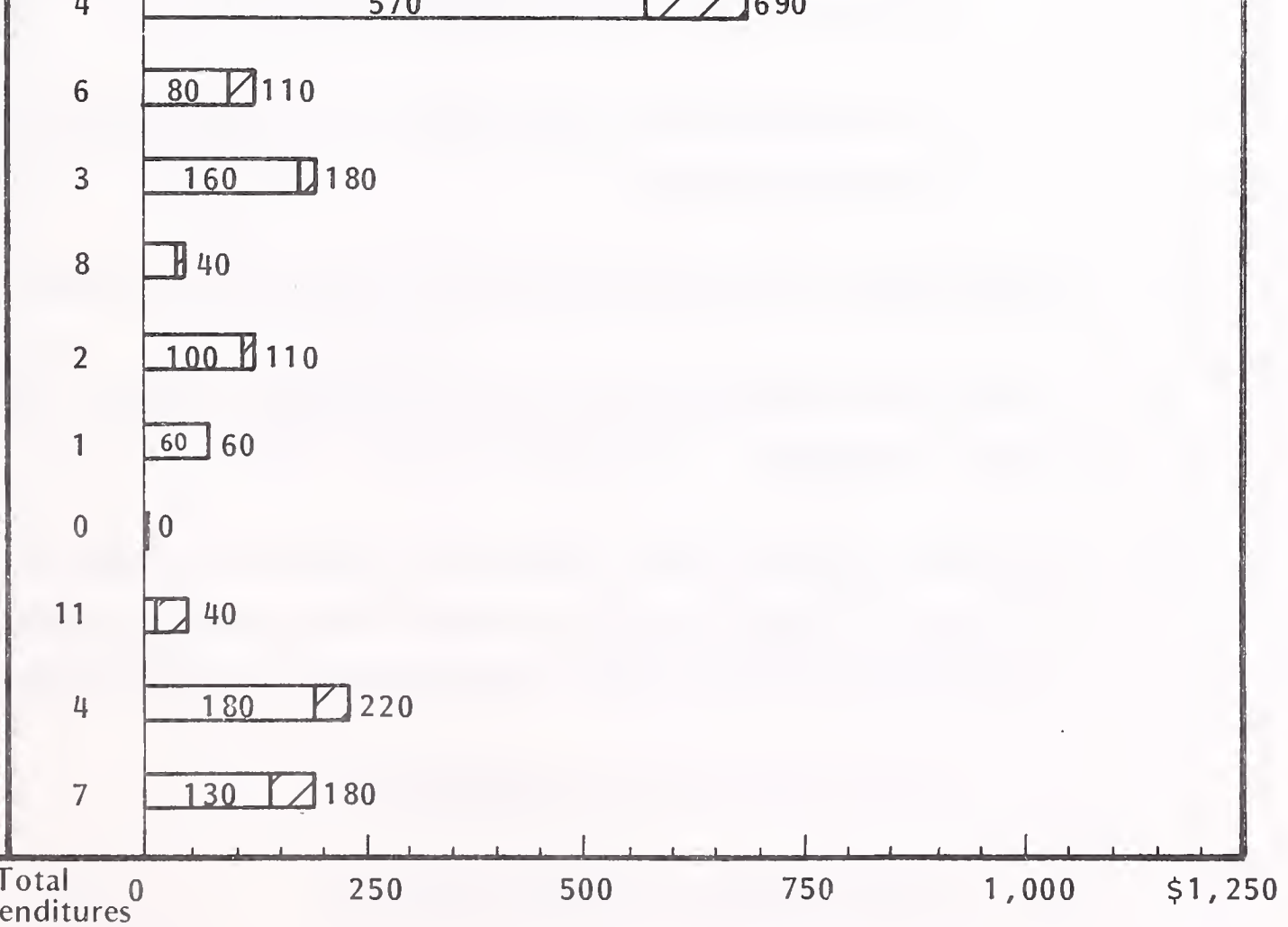
1981	$3,340 million
1986	$5,130 million

AAGR = 9%

EXHIBIT IV-13

BATCH SERVICES - INDUSTRY SPECIFIC
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	9%	80 → 130
Process Manufacturing	21	390 → 1,020
Transportation	8	40
Utilities	3	10
Banking and Finance	4	570 → 690
Insurance	6	80 → 110
Medical	3	160 → 180
Education	8	40
Retail	2	100 → 110
Wholesale	1	60 → 60
Federal Government	0	0
State and Local Government	11	40
Services	4	180 → 220
Other	7	130 → 180



1981		$1,840 million
1986		$2,840 million

AAGR = 9%

- The process manufacturing sector owes most of its size and growth to one application in the petroleum industry, seismic data processing.

- Thirty-one percent of BPS's revenues are function specific BPS revenues which will amount to slightly more than $1 billion in 1981, as shown in Exhibit IV-14.

  - Payroll and general accounting services are the major function specific BPS and they are distributed across all industry sectors.

  - Growth of function specific BPS will be above average for BPS, at 11% over the next five years.

- Utility BPS will grow at only 3% AAGR through 1986, as shown in Exhibit IV-15.

  - The only sector showing significant growth is the banking and finance sector and that is from a very small revenue base.

  - The wholesale sector will continue to be the largest sector throughout the forecast period.

2. MAJOR BATCH PROCESSING SERVICES VENDOR ACTIVITIES

- ADP was the largest vendor of batch processing services in 1980, with $260 million in revenues.

- The fastest growing batch processing application in 1980 was seismic data processing. Among the fastest growing firms marketing these services were the following, with their 1979-1980 growth rates and 1980 revenues:

  - Texas Instruments, 57%, $69 million.

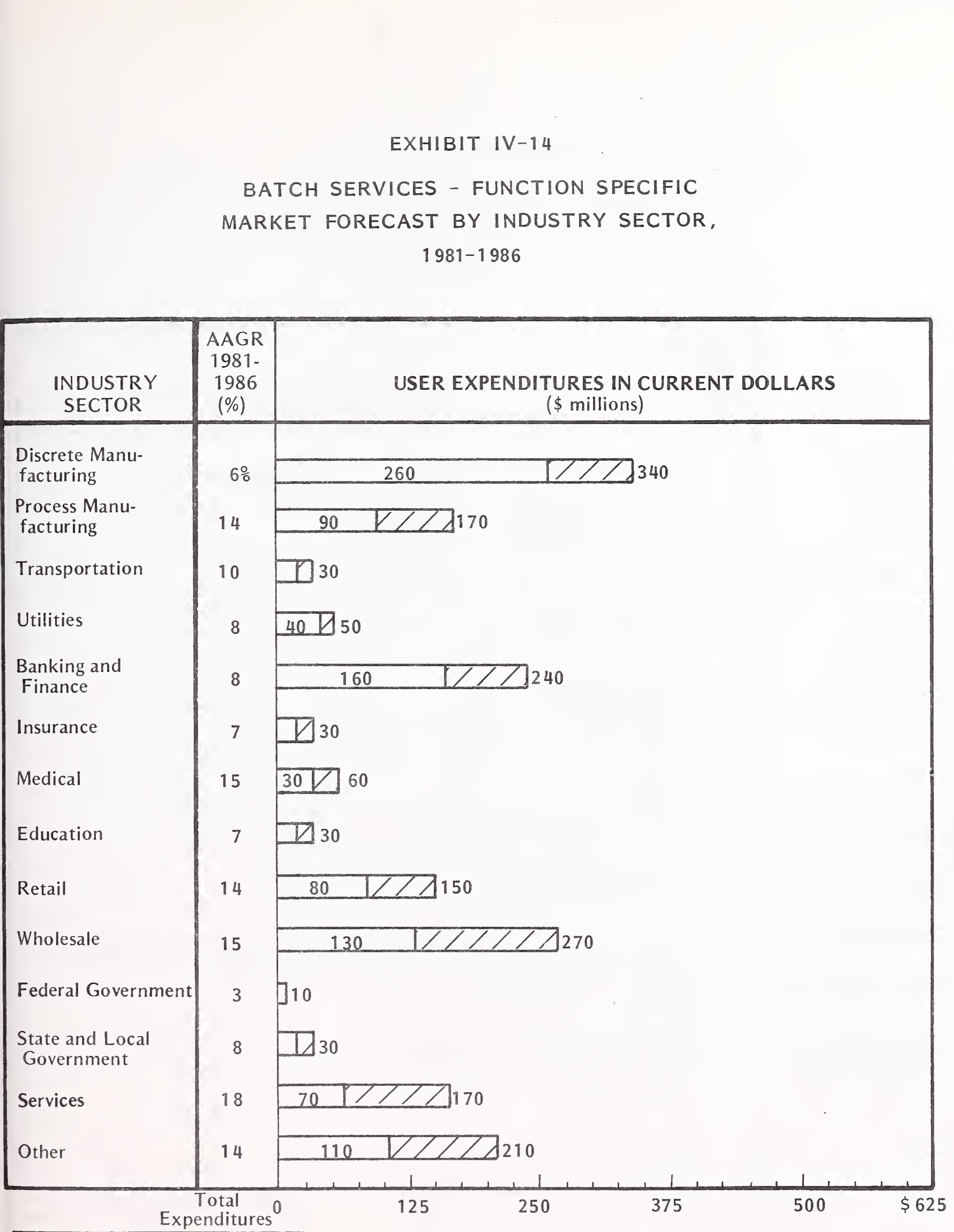
  - Western Geophysical, 39%, $82 million.

  - Digicon, 39%, $27 million.

EXHIBIT IV-14

BATCH SERVICES - FUNCTION SPECIFIC
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	6%	260 / 340
Process Manufacturing	14	90 / 170
Transportation	10	30
Utilities	8	40 / 50
Banking and Finance	8	160 / 240
Insurance	7	30
Medical	15	30 / 60
Education	7	30
Retail	14	80 / 150
Wholesale	15	130 / 270
Federal Government	3	10
State and Local Government	8	30
Services	18	70 / 170
Other	14	110 / 210



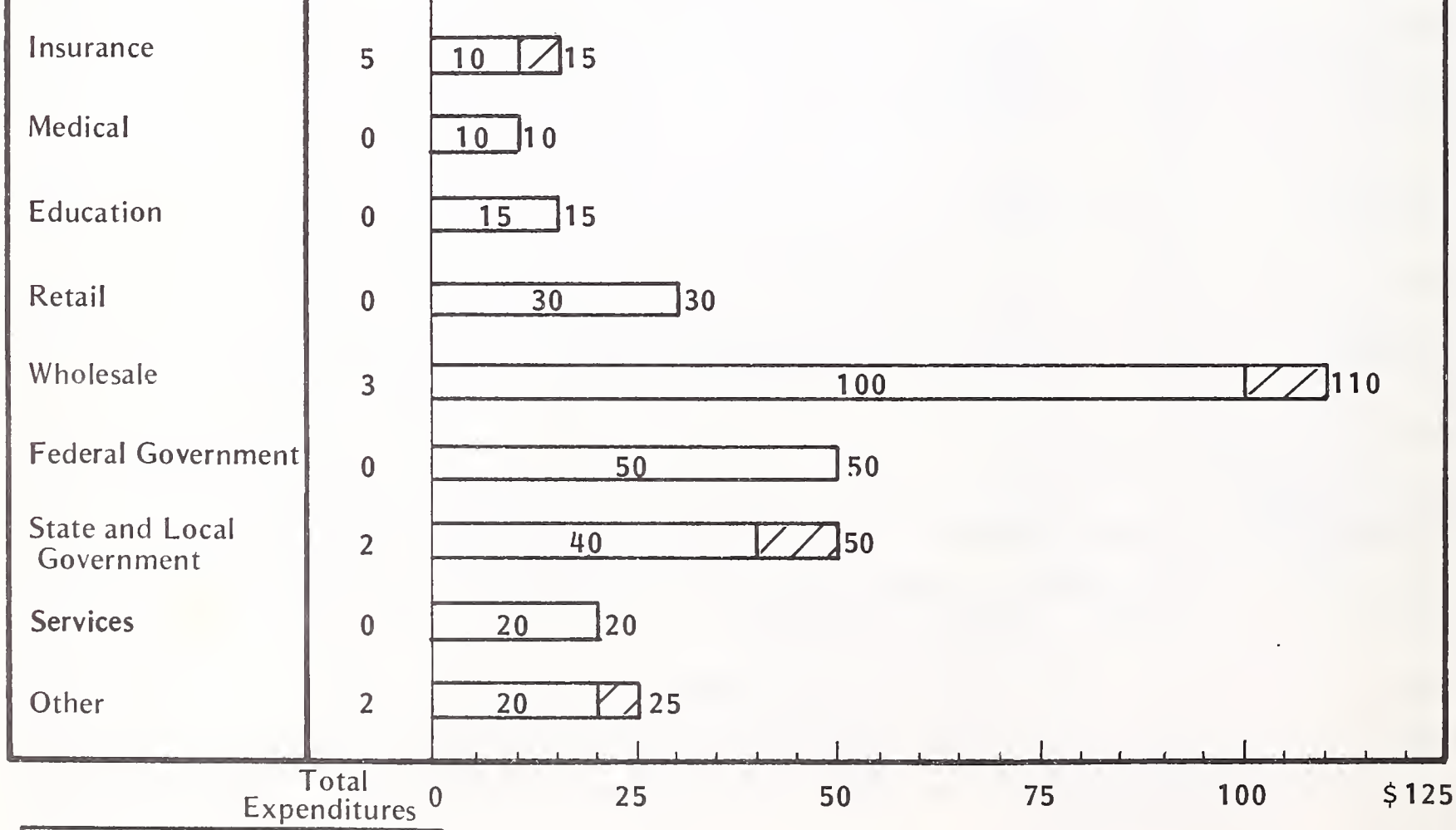
1981		$1,050 million
1986		$1,780 million

AAGR = 11%

EXHIBIT IV-15

BATCH SERVICES - UTILITY
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	4	70 / 80
Process Manufacturing	5	50 / 60
Transportation	0	10 / 10
Utilities	0	20 / 20
Banking and Finance	12	10 / 20
Insurance	5	10 / 15
Medical	0	10 / 10
Education	0	15 / 15
Retail	0	30 / 30
Wholesale	3	100 / 110
Federal Government	0	50 / 50
State and Local Government	2	40 / 50
Services	0	20 / 20
Other	2	20 / 25



1981		$450 million
1986		$510 million

AAGR = 3%

- Geosource Inc., which offers a complete range of services in land and marine seismic data acquisition and interpretation services, has developed a new data base management system called Geostar.

  - Geostar is capable of storing, retrieving, and displaying both seismic and well logging data.

  - According to Geosource, the service has the capability of significantly reducing interpretation man-hours.

- Tymshare made several acquisitions in the past year.

  - Late in 1980, Tymshare bought the stock of Telecheck, the Denver based electronic check verification and guarantee service organization, and it purchased Bankcard Association of Rhode Island (BARI) from its six shareholder banks.

  - Tymshare is expected to use the acquisition of BARI as a springboard to expand its credit card business in the northeast and east.

  - Tymshare was the only major vendor of batch processing services to have a decline in BPS revenues (-1%) in 1980 which was a result of losing some credit card processing clients to in-house EDP operations.

  - Losses in this business area have continued into 1981 and have been reflected in a decline in profit growth in the first half of 1981.

- Control Data Corporation, the second largest BPS vendor with 1980 revenues of $138 million, grew faster than the BPS industry with a modest 12% increase.

- The majority of CDC's batch processing is performed by General Business Services, a division recently transferred to CDC's Commercial Credit Company.

- The division will function as a part of the Control Data Business Centers. The Business Centers, established on a national basis, market all applicable products and services of Control Data, Commercial Credit, and The Service Bureau Company. Small business computers manufactured by other hardware companies are also sold by the Centers.

- CDC's long-range plan calls for the opening of some 400 centers throughout the U.S. Financial services, education and training, insurance, management and marketing, and financial management services will be offered to small businesses.

V SOFTWARE PRODUCTS MARKETS

V SOFTWARE PRODUCTS MARKETS

A. USER EXPENDITURES

- User expenditures for software products will quadruple by 1986, as shown in Exhibit V-1.

- Systems software products' user expenditures will be five times higher in 1986 than they will be in 1981. A number of factors will contribute to this high rate of growth.

  - Computer manufacturers are expected to nearly completely unbundle their systems software from the machine costs.

  - Computer manufacturers will sell and support independent software vendors' products.

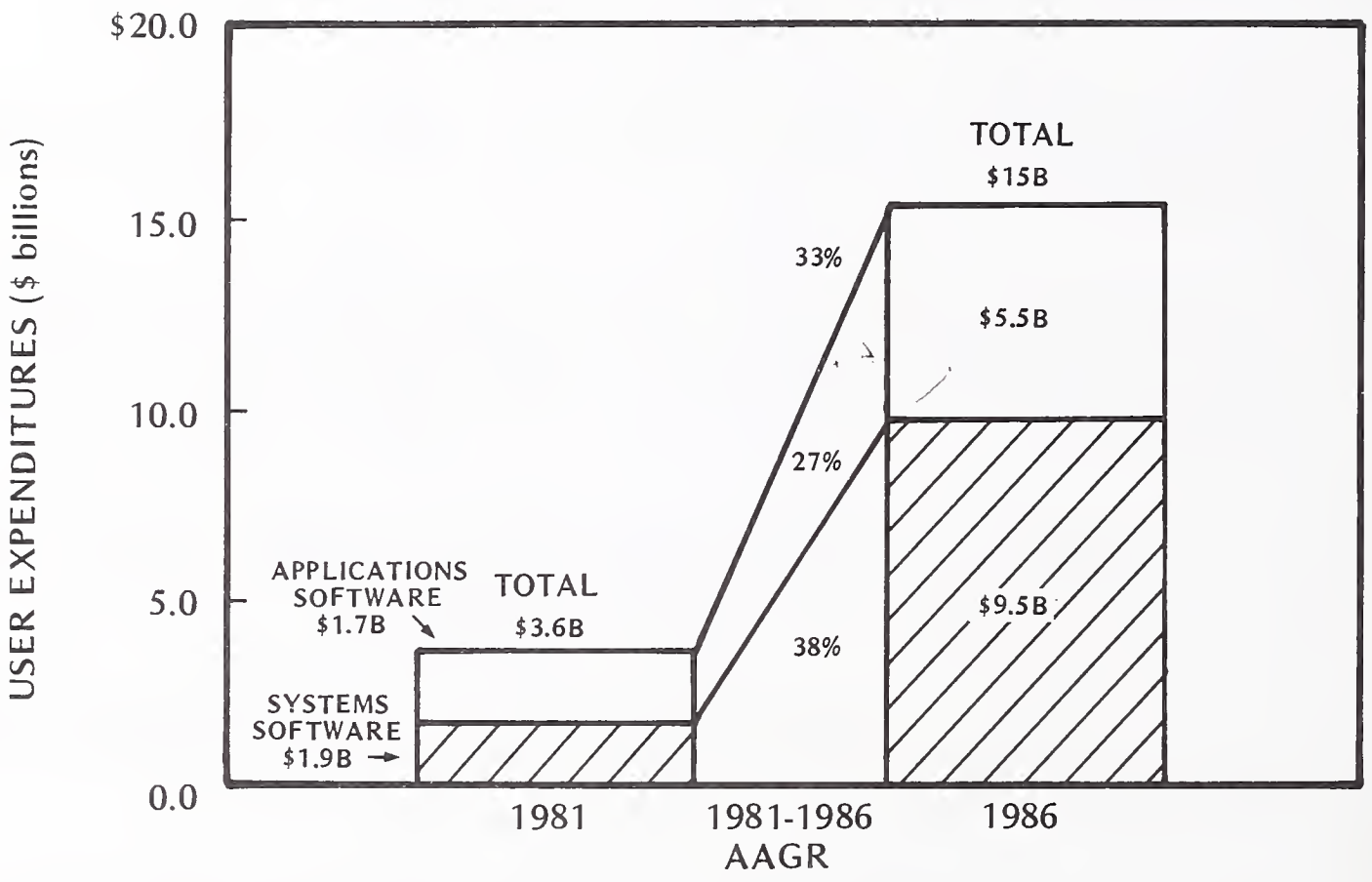
    . IBM has taken an aggressive posture in selling third-party software for its Personal Computer.

    . Digital Equipment Corporation (DEC) has been acquiring the marketing rights to independently developed software.

    . Burroughs is actively selling third-party software.

EXHIBIT V-1

U.S. SOFTWARE PRODUCTS MARKET,
1981-1986



- Computer manufacturers will continue this activity as users' expenditures continue to decline for hardware relative to software.

- End users with their own computer systems will rapidly increase their expenditures for systems software products. Their greatest demands will be for two types of products:

  . Work support systems (WSS) which enhance the productivity of technical, supervisory, and clerical functions.

  . Decision support systems (DSS) which help management make more effective decisions and policies.

- WSS and DSS will also be in great demand for personal computers and other very small business systems.

• Expenditures on applications software products will more than triple between 1981 and 1986.

- A significant portion of this growth will come from users of systems which sell for less than $100,000.

- Industry specific applications software will grow at a faster rate than functional specific applications software.

• Opportunities will be plentiful for software products firms but it will be challenging for them to keep up with the rapidly changing environment.

- Technological changes will lead to more rapid obsolescence of products. Program generators, artificial intelligence, and firmware advances will come more rapidly in the 1980s.

- Changes in distribution modes are underway which will be opportunities for some vendors and problems for others. In addition to computer

manufacturers, major as well as minor retailers, publishers, and communications companies will increasingly become mass distribution channels for packaged software.

- Software firms will have to increase their productivity in respect to customer support. Installing software, training users, fixing bugs, releasing enhancements, will need to be more efficient. This will be especially true in mass marketing and distribution environments.

- Software firms will have to "reinvent the wheel" less frequently as industry standard operating systems such as CP/M become more prevalent in all sizes of systems.

- More portable languages such as PASCAL and ADA will also contribute to increases in software development and support productivity.

- Software products vendors are on the leading edge of a technological revolution which will require astute corporate planning and agile management in order to survive if not prevail in an increasingly competitive marketplace.

B. SYSTEMS SOFTWARE PRODUCTS

1. USER EXPENDITURES

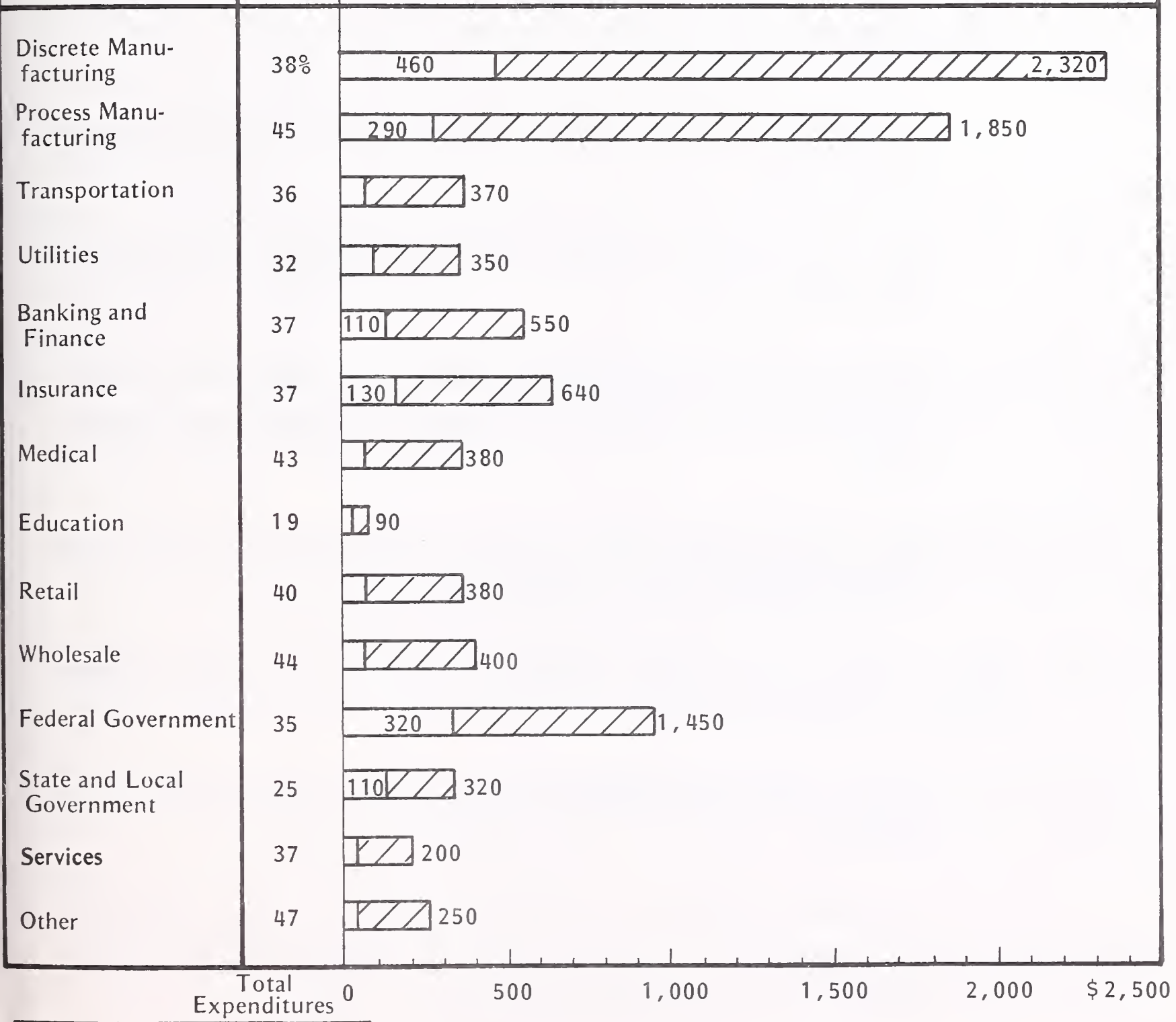
- The largest incremental growth in user expenditures for systems software will be in the discrete manufacturing sector, as shown in Exhibit V-2.

- Incremental growth in the process manufacturing sector will be about 16% smaller than in discrete manufacturing but will grow at a 45% AAGR. The energy portion of this sector will add to the higher growth rate.

EXHIBIT V-2

SYSTEMS SOFTWARE PRODUCTS
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	38%	460 / 2,320
Process Manufacturing	45	290 / 1,850
Transportation	36	370
Utilities	32	350
Banking and Finance	37	110 / 550
Insurance	37	130 / 640
Medical	43	380
Education	19	90
Retail	40	380
Wholesale	44	400
Federal Government	35	320 / 1,450
State and Local Government	25	110 / 320
Services	37	200
Other	47	250



1981		$1,910 million
1986		$9,540 million

AAGR = 38%

- Demand for systems software from the medical, wholesale, and other sectors will present major opportunities for growth to vendors.

2. MAJOR SYSTEMS SOFTWARE PRODUCTS VENDOR ACTIVITIES

- Software AG and Pansophic, two of the leading independent vendors in systems software, went public in 1981.

- IBM finally released its long awaited relational data base system, the Structured Query Language (SQL).

  - The data are defined in tabular form and addressed through operations on the tables.

  - INPUT believes that users will use SQL as an adjunct to, rather than a replacement of, IMS.

  - Performance of the new systems software is much less than Information Management Systems (IMS) or Customer Information Control Systems (CICS).

  - SQL is not the final answer to data base management and will not be rapidly embraced by the user community.

- Users of IBM plug compatible mainframes gained access to IBM licensed software and support services.

  - This is a result of an agreement between IBM and National Advanced Systems.

  - The agreement stipulates that IBM's Systems Installation Productivity Option (IPO) will be made available to all licensees of IBM programs, irrespective of type of installed processor.

- After announcing three more processors and operating systems enhancements for its 8100 line, IBM then underlined its intent to make the 8100 the firm's showcase distributed processor by announcing six program products designed to make the 8100 easier to operate in a distributed environment.

- Honeywell released its "blueprint for products in the 1980s," an X.25 compatible Distributed Systems Architecture (DSA) for integrated communications between multivendor networks.

  - DSA differs from IBM's System Network Architecture (SNA) which imposes subservience of systems to master systems within a network largely supplied by IBM or plug compatible vendors.

  - According to Honeywell, DSA is the first architecture based on the International Standards Organization (ISO) "open systems connection" reference model.

  - DSA is a layered architecture intended to optimize support for networks that employ the X.25 and X.21 interface protocols for packet and circuit switching.

  - Within a DSA network, processing systems can work as peers without supervision by a central host, although the architecture does allow for hierarchical control and hybrid systems configuration.

- Burrough has also released a DDP offering.

  - Beta test sites have been established by Burroughs for a new hardware/software combination called InterSystem Control (ISC) that enables systems from the B5900 up to be loosely coupled.

  - Burroughs listed six capabilities provided by ISC; file access, file transfer, job transfer, interprogram communication, operator display transfer, and communication transfer.

- DEC has entered the X.25 public packet switching network market with a new product called Packnet. Packnet is a collection of DEC's software products, protocols, interfaces, and support services which will link DEC computers into X.25 packet switched networks.

C. APPLICATIONS SOFTWARE PRODUCTS

1. USER EXPENDITURES

- User expenditures on applications software products will be more evenly distributed across industry sectors than for systems software products, as shown in Exhibit V-3.

  - The discrete manufacturing sector will have the largest incremental growth through 1986 with a slightly above average 30% AAGR.

  - The transportation, wholesale, retail, and process manufacturing sectors will have the fastest AAGR in user expenditures for applications products.

2. MAJOR APPLICATIONS SOFTWARE PRODUCTS VENDOR ACTIVITIES

- The largest independent applications software products vendor, Management Science America (MSA), went public in April 1981.

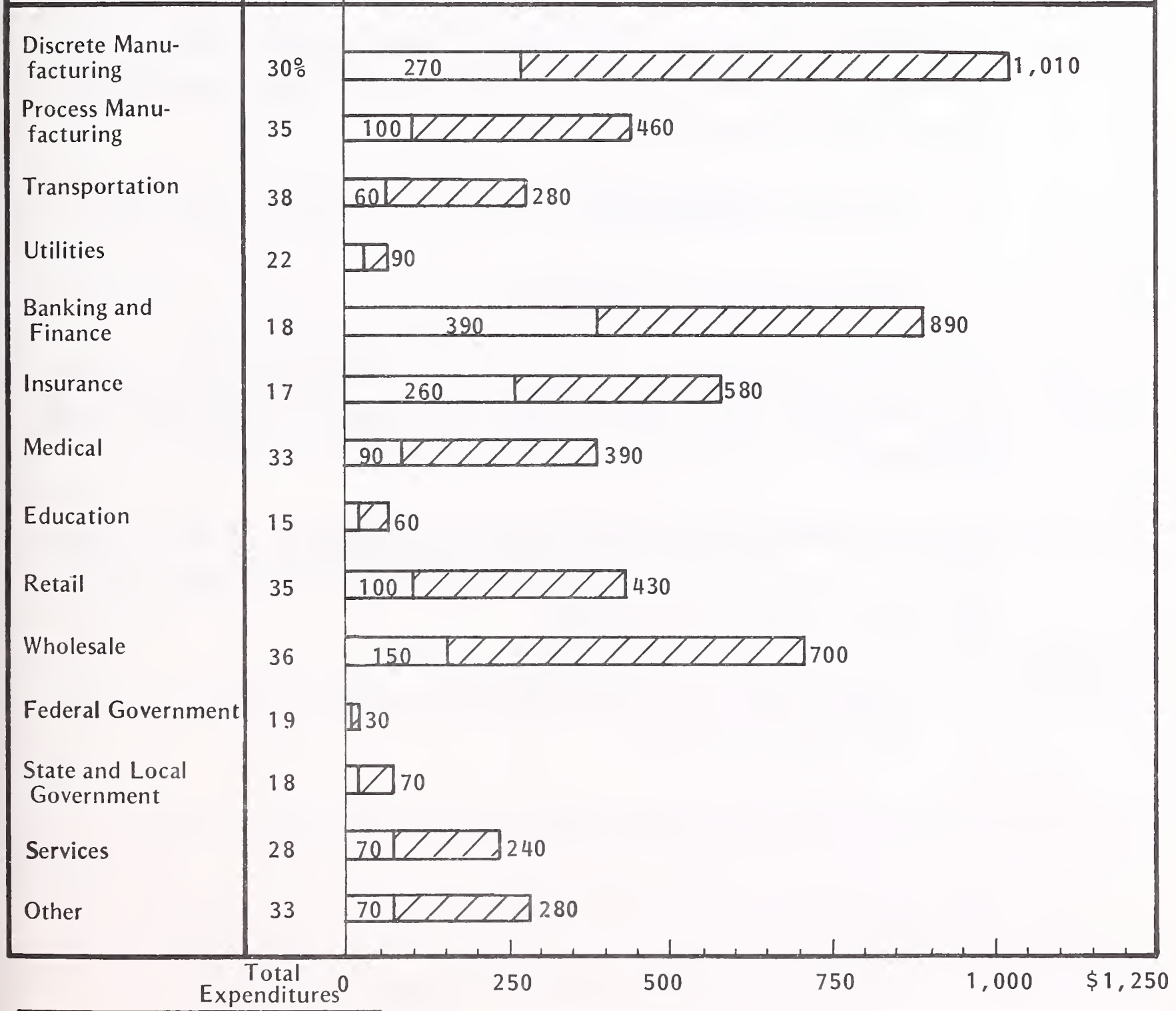
  - MSA is the first major vendor to make a strong move into the personal computer software products market with its acquisition of Peachtree Software, a major vendor of accounting software for personal computers using the CP/M operating system.

  - MSA also acquired the Q-Pac payroll package from the British firm, Q Packaged Programs.

EXHIBIT V-3

APPLICATIONS SOFTWARE PRODUCTS
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	30%	270 → 1,010
Process Manufacturing	35	100 → 460
Transportation	38	60 → 280
Utilities	22	→ 90
Banking and Finance	18	390 → 890
Insurance	17	260 → 580
Medical	33	90 → 390
Education	15	→ 60
Retail	35	100 → 430
Wholesale	36	150 → 700
Federal Government	19	→ 30
State and Local Government	18	→ 70
Services	28	70 → 240
Other	33	70 → 280



1981		$1,670 million
1986		$5,520 million

AAGR = 27%

- Other software companies who went public in 1981 were:
  - NCA Corporation.
  - ASK Computer Systems.
- GEISCO acquired Software International, a $22 million vendor of financial and manufacturing software.
- Hewlett-Packard has also been active in acquiring application software companies. Both companies acquired are HP 3000 OEMs specializing in manufacturing-related products.
  - Information Resources Ltd.
  - Software Management Corporation.
- McCormack and Dodge is now offering its general ledger/financial analysis software package, G/L Plus, for use on the Sperry Univac series 1100 mainframes.
- United Telecommunications announced that it has agreed to acquire Insurance Systems of America (ISA), which was the fourth largest independent applications software products firm in 1980.
  - ISA had software products revenue of $14 million in 1980 which was a 33% increase over 1979.
  - The purchase will be an exchange of stock valued at $41.5 million.
- UCC has acquired two financial software organizations in the last year:
  - The Systems Division of American Valuation Consultants.
  - Fortex Corporation.

- Informatics has acquired and divested itself of applications software.

  - The rights to GROUP-COMM, a group insurance administrative software system, was acquired.

  - Management Control Systems, an Atlanta developer of software for small accounting firms, was acquired.

  - Informatics sold a number of financial products (general ledger, accounts payable, purchase order, and product cost systems) to former employers.

D. VERY SMALL COMPUTER SOFTWARE MARKET

1. USER EXPENDITURES

- The very small computer presents the single largest opportunity for both systems and applications software products vendors in the next five years.

- INPUT forecasts that the growth of user expenditures will be explosive for both types of software.

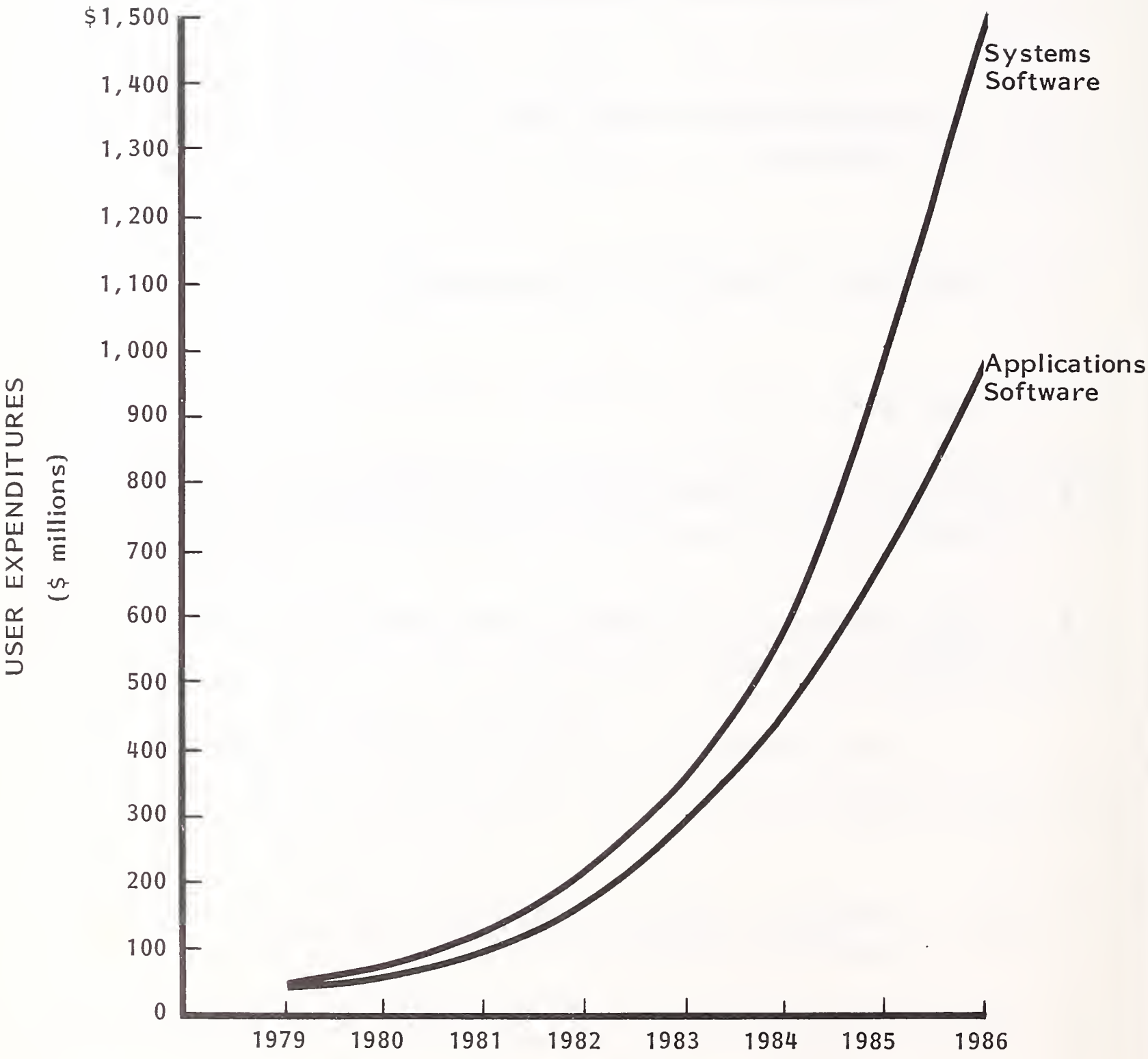
  - Systems software user expenditures will have a 63% AAGR and grow from $130 million in 1981 to $1.5 billion in 1986, as shown in Exhibit V-4.

  - Applications software user expenditures will have a 60% AAGR and grow from $95 million in 1981 to $1.0 billion in 1986.

- Very small computers are defined by INPUT as machines with a total hardware cost of $15,000 or less.

EXHIBIT V-4

U.S. USER EXPENDITURES FORECAST FOR
VERY SMALL COMPUTER SOFTWARE PRODUCTS



- Virtually all personal computers fit into this category.

- Some systems offered by the major traditional computer manufacturers also qualify for inclusion.

2. MAJOR VENDOR ACTIVITY

- For the past few years, three vendors have dominated the personal computer hardware marketplace and they all are major vendors of software:

  - Apple Computers - Apple.

  - Tandy Corporation - TRS-80.

  - Commodore - Pet.

- A number of other vendors are major participants in the very small computer marketplace, many of which have concentrated more on the small business marketplace than the home market:

  - Cromemco.

  - Northstar.

  - Altos.

  - Ohio Scientific.

  - Vector Graphics.

  - Intertec Data Systems.

  - Atari.

  - Heath/Zenith.

- In the past year a host of new vendors have entered this marketplace, some of whom are giants in the office equipment and computer markets:
  - IBM.
  - Xerox.
  - Hewlett-Packard (HP).
  - DEC.
  - Nippon Electric Corporation (NEC).
  - TRW-Fujitsu.
  - Hitachi.
  - Osborne.
- IBM's entry into the market was the most significant.
  - INPUT believes that IBM would not have entered unless it saw a billion dollar potential market within a reasonable timeframe.
  - IBM entered with two offerings:
    - Personal Computer.
    - Datamaster.
  - IBM's entry was accompanied by some of the most innovative and precedent shattering moves the company has ever made.

- IBM manufactures very little of its personal computer or its software.
  - The microprocessor is an Intel 8088.
  - The printer is made by Epsom, a subsidiary of Japan's Seiko Corporation.
  - The floppy disk drives are supplied by Tandon.
  - Hitachi provides the CRT display.
  - The principal operating system is CP/M supplied by Digital Research.
  - The primary language is Basic 80 provided by Microsoft.
  - Major systems software, including Visicalc, is provided by Personal Software.
  - Major applications software, primarily accounting packages, come from Peachtree Software, now a part of MSA.
  - Word processing software, Easywriter, is supplied by Information Unlimited Software.
  - As one can see, very little besides the name plate is being provided by IBM.
  - It is interesting to note also that nearly half of the hardware is made overseas.
- IBM is using some new distribution channels for the hardware and software.
  - One major channel will be through independent retail outlets which include Computerland and Sears Roebuck.

- The other major channel will be through a special IBM sales force which will concentrate on major multiple installation accounts through leads generated by salesmen in other divisions as well as national advertising.

  . This sales force will concentrate on Fortune 500/50 prospects.

  . Small establishment sales will be handled through the retail outlets including IBM's own "stores."

- Field services will be depot maintenance.

- IBM has set up a department to encourage third parties, including IBM employees, to develop software for the system which IBM will distribute under license from the supplier.

- The implications of the above is that IBM seems to be moving in a direction of focusing on its greatest strength, marketing and sales, and turning to third parties for product development, especially software products.

  - This has already resulted in major opportunities for the software companies mentioned above.

  - More opportunities will be available to other software companies if they focus on working with IBM.

  - INPUT predicts that this strategy will be so rewarding to IBM that it is likely to extend it upward to its mainframe offerings, as some of its major competitors such as Burroughs and DEC are already doing.

  - MSA, the largest independent software vendor in the U.S., already has a lead on other vendors in its relationship with IBM through its acquisition of Peachtree Software.

- Other important aspects of IBM's personal computer include the following:

- The processor is a 16-bit machine rather than the traditional 8 bits found on most other personal computers.

- IBM has canonized CP/M as the standard operating system for personal computers by joining the other 300 makers of personal computers who offer it, including Xerox and NEC.

- The IBM personal computer has 3270 (therefore SNA) compatibility which will increase data base access in a distributed data base environment in companies with large mainframe installations.

- This is the first time that IBM has targeted the end user as a prospect instead of the EDP department which further jeopardizes EDP management's control of EDP purchases and installations.

• The largest vendors of software products for very small computers are currently hardware manufactures.

- Tandy had $16 million in software sales in 1980, a 60% increase over 1979.

- Apple Computer had $10 million in software sales in 1980, a 100% increase over 1979.

• Several independent software companies are rapidly approaching the $10 million mark in sales of software for very small computers:

- Digital Research, the developer of CP/M.

- Microsoft, the developer of Basic 80 and a number of other languages for personal computers.

- Personal Software, the distributor of Visicalc and a variety of related software.

- MSA, accounting packages developed by Peachtree Software, its recent acquisition.

- As 16-bit microprocessors begin to proliferate in very small computers, many vendors of minicomputer software will start to exploit this marketplace.

- Lower cost 5.25-inch Winchester drives will expand the opportunities for very small computer software in the next few years.

  - These drives will make many small business applications practical.

  - Also, local networks of personal computers in large corporations will become much more commonplace.

  - Systems software will be in great demand for local networks in a variety of decision support systems configurations.

  - Accounting software, especially flexible general ledger packages, demand will be fueled by the needs of small business establishments.

- INPUT forecasts that very small computer software user expenditures will be 17%, $2.5 billion, of the total software products market by 1986. Vendors should be positioning themselves to take advantage of this high growth market today.

VI PROFESSIONAL SERVICES MARKETS

VI PROFESSIONAL SERVICES MARKETS

A. USER EXPENDITURES

- User expenditures for professional services will increase by 250% between 1981 and 1986, growing at an average annual growth rate of 29% during that period, as shown in Exhibit VI-1.

  - Standard professional services (SPS), including systems design, custom/contract programming, consulting, education, and training, will grow the fastest at 30% AAGR.

  - Professional services facilities management (PSFM) will grow at less than half the rate (12%) of SPS.

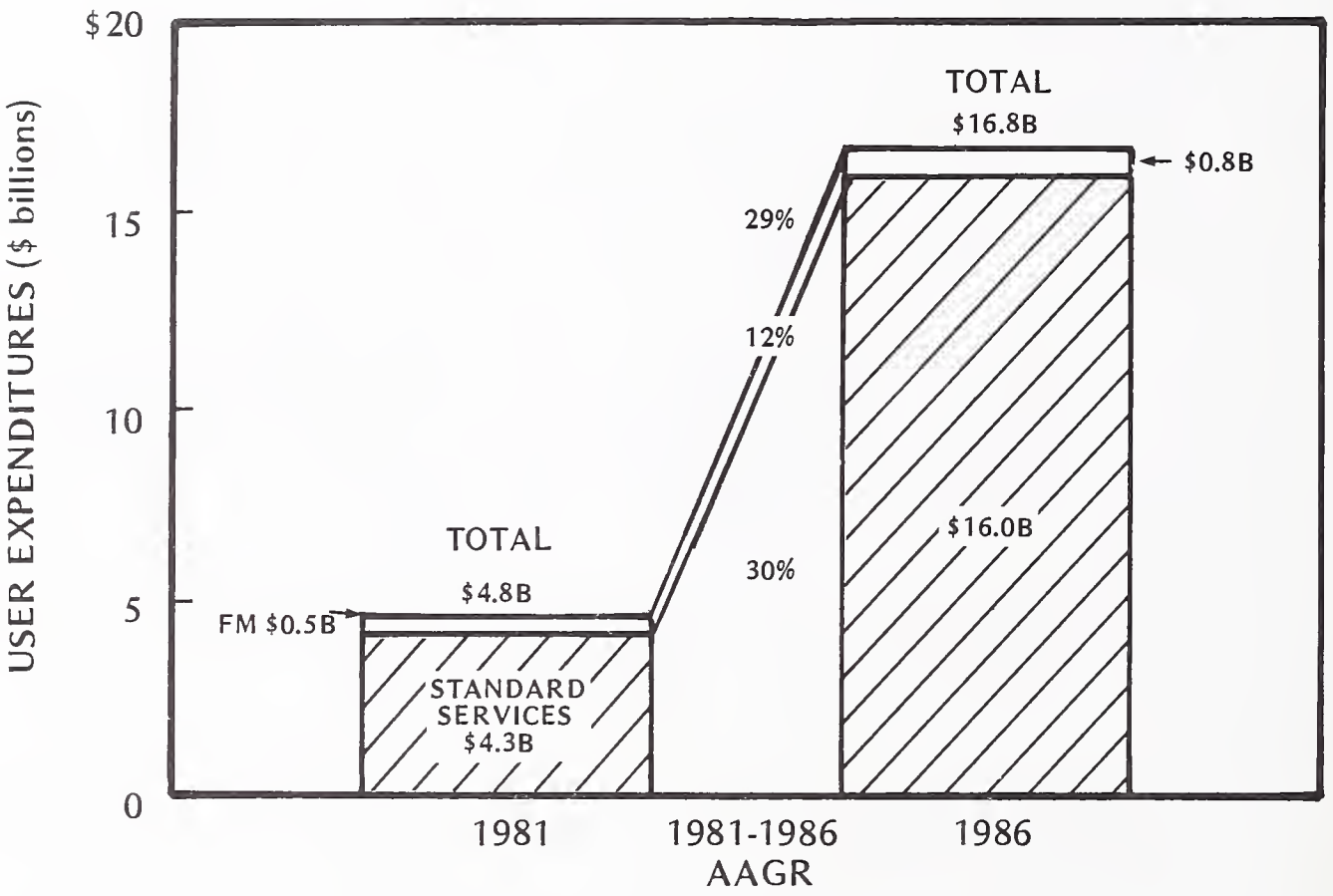
- Professional services firms in the early 1980s will benefit from the scarcity of skilled systems workers.

  - Because of this scarcity and high employee turnover, the trend will continue to grow for businesses to get away from hiring, training, and maintaining internal staffs.

  - These companies will move more and more to hiring professional services firms to assist them in their data processing.

EXHIBIT VI-1

U.S. PROFESSIONAL SERVICES MARKET,
1981-1986



- Part of this trend is a growing recognition on the part of businesses of what professional services can do for them.

- In order to sustain growth, professional services firms will have to overcome the problem of acquiring sufficient skilled personnel to serve growing user demand.

  - Service firms will have to invest heavily in training to develop skills in recent college graduate trainees to partly meet the demand.

  - They will also have to provide a work environment which not only retains current employees but also attracts new ones from user installations as well as competitors.

- Professional services companies must also build programs that are effective in reducing the trend of employees to go independent.

  - Providing equity opportunities, significant benefits, recognition, and job security will help to retain employees.

  - On the other hand, clients will be less inclined to deal with independents if firms demonstrate that large size, in-depth resources, and the professionalism of an established company contribute significantly to the client's success.

- In the past, professional services companies have had lower profit margins and lower revenue per employee productivity than processing and software companies, but this is beginning to change.

  - Professional services firms increased their revenues per employee by 18% in 1980 compared to 1979.

  - Public professional services companies increased their pretax profit margins by 29% between 1979 (7%) and 1980 (9%).

- Some of these improvements come from the efficiency of scale as many of these firms become larger.

- The three largest professional services firms all produced substantial increases in pretax profit margins in 1980 over 1979:

  - Computer Science Corporation went from 8% to 10%.

  - Systems Development Corporation went from 4% to 7%.

  - American Management Systems went from 4% to 6%.

- Recognition of the benefits of large size has fueled much of the acquisition activity that has taken place in the past year.

- Large size alone is no panacea. Companies must realize real increases in productivity and increased scope of services in order to benefit from expansion.

- Nearly half (48%) of all user expenditures for standard professional services are made by the federal and state and local government sectors which will also account for more than half of the incremental growth of these services from 1981 to 1986, as shown in Exhibit VI-2.

- Both manufacturing sectors will have above average growth.

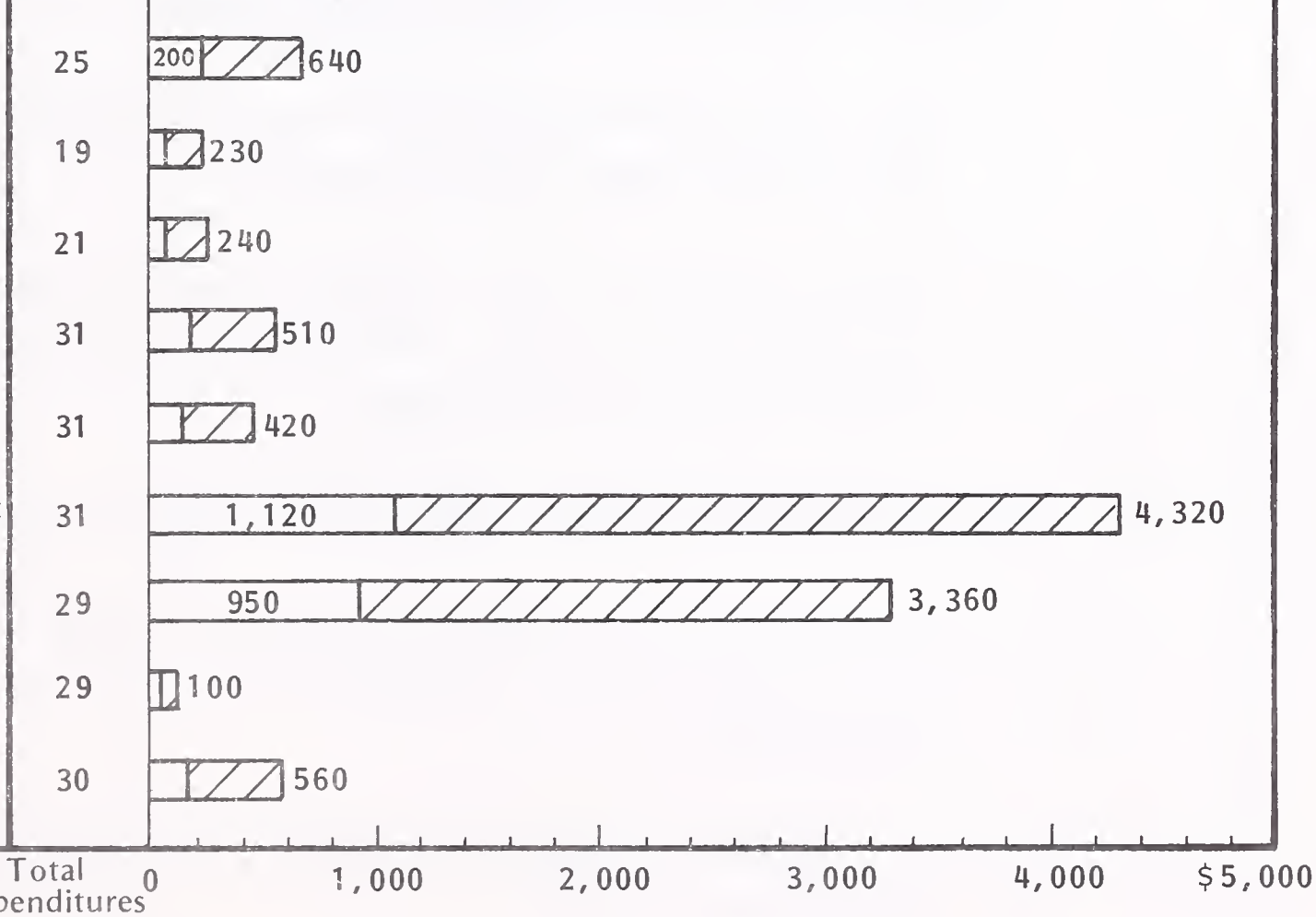
  - Discrete manufacturing will have the largest incremental growth other than the government sectors.

  - Process manufacturing will have the fastest average annual growth rate, 34%, through 1986.

EXHIBIT VI-2

STANDARD PROFESSIONAL SERVICES
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	33%	610 / 2,550
Process Manufacturing	34	320 / 1,380
Transportation	32	340
Utilities	25	500
Banking and Finance	28	250 / 870
Insurance	25	200 / 640
Medical	19	230
Education	21	240
Retail	31	510
Wholesale	31	420
Federal Government	31	1,120 / 4,320
State and Local Government	29	950 / 3,360
Services	29	100
Other	30	560



1981		$ 4,310 million
1986		$16,000 million

AAGR = 30%

- Seventy-six percent of all user expenditures made for professional services facilities management are by the federal government which will grow only at 10% through 1986, as shown in Exhibit VI-3.

- Banking and finance, and insurance are the only other sectors which will have notable incremental growth in user expenditures from 1981 to 1986.

B. MAJOR PROFESSIONAL SERVICES VENDOR ACTIVITIES

- Computer Sciences Corporation (CSC), the largest vendor of professional services, increased its revenues from professional services to $337 million in 1980, up 24% from the previous year.

- CSC is working with a group of 14 universities in establishing a Space Telescope Science Institute at Johns Hopkins University.

  - They will be developing the guide star selection system for the new space telescope under a five-year contract.

  - After the telescope has been placed in orbit by the space shuttle, CSC will provide scheduling, observation, and data processing support for the institute's scientific investigations.

- Other activities CSC has been engaged in include the following:

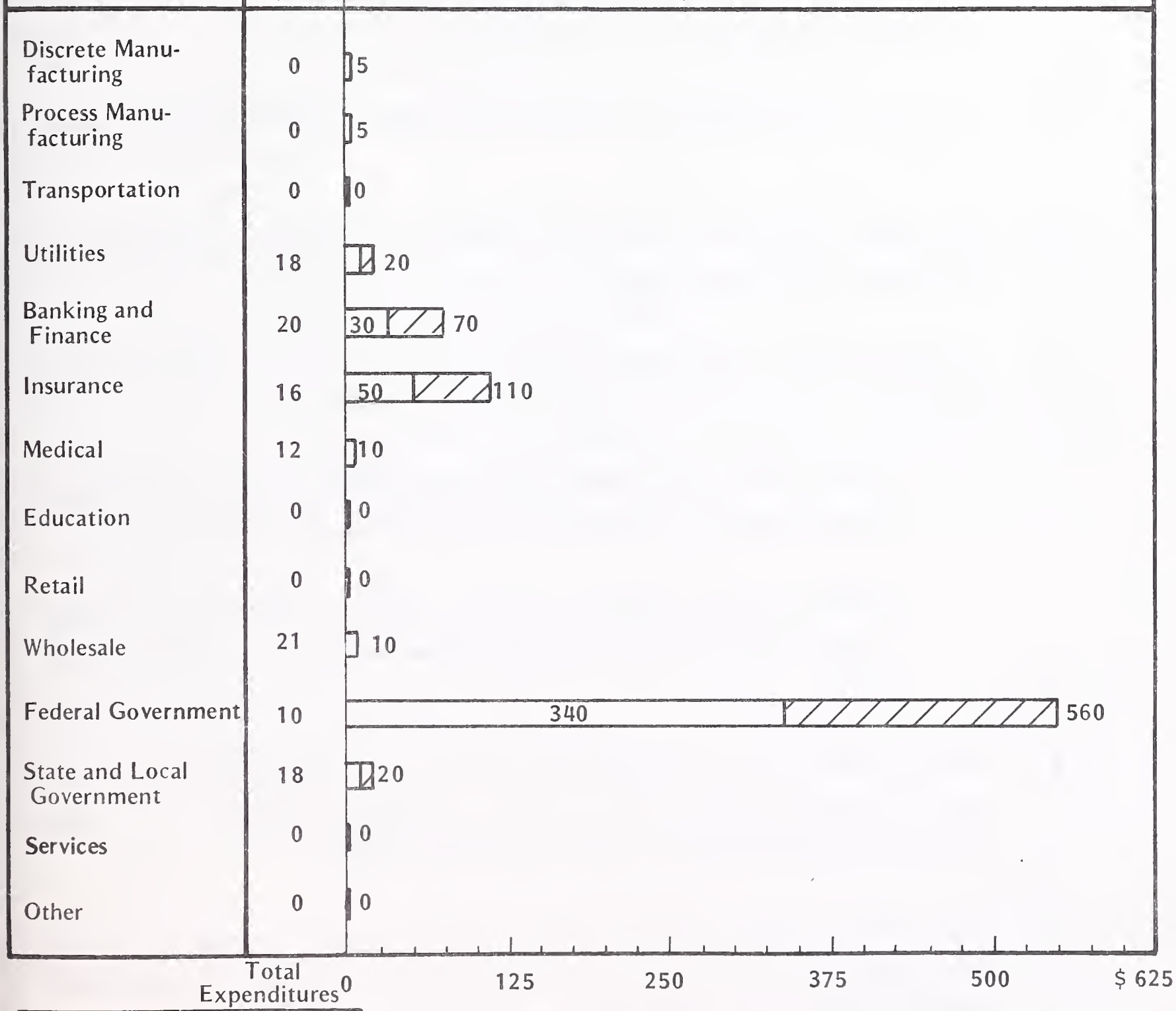
  - The company will be providing the systems engineering for a teleprocessing facility for the spacelab that will be carried aboard future shuttle flights.

  - CSC received a contract for software subsystems for the recently launched Aegis cruiser.

EXHIBIT VI-3

PROFESSIONAL SERVICES FACILITIES MANAGEMENT
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	0	5
Process Manufacturing	0	5
Transportation	0	0
Utilities	18	20
Banking and Finance	20	30 / 70
Insurance	16	50 / 110
Medical	12	10
Education	0	0
Retail	0	0
Wholesale	21	10
Federal Government	10	340 / 560
State and Local Government	18	20
Services	0	0
Other	0	0



1981		$450 million
1986		$800 million

AAGR = 12%

- The company was also selected to develop software for a new signal processor for the P-3c aircraft.

- It also received the prime contract to modernize the data handling of Knox-class frigates.

- 1981 saw the release of the largest government RFP for professional services. Project VIABLE, a $1 billion-plus, 10-year contract to upgrade 47 Army data processing installations is being competed for by CSC and EDS.

- Monchik Weber, Computer Associates, and Softech made public stock offerings in 1981.

- Burroughs Corporation acquired Systems Development Corporation in December 1980 for $98 million.

- General Electric Information Services Company acquired Lambda Technologies.

  - Lambda Technologies was the second fastest growing professional services company in 1980 with revenues of over $25 million.

  - GEISCO purchased the firm for $13 million in stock, plus up to $13 million more depending on how Lambda performs over the next four years.

- INPUT expects that major information services firms will continue to acquire large professional services firms in order to establish a presence in the $16.8 billion professional services market forecasted for 1986.

- This trend will also encourage smaller firms to merge in order to compete more effectively with the giant CPA firms and multiservice information services firms for user expenditures on professional services.

- Electronic Data Systems (EDS) has become the third largest vendor, after CSC and SDC, of professional services to the government sector.

  - EDS entered the market in 1978 and expanded its base in 1979 by acquiring Potomac Research, a $20 million revenue firm specializing in data processing and engineering services.

  - EDS's revenues from professional services sold to governments was $78 million in 1980, up 28% from the prior year.

- Planning Research Corporation (PRC), the fourth largest vendor of professional services to the government, is continuing its penetration of this marketplace.

  - During the past year, PRC received a $25.7 million contract renewal from NASA to continue its role in converting the Kennedy Space Center to accommodate the Space Shuttle.

  - Recently, PRC also received a contract with a potential value of $14 million to develop an automated life cycle support system for the Navy Command and Control System.

VII INDUSTRY SECTOR MARKETS

VII INDUSTRY SECTOR MARKETS

A. ECONOMIC CONSIDERATIONS

- The economic environment is one of many factors that influence the growth of user expenditures on Information Services.

  - The growth of usage of information services has for many years far outstripped the growth of the gross national product and the growth of those industries which use the services.

  - Users' purchases of information services have outpaced their own growth because they realize productivity improvements through the use of those services.

  - This trend is expected to continue for the next five years.

- But the growth in usage will be tempered by economic conditions. Some of the general major economic assumptions that have been factored into INPUT's forecast are the following.

- The inflation rate will continue at a relatively high level.

  - Inflation's impact on information services companies is best measured by the producer's price index (PPI).

- This rate over the forecast period is forecasted to be 9.8% per year.

- The inflation rate is expected to be reflected in information services firms' prices by the following annual increases:

  - Six percent for processing services.

  - Four percent for software products.

  - Eight percent for professional services.

- The differences between the PPI and the increase in the services is due to productivity gains made through technological advances and use of different sales and distribution methods.

B. INDUSTRY SECTOR ANALYSIS

- INPUT looks at a variety of characteristics of industry sectors in evaluating the size and potential growth of user expenditures on information services.

- The current size of the industry sectors is measured by the number of employees, the number of establishments, and the value of shipments in each industry sector.

  - This information on the sectors and subsectors is presented later in this chapter.

  - The demographic statistics of the industry sectors on employees and establishments were tabulated from the County Business Patterns, U.S. Summary - 1980.

- The value of shipments was derived from a variety of sources.

- Within an industry sector, comparable values were gathered, and where feasible, totaled for that sector.

- Values between industry sectors are not always directly comparable due to the differing nature of each industry and the measures employed.

- Also, differences arise due to definition differences between the various sources of the data.

- The census information presented here is not intended to be definitive, but rather to serve as a general guide to some of the major characteristics of the industry sectors and subsectors.

- The two manufacturing sectors are measured in value of shipments.

  - This value is the value added to the product by the industries.

  - The data were compiled from the 1978 Annual Survey of Manufacturers and the Statistical Abstract of the U.S., 1980.

- The transportation and utility sectors are measured by operating revenues. Sources for this data included:

  - The Statistical Abstract of the United States, 1980.

  - The Survey of Current Business, June 1981.

- The banking and finance sector is measured in assets which were taken from The Statistical Abstract of the United States, 1980.

- The value of the insurance industry sector is measured in premium receipts.

  - Receipts were tabulated from the Statistical Abstract of the United States, 1980 and Best's Review, July 1979.

- Operating revenue for insurance agents, brokers, and services came from a recent INPUT study entitled Computer Services Markets for Insurance Agents and Brokers.

- The value of the medical, educational, and government sectors are measures of expenditure taken from the Statistical Abstract of the United States, 1980.

- The values for the retail, wholesale, services, and other industry sectors are all measured in sales. Data came from several sources:

  - Survey of Current Business, June 1981.

  - Statistical Abstract of the United States, 1980.

  - Enterprise Statistics, 1979.

- INPUT developed an estimate of the total value of each industry group and a projection of their growth rates, which are shown in Exhibit VII-1.

  - The estimates on size of the sectors were built up from the demographic data cited above.

  - The current size measured in current dollars for each industry group in 1981 was projected from real growth rates published in the 1981 U.S. Industrial Outlooks over the most recent base year data published by the federal government.

- The projections of future growth are based upon an average growth for the subsector published in the 1981 U.S. Industrial Outlook.

- The highest growth rate shown in Exhibit VII-1 is for services, which include the information services industry, projected at 24% AAGR.

EXHIBIT VII-1

U.S. INDUSTRY GROWTH,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	VALUE IN CURRENT DOLLARS ($ billions)
Discrete Manufacturing	8.6%	900 → 1,360
Process Manufacturing	12.5	1,180 → 2,130
Transportation	11.6	220
Utilities	10.7	280 → 470
Banking and Finance	9.7	2,970 → 4,720
Insurance	11.0	300 → 500
Medical	12.2	280 → 490
Education	7.8	240
Retail	10.2	970 → 1,580
Wholesale	12.1	1,070 → 1,900
Federal Government	9.9	630 → 1,020
State and Local Government	10.2	490 → 790
Services	13.2	280 → 520
Other	9.7	820 → 1,300

0 1,000 2,000 3,000 4,000 $5,000

- Major opportunities in terms of the underlying growth of the industry sectors will be found in the process manufacturing, wholesale, and retail industrial sectors.

- Banking and finance stands out in size on the chart because it is measured in assets. If measured in revenues, it would be only 10% to 15% of the indicated size.

- The growth of the industry sectors does not necessarily translate directly into the growth of user expenditures on information services, as can be seen by comparing IS growth shown in Exhibit VII-2 with the data in Exhibit VII-1.

  - Total federal government expenditures are projected to grow at a pace (9.9%) only slightly above the underlying inflation (9.8%) rate.

  - Whereas federal expenditures on information services are projected to grow at more than 2½ times that rate (26%).

  - Some parallels can be drawn though. The slow expansion rate of education is reflected in its slow growth of IS usage.

C. DISCRETE MANUFACTURING INDUSTRY SECTOR

- The discrete manufacturing sector is characterized by companies which manufacture products that are sold as units; e.g., computers and toasters, rather than bulk products such as petroleum, food, and chemicals.

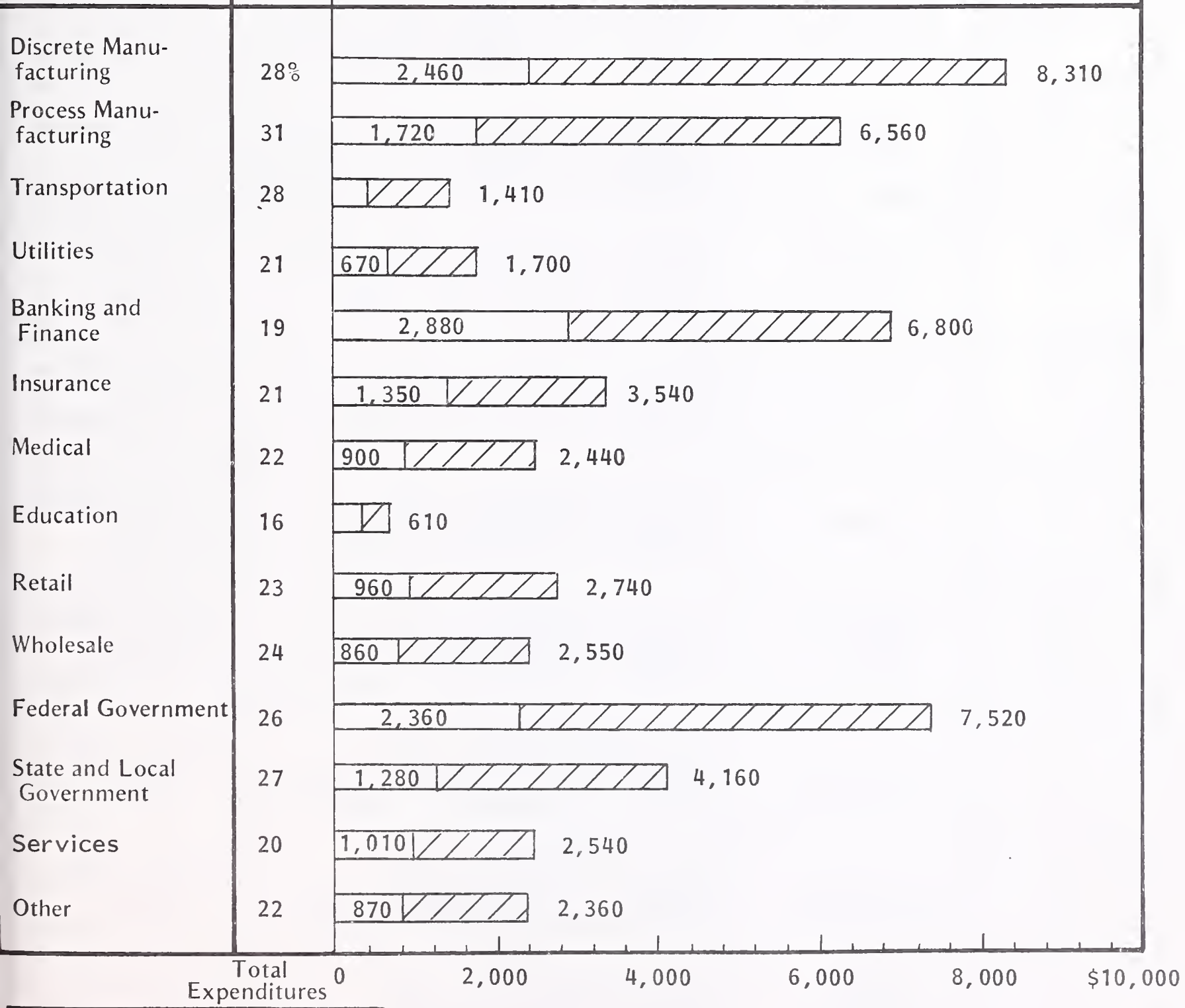
- The value of 1978 shipments was $715 billion, as shown in Exhibit VII-3.

- Growth of this sector is projected at 8.6% through 1986 which is about 17% below the economy as a whole and slightly negative in real terms.

EXHIBIT VII-2

INFORMATION SERVICES INDUSTRY
MARKET FORECAST BY INDUSTRY SECTOR,
1981-1986

INDUSTRY SECTOR	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Discrete Manufacturing	28%	2,460 / 8,310
Process Manufacturing	31	1,720 / 6,560
Transportation	28	1,410
Utilities	21	670 / 1,700
Banking and Finance	19	2,880 / 6,800
Insurance	21	1,350 / 3,540
Medical	22	900 / 2,440
Education	16	610
Retail	23	960 / 2,740
Wholesale	24	860 / 2,550
Federal Government	26	2,360 / 7,520
State and Local Government	27	1,280 / 4,160
Services	20	1,010 / 2,540
Other	22	870 / 2,360



1981		$18,030 million
1986		$53,230 million

AAGR = 24%

EXHIBIT VII-3

DISCRETE MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Discrete Manufacturing	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$714.9 Billion 199,428 11.8 Million
23	Apparel	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 42.7 Billion 23,206 1.3 Million
25	Furniture	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 19.6 Billion 9,042 489,100
27	Printing	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 56.1 Billion 44,392 1.2 Million
31	Leather	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 8.2 Billion 2,778 243,759
34	Fabricated Metal Products	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$101.3 Billion 30,713 1.6 Million
35	Machinery	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$143.2 Billion 44,859 2.2 Million
36	Electronics	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$100.5 Billion 13,544 1.8 Million
37	Trans-portation Equipment	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$188.8 Billion 9,039 1.9 Million

Continued

EXHIBIT VII-3 (Cont.)

DISCRETE MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
38	Scientific & Control Instruments	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 33.7 Billion 6,774 598,959
39	Miscel-laneous Manufacturers	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 20.8 Billion 15,081 468,307

- This sector will provide above average growth for information services (28%) through 1986, as shown in Exhibit VII-4.

- Incremental growth of user expenditures ($5,850 million) is the largest of all industry sectors.

- The lion's share of user expenditures will go to system software products and professional services.

D. PROCESS MANUFACTURING INDUSTRY SECTOR

- Products produced by companies in this sector are typically sold in volume or bulk measures (coal by the ton, oil by the barrel) rather than as discrete units such as automobiles and airplanes.

- The process manufacturing sector, shown in Exhibit VII-5, is smaller than the discrete sector but has a much higher revenue per establishment than discrete manufacturing.

- At least 40% of this industry sector's value of shipments is energy related.

  - The energy industry components of this sector will cause it to be the fastest growing industry sector (12.5%) other than services (which includes information services) in the next five years.

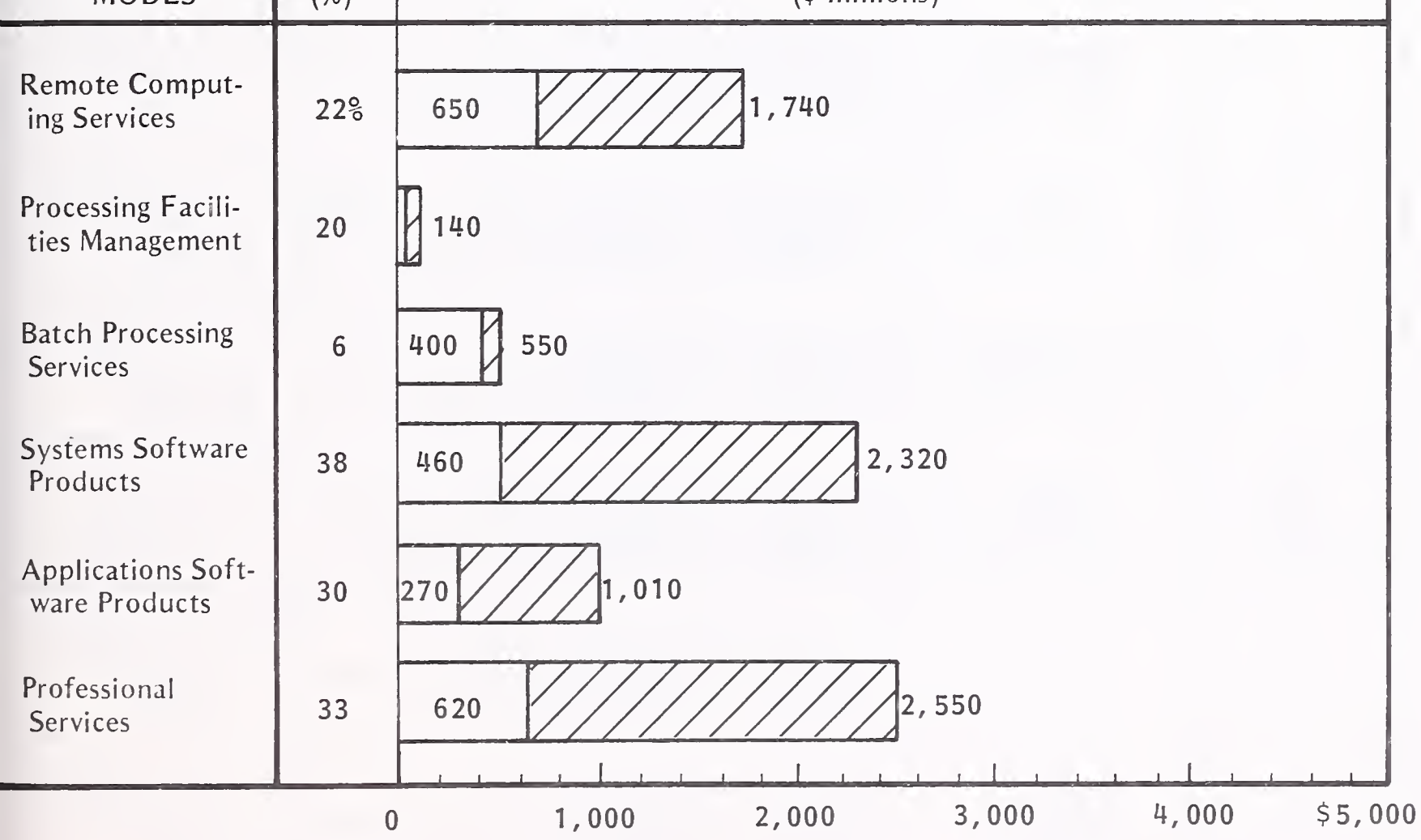
  - More than coincidentally, it will also have the fastest growth rate (31%) for user expenditures in information services.

- Incremental revenue growth for information services sold to this sector will be exceeded only by the discrete manufacturing and federal government sector.

EXHIBIT VII-4

INFORMATION SERVICES FORECAST
DISCRETE MANUFACTURING SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	22%	650 / 1,740
Processing Facilities Management	20	140
Batch Processing Services	6	400 / 550
Systems Software Products	38	460 / 2,320
Applications Software Products	30	270 / 1,010
Professional Services	33	620 / 2,550



Total Expenditures

1981		$2,460 million
1986		$8,310 million

AAGR = 28%

EXHIBIT VII-5
PROCESS MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Process Manufacturing	Number of Establishments (1978) Number of Employees (1978)	137,675 8.1 Million
10	Metal Mining	Value of Shipments (1977) Number of Establishments (1978) Number of Employees (1978)	$ 5.3 Billion 851 88,727
11	Anthracite Mining	Value of Shipments (1977) Number of Establishments (1978) Number of Employees (1978)	$226.0 Million 169 3,539
12	Coal Mining	Value of Shipments (1977) Number of Establishments (1978) Number of Employees (1978)	$ 16.6 Billion 4,419 191,357
13	Oil and Gas Extraction	Value of Shipments (1977) Number of Establishments (1978) Number of Employees (1978)	$ 66.4 Billion 15,781 352,709
20	Food Products	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$216.1 Billion 23,748 1.5 Million
21	Tobacco	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 10.0 Billion 225 59,000
22	Textile Products	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 42.3 Billion 6,482 882,011
24	Lumber and Wood Products	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 46.5 Billion 31,983 737,521

Continued

EXHIBIT VII-5 (Cont.)

PROCESS MANUFACTURING INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
26	Paper Products	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 57.0 Billion 6,239 650,380
28	Chemicals	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$129.8 Billion 11,446 909,083
29	Petroleum	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$103.9 Billion 2,080 144,938
30	Rubber & Plastics	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 43.2 Billion 10,857 749,650
32	Stone, Glass, Clay	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$ 41.7 Billion 16,319 636,546
33	Primary Metals	Value of Shipments (1978) Number of Establishments (1978) Number of Employees (1978)	$118.1 Billion 7,076 1.2 Million

- The fastest rate of growth and largest incremental growth will both come from systems software, as shown in Exhibit VII-6.

- Batch processing services will grow at more than double the average rate due to the use of seismic data processing services.

- Virtually all service modes present outstanding growth opportunities for information services vendors.

- The greatest growth opportunities for information services in the energy industry - exploration and production - are shown in Exhibit VII-7.

- This industry and its use of services are examined in depth in INPUT's recent report entitled Computer Services Opportunities in Energy Markets.

E. TRANSPORTATION INDUSTRY SECTOR

- The transportation sector is dominated by the airlines which account for 46% of the sector's operating revenues, as shown in Exhibit VII-8.

- Deregulation and high fuel costs have had a major impact on the earnings of companies in this sector.

  - But increased competition along with the squeeze on earnings is causing many of these companies to rely more on information services.

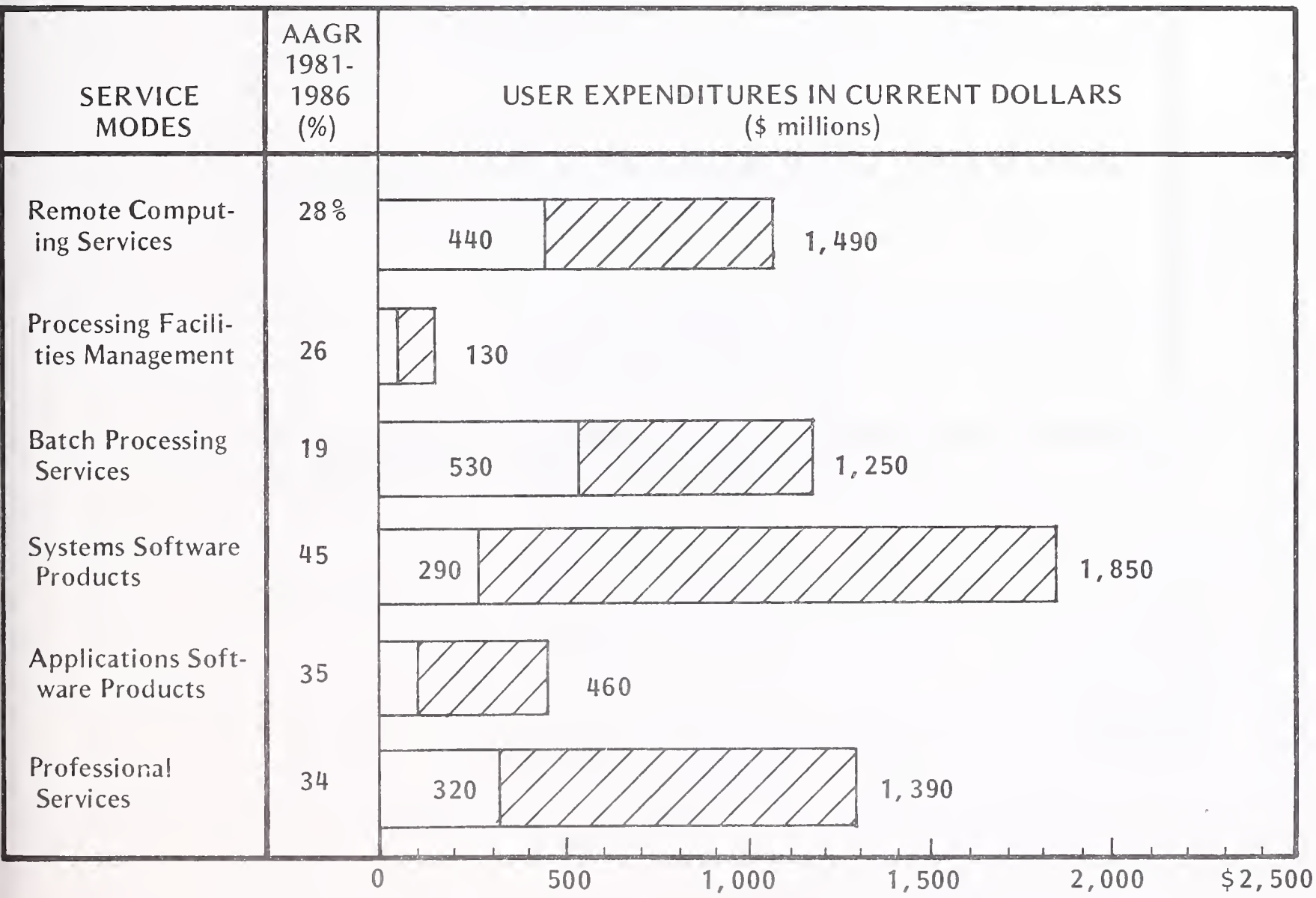
  - The industry is expected to have above average growth in the next five years.

- User expenditures on information services will more than triple through 1986, as shown in Exhibit VII-9.

EXHIBIT VII-6

INFORMATION SERVICES FORECAST
MANUFACTURING SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	28%	440 → 1,490
Processing Facilities Management	26	130
Batch Processing Services	19	530 → 1,250
Systems Software Products	45	290 → 1,850
Applications Software Products	35	460
Professional Services	34	320 → 1,390



Total Expenditures		
1981		$1,720 million
1986		$6,560 million

AAGR = 31%

EXHIBIT VII-7

INFORMATION SERVICES MARKETS
IN ENERGY INDUSTRY

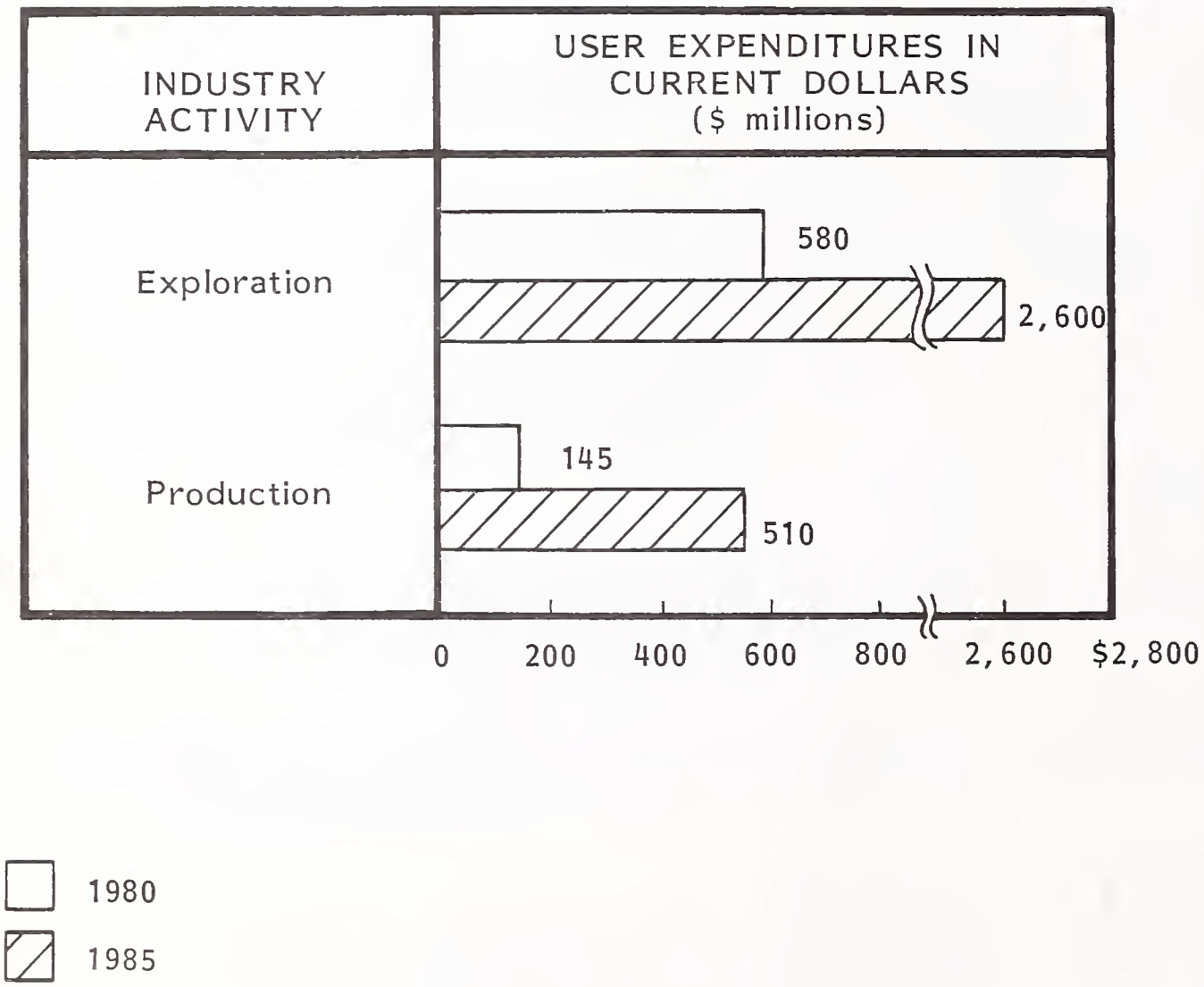


EXHIBIT VII-8

TRANSPORTATION INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Transportation	Operating Revenues (1978) Number of Establishments (1978) Number of Employees (1978)	$ 68.2 Billion 125,774 2.3 Million
41	Local and Suburban Transit	Operating Revenues (1978) Number of Establishments (1978) Number of Employees (1978)	$ 2.4 Billion 13,286 264,271
42	Motor Freight	Operating Revenues (1978) Number of Establishments (1978) Number of Employees (1978)	$ 36.5 Billion 80,270 1.3 Million
44	Water Transportation	Operating Revenues (1978) Number of Establishments (1978) Number of Employees (1978)	$944.0 Million 6,263 203,974
45	Air Transportation	Operating Revenues (1978) Number of Air Carriers (1978) Number of Employees (1978)	$ 22.8 Billion 5,666 375,855
46	Pipelines	Operating Revenues (1978) Number of Establishments (1978) Number of Employees (1978)	$ 4.9 Billion 500 17,785
47	Transportation Services	Operating Revenues (1978) Number of Establishments (1978) Number of Employees (1978)	$ 68.8 Million 19,789 176,616

EXHIBIT VII-9

INFORMATION SERVICES FORECAST
TRANSPORTATION SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	20%	110 / 280
Processing Facilities Management	18	30 / 70
Batch Processing Services	7	60 / 80
Systems Software Products	36	80 / 370
Applications Software Products	38	60 / 280
Professional Services	32	80 / 340

0 100 200 300 400 $500

Total Expenditures

1981		$ 420 million
1986		$1,410 million

AAGR = 28%

- Applications software products, particularly industry specialized, will grow the fastest of all service modes.

- Systems software will have the largest incremental growth in revenues.

F. UTILITIES INDUSTRY SECTOR

- The utilities industry sector, as shown in Exhibit VII-10, is the most highly regulated sector but is undergoing rapid change.

  - A trend toward deregulation was established several years ago.

  - Recently both the telephone and broadcasting sectors have been opened up to more free competition by the regulators.

- The largest subsector, electric services, has had its earnings come under pressure from higher energy costs and a reluctance of Public Utility Commissions to permit commensurate increases in rates.

- As shown in Exhibit VII-11, the greatest incremental growth of information services in this sector will come from remote computing services and professional services.

  - Much of this growth will come from the telephone communication subsector.

  - This sector is dominated by AT&T and its 20 operating companies.

- Growth of all information services modes in the utilities will be below average.

- Services sold to this industry tend to be highly industry specialized except for systems software.

EXHIBIT VII-10

UTILITIES INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Utilities	Number of Establishments (1978) Number of Employees (1978)	42,415 1.9 Million
481	Telephone Communications	Operating Revenues (1979) Number of Companies (1978) Number of Employees (1978)	$ 55.7 Billion 13,978 990,548
482	Telegraph Companies	Operating Revenues (1979) Number of Companies (1978) Number of Employees (1978)	$ 1.1 Billion 863 14,200
483	Radio and TV Broadcasting	Operating Revenues (1978) Number of Stations (1978) Number of Employees (1978)	$ 10.7 Billion 5,969 167,544
489	Communications Services (N.E.C.)*	Operating Revenues Number of Establishments (1978) Number of Employees (1978)	- 2,923 49,352
491	Electric Services	Revenues (1979) Number of Plants (1978) Number of Employees (1978)	$ 77.7 Billion 4,407 350,641
492	Gas Products & Services	Revenues (1979) Number of Establishments (1978) Number of Employees (1978)	$ 39.4 Billion 2,789 126,388
493	Combined Gas and Electric	Operating Revenues Number of Establishments (1978) Number of Employees (1978)	- 964 151,308
494	Water Supply	Operating Revenues Number of Establishments (1978) Number of Employees (1978)	- 2,967 20,928

* NOT ELSEWHERE CLASSIFIED

Continued

EXHIBIT VII-10 (Cont.)

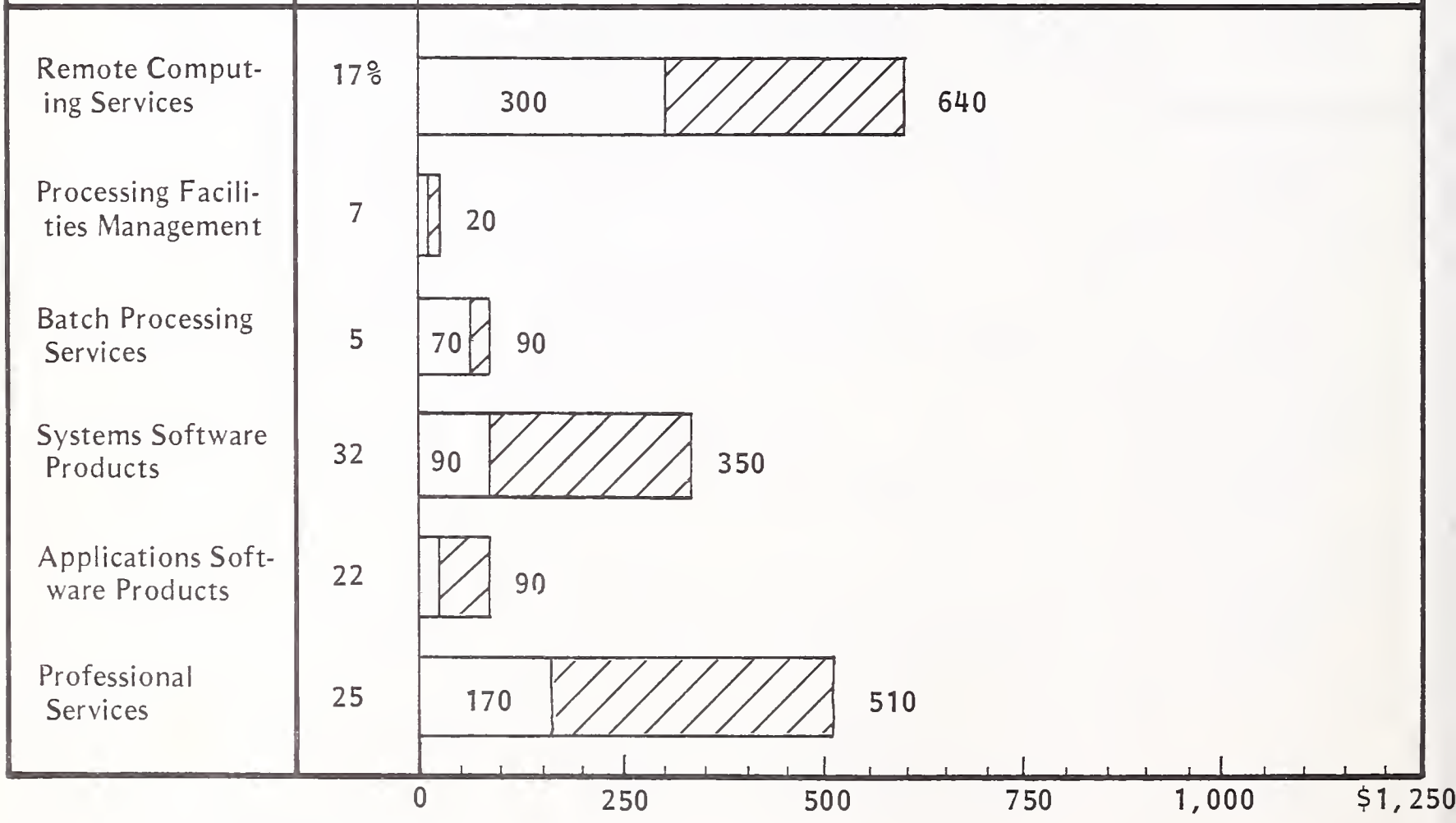
UTILITIES INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
495	Sanitary Services	Operating Revenues Number of Establishments (1978) Number of Employees (1978)	- 3,496 44,904
496	Steam Supply	Operating Revenues Number of Establishments (1978) Number of Employees (1978)	- 54 3,743
497	Irrigation Systems	Operating Revenues Number of Establishments (1978) Number of Employees (1978)	- 316 1,812

EXHIBIT VII-11

INFORMATION SERVICES FORECAST
UTILITIES SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	17%	300 → 640
Processing Facilities Management	7	20
Batch Processing Services	5	70 → 90
Systems Software Products	32	90 → 350
Applications Software Products	22	90
Professional Services	25	170 → 510



Total Expenditures		
1981		$ 670 million
1986		$1,700 million

AAGR = 21%

G. BANKING AND FINANCE INDUSTRY SECTOR

- The banking and finance industry sector is projected to expand at a slightly slower pace than the inflation rate through 1986.

- Commercial banks, with over $1.3 billion in assets, are the largest segment of the banking and finance industry sector, as shown in Exhibit VII-12.

- About 65% of all IS expenditures in this sector are made by commercial banks. The remaining expenditures are distributed as follows:

  - Savings and loans, 9%.

  - Credit unions, 5%.

  - Security and commodities brokers, 12%.

  - All other financial institutions, 9%.

- Credit union expenditures will grow the fastest, at 22%, followed by commercial banks at 19%. The other categories will grow at less than 18%.

- Although it will grow at a below average rate, incremental IS revenue growth for the banking and finance industry sector will approach $4 billion for 1981 to 1986.

- Systems software expenditures will grow the fastest but from the smallest base of business, as shown in Exhibit VII-13.

- RCS will grow at a slightly slower rate than the overall average for several reasons:

  - The low growth of the industry sector.

EXHIBIT VII-12

BANKING AND FINANCE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Banking and Finance	Number of Establishments (1978) Number of Employees (1978)	123,994 2.2 Million
60	Banks (Total)	Number of Establishments (1978) Number of Employees (1978)	43,505 1.4 Million
601	Federal Reserve Banks	Assets (1979) Number of Banks (1978) Number of Employees (1978)	$ 162.9 Billion 47 20,370
602	Commercial Banks	Assets (1978) Deposits (1978) Number of Banks (1978) Number of Employees (1978)	$1,329.0 Billion $1,043.0 Billion 14,741 1.3 Million
603	Mutual Savings Banks	Assets (1978) Deposits (1978) Number of Banks (1978) Number of Employees (1978)	$ 158.2 Billion $ 143.7 Billion 2,062 54,329
604/605	Trust Companies and Other Functions	Assets Number of Establishments (1978) Number of Employees (1978)	- 1,636 25,590
61	Credit Agencies (Total)	Assets Number of Companies (1978) Number of Employees (1978)	- 58,358 532,786
611	Rediscount and Financing Institutions	Assets Number of Establishments (1978) Number of Employees (1978)	- 63 1,268
612	Savings and Loan Associations	Assets (1978) Number of Associations (1978) Number of Employees (1976)	$ 523.6 Billion 4,761 208,974

Continued

EXHIBIT VII-12 (CONT.)

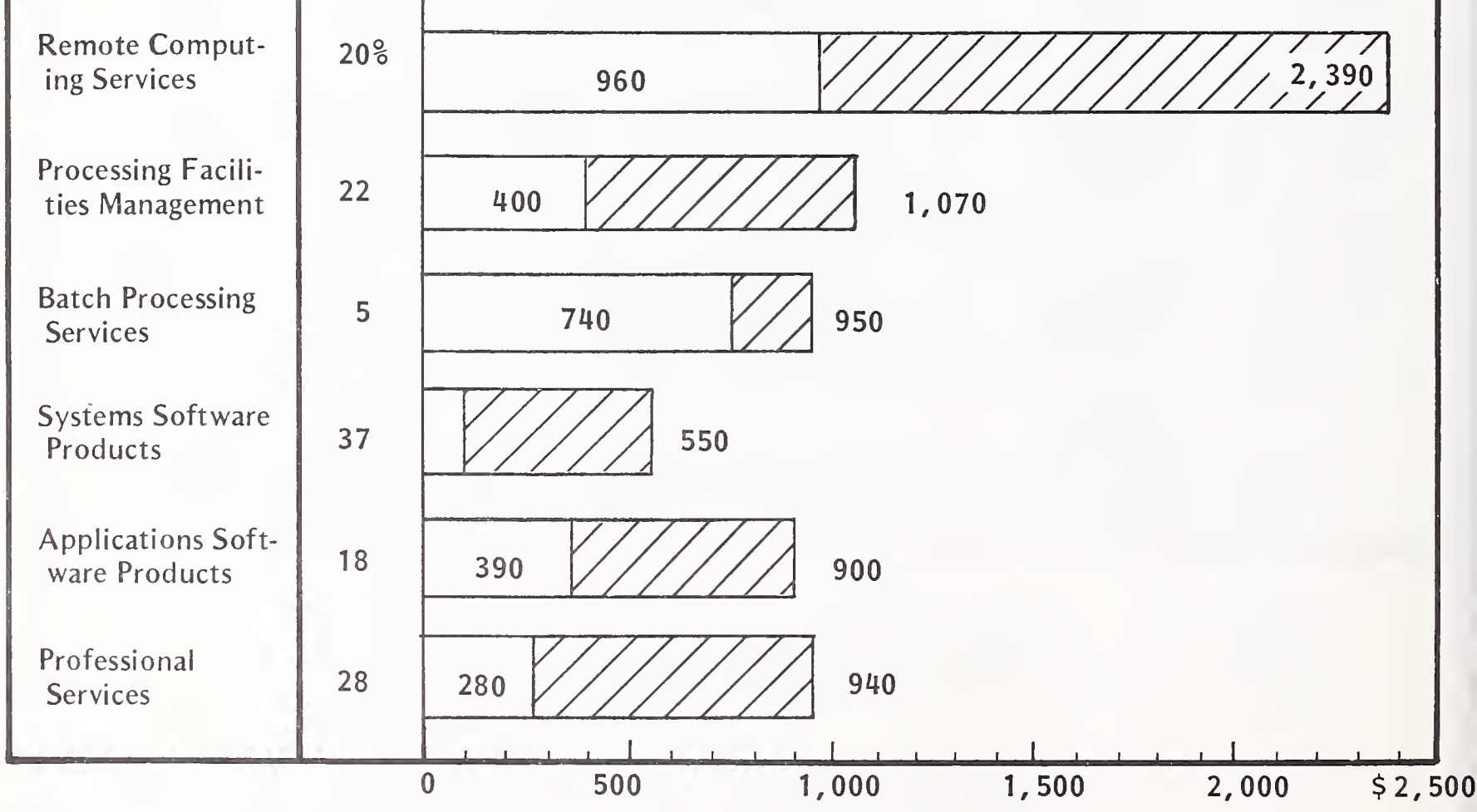
BANKING AND FINANCE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
613	Agricultural Credit Institutions	Assets Number of Establishments (1978) Number of Employees (1978)	- 1,388 15,004
614	Credit Unions	Assets (1978) Number of Credit Unions (1978) Number of Employees (1978)	$ 62.6 Billion 36,631 202,752
615	Business Credit Institutions	Assets Number of Establishments (1978) Number of Employees (1978)	- 2,342 44,887
616	Mortgage Bankers & Brokers	Value of Mortgage Originations (1978) Number of Firms (1978) Number of Employees (1978)	$104 Billion 4,189 57,132
62	Security & Commodity Brokers	Total Capitalization (1978) Number of Companies (1978) Number of Employees (1976)	$ 5.7 Billion 9,700 176,768
67	Holding and Other Investment Companies	Number of Establishments (1978) Number of Employees (1978)	12,431 131,247

EXHIBIT VII-13

INFORMATION SERVICES FORECAST
BANKING AND FINANCE SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	20%	960 / 2,390
Processing Facilities Management	22	400 / 1,070
Batch Processing Services	5	740 / 950
Systems Software Products	37	550
Applications Software Products	18	390 / 900
Professional Services	28	280 / 940



Total Expenditures		
1981		$2,880 million
1986		$6,810 million

AAGR = 19%

- The above average trend to going in-house with on-line systems, particularly as financial institutions move themselves into the IS industry.

- Batch processing services will also suffer from the in-house movement.

- INPUT projects that substantial structural changes will occur in this industry which will impact vendor opportunities. These are reviewed in a recent management brief entitled Banking and Finance Industry Trends: Impact on Computer Services. The most significant change will be a reduction in the number of commercial banks due to mergers and acquisitions.

H. INSURANCE INDUSTRY SECTOR

- There are over 100,000 establishments in the insurance sector of which approximately 75% are insurance agents, brokers, and services, as shown in Exhibit VII-14.

- The insurance sector is composed of about 2,000 corporate groups, each of which consist of from one to fifteen companies.

  - Twelve hundred of the groups are in life and health insurance.

  - Eight hundred are involved in property/casualty insurance.

- Net premium income (total income less investment income), the best indication of daily business activity in the insurance industry, was nearly $160 billion in 1978 for the groups mentioned above.

  - Seventy-six billion dollars for the life and health insurance companies.

EXHIBIT VII-14

INSURANCE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Insurance	Number of Establishments (1978) Number of Employees (1978)	107,707 1.6 Million
631	Life Insurance	Premium Receipts (1978) Number of Corporate Groups (1978) Number of Establishments (1978) Number of Employees (1978)	$ 36.6 Billion 1,824 15,902 540,341
632	Medical and Health Insurance	Premium Receipts (1976) Number of Establishments (1978) Number of Employees (1978)	$ 39.4 Billion 1,550 107,290
633	Fire, Marine and Casualty Insurance	Premium Receipts (1978) Number of Establishments (1978) Number of Corporate Groups (1978) Number of Employees (1978)	$ 81.7 Billion 7,467 - 419,689
635	Surety Insurance	Premium Receipts (1978) Number of Establishments (1978) Number of Employees (1978)	$835.8 Million 450 7,047
636	Title Insurance	Premiums Written Number of Establishments (1978) Number of Employees (1978)	- 2,235 48,525
637	Pension, Health and Welfare Funds	Premiums Written-Amount in Force Number of Establishments (1978) Number of Employees (1978)	- 3,347 54,279
639	Insurance Carriers (N.E.C.)*	Premiums Written Number of Establishments (1978) Number of Employees (1978)	- 167 3,149
64	Insurance Agents, Brokers and Services	Operating Revenues (1979) Number of Establishments (1978) Number of Employees (1978)	$ 20.7 Billion 76,589 411,728

* NOT ELSEWHERE CLASSIFIED

- Eighty-two and one-half billion dollars for the property/casualty insurance companies.

- Financial assets are concentrated in very large and large companies or groups.

  - Life and health insurance groups with assets exceeding $1 billion control 78% of total assets.

  - Property/casualty insurance groups with net premium revenues exceeding $250 million hold 80% of total assets.

- The insurance industry is projected to grow at an average annual rate of 11% in the next five years.

  - Casualty insurance company revenue will grow faster than life insurance company revenue.

  - Both growth rates will exceed the inflation rate.

- IS expenditures in the insurance sector will grow at a slightly lower rate (21%), as shown in Exhibit VII-15, than total user expenditures (24%) in the 1981-1986 period.

- The largest incremental growth in IS will be in processing facilities management. Much of this growth will come from government funded health insurance such as Medicare and Medicaid.

- RCS expenditures will grow at a below average rate (18%) as the larger companies continue to bring timesharing services in-house and replace some RCS specialty applications with desktop computers.

EXHIBIT VII-15

INFORMATION SERVICES FORECAST
INSURANCE SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	18%	210 → 480
Processing Facilities Management	21	360 → 940
Batch Processing Services	6	120 → 160
Systems Software Products	37	130 → 640
Applications Software Products	17	260 → 580
Professional Services	23	260 → 750

0 250 500 750 1,000 $1,250

Total Expenditures

1981		$1,350 million
1986		$3,540 million

AAGR = 21%

I. MEDICAL INDUSTRY SECTOR

- Total health care expenditures will exceed $200 billion in 1981.
  - Expenditures are projected to grow at 12.2% over the next five years, reaching an estimated $490 billion in 1986.
  - This growth is well above the average for the U.S. economy as a whole.
- Hospitals are the largest segment of the medical industry sector with expenditures of $76 billion, as shown in Exhibit VII-16.
- Very large expenditures are also made on physicians and dentists ($48 billion).
- Although there are indications that there may be a movement in the federal government to attempt to cut health care's escalating costs, INPUT does not expect the growth to be materially affected.
- Processing facilities management will provide the largest incremental growth of information services through 1986, as shown in Exhibit VII-17.
- IS expenditures will grow the fastest for software products.
  - Systems software products will grow by an AAGR of 43% through 1986.
  - Much of this growth will come from small hospitals and clinics, and independent physicians and dentists as the cost of small computer systems become increasingly affordable.
  - Lower costs of small systems as well as RCS services will also impact batch processing services in a negative manner, producing very slow growth for that sector.

EXHIBIT VII-16

MEDICAL INDUSTRY SECTOR -

DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Medical	Health Expenditures Number of Establishments (1978) Number of Employees (1978)	- 287,369 4.7 Million
801	Physicians	Health Expenditures (1978) Number of Establishments (1978) Number of Employees (1978)	$ 35.8 Billion 135,164 659,153
802	Dentists	Health Expenditures (1978) Number of Establishments (1978) Number of Employees (1978)	$ 11.9 Billion 81,712 313,945
803	Osteopaths	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$776.3 Million 4,663 17,978
804	Health Practitioners (N.E.C.)*	Health Expenditures (1977) Number of Establishments (1978) Number of Employees (1978)	$ 2.2 Billion 25,746 75,279
805	Nursing Homes	Health Expenditures (1978) Number of Establishments (1978) Number of Employees (1978)	$ 15.1 Billion 12,258 870,602
806	Hospitals	Health Expenditures (1978) Number of Establishments (1978) Number of Employees (1978)	$ 75.8 Billion 5,350 2.4 Million
807	Medical and Dental Laboratories	Health Expenditures (1977) Number of Establishments (1978) Number of Employees (1978)	$ 2.1 Billion 10,436 95,622
808	Outpatient Care Facilities	Health Expenditures (1977) Number of Establishments (1978) Number of Employees (1978)	$ 1.8 Billion 8,052 154,049

* NOT ELSEWHERE CLASSIFIED

Continued

EXHIBIT VII-16 (Cont.)

MEDICAL INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
809	Health and Allied Services (N.E.C.) *	Health Expenditures (1977) Number of Establishments (1978) Number of Employees (1978)	$ 3.6 Billion 3,988 102,393

* NOT ELSEWHERE CLASSIFIED

EXHIBIT VII-17

INFORMATION SERVICES FORECAST
MEDICAL SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	23%	200 → 580
Processing Facilities Management	20	240 → 600
Batch Processing Services	5	200 → 250
Systems Software Products	43	60 → 380
Applications Software Products	33	90 → 390
Professional Services	19	100 → 240

0 125 250 375 500 $ 625

Total Expenditures

1981		$ 900 million
1986		$2,440 million

AAGR = 22%

J. EDUCATION INDUSTRY SECTOR

- Although the expenditures have been increasing on education, the number of employees declined from 4.5 million in 1976, as reported in the 1979 annual report, to 4.4 million in 1977, as shown in Exhibit VII-18.

  - The decline in employees is due to a decline in the student population and to an increase in the ratio of students to teachers caused by a reluctance of communities to absorb the higher costs of education.

  - Expenditures on education are the lowest of all the industry sectors and they will grow at the slowest rate (7.8%) of all industry sectors.

- Education is the smallest industry sector for information services and will grow at the lowest rate (16%) from 1981 to 1986.

- The largest user expenditures in 1981 will be for professional services, as shown in Exhibit VII-19.

  - Professional services will also provide the largest incremental growth for 1981 to 1986.

  - Because of the severe constraints on spending in this sector, users will seek to increase productivity through a greater use of information systems and they will continue to rely on professional services in their implementation.

- The projected growth of processing facilities management will come largely at the expense of the conversion of RCS and batch services to long-term contracts in cost reduction moves.

EXHIBIT VII-18

EDUCATION INDUSTRY SECTOR - DEMOGRAPHIC DATA

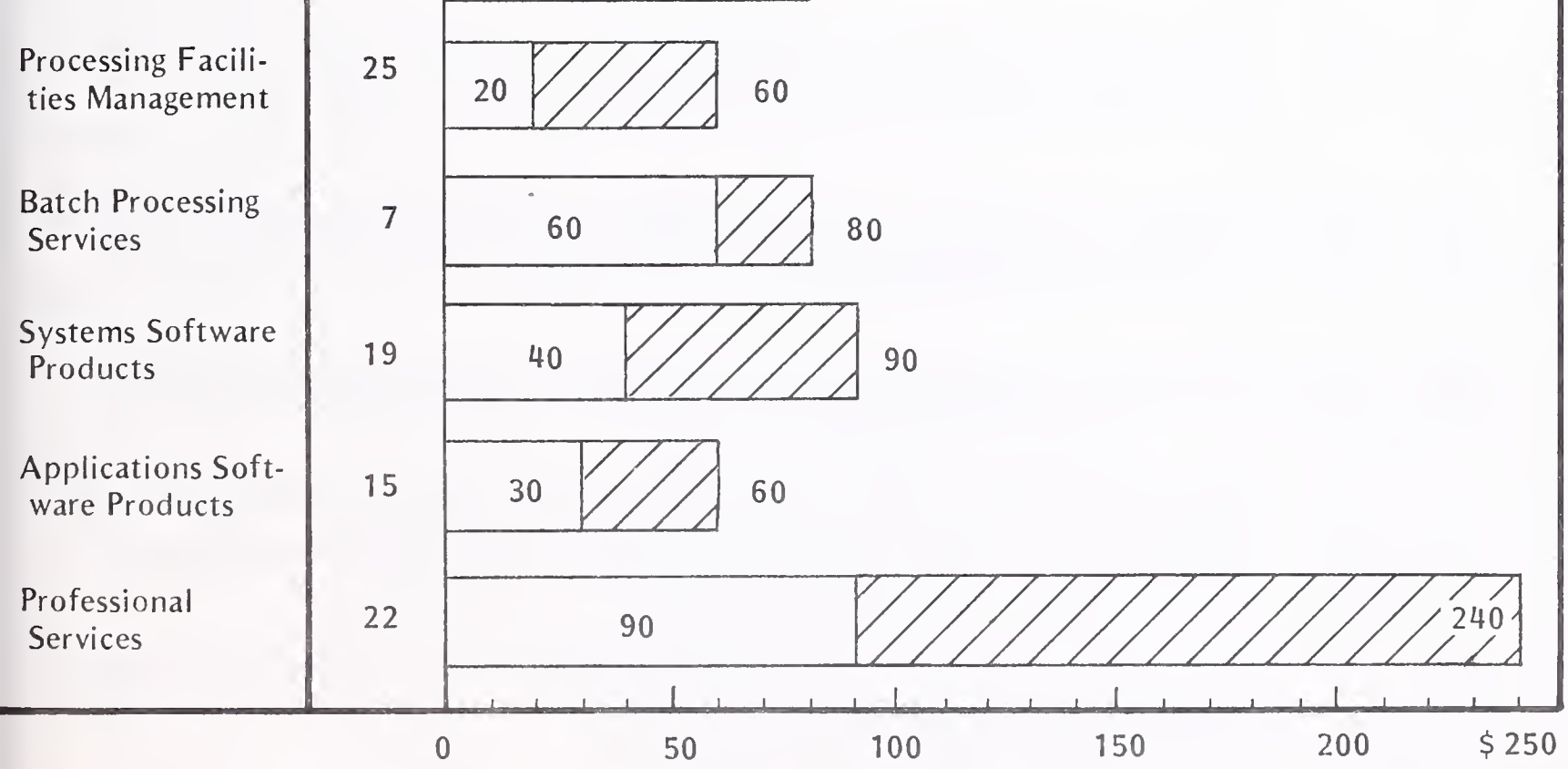
STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Education	Expenditures (1977) Number of Establishments (1977) Number of Employees (1977)	$142.5 Billion 119,119 4.4 Million
821	Elementary and Secondary	Expenditures (1977) Number of Schools (1977) Number of Employees (1977)	$ 90.9 Billion 107,000 3.6 Million
822	Higher Education	Expenditures (1977) Number of Colleges (1977) Number of Employees (1977)	$ 49.5 Billion 2,785 697,299
823	Libraries and Similar	Expenditures (1977) Number of Establishments (1977) Number of Employees (1977)	$188.3 Million 1,600 12,479
824	Correspondence and Vocational	Expenditures (1977) Number of Establishments (1978) Number of Employees (1978)	$ 1.0 Billion 2,907 48,742
829	Schools and Educational Services (N.E.C.)*	Expenditures (1977) Number of Establishments (1978) Number of Employees (1978)	$895.2 Million 4,827 66,131

* NOT ELSEWHERE CLASSIFIED

EXHIBIT VII-19

INFORMATION SERVICES FORECAST
EDUCATION SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	8%	60 → 80
Processing Facilities Management	25	20 → 60
Batch Processing Services	7	60 → 80
Systems Software Products	19	40 → 90
Applications Software Products	15	30 → 60
Professional Services	22	90 → 240



Total Expenditures

1981		$ 290 million
1986		$ 610 million

AAGR = 16%

- The most promising growth opportunities will be in the software products sector which will be focused on the use of microcomputers and local networks primarily in the elementary and secondary schools.

- Batch processing services will also suffer from increased competition from turnkey system vendors.

K. RETAIL INDUSTRY SECTOR

- The value of shipments in 1981 for the retail sector is projected to approach $1,000 billion, making it one of the largest industry sectors.

  - The projected growth of this sector (10.2%) over the next five years is slightly higher than the inflation rate.

  - The most pronounced characteristic of this sector is the large number of establishments, 1.2 million in 1978, as shown in Exhibit VII-20.

- Two subsectors, food stores and automative dealers/gasoline service stations, each have 25% or more of the industry sector sales.

- The retail trade is dominated by small companies, as shown in Exhibit VII-21.

  - There are over a million companies with less than 100 employees while there are only slightly more than 500 with more than 1,000 employees.

  - More than half of the largest companies are in the general merchandise and food store subsectors.

- In the past, it has been primarily the 8,000 plus retail companies with more than 100 employees who have been buyers of information services, but this is starting to change.

EXHIBIT VII-20

RETAIL INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Retail Trade	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$866.4 Billion 1.2 Million 14.0 Million
52	Building Materials, Hardware	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$ 48.2 Billion 63,463 514,401
53	General Merchandise	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$116.7 Billion 36,994 2.0 Million
54	Food Stores	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$217.5 Billion 161,230 2.1 Million
55	Automotive Dealers & Gasoline Service Stations	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$261.5 Billion 221,392 1.9 Million
56	Apparel & Accessories	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$ 44.5 Billion 121,574 927,910
57	Furniture, Home Furnishings & Equipment	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$ 43.2 Billion 87,543 552,993
58	Eating & Drinking	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$ 86.6 Billion 283,507 4.2 Million
59	Miscellaneous Retail	Sales (1980) Number of Establishments (1978) Number of Employees (1978)	$ 48.2 Billion 258,086 1.8 Million

EXHIBIT VII-21

RETAIL ORGANIZATIONS - DISTRIBUTION
BY NUMBER OF EMPLOYEES, 1977

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	NUMBER OF COMPANIES BY NUMBER OF EMPLOYEES				TOTAL
		1-99	100-249	250-999	1,000 & Over	
All	Retail Trade	1,084,102	5,254	1,615	518	1,091,489
52	Building Materials, Hardware	56,741	200	60	14	57,015
53	General Merchandise	16,956	226	160	134	17,476
54	Food Stores	121,383	753	322	146	122,604
55	Auto Dealers and Gasoline Service Stations	216,436	1,003	117	6	217,562
56	Apparel Accessories	77,892	456	170	49	78,567
57	Furniture, Home Furnishings and Equipment	79,053	183	65	11	79,312
58	Eating and Drinking	288,013	1,935	529	58	290,535
59	Miscellaneous Retail	227,628	498	192	100	228,418

  - RCS services based on common applications such as payroll are increasingly being sold to small establishments.

  - Many of these small establishments are finding computer costs to be more in reach and are becoming a major market for software products.

- Some of the growth in user expenditures for information services among small establishments is being offset by a migration to in-house systems by the large establishments.

- The small retail establishments will provide much of the growth in user expenditures on systems and applications software products shown in Exhibit VII-22.

- The largest incremental growth will come from RCS where the primary market will continue to be the larger establishments.

L. WHOLESALE INDUSTRY SECTOR

- The wholesale industry sector is characterized by a preponderance of small establishments. The average firm has 13 employees and only 1% of all wholesalers have more than 250 employees.

- Approximately 40% of the industry deals in nondurable goods and the remaining 60% deal in durable goods.

- The largest subsector is groceries and related products, as shown in Exhibit VII-23.

- The wholesale industry sector is slightly larger than the retail sector, with a value in 1981 of $1,070 billion.

EXHIBIT VII-22

INFORMATION SERVICES FORECAST
RETAIL SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	20%	440 → 1,090
Processing Facilities Management	20	40
Batch Processing Services	7	210 → 290
Systems Software Products	40	70 → 380
Applications Software Products	35	100 → 430
Professional Services	31	130 → 510

0 250 500 750 1,000 $1,250

Total Expenditures

1981		$ 960 million
1986		$2,740 million

AAGR = 23%

EXHIBIT VII-23

WHOLESALE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
50-51	Wholesale Trade	Total Sales (1980 Estimate) Number of Establishments (1978) Number of Employees (1978)	$1,043.9 Billion 307,056 4.1 Million
501	Motor Vehicles & Automotive Equipment	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 52.3 Billion 37,236 443,494
502	Furniture	Total Sales Number of Establishments (1978) Number of Employees (1978)	- 9,943 107,599
503	Lumber and Construction	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 25.3 Billion 15,730 197,263
504	Sporting Goods and Toys	Total Sales Number of Establishments (1978) Number of Employees (1976)	- 5,873 83,778
505	Metals and Minerals	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 29.0 Billion 8,756 136,662
506	Electrical Goods	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 37.6 Billion 24,145 288,210
507	Hardware, Plumbing and Heating	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 23.2 Billion 18,161 204,571
508	Machinery and Equipment	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 93.8 Billion 83,098 1.1 Million

Continued

EXHIBIT VII-23 (Cont.)

WHOLESALE INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
509	Miscellaneous Durables	Total Sales Number of Establishments (1978) Number of Employees (1978)	- 16,887 175,124
511	Paper and Paper Products	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 14.2 Billion 11,071 153,716
512	Drugs and Sundries	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 11.8 Billion 11,071 91,628
513	Apparel Piece Goods and Notions	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 22.1 Billion 12,171 137,212
514	Groceries & Related Products	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$131.0 Billion 35,019 601,896
515	Farm Products	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 84.2 Billion 13,149 132,819
516	Chemicals and Allied Products	Total Sales Number of Establishments (1978) Number of Employees (1978)	- 7,383 92,032
517	Petroleum and Petroleum Products	Total Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$ 54.7 Billion 18,377 178,083

- Growth of the industry is projected to be among the highest of all industry sectors, at 12.1% for the next five years.

- The wholesale industry has been and will continue to be a big user of information systems and services, as shown in Exhibit VII-24.

  - The high cost of carrying inventory due to the unprecedented high interest rates of recent times has made the automation of inventory controls extremely important to wholesalers.

  - It is much easier to justify the costs of information systems and services in this new environment.

- Vendors of software products, particularly inventory related applications, will experience high growth selling to small companies in this sector.

- Batch processing services will continue to be important to wholesalers but they will lose market share to RCS, small business systems, and turnkey systems.

M. FEDERAL GOVERNMENT SECTOR

- Federal government total expenditures are projected to keep pace with the general inflation rate over the next five years, while expenditures on information services are forecasted to grow more than two and a half times faster, with a 26% AAGR, as shown in Exhibit VII-25.

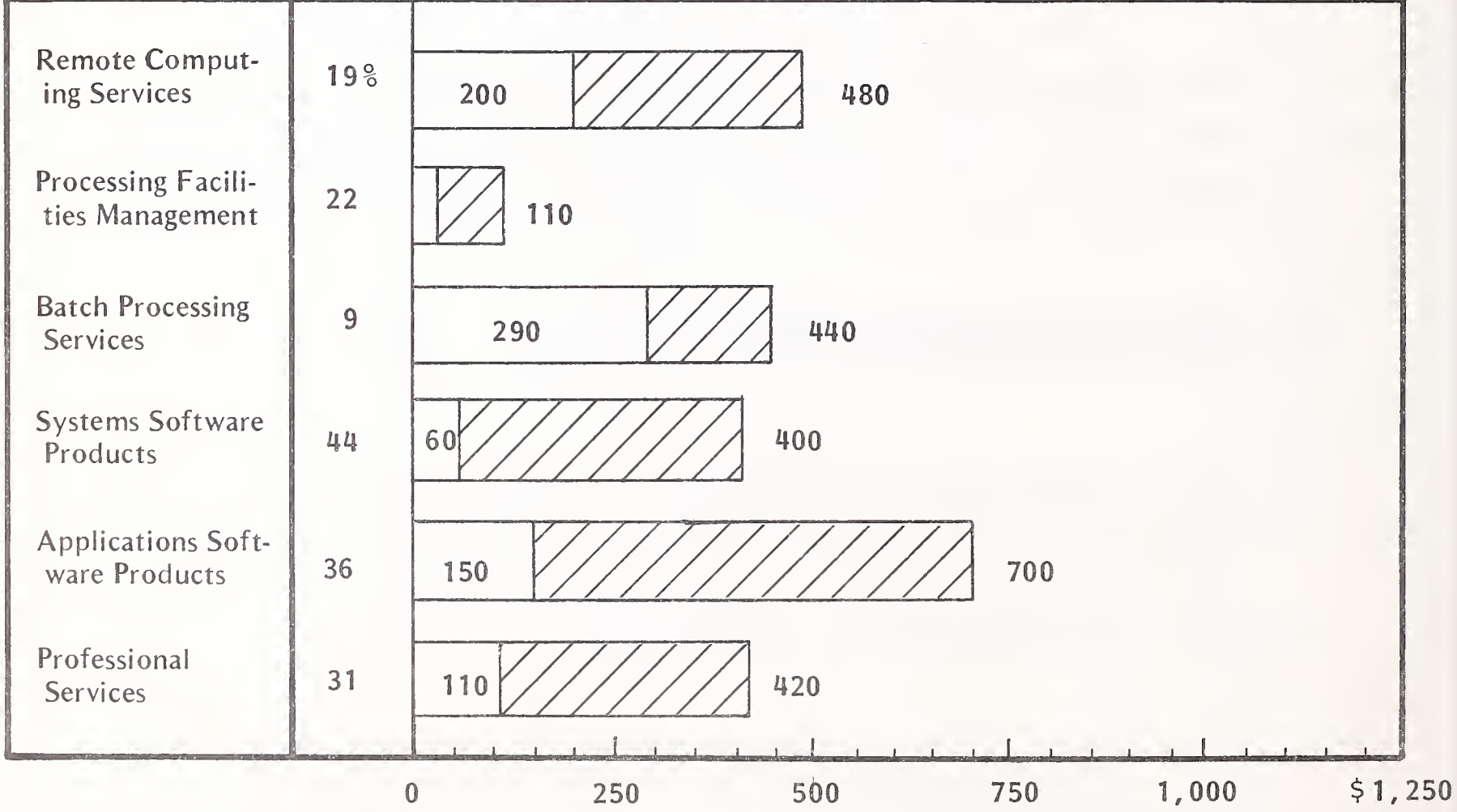
  - Systems software will grow at the fastest rate headed by the proliferation of mini- and microcomputers throughout the government.

  - The demand for professional services will lead to nearly $3.5 billion in incremental growth for those services.

EXHIBIT VII-24

INFORMATION SERVICES FORECAST
WHOLESALE SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	19%	200 → 480
Processing Facilities Management	22	110
Batch Processing Services	9	290 → 440
Systems Software Products	44	60 → 400
Applications Software Products	36	150 → 700
Professional Services	31	110 → 420



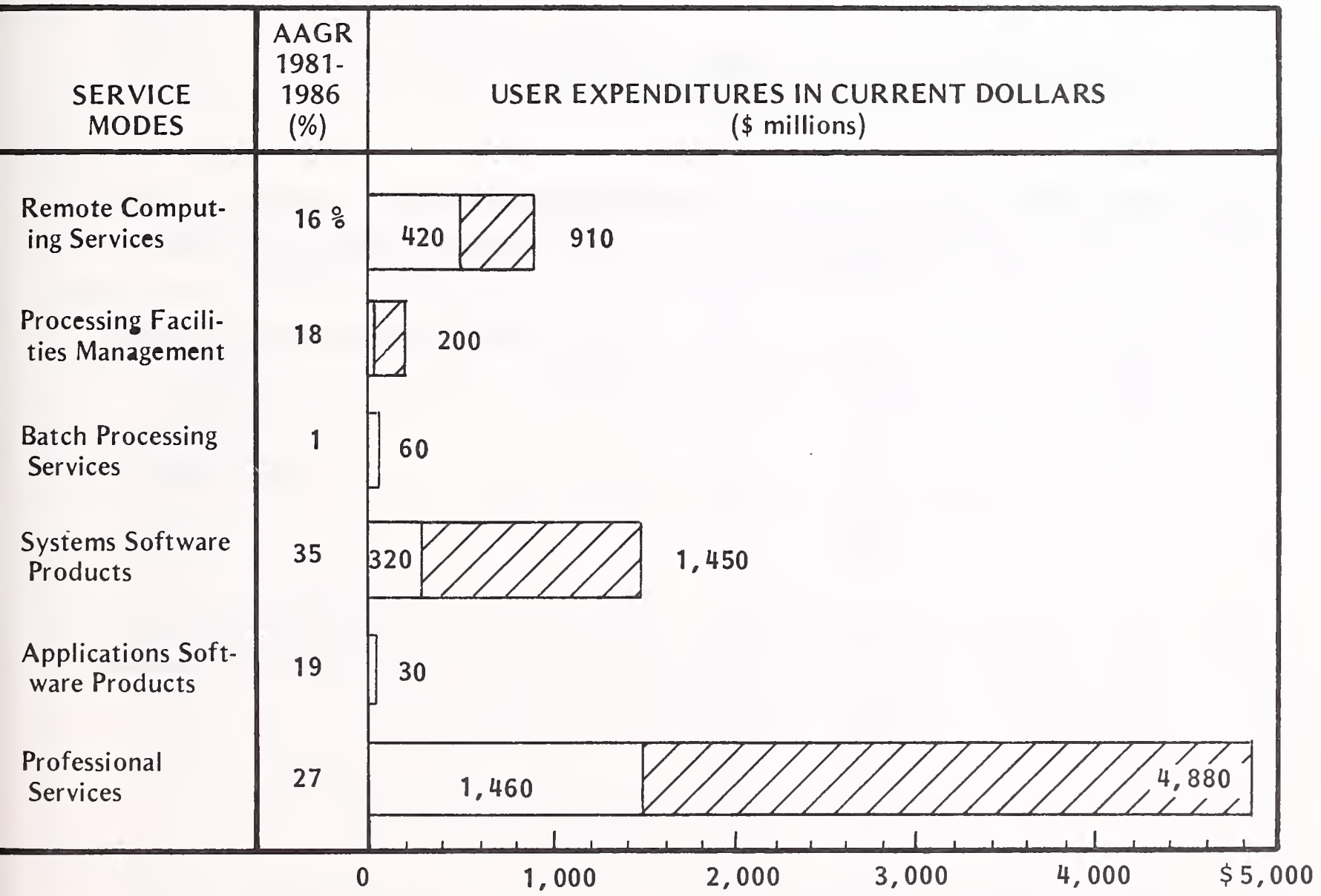
Total Expenditures

1981		$ 860 million
1986		$2,550 million

AAGR = 24%

EXHIBIT VII-25

INFORMATION SERVICES FORECAST
FEDERAL GOVERNMENT SECTOR,
1981-1986



Total Expenditures

1981		$2,360 million
1986		$7,520 million

AAGR = 26%

- Approximately 65% of the federal government's expenditures on EDP will be for software products and professional services in 1981.
  - This will grow to 75% or 80% by 1986.
  - Costs of these services will continue to rise while the cost of computer hardware will continue to decline.
- About 49% of the federal government expenditures in 1981 will be made by the Department of Defense. This will increase to at least 50% by 1986.

N. STATE AND LOCAL GOVERNMENT SECTOR

- State and local government total expenditures have been increasing by about 12% per year for the last three years and will approach $500 billion in 1981.
- Because of tax cutting legislation in nearly half the states these expenditures are expected to grow at a slower rate (10.2%) over the next five years.
- Large expenditures are made for welfare, health services, and hospitals, as shown in Exhibit VII-26.
- As with the federal government, state and local governments are expected to increase their expenditures for professional services by an enormous amount between 1981 and 1986, as shown in Exhibit VII-27.
  - Incremental growth will be almost $2.5 billion.
  - Much of this growth will be due to the inability of state and local governments to attract and hold skilled EDP personnel.

EXHIBIT VII-26

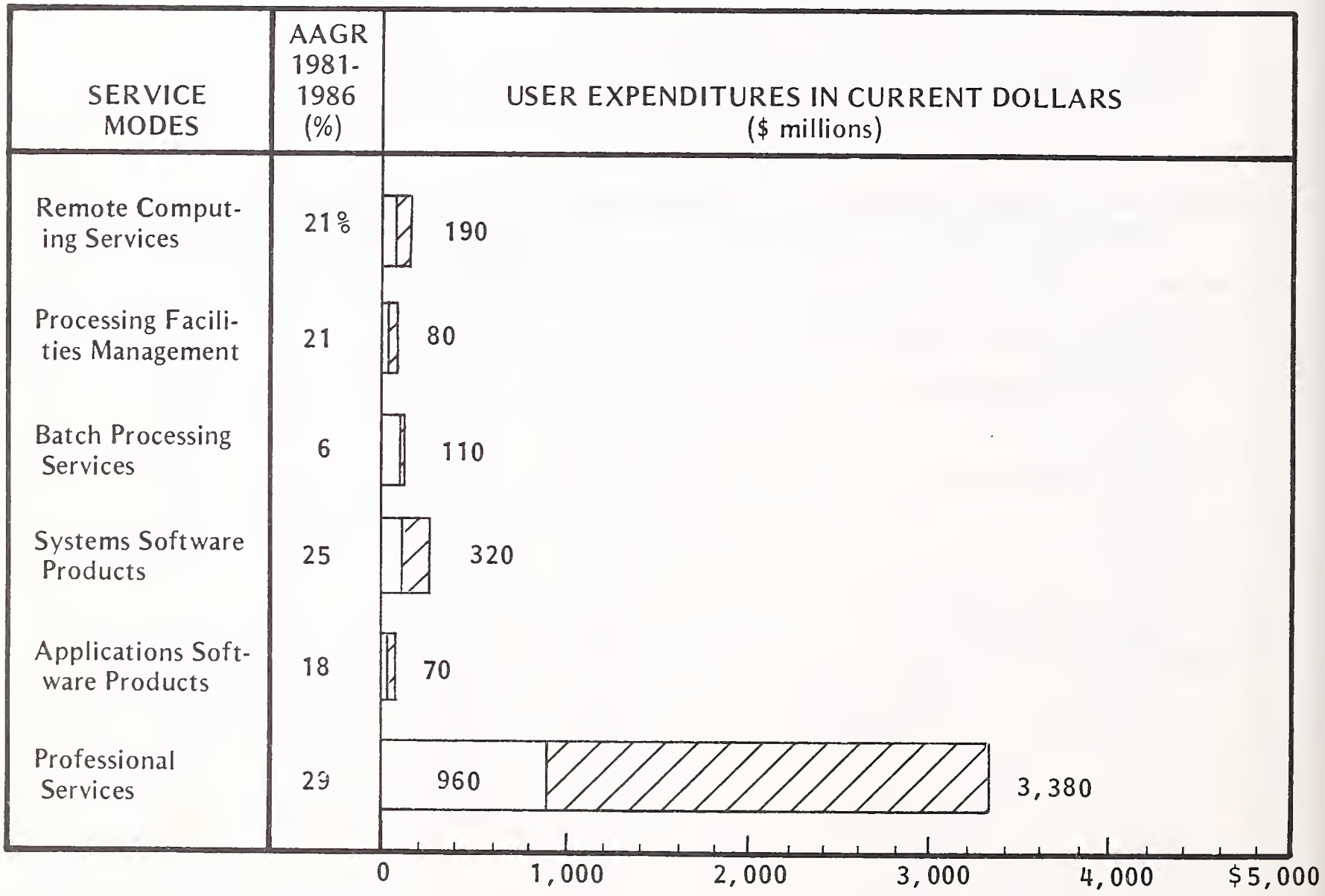
STATE AND LOCAL GOVERNMENT -
DEMOGRAPHIC DATA

SUMMARY OF FINANCES	DATA
Revenues (Fiscal 1978)	$371.6 Billion
Expenditures (Fiscal 1978)	$345.3 Billion
Number of Employees (1979)	13.1 Million
Number of States (1977)	50
Number of Municipalities (1977)	18,862
Number of Townships & Towns (1977)	16,822
Number of Counties (1977)	3,042
Number of School Districts (1977)	15,174
Number of Special Districts (1977)	25,962
Total State & Local Government Entities (1977)	79,912

EXPENDITURES BY FUNCTION, FISCAL 1978	EXPENDITURES ($ billion)	PERCENT
Direct General Expenditures	$295.5	85.5%
Education	110.6	32.1
Higher Education	28.4	8.2
Local Schools	76.7	22.2
Highways	24.6	7.1
Public Welfare	37.7	10.9
Health	6.3	1.8
Hospitals	18.6	5.4
Police Protection	12.9	3.7
Local Fire Protection	4.8	1.4
Natural Resources	4.2	1.2
Sanitation & Sewage	9.9	2.9
Housing & Urban Renewal	7.1	2.0
Local Parks & Recreation	5.3	1.5
Financial Administration	5.3	1.5
General Control	7.0	2.4
Interest on General Debt	12.0	3.5
Utility & Liquor Store Expenditures	26.3	7.6
Water Supply System	6.9	2.0
Electric Power System	10.6	3.1
Transit System	5.6	1.6
Gas Supply System	0.9	0.3
Liquor Stores	2.3	0.7
Insurance Trust Expenditures	23.5	6.8
Employee Retirement	10.8	3.1
Unemployment Compensation	10.7	3.1

EXHIBIT VII-27

INFORMATION SERVICES FORECAST
STATE AND LOCAL GOVERNMENT SECTOR,
1981-1986



Total Expenditures		
1981		$1,280 million
1986		$4,160 million

AAGR = 27%

- RCS will continue to be a reasonable alternative to in-house systems in response to tighter budgets throughout the forecast period.

  - Planning Departments will need to implement decision support systems.

  - Many RCS companies have a competitive edge with those systems.

O. SERVICES INDUSTRY SECTOR

- Slightly more than 35% of the services industry's projected growth rate of 13.2% is attributable to information services being in this sector.

  - Information services is included in the business services subsector SIC (73) shown in Exhibit VII-28.

  - This is the largest services industry subsector.

- Although total revenues for this sector will total only $280 billion in 1981, it is an important information services market due largely to the project orientation and analytical content of the work done by the services industry sector.

- User expenditures on information services will more than double between 1981 and 1986, as shown in Exhibit VII-29.

  - Sixty-five percent of the information services growth will come from RCS which will grow at an AAGR of 22% through 1986.

  - Much of the projected growth of software products will come from software sold for use on very small computer systems. These systems will be favored by firms in this sector that are characterized by a low number of employees (12) per establishment.

EXHIBIT VII-28

SERVICES INDUSTRY SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFICATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	Services	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$178.0 Billion 316,425 3.8 Million
73	Business Services	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 54.5 Billion 146,801 2.6 Million
81	Legal Services	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 18.7 Billion 92,437 437,412
891	Engineering and Architectural Services	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 14.7 Billion 33,679 414,285
892	Non-Commercial Research Organizations	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 81.7 Million 2,399 58,490
893	Accounting, Auditing & Bookkeeping	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 8.0 Billion 37,967 261,297
899	Services (N.E.C.)*	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$439.2 Million 3,142 16,553

* NOT ELSEWHERE CLASSIFIED

EXHIBIT VII-29

INFORMATION SERVICES FORECAST
SERVICES SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	22%	590 → 1,580
Processing Facilities Management	25	20
Batch Processing Services	8	280 → 410
Systems Software Products	37	200
Applications Software Products	28	240
Professional Services	29	100

0 500 1,000 1,500 2,000 $2,500

Total Expenditures

1981		$1,010 million
1986		$2,540 million

AAGR = 20%

- Accounting firms, both large and small, are buying personal computers and software at a very high rate.

P. OTHER INDUSTRIES SECTOR

- This sector, which includes everything that is not included in the 13 previously described sectors, is a mix of widely differing subsectors, as shown in Exhibit VII-30.

  - This sector's revenues are projected to grow at 9.7% from $820 billion in 1981 to $1,300 billion in 1986.

  - Construction, agriculture, and real estate dominate this sector in terms of revenues.

  - Construction and real estate growth are expected to continue to suffer from inflation and recession for the next few years but should show a significant rebound in the last few years of the forecast period.

- Overall growth (22%) of user expenditures on information services in this sector is projected to be a little below average over the forecast period, as shown in Exhibit VII-31.

  - Systems software growth will be the most dramatic of the information services. Most of these expenditures will come from the three largest subsectors mentioned above and will be for minicomputers and very small computer systems.

  - The largest incremental growth of information services will come from RCS sold to the larger establishments throughout all the industry subsectors.

EXHIBIT VII-30

OTHER INDUSTRIES SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
All	All	Number of Establishments (1978) Number of Employees (1978)	1.4 Million 11.4 Million
01-09	Agriculture, Forestry, Fishing	Sales (1978) Number of Establishments (1978) Number of Employees (1978)	$136.7 Billion 44,217 265,068
15-17	Construction	Sales (1977) Number of Establishments (1978) Number of Employees (1978)	$223.2 Billion 444,680 4.1 Million
65	Real Estate	Sales (1979) Number of Establishments (1978) Number of Employees (1978)	$119.8 Billion 171,965 948,265
66	Real Estate, Insurance	Sales (1979) Number of Establishments (1978) Number of Employees (1978)	$341.0 Million 6,971 31,382
70	Hotels, Etc.	Receipts (1979) Number of Establishments (1978) Number of Employees (1978)	$ 23.5 Billion 43,307 997,295
72	Personal Services	Receipts (1979) Number of Establishments (1978) Number of Employees (1978)	$ 22.2 Billion 157,535 947,337
75	Auto Repair	Receipts (1979) Number of Establishments (1978) Number of Employees (1978)	$ 29.3 Billion 97,635 525,450
76	Miscellaneous Repair	Receipts (1978) Number of Establishments (1978) Number of Employees (1978)	$ 15.8 Billion 47,807 280,363

Continued

EXHIBIT VII-30 (Cont.)

OTHER INDUSTRIES SECTOR -
DEMOGRAPHIC DATA

STANDARD INDUSTRIAL CLASSIFI-CATION	INDUSTRY NAME	TYPE OF STATISTIC	DATA
78	Motion Pictures	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 7.8 Billion 14,663 193,892
79	Recreation	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 11.9 Billion 45,404 659,407
83	Social Services	Receipts (1977) Number of Establishments (1978) Number of Employees (1978)	$ 10.3 Billion 53,174 891,356
84	Museums, Etc.	Expenses (1977) Number of Establishments (1978) Number of Employees (1978)	$613.1 Million 1,016 24,119
86	Membership Organizations	Expenses (1977) Number of Establishments (1978) Number of Employees (1978)	$ 12.1 Billion 135,628 1.2 Million
99	Non-Classifiable	Number of Establishments (1978) Number of Employees (1978)	138,714 353,113

EXHIBIT VII-31

INFORMATION SERVICES FORECAST
OTHER INDUSTRIES SECTOR,
1981-1986

SERVICE MODES	AAGR 1981-1986 (%)	USER EXPENDITURES IN CURRENT DOLLARS ($ millions)
Remote Computing Services	19%	340 → 820
Processing Facilities Management	19	30
Batch Processing Services	10	260 → 420
Systems Software Products	47	→ 250
Applications Software Products	33	70 → 280
Professional Services	30	150 → 560

0 250 500 750 1,000 $1,250

Total Expenditures

1981		$ 870 million
1986		$2,360 million

AAGR = 22%

- Batch processing will continue to be in demand by the many local small establishments in this sector.

- Significant expenditures will be made for professional services to assist medium size firms (over 100 employees) to expand their information systems utilization through their organizations.

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

INFORMATION SERVICES

- These are services provided by vendors which perform data processing functions using vendors' computers (processing services) or assist users to perform such functions on their own computers (software products and/or professional services).

- The following are definitions of the modes of service used in this report.

  - Remote Computing Services (RCS) provide data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. There are five submodes of RCS:

    . Interactive (timesharing) is characterized by the interaction of the user with the system, primarily for problem-solving timesharing but also for data entry and transaction processing: the user is on-line to the program/files.

    . Remote Batch is where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.

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

- User Site Hardware Services (USHS). These offerings provided by RCS vendors place programmable hardware on the user's site (rather than the EDP center). USHS offers:

  - Access to a communications network.

  - Access through the network to the RCS vendor's larger computers.

  - Significant software as part of the service.

- Videotext is a varient of interactive Remote Computing Services.

  - Access may be through cable television systems as well as ordinary telephone lines.

  - the display is a television set equipped with a keypad or typewriter keyboard and special circuitry.

  - The user may not create programs on the remote computer.

  - The user may query or enter transactions to the remote computer through menu driven software.

  - Prestel and QUBE are examples of videotext.

- Batch Services include data processing performed at vendors' sites of user programs and/or data which 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 COM processing, are also included. Batch services include those expenditures by users who take their data to a vendor's site, where a terminal connected to a remote computer is used for the actual processing.

- Processing Services Facilities Management (FM). (Also referred to as "Resource Management" or "Systems Management.") The management of all or a significant part of a user's data processing functions under a long-term contract (not less than one year). To qualify as processing services FM, the contractor must directly plan and control as well as operate its own computers/communications network, including providing computers at the client's site, to deliver the service. Simply providing resources, even though under a long-term contract, and/or providing for all of a user's processing needs, does not necessarily qualify as FM.

TYPES OF PROCESSING SERVICES

- Processing services encompass processing services facilities management, remote computing services, and batch services. They are categorized by type of services bought by users as follows:

  - Function Specific services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general ledger, accounts receivable, payroll and personnel applications fall into this category. General purpose tools such as financial planning systems, linear regression packages and other statistical routines are also included in this category. However, when the application or tool is designed for specific industry usage, then the service is industry specific.

- Industry Specific services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications "tool" which the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation; data base services, where 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 where the vendor provides access to a computer and/or communications network with basic software that enables any user to develop its own problem solution or processing system. These basic tools include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

USE OF PROCESSING SERVICES

- Processing can be categorized by use as follows:

  - Transaction Processing indicates those services where the primary or predominant purpose of the application is to process transactions, usually in a highly repetitive fashion. Most business accounting fits into this category. Payroll, accounts receivable, order entry, portfolio accounting, and inventory control are all good examples of transaction processing.

  - Information Analysis services are processing services where the primary or predominant purpose of the application is to convert data into

information through the use of mathematical, statistical, or financial analysis tools that readily and easily display the results in report or graphical form. The tools may be rapidly adapted to address a variety of nonrepetitive problems. These tools are often in the areas of financial analysis, marketing, planning, and statistical analysis. Many of the techniques incorporated have their origins in scientific and engineering applications, which also generally fall within this category.

- User Data Base Management services are processing services where the primary or predominant purpose of the application is to organize and maintain a data base of user information in a manner that facilitates its rapid and efficient retrieval and display according to user-defined parameters, either in ad hoc or fixed form.

- Vendor Data Base services are processing services where the primary or predominant purpose of the application is to retrieve and/or process data supplied by the vendor who controls access to it (although it may be owned by a third party). There are two modes of delivery of this service:

  . Inquiry data base services provide a means of selection and retrieval of data only. They neither provide, nor usually allow, for the subsequent processing of the data. Stock market statistics, news services, and bibliographic data bases are commonly offered in this mode.

  . Application Processing services, in addition to providing a means of selection and retrieval, also provide a means of further processing the data into information through the full use of information analysis tools and data base management systems, which permit the merging of vendor data with user data. Demographic, marketing, and financial and economic data bases are commonly offered in this mode.

PROFESSIONAL SERVICES

- This category is made up of services related to EDP, including professional services facilities management, system design, custom/contract programming, consulting, education, and training. Services are provided on the basis of:

  - Time and Materials - The billing rate is measured in units of time, rather than actual costs.

  - Fixed Price - A firm price is agreed upon for a defined piece of work.

  - Cost Plus Fee - The billing rate depends on actual costs plus a fixed fee.

- Professional Services Facilities Management is the management of all or a significant part of a user's data processing functions under a long-term contract (not less than one year). To qualify as professional services facilities management, the contractor must directly plan and control as well as operate the client's facility, where the computers are owned by the client. Simply providing resources, even though under a long-term contract, does not necessarily qualify as professional services facilities management.

SOFTWARE PRODUCTS

- This category includes the user's purchase of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures as well as fees for work performed by the vendor to implement and maintain the package at the user's site(s). Fees for work performed by organizations other than the package vendor are counted in professional services. There are several subcategories of software products:

- Applications Products are software products which perform processing to serve user functions. They consist of:

  . Cross-industry products, which are used in multiple-user industry sectors. Examples are payroll, inventory control, and financial planning.

  . Industry-specialized products, which are used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.

- Systems Products are software products which enable the computer/communications system to perform basic functions. They consist of:

  . Systems operations products, which function during applications program execution to manage the computer system resource. Examples include operating systems, DBMS, communication monitors, emulators, and spoolers.

  . Systems utilization products, used by operations personnel to utilize the computer system more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.

  . Systems implementation products, used to prepare applications for execution by assisting in designing, programming, testing and related functions. Examples include languages, sorts, productivity aids, data dictionaries, report writers, project control systems, and retrieval systems.

TURNKEY SYSTEMS

- A turnkey system is a combination of hardware and software integrated into a total system designed to fulfill the processing requirements of an application (or applications) for a user.

TELETEXT

- Teletext is an information service that is distinct from processing services.
  - Information is provided to the user through a broadcast transmission.
  - The vendor does not process user data.
  - Information may be selectively displayed through interaction with the receiver, not the vendor's computer.
  - The receiver is usually a television set equipped with special circuitry and sometimes a device which allows the user to select which portion of the broadcast should be displayed. There are two types of service:
    - . Continuous. Transmission is continuous. The user cannot select information to be displayed.
    - . Selective. The user can select a portion of the transmission to be displayed.
  - Examples of teletext includes cable TV broadcast of news services and stock quotations.

OTHER CONSIDERATIONS

- All expenditures and revenues addressed are "available" in that they are open for competition. "Captive" figures, which refer to expenditures by a user for services from a subsidiary company, such as Boeing Aircraft with Boeing Computer Services (BCS), are not included. They may be referred to when examining an individual "spin-off" vendor, such as BCS.

- When any questions arise as to the proper place to count certain user expenditures, INPUT addresses the questions from the user viewpoint and categorizes the expenditures according to the answer to the question, "What do the users perceive they are buying?"

- Industry sectors used in this report are defined 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 MFG.
PROCESS MANUFACTURING	10	METAL MINING
	11	ANTHRACITE MINING
	12	COAL MINING
	13	OIL AND GAS EXTRACTION
	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

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	48	COMMUNICATIONS
	49	ELECTRIC, GAS,& SANITARY
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

EXHIBIT A-1 (Cont.)

INDUSTRY SECTOR DEFINITIONS

INDUSTRY SECTOR	INDUSTRY SIC	INDUSTRY NAME
EDUCATION	82	EDUCATIONAL SERVICES
RETAIL	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
WHOLESALE	50	DURABLE GOODS
	51	NON-DURABLE GOODS
STATE AND LOCAL GOVERNMENT	91-97	AS APPROPRIATE
FEDERAL GOVERNMENT	91-97	AS APPROPRIATE
SERVICES	73	BUSINESS SERVICES

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
	83	SOCIAL SERVICES
	84	MUSEUMS, ART GALLERIES, BOTANICAL AND ZOOLOGICAL GARDENS
	86	MEMBERSHIP ORGANIZATIONS
	89	MISCELLANEOUS SERVICES

APPENDIX B: DATA BASE

APPENDIX B: DATA BASE

- This section contains the data base used in this report.
- In addition to the 1980 base year data, data are given for all of the intervening years from 1981 to 1986.
- None of the numbers have been rounded as they have been in the main body of the report, but the reader should not assume a higher degree of accuracy for these data than in the main body of the report.
  - Certain items will not total due to truncations and/or rounding.
  - The exhibits will not necessarily cross-foot and total exactly because the tabulations were done along different axis.
- Exhibits B-1 through B-23 present the market data by service mode.
- Exhibits B-24 through B-53 present the market data by industry sector.
- Exhibit B-54 shows the forecast of incremental growth of the U.S. economy by industry classification.

EXHIBIT B-1

INFORMATION SERVICES - MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 1,967	$ 2,461	25%	$ 3,096	$ 3,922	$5,009	$6,429	$8,309	28%
Process Manufacturing	1,342	1,718	28	2,220	2,888	3,775	4,960	6,560	31
Transportation	332	416	25	525	665	851	1,094	1,414	28
Utilities	558	667	20	797	957	1,155	1,398	1,699	21
Banking and Finance	2,455	2,881	17	3,386	3,999	4,747	5,664	6,806	19
Insurance	1,127	1,352	20	1,626	1,965	2,381	2,900	3,544	21
Medical	754	900	19	1,081	1,311	1,598	1,964	2,435	22
Education	253	291	15	335	387	449	523	610	16
Retail	801	964	20	1,169	1,429	1,762	2,187	2,736	23
Wholesale	714	858	20	1,044	1,286	1,599	2,009	2,550	24
Federal Government	1,921	2,361	23	2,944	3,694	4,659	5,905	7,520	26
State and Local Government	1,019	1,280	26	1,617	2,040	2,584	3,273	4,157	27
Services	850	1,010	19	1,200	1,437	1,728	2,091	2,536	20
Other	722	868	20	1,047	1,268	1,549	1,904	2,362	22
Total	$14,815	$18,027	22%	$22,085	$27,245	$33,843	$42,305	$53,227	24%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-2

PROCESSING SERVICES TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 952	$1,108	16 %	$1,284	$ 1,493	$ 1,749	$ 2,056	$ 2,428	17 %
Process Manufacturing	814	1,003	23	1,230	1,515	1,869	2,309	2,865	23
Transportation	170	197	16	229	265	311	364	428	17
Utilities	330	376	14	429	490	562	645	744	15
Banking and Finance	1,818	2,095	15	2,411	2,787	3,235	3,771	4,413	16
Insurance	590	695	18	814	957	1,129	1,335	1,579	18
Medical	555	644	16	748	875	1,026	1,209	1,430	17
Education	123	135	10	148	162	179	199	223	11
Retail	577	664	15	766	887	1,033	1,205	1,412	16
Wholesale	475	534	12	603	686	783	896	1,031	14
Federal Government	494	568	15	654	755	872	1,009	1,170	16
State and Local Government	166	188	13	216	247	286	330	383	15
Services	744	872	17	1,020	1,201	1,418	1,683	2,003	18
Other	530	612	15	707	814	942	1,091	1,269	16
Total	$ 8,338	$9,691	16%	$11,258	$13,134	$15,391	$18,101	$21,375	17%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-3

INDUSTRY SPECIFIC PROCESSING SERVICES - MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 425	$ 521	23%	$ 636	$ 779	$ 957	$1,176	$1,450	23%
Process Manufacturing	395	484	23	593	728	894	1,097	1,348	23
Transportation	100	119	19	141	168	202	243	292	20
Utilities	99	118	19	142	170	205	247	299	20
Banking and Finance	1,538	1,785	16	2,067	2,406	2,811	3,300	3,888	17
Insurance	464	549	18	650	772	919	1,096	1,308	19
Medical	499	579	16	673	787	923	1,088	1,287	17
Education	50	57	14	65	74	86	99	117	15
Retail	412	474	15	547	633	737	858	1,004	16
Wholesale	182	208	14	239	278	323	379	447	17
Federal Government	30	35	17	43	52	63	76	92	21
State and Local Government	37	43	16	52	62	75	90	109	20
Services	479	562	17	660	782	929	1,112	1,335	19
Other	301	348	16	402	463	538	624	727	16
Total	$5,011	$5,882	17%	$6,910	$8,154	$9,662	$11,485	$13,707	18%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-4

FUNCTION SPECIFIC PROCESSING SERVICES - MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 366	$ 406	11%	$ 444	$ 485	$ 533	$ 586	$ 644	10 %
Process Manufacturing	189	239	26	300	377	478	605	775	27
Transportation	39	44	13	50	55	62	68	77	12
Utilities	104	119	14	135	153	174	197	225	14
Banking and Finance	223	246	10	271	300	332	367	407	11
Insurance	96	113	18	128	146	168	192	220	14
Medical	39	47	21	55	66	79	94	113	20
Education	36	39	8	43	46	49	54	58	8
Retail	103	122	18	144	170	202	241	287	19
Wholesale	171	196	15	226	262	303	350	405	32
Federal Government	145	166	14	190	218	249	285	326	14
State and Local Government	37	43	16	50	57	67	78	91	17
Services	188	219	16	253	292	337	389	449	15
Other	140	161	15	186	213	245	282	325	15
Total	$1,876	$2,160	15%	$2,475	$2,840	$3,278	$3,788	$4,402	15%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-5

UTILITY PROCESSING SERVICES - MARKET FORECAST BY INDUSTRY SECTOR, 1980-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 161	$ 181	12%	$ 204	$ 229	$ 259	$ 294	$ 334	13%
Process Manufacturing	230	280	22	337	410	497	607	742	22
Transportation	31	34	10	38	42	47	53	59	12
Utilities	127	139	9	152	167	183	201	220	10
Banking and Finance	57	64	12	73	81	92	104	118	13
Insurance	30	33	10	36	39	42	47	51	9
Medical	17	18	6	20	22	24	27	30	11
Education	37	39	5	40	42	44	46	48	4
Retail	62	68	10	75	84	94	106	121	12
Wholesale	122	130	7	138	146	157	167	179	7
Federal Government	319	367	15	421	485	560	648	752	15
State and Local Government	92	102	11	114	128	144	162	183	12
Services	77	91	18	107	127	152	182	219	19
Other	89	103	16	119	138	159	185	217	16
Total	$1,451	$ 1,649	14%	$ 1,874	$2,140	$2,454	$ 2,829	$ 3,273	15%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-6

REMOTE COMPUTING SERVICES - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 529	$ 649	23%	$ 788	$ 958	$1,168	$1,424	$1,739	22%
Process Manufacturing	333	435	31	554	709	907	1,159	1,488	26
Transportation	93	111	19	134	159	192	231	278	20
Utilities	254	296	17	344	401	468	546	640	17
Banking and Finance	792	956	21	1,147	1,377	1,654	1,988	2,389	20
Insurance	179	213	19	250	293	345	407	478	18
Medical	168	207	23	254	313	385	474	583	23
Education	50	55	10	59	64	69	75	81	8
Retail	369	442	20	528	632	757	906	1,086	20
Wholesale	174	205	18	242	288	341	404	480	19
Federal Government	362	424	17	493	575	670	780	908	16
State and Local Government	61	74	21	89	108	131	157	189	21
Services	482	591	23	717	872	1,062	1,294	1,577	22
Other	280	338	21	404	481	574	685	818	19
Total	$4,126	$4,996	21%	$6,003	$ 7,230	$8,723	$10,530	$12,734	21%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-7

REMOTE COMPUTING SERVICES - FUNCTION SPECIFIC FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 123	$ 145	17%	$ 167	$ 192	$ 221	$ 254	$ 292	15%
Process Manufacturing	110	150	35	198	261	345	455	601	32
Transportation	22	25	15	29	32	37	41	47	13
Utilities	68	80	18	93	108	125	145	169	16
Banking and Finance	75	85	13	97	112	129	148	170	15
Insurance	74	89	20	103	119	139	161	187	16
Medical	15	19	25	23	29	37	46	57	25
Education	19	21	11	23	25	27	30	32	9
Retail	36	46	27	57	71	89	112	140	25
Wholesale	55	63	14	73	86	100	117	137	17
Federal Government	99	116	17	134	156	181	210	243	16
State and Local Government	20	25	24	30	36	44	53	64	21
Services	125	145	15	165	188	215	245	279	14
Other	44	52	18	61	71	83	97	114	17
Total	$ 885	$1,060	20%	$ 1,254	$1,488	$1,771	$2,114	$2,532	19%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-8

REMOTE COMPUTING SERVICES - INDUSTRY SPECIFIC FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 325	$ 410	26%	$ 512	$ 640	$ 800	$1,000	$1,250	25%
Process Manufacturing	43	58	34	75	99	130	170	222	31
Transportation	50	62	24	77	95	118	147	182	24
Utilities	86	105	22	128	156	191	232	284	22
Banking and Finance	671	819	22	991	1,199	1,450	1,755	2,123	21
Insurance	85	102	20	122	147	176	212	254	20
Medical	146	180	23	221	272	334	411	506	23
Education	9	10	10	11	12	13	14	16	10
Retail	301	358	19	426	507	604	718	855	19
Wholesale	96	115	20	138	166	199	239	287	20
Federal Government	30	35	18	43	52	63	76	92	21
State and Local Government	10	12	24	15	19	24	29	36	24
Services	300	375	25	465	577	715	887	1,099	24
Other	172	210	22	252	302	363	435	522	20
Total	$2,324	$ 2,850	23%	$ 3,476	$ 4,242	$5,179	$6,324	$7,727	22%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-9

REMOTE COMPUTING SERVICES - UTILITY FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 81	$ 94	16%	$ 109	$ 126	$ 147	$ 170	$ 197	16%
Process Manufacturing	180	227	26	281	349	432	536	665	24
Transportation	21	24	16	28	32	37	43	49	15
Utilities	100	111	11	123	137	152	169	187	11
Banking and Finance	46	52	13	59	66	75	85	96	13
Insurance	20	22	11	25	27	30	34	37	11
Medical	7	8	19	10	12	14	17	20	19
Education	22	24	7	25	27	29	31	33	7
Retail	32	38	19	45	54	64	76	91	19
Wholesale	23	27	16	31	36	42	48	56	16
Federal Government	233	273	17	316	367	426	494	573	16
State and Local Government	31	37	20	44	53	63	75	89	19
Services	57	71	24	87	107	132	162	199	23
Other	64	76	19	91	108	128	153	182	19
Total	$ 917	$1,084	18%	$1,274	$ 1,501	$ 1,770	$2,091	$ 2,473	18%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-10

PROCESSING FACILITIES MANAGEMENT - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 47	$ 57	$ 21%	$ 69	$ 81	$ 99	$ 119	$ 143	20%
Process Manufacturing	33	40	21	51	64	81	102	128	26
Transportation	25	30	18	35	42	50	59	70	18
Utilities	11	12	8	13	14	15	16	17	7
Banking and Finance	325	397	22	484	591	721	879	1,073	22
Insurance*	300	363	21	439	531	643	778	942	21
Medical	200	240	20	288	346	415	498	597	20
Education	16	20	25	25	31	39	48	61	25
Retail	12	15	25	18	21	26	31	38	20
Wholesale	33	40	21	49	59	73	89	109	22
Federal Government	75	87	16	103	122	144	170	203	18
State and Local Government	28	33	18	40	48	58	70	84	21
Services	4	5	25	6	8	9	12	15	25
Other	12	14	17	17	20	24	28	34	19
Total	$1,121	$1,353	21%	$1,637	$1,978	$2,397	$2,899	$3,514	21%

MAY NOT TOTAL DUE TO TRUNCATION.

*REMOVED BLUE CROSS/BLUE SHIELD PROCESSING.

EXHIBIT B-11

PROCESSING FACILITIES MANAGEMENT - FUNCTION SPECIFIC MARKET FORECASTS BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 5	$ 6	15%	$ 7	$ 7	$ 9	$ 10	$ 11	14%
Process Manufacturing	2	2	20	3	3	4	5	6	20
Transportation	0	0	0	0	0	0	0	0	0
Utilities	2	2	0	2	2	2	2	2	0
Banking and Finance	0	0	0	0	0	0	0	0	0
Insurance	0	0	0	0	0	0	0	0	0
Medical	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0
Wholesale	0	0	0	0	0	0	0	0	0
Federal Government	36	40	12	45	51	57	63	71	12
State and Local Government	0	0	0	0	0	0	0	0	0
Services	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	$ 45	$ 50	$ 12	$ 57	$ 64	$ 71	$ 80	$ 90	12%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-12

ROCESSING FACILITIES MANAGEMENT - INDUSTRY SPECIFIC MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 25	$ 30	20 %	$ 36	$ 43	$ 52	$ 62	$ 75	20%
Process Manufacturing	27	33	24	42	53	67	84	106	26
Transportation	25	30	18	35	42	50	59	70	18
Utilities	2	2	0	2	2	2	2	2	0
Banking and Finance	325	397	22	484	591	721	879	1,073	22
Insurance	300	363	21	439	531	643	778	942	21
Medical	200	240	20	288	346	415	498	597	20
Education	16	20	24	25	31	39	48	61	25
Retail	12	15	21	18	21	26	31	38	21
Wholesale	29	35	21	43	53	65	80	99	23
Federal Government	0	0	0	0	0	0	0	0	0
State and Local Government	8	10	29	13	17	22	29	37	29
Services	4	5	25	6	8	9	12	15	25
Other	8	9	18	11	13	16	19	23	19
Total	$ 981	$1,189	21%	$1,442	$1,751	$2,127	$2,581	$3,138	22%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-13

PROCESSING FACILITIES MANAGEMENT - UTILITY MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$17	$ 21	24 %	$ 26	$ 31	$ 38	$ 47	$ 57	22%
Process Manufacturing	4	5	25	6	8	10	13	16	26
Transportation	0	0	0	0	0	0	0	0	0
Utilities	7	8	12	9	10	11	12	13	11
Banking and Finance	0	0	0	0	0	0	0	0	0
Insurance	0	0	0	0	0	0	0	0	0
Medical	0	0	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0
Wholesale	4	5	18	6	6	8	9	10	17
Federal Government	39	47	20	58	71	87	107	132	23
State and Local Government	20	23	17	27	31	36	41	47	15
Services	0	0	0	0	0	0	0	0	0
Other	4	5	18	6	7	8	9	11	18
Total	$95	$ 114	20%	$ 136	$164	$ 197	$ 237	$ 286	20%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-14

BATCH SERVICES - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 376	$ 402	7%	$ 427	$ 454	$ 482	$ 513	$ 546	6%
Process Manufacturing	448	528	18	625	742	881	1,048	1,249	19
Transportation	52	56	8	60	64	69	74	80	7
Utilities	65	68	5	72	75	79	83	87	5
Banking and Finance	701	742	6	780	819	860	904	951	5
Insurance	111	119	7	125	133	141	150	159	6
Medical	187	197	5	206	216	226	237	250	5
Education	57	60	5	64	67	71	76	81	6
Retail	196	207	6	220	234	250	268	288	7
Wholesale	268	289	8	312	339	369	403	442	9
Federal Government	57	57	0	58	58	58	59	59	1
State and Local Government	77	81	5	87	91	97	103	110	6
Services	258	276	7	297	321	347	377	411	8
Other	238	260	9	286	313	344	378	417	10
Total	$3,091	$3,342	8%	$ 3,619	$ 3,926	$4,274	$4,673	$5,130	9%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-15

BATCH SERVICES - INDUSTRY SPECIFIC MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 75	$ 81	8%	$ 88	$ 96	$ 105	$ 114	$ 125	9%
Process Manufacturing	325	393	21	476	576	697	843	1,020	21
Transportation	25	27	8	29	31	34	37	40	8
Utilities	11	11	3	12	12	12	13	13	3
Banking and Finance	542	569	5	592	616	640	666	692	4
Insurance	79	84	6	89	94	100	106	112	6
Medical	153	159	4	164	169	174	179	184	3
Education	25	27	8	29	31	34	37	40	8
Retail	99	101	2	103	105	107	109	111	2
Wholesale	57	58	1	58	59	59	60	61	1
Federal Government	0	0	0	0	0	0	0	0	0
State and Local Government	19	21	12	24	26	29	32	36	11
Services	175	182	4	189	197	205	213	221	4
Other	121	129	7	139	148	159	170	182	7
Total	$1,706	$1,843	8%	$1,991	$2,161	$2,355	$2,578	$2,837	9%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-16

BATCH SERVICES - FUNCTION SPECIFIC MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 238	$ 255	7%	$ 270	$ 286	$ 303	$ 322	$ 341	6%
Process Manufacturing	77	87	13	99	113	129	147	168	14
Transportation	17	19	10	21	23	25	27	30	10
Utilities	34	37	9	40	43	47	50	54	8
Banking and Finance	148	161	9	174	188	203	219	237	8
Insurance	22	24	7	25	27	29	31	33	7
Medical	24	28	15	32	37	42	48	56	15
Education	17	18	8	20	21	22	24	26	7
Retail	67	76	14	87	99	113	129	147	14
Wholesale	116	133	15	153	176	203	233	268	15
Federal Government	10	10	3	11	11	11	12	12	3
State and Local Government	17	18	8	20	21	23	25	27	8
Services	63	74	18	88	104	122	144	170	18
Other	96	109	14	125	142	162	185	211	14
Total	$ 946	$1,050	11%	$1,164	$1,291	$1,435	$ 1,597	$ 1,779	11%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-17

BATCH SERVICES - UTILITY MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 63	$ 66	5%	$ 69	$ 72	$ 74	$ 77	$ 80	4%
Process Manufacturing	46	48	4	50	53	55	58	61	5
Transportation	10	10	0	10	10	10	10	10	0
Utilities	20	20	0	20	20	20	20	20	0
Banking and Finance	11	12	12	14	15	17	19	22	12
Insurance	10	11	6	11	12	12	13	14	5
Medical	10	10	0	10	10	10	10	10	0
Education	15	15	0	15	15	15	15	15	0
Retail	30	30	0	30	30	30	30	30	0
Wholesale	95	98	3	101	104	107	110	113	3
Federal Government	47	47	0	47	47	47	47	47	0
State and Local Government	41	42	3	43	44	45	46	47	2
Services	20	20	0	20	20	20	20	20	0
Other	21	22	3	22	23	23	23	24	2
Total	$ 439	$ 451	3%	$ 462	$ 474	$ 486	$ 499	$ 513	3%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-18

SOFTWARE PRODUCTS - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 550	$ 736	34 %	$ 993	$1,342	$1,816	$2,458	$3,330	35%
Process Manufacturing	281	391	39	557	794	1,132	1,616	2,310	43
Transportation	99	135	36	185	253	346	474	648	37
Utilities	94	121	29	157	203	263	342	443	30
Banking and Finance	413	506	23	618	759	935	1,159	1,447	23
Insurance	321	396	23	490	610	762	960	1,217	25
Medical	114	156	37	214	294	403	554	765	37
Education	58	68	17	80	94	110	129	152	17
Retail	122	167	37	229	314	431	591	812	37
Wholesale	155	215	39	297	412	570	791	1,097	39
Federal Government	248	334	35	449	604	813	1,094	1,473	35
State and Local Government	111	136	23	169	208	258	318	394	24
Services	84	110	31	143	189	249	329	432	31
Other	76	105	38	144	199	276	382	533	38
Total	$2,726	$3,576	31%	$4,725	$6,275	$8,364	$11,197	$15,053	33%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-19

APPLICATIONS SOFTWARE PRODUCTS - MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 209	$ 272	30%	$ 353	$ 459	$ 597	$ 776	$1,009	30%
Process Manufacturing	78	103	32	139	188	253	342	462	35
Transportation	41	56	37	78	107	148	204	281	38
Utilities	27	33	22	40	49	60	73	89	22
Banking and Finance	330	393	19	463	547	645	761	898	18
Insurance	224	264	18	309	362	423	495	580	17
Medical	69	93	35	124	165	219	291	388	33
Education	26	30	15	34	40	45	52	60	15
Retail	71	97	36	130	176	238	321	433	35
Wholesale	110	151	37	205	279	379	516	701	36
Federal Government	9	11	23	13	16	19	22	26	19
State and Local Government	26	30	17	36	42	50	59	70	18
Services	54	69	28	88	113	145	186	237	28
Other	51	68	33	90	120	160	212	282	33
Total	$1,325	$1,670	26%	$ 2,621	$ 2,662	$3,381	$4,310	$5,516	27%

MAY NOT TOTAL DUE TO TRUNCATION .

EXHIBIT B-20

SYSTEMS SOFTWARE PRODUCTS - MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 341	$ 464	36%	$ 640	$ 883	$1,219	$1,682	$ 2,321	38%
Process Manufacturing	203	288	42	418	606	879	1,274	1,848	45
Transportation	58	79	36	107	146	198	270	367	36
Utilities	67	88	32	117	154	203	269	354	32
Banking and Finance	83	113	36	155	212	290	398	549	37
Insurance	97	132	36	181	248	339	465	637	37
Medical	45	63	40	90	129	184	263	377	43
Education	32	38	20	46	54	65	77	92	19
Retail	51	70	38	99	138	193	270	379	40
Wholesale	45	64	42	92	133	191	275	396	44
Federal Government	239	323	35	436	588	794	1,072	1,447	35
State and Local Government	85	106	25	133	166	208	259	324	25
Services	30	41	35	55	76	104	143	195	37
Other	25	37	46	54	79	116	170	251	47
Total	$ 1,401	$1,906	36%	$ 2,621	$3,611	$4,983	$6,887	$ 9,535	38%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-21

PROFESSIONAL SERVICES - TOTAL MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 465	$ 617	33%	$ 819	$ 1,087	$1,444	$1,919	$2,551	33%
Process Manufacturing	247	324	31	433	579	774	1,035	1,385	34
Transportation	63	84	34	111	147	194	256	338	32
Utilities	134	170	27	211	264	330	411	512	25
Banking and Finance	224	280	25	357	453	577	734	946	28
Insurance	216	261	21	322	398	490	605	748	23
Medical	85	100	18	119	142	169	201	240	19
Education	72	88	22	107	131	160	195	235	22
Retail	102	133	30	174	228	298	391	512	31
Wholesale	84	109	30	144	188	246	322	422	31
Federal Government	1,179	1,459	24	1,841	2,335	2,968	3,802	4,866	27
State and Local Government	742	956	29	1,232	1,585	2,040	2,625	3,380	29
Services	22	28	29	37	47	61	79	101	29
Other	116	151	30	196	255	331	431	560	30
Total	$3,751	$ 4,762	27%	$ 6,102	$ 7,837	$10,289	$13,006	$16,797	29%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-22

STANDARD PROFESSIONAL SERVICES - MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 460	$ 612	33%	$ 814	$1,082	$1,439	$1,914	$2,546	33%
Process Manufacturing	242	319	32	428	574	769	1,030	1,380	34
Transportation	63	84	34	111	147	194	256	338	32
Utilities	128	163	27	203	254	318	397	496	25
Banking and Finance	200	252	26	323	413	528	676	866	28
Insurance	170	209	23	261	327	408	510	638	25
Medical	80	94	18	113	135	161	192	230	19
Education	72	88	22	107	131	160	195	235	21
Retail	102	133	30	174	228	298	391	512	31
Wholesale	82	107	31	141	185	242	317	416	31
Federal Government	868	1,120	29	1,467	1,922	2,517	3,298	4,320	31
State and Local Government	736	949	29	1,223	1,575	2,028	2,611	3,363	29
Services	22	28	27	37	47	61	79	101	29
Other	116	151	30	196	255	331	431	560	30
Total	$ 3,341	$4,310	29%	$5,597	$ 7,273	$ 9,655	$12,298	$16,001	30%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-23

PROFESSIONAL SERVICES FACILITIES MANAGEMENT MARKET FORECAST BY INDUSTRY SECTOR, 1981-1986

INDUSTRY SECTOR	USER EXPENDITURES BY INDUSTRY SECTOR, 1981-1986								
	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Discrete Manufacturing	$ 5	$ 5	0 %	$ 5	$ 5	$ 5	$ 5	$ 5	0%
Process Manufacturing	5	5	0	5	5	5	5	5	0
Transportation	0	0	0	0	0	0	0	0	0
Utilities	6	7	20	8	10	12	14	16	18
Banking and Finance	24	28	17	34	40	49	58	70	20
Insurance	46	52	14	61	71	82	95	110	16
Medical	5	6	10	6	7	8	9	10	12
Education	0	0	0	0	0	0	0	0	0
Retail	0	0	0	0	0	0	0	0	0
Wholesale	2	2	18	3	3	4	5	6	21
Federal Government	311	339	9	374	413	457	504	557	10
State and Local Government	6	7	23	9	10	12	14	17	18
Services	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	$ 410	$ 452	10%	$ 505	$ 564	$634	$ 709	$796	12%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-24

INFORMATION SERVICES MARKET FORECAST - TOTAL, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$4,126	$4,994	21%	$6,004	$7,231	$8,720	$10,529	$12,732	21%
Facilities Management		1,121	1,353	21	1,635	1,979	2,395	2,898	3,514	21
Batch		3,091	3,344	8	3,619	3,926	4,276	4,674	5,129	9
Subtotal Processing		8,338	9,691	16	11,258	13,136	15,391	18,101	21,375	17
Software Products	Systems	1,401	1,906	36	2,621	3,611	4,983	6,887	9,535	38
	Applications	1,325	1,670	26	2,104	2,662	3,381	4,310	5,516	27
Subtotal Software Products		2,726	3,576	31	4,725	6,273	8,364	11,197	15,051	33
Professional Services	Services	3,341	4,310	29	5,597	7,272	9,454	12,297	16,001	30
	Facilities Management	410	452	10	505	564	634	709	796	12
Subtotal Professional Services		3,751	4,762	27	6,102	7,836	10,088	13,006	16,797	29
Grand Total		$14,815	$18,027	22%	$22,085	$27,245	$33,843	$42,305	$53,227	24%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-25

MARKET FORECAST FOR PROCESSING SERVICES -
TOTAL, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 885	$ 1,060	20%	$1,254	$1,488	$1,771	$ 2,114	$ 2,532	19%
	Industry Specific	2,324	2,850	23	3,476	4,242	5,179	6,324	7,727	22
	Utility	917	1,084	18	1,274	1,501	1,770	2,091	2,473	18
Subtotal		4,126	4,994	21	6,004	7,231	8,720	10,529	12,732	21
Facilities Management	Function Specific	45	50	12	57	64	71	80	90	12
	Industry Specific	981	1,189	21	1,442	1,751	2,127	2,581	3,138	22
	Utility	95	114	20	136	164	197	237	286	20
Subtotal		1,121	1,353	21	1,635	1,979	2,395	2,898	3,514	21
Batch	Function Specific	946	1,050	11	1,164	1,291	1,435	1,597	1,779	11
	Industry Specific	1,706	1,843	8	1,991	2,161	2,355	2,578	2,837	9
	Utility	439	451	3	462	474	486	499	513	3
Subtotal		3,091	3,344	8	3,619	3,926	4,276	4,674	5,129	9
Total Processing	Function Specific	1,876	2,160	15	2,475	2,843	3,277	3,791	4,401	15
	Industry Specific	5,011	5,882	17	6,909	8,154	9,661	11,483	13,702	18
	Utility	1,451	1,649	14	1,872	2,139	2,453	2,827	3,272	15
Grand Total		$ 8,338	$9,691	16%	$11,258	$ 13,136	$15,391	$18,101	$21,375	17%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-26

INFORMATION SERVICES MARKET FORECAST - DISCRETE MANUFACTURING SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 529	$ 649	23%	$ 788	$ 958	$1,168	$1,424	$1,739	22%
Facilities Management		47	57	21	69	81	99	119	143	20
Batch		376	402	7	427	454	482	513	546	6
Subtotal Processing		952	1,108	16	1,284	1,493	1,749	2,056	2,428	17
Software Products	Systems	341	464	36	640	883	1,219	1,682	2,321	38
	Applications	209	272	30	353	459	597	776	1,009	30
Subtotal Software Products		550	736	34	993	1,342	1,816	2,458	3,330	35
Professional Services	Services	460	612	33	814	1,082	1,439	1,914	2,546	33
	Facilities Management	5	5	0	5	5	5	5	5	0
Subtotal Professional Services		465	617	33	819	1,087	1,444	1,915	2,551	33
Grand Total		$1,967	$2,461	25%	$3,096	$3,922	$5,009	$6,429	$8,309	28%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-27

MARKET FORECAST FOR PROCESSING SERVICES -

DISCRETE MANUFACTURING SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$123	$ 145	17%	$ 167	$ 192	$ 221	$ 254	$ 292	15%
	Industry Specific	325	410	26	512	640	800	1,000	1,250	25
	Utility	81	94	16	109	126	147	170	197	16
Subtotal		529	649	23	788	958	1,168	1,424	1,739	22
Facilities Management	Function Specific	5	6	15	7	7	9	10	11	14
	Industry Specific	25	30	20	36	43	52	62	75	20
	Utility	17	21	24	26	31	38	47	57	22
Subtotal		47	57	21	69	81	99	119	143	20
Batch	Function Specific	238	255	7	270	286	303	322	341	6
	Industry Specific	75	81	8	88	96	105	114	125	9
	Utility	63	66	5	69	72	74	77	80	4
Subtotal		376	402	7	427	454	482	513	546	6
Total Processing	Function Specific	366	406	11	444	485	533	586	644	10
	Industry Specific	425	521	23	636	779	957	1,176	1,450	23
	Utility	161	181	12	204	229	259	294	334	13
Grand Total		$ 952	$1,108	16%	$1,284	$1,493	$1,749	$2,056	$ 2,428	17%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-28

INFORMATION SERVICES MARKET FORECAST - PROCESS MANUFACTURING SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 333	$ 435	31%	$ 554	$ 709	$ 907	$1,159	$1,488	28%
Facilities Management		33	40	21	51	64	81	102	128	26
Batch		448	528	18	625	742	881	1,048	1,249	19
Subtotal Processing		814	1,003	23	1,230	1,515	1,869	2,309	2,865	23
Software Products	Systems	203	288	42	418	606	879	1,274	1,848	45
	Applications	78	103	32	139	188	253	342	462	35
Subtotal Software Products		281	391	39	557	794	1,132	1,616	2,310	43
Professional Services	Services	242	319	32	428	574	769	1,030	1,380	34
	Facilities Management	5	5	0	5	5	5	5	5	0
Subtotal Professional Services		247	324	31	433	579	774	1,035	1,385	34
Grand Total		$1,342	$1,718	28%	$2,220	$2,888	$3,775	$4,960	$6,560	31%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-29

MARKET FORECAST FOR PROCESSING SERVICES - PROCESS MANUFACTURING SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$110	$ 150	35 %	$ 198	$ 261	$ 345	$ 455	$ 601	32%
	Industry Specific	43	58	34	75	99	130	170	222	31
	Utility	180	227	26	281	349	432	536	665	24
Subtotal		333	435	31	554	709	907	1,159	1,488	28
Facilities Management	Function Specific	2	2	20	3	3	4	5	6	20
	Industry Specific	27	33	24	42	53	67	84	106	26
	Utility	4	5	25	6	8	10	13	16	26
Subtotal		33	40	21	51	64	81	102	128	26
Batch	Function Specific	77	87	13	99	113	129	147	168	14
	Industry Specific	325	393	21	476	576	697	843	1,020	21
	Utility	46	48	4	50	53	55	58	61	5
Subtotal		448	528	18	625	742	881	1,048	1,249	19
Total Processing	Function Specific	189	239	26	300	377	478	605	775	27
	Industry Specific	395	484	23	593	728	894	1,097	1,348	23
	Utility	230	280	22	337	410	497	607	742	22
Grand Total		$ 814	$ 1,003	23%	$1,230	$ 1,515	$1,869	$ 2,309	$2,865	23%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-30

INFORMATION SERVICES MARKET FORECAST - TRANSPORTATION SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 93	$111	19 %	$134	$159	$192	$ 231	$ 278	20%
Facilities Management		25	30	18	35	42	50	59	70	18
Batch		52	56	8	60	64	69	74	80	7
Subtotal Processing		170	197	16	229	265	311	364	428	17
Software Products	Systems	58	79	36	107	146	198	270	367	36
	Applications	41	56	37	78	107	148	204	281	38
Subtotal Software Products		99	135	36	185	253	346	474	648	37
Professional Services	Services	63	84	34	111	147	194	256	338	32
	Facilities Management	0	0	0	0	0	0	0	0	0
Subtotal Professional Services		63	84	34	111	147	194	256	338	32
Grand Total		$332	$416	25%	$525	$ 665	$ 851	$ 1,094	$ 1,414	28%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-31

MARKET FORECAST FOR PROCESSING SERVICES - TRANSPORTATION SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 22	$ 25	15%	$ 29	$ 32	$ 37	$ 41	$ 47	13%
	Industry Specific	50	62	24	77	95	118	147	182	24
	Utility	21	24	16	28	32	37	43	49	15
Subtotal		93	111	19	134	159	192	231	278	20
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	25	30	18	35	42	50	59	70	18
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		25	30	18	35	42	50	59	70	18
Batch	Function Specific	17	19	10	21	23	25	27	30	10
	Industry Specific	25	27	8	29	31	34	37	40	8
	Utility	10	10	0	10	10	10	10	10	0
Subtotal		52	56	8	70	64	69	74	80	7
Total Processing	Function Specific	39	44	13	50	55	62	68	77	12
	Industry Specific	100	119	19	141	168	202	243	292	20
	Utility	31	34	10	38	42	47	53	59	12
Grand Total		$ 170	$ 197	16%	$ 229	$ 265	$ 311	$ 364	$ 428	17%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-32

INFORMATION SERVICES MARKET FORECAST - UTILITIES SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 254	$ 296	17%	$ 344	$ 401	$ 468	$ 546	$ 640	17 %
Facilities Management		11	12	8	13	14	15	16	17	7
Batch		65	68	5	72	75	79	83	87	5
Subtotal Processing		330	376	14	429	490	562	645	744	15
Software Products	Systems	67	88	32	117	154	203	269	354	32
	Applications	27	33	22	40	49	60	73	89	22
Subtotal Software Products		94	121	29	157	203	263	342	443	30
Professional Services	Services	128	163	27	203	254	318	397	496	25
	Facilities Management	6	7	20	8	10	12	14	16	18
Subtotal Professional Services		134	170	27	211	264	330	411	512	25
Grand Total		$ 558	$ 667	20%	$ 797	$ 957	$1,155	$ 1,398	$1,699	21%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-33

MARKET FORECAST FOR PROCESSING SERVICES - UTILITIES SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 68	$ 80	18 %	$ 93	$ 108	$ 125	$ 145	$ 169	16 %
	Industry Specific	86	105	22	128	156	191	232	284	22
	Utility	100	111	11	123	137	152	169	187	11
Subtotal		254	296	17	344	401	468	546	640	17
Facilities Management	Function Specific	2	2	0	2	2	2	2	2	0
	Industry Specific	2	2	0	2	2	2	2	2	0
	Utility	7	8	12	9	10	11	12	13	11
Subtotal		11	12	8	13	14	15	16	17	7
Batch	Function Specific	34	37	9	40	43	47	50	54	8
	Industry Specific	11	11	3	12	12	12	13	13	3
	Utility	20	20	0	20	20	20	20	20	0
Subtotal		65	68	5	72	75	79	83	87	5
Total Processing	Function Specific	104	119	14	135	153	174	197	225	14
	Industry Specific	99	118	19	142	170	205	247	299	20
	Utility	127	139	9	152	167	183	201	220	10
Grand Total		$ 330	$ 376	14%	$ 429	$ 490	$ 562	$ 645	$ 744	15 %

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-34

INFORMATION SERVICES MARKET FORECAST - BANKING & FINANCE SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 792	$ 956	21%	$1,147	$ 1,377	$ 1,654	$ 1,988	$ 2,389	20 %
Facilities Management		325	397	22	484	591	721	879	1,073	22
Batch		701	742	6	780	819	860	904	951	5
Subtotal Processing		1,818	2,095	15	2,411	2,787	3,235	3,771	4,413	16
Software Products	Systems	83	113	36	155	212	290	398	549	37
	Applications	330	393	19	463	547	645	761	898	18
Subtotal Software Products		413	506	23	618	759	935	1,159	1,447	23
Profes-sional Services	Services	200	252	26	323	413	528	676	866	28
	Facilities Management	24	28	17	34	40	49	58	70	20
Subtotal Profes-sional Services		224	280	25	357	453	577	734	936	28
Grand Total		$2,455	$2,881	17%	$3,386	$ 3,999	$ 4,747	$ 5,664	$ 6,796	19%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-35

MARKET FORECAST FOR PROCESSING SERVICES - BANKING & FINANCE SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 75	$ 85	13%	$ 97	$ 112	$ 129	$ 148	$ 170	15%
	Industry Specific	671	819	22	991	1,199	1,450	1,755	2,123	21
	Utility	46	52	13	59	66	75	85	96	13
Subtotal		792	956	21	1,147	1,377	1,654	1,988	2,389	20
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	325	397	22	484	591	721	879	1,073	22
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		325	397	22	484	591	721	879	1,073	22
Batch	Function Specific	148	161	9	174	188	203	219	237	8
	Industry Specific	542	569	5	592	616	640	666	692	4
	Utility	11	12	12	14	15	17	19	22	12
Subtotal		701	742	6	780	819	860	904	951	5
Total Processing	Function Specific	223	246	10	271	300	332	367	407	11
	Industry Specific	1,538	1,785	16	2,067	2,406	2,811	3,300	3,888	17
	Utility	57	64	12	73	81	92	104	118	13
Grand Total		$1,818	$ 2,095	15%	$ 2,411	$ 2,787	$ 3,235	$ 3,771	$4,413	16%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-36

COMPUTER SERVICES MARKET FORECAST - INSURANCE SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 179	$ 213	19 %	$ 250	$ 293	$ 345	$ 407	$ 478	18%
Facilities Management		300	363	21	439	531	643	778	942	21
Batch		111	119	7	125	133	141	150	159	6
Subtotal Processing		590	695	18	814	957	1,129	1,335	1,579	18
Software Products	Systems	97	132	36	181	248	339	465	637	37
	Applications	224	264	18	309	362	423	495	580	17
Subtotal Software Products		321	396	23	490	610	762	960	1,217	25
Professional Services	Services	170	209	23	261	327	408	510	638	25
	Facilities Management	46	52	14	61	71	82	95	110	16
Subtotal Professional Services		216	261	21	322	398	490	605	748	23
Grand Total		$1,127	$1,352	20%	$1,626	$ 1,965	$ 2,381	$ 2,900	$ 3,544	21%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-37

MARKET FORECAST FOR PROCESSING SERVICES - INSURANCE SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 74	$ 89	20%	$ 103	$ 119	$ 139	$ 161	$ 187	16%
	Industry Specific	85	102	20	122	147	176	212	254	20
	Utility	20	22	11	25	27	30	34	37	11
Subtotal		179	213	19	250	293	345	407	478	18
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	300	363	21	439	531	643	778	942	21
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		300	363	21	439	531	643	778	942	21
Batch	Function Specific	22	24	7	25	27	29	31	33	7
	Industry Specific	79	84	6	89	94	100	106	112	6
	Utility	10	11	6	11	12	12	13	14	5
Subtotal		111	119	7	125	133	141	150	159	6
Total Processing	Function Specific	96	113	18	128	146	168	192	220	14
	Industry Specific	464	549	18	650	772	919	1,096	1,308	19
	Utility	30	33	10	36	39	42	47	51	9
Grand Total		$ 590	$ 695	18%	$ 814	$ 957	$1,129	$1,335	$1,579	18%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-38

INFORMATION SERVICES MARKET FORECAST - MEDICAL SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 168	$ 207	23 %	$ 254	$ 313	$ 385	$ 474	$ 583	23 %
Facilities Management		200	240	20	288	346	415	498	597	20
Batch		187	197	5	206	216	226	237	250	5
Subtotal Processing		555	644	16	748	875	1,026	1,209	1,430	17
Software Products	Systems	45	63	40	90	129	184	263	377	43
	Applications	69	93	35	124	165	219	291	388	33
Subtotal Software Products		114	156	37	214	294	403	554	765	37
Profes-sional Services	Services	80	94	18	113	135	161	192	230	19
	Facilities Management	5	6	10	6	7	8	9	10	12
Subtotal Profes-sional Services		85	100	18	119	142	169	201	240	19
Grand Total		$ 754	$ 900	19%	$ 1,081	$ 1,311	$ 1,598	$ 1,964	$ 2,435	22%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-39

MARKET FORECAST FOR PROCESSING SERVICES - MEDICAL SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 15	$ 19	25%	$ 23	$ 29	$ 37	$ 46	$ 57	25 %
	Industry Specific	146	180	23	221	272	334	411	506	23
	Utility	7	8	19	10	12	14	17	20	19
Subtotal		168	207	23	254	313	385	474	583	23
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	200	240	20	288	346	415	498	597	20
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		200	240	20	288	346	415	498	597	20
Batch	Function Specific	24	28	15	32	37	42	48	56	15
	Industry Specific	153	159	4	164	169	174	179	184	3
	Utility	10	10	0	10	10	10	10	10	0
Subtotal		187	197	5	206	216	226	237	250	5
Total Processing	Function Specific	39	47	21	55	66	79	94	113	20
	Industry Specific	499	579	16	673	787	923	1,088	1,287	17
	Utility	17	18	6	20	22	24	27	30	11
Grand Total		$ 555	$644	16%	$ 748	$ 875	$ 1,026	$1,209	$ 1,430	17%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-40

INFORMATION SERVICES MARKET FORECAST - EDUCATION SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 50	$ 55	10%	$ 59	$ 64	$ 69	$ 75	$ 81	8%
Facilities Management		16	20	25	25	31	39	48	61	25
Batch		57	60	5	64	67	71	76	81	6
Subtotal Processing		123	135	10	148	162	179	199	223	11
Software Products	Systems	32	38	20	46	54	65	77	92	19
	Applications	26	30	15	34	40	45	52	60	15
Subtotal Software Products		58	68	17	80	94	110	129	152	17
Professional Services	Services	72	88	22	107	131	160	195	235	21
	Facilities Management	0	0	0	0	0	0	0	0	0
Subtotal Professional Services		72	88	22	107	131	160	195	235	21
Grand Total		$ 253	$ 291	15%	$ 335	$ 387	$ 449	$ 523	$ 610	16%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-41

MARKET FORECAST FOR PROCESSING SERVICES - EDUCATION SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 19	$ 21	11%	$ 23	$ 25	$ 27	$ 30	$ 32	9%
	Industry Specific	9	10	10	11	12	13	14	16	10
	Utility	22	24	7	25	27	29	31	33	7
Subtotal		50	55	10	59	64	69	75	81	8
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	16	20	25	25	31	39	48	61	25
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		16	20	25	25	31	39	48	61	25
Batch	Function Specific	17	18	8	20	21	22	24	26	7
	Industry Specific	25	27	8	29	31	34	37	40	8
	Utility	15	15	0	15	15	15	15	15	0
Subtotal		57	60	5	64	67	71	76	81	6
Total Processing	Function Specific	36	39	8	43	46	49	54	58	8
	Industry Specific	50	57	14	65	74	86	99	117	15
	Utility	37	39	5	40	42	44	46	48	4
Grand Total		$123	$ 135	10%	$148	$ 162	$ 179	$ 199	$ 223	11%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-42

INFORMATION SERVICES MARKET FORECAST - RETAIL SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 369	$ 442	20%	$ 528	$ 632	$ 757	$ 906	$1,086	20%
Facilities Management		12	15	25	18	21	26	31	38	20
Batch		196	207	6	220	234	250	268	288	7
Subtotal Processing		577	664	15	766	887	1,033	1,205	1,412	16
Software Products	Systems	51	70	38	99	138	193	270	379	40
	Applications	71	97	36	130	176	238	321	433	35
Subtotal Software Products		122	167	37	229	314	431	591	812	37
Professional Services	Services	102	133	30	174	228	298	391	512	31
	Facilities Management	0	0	0	0	0	0	0	0	0
Subtotal Professional Services		102	133	30	174	228	298	391	512	31
Grand Total		$ 801	$ 964	20%	$1,169	$1,429	$1,762	$2,187	$2,736	23%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-43

MARKET FORECAST FOR PROCESSING SERVICES - RETAIL SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 36	$ 46	27%	$ 57	$ 71	$ 89	$ 112	$ 140	25%
	Industry Specific	301	358	19	426	507	604	718	855	19
	Utility	32	38	19	45	54	64	76	91	19
Subtotal		369	442	20	528	632	757	906	1,086	20
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	12	15	21	18	21	26	31	38	21
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		12	15	25	18	21	26	31	38	20
Batch	Function Specific	67	76	14	87	99	113	129	147	14
	Industry Specific	99	101	2	103	105	107	109	111	2
	Utility	30	30	0	30	30	30	30	30	0
Subtotal		196	207	6	220	234	250	268	288	7
Total Processing	Function Specific	103	122	18	144	170	202	241	287	19
	Industry Specific	412	474	15	547	633	737	858	1,004	16
	Utility	62	68	10	75	84	94	106	121	12
Grand Total		$ 577	$ 664	15%	$ 766	$ 887	$1,033	$1,205	$1,412	16%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-44

INFORMATION SERVICES MARKET FORECAST - WHOLESALE SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$174	$ 205	18%	$ 242	$ 288	$ 341	$ 404	$ 480	19%
Facilities Management		33	40	21	49	59	73	89	109	22
Batch		268	289	8	312	339	369	403	442	9
Subtotal Processing		475	534	12	603	686	783	896	1,031	14
Software Products	Systems	45	64	42	92	133	191	275	396	44
	Applications	110	151	37	205	279	379	516	701	36
Subtotal Software Products		155	215	39	297	412	570	791	1,097	39
Professional Services	Services	82	107	31	141	185	242	317	416	31
	Facilities Management	2	2	18	3	3	4	5	6	21
Subtotal Professional Services		84	109	30	144	188	246	322	422	31
Grand Total		$714	$ 858	20%	$1,044	$1,286	$1,599	$ 2,009	$ 2,550	24%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-45

MARKET FORECAST FOR PROCESSING SERVICES - WHOLESALE SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 55	$ 63	14%	$ 73	$ 86	$ 100	$ 117	$ 137	17 %
	Industry Specific	96	115	20	138	166	199	239	287	20
	Utility	23	27	16	31	36	42	48	56	16
Subtotal		174	205	18	242	288	341	404	480	19
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	29	35	21	43	53	65	80	99	23
	Utility	4	5	18	6	6	8	9	10	17
Subtotal		33	40	21	49	59	73	89	109	22
Batch	Function Specific	116	133	15	153	176	203	233	268	15
	Industry Specific	57	58	1	58	59	59	60	61	1
	Utility	95	98	3	101	104	107	110	113	3
Subtotal		268	289	8	312	339	369	403	442	9
Total Processing	Function Specific	171	196	15	226	262	303	350	405	32
	Industry Specific	182	208	14	239	278	323	379	447	17
	Utility	122	130	7	138	146	157	167	179	7
Grand Total		$ 475	$ 534	12%	$603	$ 686	$ 783	$896	$1,031	14%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-46

INFORMATION SERVICES MARKET FORECAST - FEDERAL GOVERNMENT SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 362	$ 424	17%	$ 493	$ 575	$ 670	$ 780	$ 908	16%
Facilities Management		75	87	16	103	122	144	170	203	18
Batch		57	57	0	58	58	58	59	59	1
Subtotal Processing		494	568	15	654	755	872	1,009	1,170	16
Software Products	Systems	239	323	35	436	588	794	1,072	1,447	35
	Applications	9	11	23	13	16	19	22	26	19
Subtotal Software Products		248	334	35	449	604	813	1,094	1,473	35
Professional Services	Services	868	1,120	29	1,467	1,922	2,517	3,298	4,320	31
	Facilities Management	311	339	9	374	413	457	504	557	10
Subtotal Professional Services		1,179	1,459	24	1,841	2,335	2,974	3,802	4,877	27
Grand Total		$1,921	$2,361	23%	$2,944	$3,694	$ 4,659	$5,905	$7,520	26%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-47

MARKET FORECAST FOR PROCESSING SERVICES - FEDERAL GOVERNMENT SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 99	$ 116	17%	$ 134	$ 156	$ 181	$ 210	$ 243	16%
	Industry Specific	30	35	18	43	52	63	76	92	21
	Utility	233	273	17	316	367	426	494	573	16
Subtotal		362	424	17	493	575	670	780	908	16
Facilities Management	Function Specific	36	40	12	45	51	57	63	71	12
	Industry Specific	0	0	0	0	0	0	0	0	0
	Utility	39	47	20	58	71	87	107	132	23
Subtotal		75	87	16	103	122	144	170	203	18
Batch	Function Specific	10	10	3	11	11	11	12	12	3
	Industry Specific	0	0	0	0	0	0	0	0	0
	Utility	47	47	0	47	47	47	47	47	0
Subtotal		57	57	0	58	58	58	59	59	1
Total Processing	Function Specific	145	166	14	190	218	249	285	326	14
	Industry Specific	30	35	17	43	52	63	76	92	21
	Utility	319	367	15	421	485	560	648	752	15
Grand Total		$ 494	$ 568	15%	$ 654	$ 755	$ 872	$1,009	$1,170	16%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-48

INFORMATION SERVICES MARKET FORECAST - STATE AND LOCAL GOVERNMENT SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$ 61	$ 74	21%	$ 89	$ 108	$ 131	$ 157	$ 189	21%
Facilities Management		28	33	18	40	48	58	70	84	21
Batch		77	81	5	87	91	97	103	110	6
Subtotal Processing		166	188	13	216	247	286	330	383	15
Software Products	Systems	85	106	25	133	166	208	259	324	25
	Applications	26	30	17	36	42	50	59	70	18
Subtotal Software Products		111	136	23	169	208	258	318	394	24
Professional Services	Services	736	949	29	1,223	1,575	2,028	2,611	3,363	29
	Facilities Management	6	7	23	9	10	12	14	17	18
Subtotal Professional Services		742	956	29	1,232	1,585	2,040	2,625	3,380	29
Grand Total		$1,019	$1,280	26%	$1,617	$2,040	$2,584	$3,273	$4,157	27%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-49

MARKET FORECAST FOR PROCESSING SERVICES - STATE AND LOCAL GOVERNMENT SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 20	$ 25	24%	$ 30	$ 36	$ 44	$ 53	$ 64	21%
	Industry Specific	10	12	24	15	19	24	29	36	24
	Utility	31	37	20	44	53	63	75	89	19
Subtotal		61	74	21	89	108	131	157	189	21
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	8	10	29	13	17	22	29	37	29
	Utility	20	23	17	27	31	36	41	47	15
Subtotal		28	33	18	40	48	58	70	84	21
Batch	Function Specific	17	18	8	20	21	23	25	27	8
	Industry Specific	19	21	12	24	26	29	32	36	11
	Utility	41	42	3	43	44	45	46	47	2
Subtotal		77	81	5	87	91	97	103	110	6
Total Processing	Function Specific	37	43	16	50	57	67	78	91	17
	Industry Specific	37	43	16	52	62	75	90	109	20
	Utility	92	102	11	114	128	144	162	183	12
Grand Total		$ 166	$188	13%	$ 216	$ 247	$ 286	$ 330	$383	15%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-50

INFORMATION SERVICES MARKET FORECAST - SERVICES SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$482	$ 591	23%	$ 717	$ 872	$1,062	$1,294	$1,577	22%
Facilities Management		4	5	25	6	8	9	12	15	25
Batch		258	276	7	297	321	347	377	411	8
Subtotal Processing		744	872	17	1,020	1,201	1,418	1,683	2,003	18
Software Products	Systems	30	41	35	55	76	104	143	195	37
	Applications	54	69	28	88	113	145	186	237	28
Subtotal Software Products		84	110	31	143	189	249	329	432	31
Professional Services	Services	22	28	29	37	47	61	79	101	29
	Facilities Management	0	0	0	0	0	0	0	0	0
Subtotal Professional Services		22	28	29	37	47	61	79	101	29
Grand Total		$850	$1,010	19%	$1,200	$1,437	$1,728	$2,091	$2,536	20%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-51

MARKET FORECAST FOR PROCESSING SERVICES - SERVICES SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 125	$ 145	15 %	$ 165	$ 188	$ 215	$ 245	$ 279	14 %
	Industry Specific	300	375	25	465	577	715	887	1,099	24
	Utility	57	71	24	87	107	132	162	199	23
Subtotal		482	591	23	717	872	1,062	1,294	1,577	22
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	4	5	25	6	8	9	12	15	25
	Utility	0	0	0	0	0	0	0	0	0
Subtotal		4	5	25	6	8	9	12	15	25
Batch	Function Specific	63	74	18	88	104	122	144	170	18
	Industry Specific	175	182	4	189	197	205	213	221	4
	Utility	20	20	0	20	20	20	20	20	0
Subtotal		258	276	7	297	321	347	377	411	8
Total Processing	Function Specific	188	219	16	253	292	337	389	449	15
	Industry Specific	479	562	17	660	782	929	1,112	1,335	19
	Utility	77	91	18	107	127	152	182	219	19
Grand Total		$ 744	$ 872	17%	$1,020	$1,201	$ 1,418	$1,683	$2,003	18%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-52

INFORMATION SERVICES MARKET FORECAST - OTHER SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (%)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (%)
Remote Computing Services		$280	$ 338	21%	$ 404	$ 481	$ 574	$ 685	$ 818	19%
Facilities Management		12	14	17	17	20	24	28	34	19
Batch		238	260	9	286	313	344	378	417	10
Subtotal Processing		530	612	15	707	814	942	1,091	1,269	16
Software Products	Systems	25	37	46	54	79	116	170	251	47
	Applications	51	68	33	90	120	160	212	282	33
Subtotal Software Products		76	105	38	144	199	276	382	533	38
Profes-sional Services	Services	116	151	30	196	255	331	431	560	30
	Facilities Management	0	0	0	0	0	0	0	0	0
Subtotal Profes-sional Services		116	151	30	196	255	331	431	560	30
Grand Total		$ 722	$ 868	20%	$1,047	$1,268	$ 1,549	$1,904	$2,362	22%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-53

MARKET FORECAST FOR PROCESSING SERVICES - OTHER SECTOR, 1981-1986

INFORMATION SERVICE		USER EXPENDITURES								
MODE	TYPE	1980 ($M)	1981 ($M)	GROWTH 1980-1981 (percent)	1982 ($M)	1983 ($M)	1984 ($M)	1985 ($M)	1986 ($M)	AAGR 1981-1986 (percent)
Remote Computing Services	Function Specific	$ 44	$ 52	18%	$ 61	$ 71	$ 83	$ 97	$114	17%
	Industry Specific	172	210	22	252	302	363	435	522	20
	Utility	64	76	19	91	108	128	153	182	19
Subtotal		280	338	21	404	481	574	685	818	19
Facilities Management	Function Specific	0	0	0	0	0	0	0	0	0
	Industry Specific	8	9	18	11	13	16	19	23	19
	Utility	4	5	18	6	7	8	9	11	18
Subtotal		12	14	17	17	20	24	28	34	19
Batch	Function Specific	96	109	14	125	142	162	185	211	14
	Industry Specific	121	129	7	139	148	159	170	182	7
	Utility	21	22	3	22	23	23	23	24	2
Subtotal		238	260	9	286	313	344	378	417	10
Total Processing	Function Specific	140	161	15	186	213	245	282	325	15
	Industry Specific	301	348	16	402	463	538	624	727	16
	Utility	89	103	16	119	138	159	185	217	16
Grand Total		$530	$612	15%	$707	$814	$ 942	$ 1,091	$1,269	16%

MAY NOT TOTAL DUE TO TRUNCATION.

EXHIBIT B-54

INDUSTRY GROWTH, 1981-1986

INDUSTRY	VALUE* 1981[e] ($ billions)	AVERAGE ANNUAL GROWTH RATE 1981-1986 (percent)	INCREMENTAL GROWTH IN INDUSTRY 1981-1986 ($ billions)
Banking & Finance	$ 2,968	9.7%	$1,745
Process Manufacturing	1,180	12.5	954
Wholesale	1,073	12.1	831
Retail	970	10.2	610
Other	822	9.7	482
Discrete Manufacturing	899	8.6	461
Federal Government	634	9.9	382
State and Local Government	486	10.2	305
Services	278	13.2	244
Medical	276	12.2	215
Insurance	298	11.0	204
Utilities	284	10.7	188
Transportation	129	11.6	94
Education	166	7.8	76
Total	$10,463	10.5%	$6,791

0 400 800 1,000 $ 7,000

e = ESTIMATED

*VALUE HAS BEEN DEFINED AS COMPARABLE UNITS OF MEASURE OF REVENUE BASE, SUCH AS VALUE OF SHIPMENTS, SALES, OPERATING REVENUES, ETC. THE VALUE FOR BANKING AND FINANCE IS ASSETS.

APPENDIX C: METHODOLOGY AND RECONCILIATION

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A. METHODOLOGY

- The process of developing the estimates and forecasts is a continuous one.

  - Every year INPUT expends thousands of man-days researching various aspects of the information systems and services activities engaged in by both users and vendors.

  - This research is analyzed and distilled into over 100 reports and more than 10,000 pages of results for clients of subscription programs, multi-client and custom studies.

  - Every year, as the result of technological, economic, social, political, and market changes, new questions and issues arise concerning the use and future of information systems and services which INPUT strives to answer.

  - This body of work is systematically reviewed and analyzed with a view to finding elements which will affect the course of users' needs and expenditures for information services. The ability of service vendors to respond to those needs is also examined, particularly in light of growing and stronger competition from a variety of quarters.

- In addition to the general research cited above, more than a thousand man-days a year are directed at gathering information specifically directed at arriving at market estimates and forecasts for the information services industry.

- Each year the data base is reexamined. Every assumption is questioned. Every prior projection is measured against every current piece of empirical information.

- Much of the data base remains relatively unchanged, but it seems that every year some parts of it require extensive revision as a result of new knowledge from new research.

• Each year INPUT raises new questions to challenge the validity of the long-term forecasts. This year a number of areas were researched in depth.

- The tremendous upheaval and changes in the cost, sources, and types of energy in recent years caused INPUT to study this industry sector in a report for the Information Services Industry Program.

- The explosive growth of the personal computer marketplace resulted in several studies.

- Computer Aided Engineering (CAE) was the subject of a multiclient study entitled Improving the Productivity of Engineering and Manufacturing Using CAD/CAM.

- In-depth research was conducted on both the applications software and professional services markets.

- Business graphics in the domestic information services markets and data bases in the world markets were also studied.

- These are just a few of the areas looked at which impacted the market forecast.

- In addition to the above type of specific research employed in building the information services industry data base, INPUT does the following on an annual basis.

  - The Company Analysis and Monitoring Program (CAMP) maintains a data base of approximately 3,000 vendor companies in on-line systems.

    . This data base is updated continuously. Questionnaires are sent to all companies every year. In addition, more than a thousand telephone interviews are conducted annually to update data. Where companies are uncooperative, data are gathered from INPUT's vendor files and other sources.

    . Information maintained in the CAMP data base includes revenue sources by service modes and industry sector.

    . CAMP also reviews all companies monitored for potential inclusion in the INPUT Directory of Leading U.S. Computer Services Firms. More than 250 companies were investigated this year.

  - The INPUT Directory is one of the major sources of data for estimating industry revenues and current growth rates of service modes.

    . This year 179 companies qualified for the directory by having more than $10 million in available U.S. computer services revenue.

    . Revenues for each company are broken out into service modes compatible with the forecast contained in this report.

  - The vendors included in this directory sell nearly 60% of all U.S. information services.

- The data gathered for the INPUT Directory contain no statistical error since it is a census of all companies in the defined category (over $10 million) and not a sample.

- In spite of the rigorous research described above, a few companies each year do manage to escape our attention. New findings this year are cited in the following reconciliation.

- A stratified random sample is taken of companies with less than $10 million in revenues.

  - The sample is stratified by size of company and type of service mode.

  - The sample is taken through telephone interviews with vendors.

- Both the census (Directory) and the random sample are structured to correlate with the U.S. Government Bureau of Census County Business Patterns statistics.

  - A direct correlation is not possible because the government includes software services and professional services in the same category.

  - But the rough correlation is useful as a check and in some instances called for some modification of the estimates after further research and examination.

  - These modifications are noted below in the reconciliation.

- Several other surveys are utilized in addition to the above to aid in identifying user expenditures by industry sector.

  . INPUT's EDP manager panel is an important source. In the past 18 months, more than 1,000 managers of EDP systems and services were polled concerning their expenditures on computer services.

  . A special stratified random sample of 100 vendors was conducted for this study to further examine user expenditures by industry sector. This survey also produced useful information on long-term trends as perceived by vendors on user expenditures.

- As a supplement to the above, several other information sources are employed.

  - INPUT maintains files on over 3,000 vendors which contain promotional and product bulletins and brochures, annual reports, press releases, clippings from periodicals, interview questionnaires, and contact reports with company management and industry experts.

  - Information is gathered from a number of government sources including the following:

    . The Department of Labor.

    . The Department of Commerce.

    . The Government Services Administration.

    . The Department of Defense.

  - EDP equipment installations by manufacturer within industry sectors are provided by Computer Intelligence Incorporated.

- The above procedure yields an Information Services Industry size which has a 90% confidence factor of being within 5% of the true value in 1980.

B. RECONCILIATION

- In past years INPUT's industry estimates have differed substantially from those reported by INPUT in the ADAPSO annual report. This was because the report for ADAPSO focused on vendors and excluded certain types of vendors. There is much less of a difference this year.

  - ADAPSO used to exclude the following but included them this year:

    . Organizations buying computer services from firms in their own industry, such as banks buying processing services from other banks.

    . Expenditures to computer manufacturers for software products and professional services.

  - This year the difference in estimated user expenditures is less than 1%. INPUT lowered the estimated size of the industry by $98 million due to additional research since the publication of the ADAPSO report.

- User expenditures on information services in 1980 were $14,815 million, as shown in Exhibit C-1.

  - These expenditures were 4.5% higher than those which were forecasted by INPUT in the 1980 Annual Report.

  - A little more than half of this difference is due to the industry growing at a higher rate (21%) than was forecasted (18%) from 1979 to 1980.

EXHIBIT C-1

RECONCILIATION OF INFORMATION SERVICES FORECASTS BY INDUSTRY SECTOR BETWEEN 1980 AND 1981 ANNUAL REPORTS

INDUSTRY SECTOR	1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
Discrete Manufacturing	$ 2,076	$ 1,967	$ 7,366	$ 8,309	24 %	28 %
Process Manufacturing	1,245	1,342	4,620	6,560	25	31
Transportation	350	332	1,358	1,414	25	28
Utilities	615	558	1,766	1,699	19	21
Banking and Finance	2,328	2,455	6,145	6,806	18	19
Insurance	1,292	1,127	3,095	3,544	16	21
Medical	725	754	1,984	2,435	18	22
Education	276	253	531	610	12	16
Retail	811	801	2,534	2,736	21	23
Wholesale	717	714	2,024	2,550	18	24
Federal Government	1,478	1,921	3,912	7,509	15	26
State and Local Government	680	1,019	1,753	4,157	17	27
Services	835	850	2,517	2,536	20	20
Other	742	722	2,225	2,362	21	22
Total	$14,170	$14,815	$41,830	$53,227	20%	24%

- The remaining difference is due to an increase in the base due to additional research primarily in the energy industry and professional services.

- The total processing services market size for 1980 is essentially the same size as forecasted in last year's report.

  - RCS revenues came in fairly close to projections.

  - The PFM market was reduced by $180 million because INPUT reclassified Blue Cross/Blue Shield industry specialty revenues from noncaptive to captive revenues.

  - The batch processing market was found to be about 15% larger than previously forecasted because more user expenditures were found for seismic data processing as a result of the energy study done earlier this year by INPUT.

- The most significant differences between last year's forecast and this year's report of user expenditures in 1980 were for software products.

  - Expenditures on systems software were overstated by about 8%.

  - The estimate for applications software was increased by nearly 50% this year.

- A number of factors account for the increase in the estimate of applications software expenditures.

  - Sixty companies were added to the under $10 million category due to the random sample. These companies produced about $170 million in revenue in 1980.

- An additional $120 million in revenue was identified in companies with more than $10 million in revenue.

- The applications software expenditures for personal computers were recognized and counted for the first time. These amounted to $60 million in 1980.

- The vendor revenues were converted to user expenditures by eliminating revenues from services sold by one vendor to another vendor.

- The balance of the increase in this market came from a higher growth rate than projected.

- The professional services market was found to be 9% larger than projected.

  - Fourteen new companies were discovered that belonged in the over $10 million category.

  - An additional 75 companies were added to the under $10 million category.

- The professional services user expenditures have been the most difficult to estimate for a number of reasons.

  - Most of these companies are privately held.

  - Very few advertise their services.

  - A large portion of the expenditures comes from the government sector which is often harder to identify.

- The Census Bureau data supported INPUT's research in raising the estimate for professional services expenditures.

- INPUT is increasing its five-year forecast for the information services industry from 20% AAGR to 24% AAGR, as shown in Exhibit C-2.
  - This is the largest change INPUT has ever made to the long-range industry forecast.
  - No change has been made to the processing services forecast, while major increases have been made for software and professional services.
- The projection for PFM was the only processing mode which was increased substantially.
  - Conversion of RCS and batch services to long-term FM contracts is expected to continue at a high rate.
  - Growth of industry specific PFM will increase in a number of industry sectors.
- RCS revenue growth has been reduced slightly for several reasons.
  - Conversion to PFM.
  - Conversion to in-house.
  - Turnkey and microcomputer alternatives.
- Software products expenditures are forecasted to grow much faster than in last year's report, for a variety of reasons given in the text in Chapter V.
- Professional services increases are due to major increases in demand fueled by a shortage of skilled people, particularly in the government sectors.

EXHIBIT C-2

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN ALL SECTORS BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 936	$ 885	$ 2,730	$ 2,532	19%	19%
	Industry Spec.	2,313	2,324	8,198	7,727	23	22
	Utility	1,021	917	3,056	2,473	20	18
Subtotal		4,270	4,126	13,984	12,732	22	21
Facilities Management	Function Spec.	53	45	83	90	8	12
	Industry Spec.	1,181	981	2,749	3,138	15	22
	Utility	158	95	362	286	15	20
Subtotal		1,392	1,121	3,194	3,514	15	21
Batch	Function Spec.	895	946	1,705	1,779	11	11
	Industry Spec.	1,344	1,706	2,378	2,837	10	9
	Utility	443	439	524	513	3	3
Subtotal		2,682	3,091	4,607	5,129	9	9
Total Processing	Function Spec.	1,884	1,876	4,518	4,401	15	15
	Industry Spec.	4,838	5,011	13,325	13,707	18	18
	Utility	1,622	1,451	3,942	3,272	16	15
Total Processing		$ 8,344	$ 8,338	$21,785	$21,375	17%	17%
Software Products	Systems	1,521	1,401	7,525	9,535	30	38
	Applications	883	1,325	3,343	5,516	25	27
Total Software		$ 2,404	$ 2,726	$10,868	$15,051	28%	33%
Professional Services		3,422	3,751	9,177	16,797	17	29
Grand Total		$14,170	$14,815	$41,830	$ 53,227	20%	24%

- Only two industry sectors, federal government and state and local government, had major changes between last year's forecast and this year's report of 1980 user expenditures, as shown in Exhibit C-13 and C-14.

  - Federal government expenditures were 30% higher than forecasted.

  - State and local government expenditures were 50% higher than forecasted.

- Government expenditures on professional services are substantially higher than previously estimated by INPUT.

  - The growth of these expenditures had been underestimated by as much as one-third.

  - These expenditures were highlighted when INPUT oriented its examination of professional services along commercial and government sectors in its Directory of Leading Computer Services Companies research.

  - The explosive growth in this area called for the substantial revision incorporated in this year's report.

- Reconciliations of forecasts for the individual industry sectors are presented in Exhibits C-3 through C-16.

  - Changes in the forecasts which materially affected individual industry sectors are discussed in Chapter VII.

  - Changes in the forecast which materially affect the forecast by modes of delivery are discussed in Chapters IV, V, and VI.

EXHIBIT C-3

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN DISCRETE MANUFACTURING BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 130	$ 123	$ 405	$ 292	21%	15%
	Industry Spec.	315	325	1,314	1,250	27	25
	Utility	90	81	248	197	18	16
Subtotal		535	529	1,967	1,739	24	22
Facilities Management	Function Spec.	6	5	11	11	11	14
	Industry Spec.	37	25	101	75	18	20
	Utility	28	17	73	57	17	22
Subtotal		71	47	185	143	17	20
Batch	Function Spec.	225	238	342	341	7	6
	Industry Spec.	66	75	129	125	12	9
	Utility	64	63	92	80	6	4
Subtotal		355	376	563	546	8	6
Total Processing	Function Spec.	361	366	758	644	13	10
	Industry Spec.	418	425	1,544	1,450	24	23
	Utility	182	161	413	334	15	13
Total Processing		$ 961	$ 952	$2,715	$2,428	19%	17%
Software Products	Systems	370	341	1,860	2,321	31	38
	Applications	140	209	663	1,009	30	30
Total Software		$ 510	$ 550	$2,523	$3,330	31%	35%
Professional Services		605	465	2,128	2,551	23	33
Grand Total		$ 2,076	$ 1,967	$ 7,366	$ 8,309	24%	28%

EXHIBIT C-4

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN PROCESS MANUFACTURING BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 117	$ 110	$ 512	$ 601	28 %	32 %
	Industry Spec.	43	43	148	222	23	31
	Utility	200	180	671	665	22	24
Subtotal		360	333	1,331	1,488	24	28
Facilities Management	Function Spec.	2	2	6	6	20	20
	Industry Spec.	39	27	101	106	17	26
	Utility	6	4	17	16	18	26
Subtotal		47	33	124	128	17	26
Batch	Function Spec.	73	77	146	168	12	14
	Industry Spec.	122	325	409	1,020	22	21
	Utility	46	46	57	61	4	5
Subtotal		241	448	612	1,249	17	19
Total Processing	Function Spec.	192	189	664	775	23	27
	Industry Spec.	204	395	658	1,348	22	23
	Utility	252	230	745	742	20	22
Total Processing		$ 648	$ 814	$ 2,067	$ 2,865	21%	23%
Software Products	Systems	220	203	1,310	1,848	35	45
	Applications	52	78	271	462	32	35
Total Software		$ 272	$ 281	$ 1,581	$ 2,310	35%	43%
Professional Services		325	247	972	1,385	20	34
Grand Total		$ 1,245	$ 1,342	$ 4,620	$ 6,560	25%	31%

EXHIBIT C-5

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN TRANSPORTATION BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 23	$ 22	$ 47	$ 47	13%	13%
	Industry Spec.	50	50	194	182	25	24
	Utility	23	21	49	49	13	15
Subtotal		96	93	290	278	20	20
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	33	25	64	70	12	18
	Utility	0	0	0	0	0	0
Subtotal		33	25	64	70	12	18
Batch	Function Spec.	16	17	29	30	10	10
	Industry Spec.	22	25	43	40	12	8
	Utility	10	10	10	10	0	0
Subtotal		48	52	82	80	9	7
Total Processing	Function Spec.	39	39	76	77	12	12
	Industry Spec.	105	100	301	292	19	20
	Utility	33	31	59	59	10	12
Total Processing		$177	$170	$ 436	$ 428	16%	17%
Software Products	Systems	63	58	394	367	36	36
	Applications	27	41	170	281	36	38
Total Software		$ 90	$ 99	$ 564	$ 648	36%	37%
Professional Services		83	63	358	338	28	32
Grand Total		$350	$332	$1,358	$1,414	25%	28%

EXHIBIT C-6

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN UTILITIES BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 72	$ 68	$ 224	$ 169	21%	16%
	Industry Spec.	86	86	301	284	23	22
	Utility	112	100	224	187	12	11
Subtotal		270	254	749	640	18	17
Facilities Management	Function Spec.	2	2	2	2	0	0
	Industry Spec.	2	2	2	2	0	0
	Utility	12	7	24	13	12	11
Subtotal		16	11	28	17	9	7
Batch	Function Spec.	32	34	52	54	8	8
	Industry Spec.	10	11	14	13	5	3
	Utility	20	20	20	20	0	0
Subtotal		62	65	86	87	5	5
Total Processing	Function Spec.	106	104	278	225	17	14
	Industry Spec.	98	99	317	299	22	20
	Utility	144	127	268	220	11	10
Total Processing		$348	$330	$ 863	$ 744	16%	15%
Software Products	Systems	73	67	389	354	32	32
	Applications	18	27	54	89	20	22
Total Software		$ 91	$ 94	$ 443	$ 443	30%	30%
Professional Services		176	134	460	512	17	25
Grand Total		$615	$558	$ 1,766	$1,699	19%	21%

EXHIBIT C-7

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN BANKING & FINANCE BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 79	$ 75	$ 248	$ 170	21%	15%
	Industry Spec.	670	671	2,337	2,123	23	21
	Utility	51	46	107	96	13	13
Subtotal		800	792	2,692	2,389	22	20
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	300	325	784	1,073	17	22
	Utility	0	0	0	0	0	0
Subtotal		300	325	784	1,073	17	22
Batch	Function Spec.	140	148	240	237	9	8
	Industry Spec.	480	542	745	692	8	4
	Utility	10	11	22	22	14	12
Subtotal		630	701	1,007	951	8	5
Total Processing	Function Spec.	219	223	488	407	14	11
	Industry Spec.	1,450	1,538	3,866	3,888	18	17
	Utility	61	57	129	118	13	13
Total Processing		$1,730	$1,818	$4,483	$4,413	17%	16%
Software Products	Systems	90	83	442	549	30	37
	Applications	220	330	545	898	16	18
Total Software		$ 310	$ 413	$ 987	$1,447	22%	23%
Professional Services		288	224	675	946	15	28
Grand Total		$2,328	$2,455	$6,145	$6,806	18%	19%

EXHIBIT C-8

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN INSURANCE BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 78	$ 74	$ 194	$ 187	16 %	16 %
	Industry Spec.	85	85	266	254	21	20
	Utility	22	20	43	37	12	11
Subtotal		185	179	503	478	18	18
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	480	300	1,037	942	14	21
	Utility	0	0	0	0	0	0
Subtotal		480	300	1,037	942	14	21
Batch	Function Spec.	21	22	31	33	7	7
	Industry Spec.	70	79	113	112	8	6
	Utility	11	10	15	14	5	5
Subtotal		102	111	159	159	8	6
Total Processing	Function Spec.	99	96	225	220	15	14
	Industry Spec.	635	464	1,416	1,308	14	19
	Utility	33	30	58	51	9	9
Total Processing		$ 767	$ 590	$1,699	$1,579	14 %	18 %
Software Products	Systems	105	97	507	637	30	37
	Applications	150	224	351	580	15	17
Total Software		$ 255	$ 321	$ 858	$1,217	22 %	25 %
Professional Services		270	216	538	748	12	23
Grand Total		$1,292	$1,127	$3,095	$3,544	16 %	21 %

EXHIBIT C-9

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN MEDICAL BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 16	$ 15	$ 57	$ 57	24 %	25 %
	Industry Spec.	146	146	526	506	24	23
	Utility	8	7	24	20	20	19
Subtotal		170	168	607	583	24	23
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	180	200	388	597	14	20
	Utility	0	0	0	0	0	0
Subtotal		180	200	388	597	14	20
Batch	Function Spec.	23	24	54	56	15	15
	Industry Spec.	135	153	191	184	6	3
	Utility	10	10	10	10	0	0
Subtotal		168	187	255	250	7	5
Total Processing	Function Spec.	39	39	111	113	19	20
	Industry Spec.	461	499	1,105	1,287	15	17
	Utility	18	17	23	30	11	11
Total Processing		$ 518	$ 555	$ 1,250	$ 1,430	16 %	17 %
Software Products	Systems	49	45	322	377	37	43
	Applications	46	69	236	388	31	33
Total Software		$ 95	$ 114	$ 558	$ 765	34 %	37 %
Professional Services		112	85	176	240	8	19
Grand Total		$ 725	$ 754	$ 1,984	$ 2,435	18 %	22 %

EXHIBIT C-10

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN EDUCATION BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 20	$ 19	$ 34	$ 32	9%	9%
	Industry Spec.	9	9	17	16	11	10
	Utility	24	22	36	33	7	7
Subtotal		53	50	87	81	9	8
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	23	16	61	61	18	25
	Utility	0	0	0	0	0	0
Subtotal		23	16	61	61	18	25
Batch	Function Spec.	16	17	16	26	8	7
	Industry Spec.	22	25	37	40	9	8
	Utility	15	15	15	15	0	0
Subtotal		53	57	78	81	7	6
Total Processing	Function Spec.	36	36	60	58	9	8
	Industry Spec.	54	50	115	117	13	15
	Utility	39	37	51	48	5	4
Total Processing		$129	$123	$226	$223	10%	11%
Software Products	Systems	35	32	81	92	16	19
	Applications	17	26	34	60	12	15
Total Software		$ 52	$ 58	$115	$152	15%	17%
Professional Services		95	72	190	235	12	21
Grand Total		$276	$253	$531	$610	12%	16%

EXHIBIT C-11

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN RETAIL BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 38	$ 36	$ 144	$ 140	25%	25%
	Industry Spec.	301	301	953	855	21	19
	Utility	36	32	104	91	19	19
Subtotal		375	369	1,201	1,086	21	20
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	18	12	48	38	18	21
	Utility	0	0	0	0	0	0
Subtotal		18	12	48	38	18	20
Batch	Function Spec.	63	67	151	147	16	14
	Industry Spec.	88	99	109	111	4	2
	Utility	30	30	30	30	0	0
Subtotal		181	196	290	288	8	7
Total Processing	Function Spec.	101	103	295	287	19	19
	Industry Spec.	407	412	1,110	1,004	18	16
	Utility	66	62	134	121	12	12
Total Processing		$574	$577	$1,539	$1,412	18%	16%
Software Products	Systems	55	51	340	379	36	40
	Applications	47	71	259	433	33	35
Total Software		$102	$122	$ 599	$ 812	34%	37%
Professional Services		135	102	396	512	20	31
Grand Total		$811	$801	$2,534	$2,736	21%	23%

EXHIBIT C-12

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN WHOLESALE BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 58	$ 55	$ 146	$ 137	17%	17%
	Industry Spec.	96	96	296	287	21	20
	Utility	26	23	64	56	16	16
Subtotal		180	174	506	480	19	19
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	40	29	84	99	13	23
	Utility	6	4	10	10	8	17
Subtotal		46	33	94	109	13	22
Batch	Function Spec.	110	116	226	268	13	15
	Industry Spec.	50	57	50	61	0	1
	Utility	97	95	113	113	3	3
Subtotal		257	268	389	442	7	9
Total Processing	Function Spec.	168	171	372	405	14	32
	Industry Spec.	186	182	430	447	15	17
	Utility	129	122	187	179	6	7
Total Processing		$483	$475	$ 989	$1,031	12%	14%
Software Products	Systems	49	45	329	396	37	44
	Applications	73	110	399	701	33	36
Total Software		$122	$155	$ 728	$1,097	35%	39%
Professional Services		112	84	307	422	18	31
Grand Total		$717	$714	$ 2,024	$2,550	18%	24%

EXHIBIT C-13

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN FEDERAL GOVERNMENT BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 105	$ 99	$ 255	$ 243	16%	16%
	Industry Spec.	30	30	100	92	22	21
	Utility	260	233	930	573	24	16
Subtotal		395	362	1,285	908	22	16
Facilities Management	Function Spec.	43	36	64	71	7	12
	Industry Spec.	0	0	0	0	0	0
	Utility	67	39	174	132	16	23
Subtotal		110	75	238	203	14	18
Batch	Function Spec.	9	10	10	12	2	3
	Industry Spec.	0	0	0	0	0	0
	Utility	48	47	48	47	0	0
Subtotal		57	57	58	59	0	1
Total Processing	Function Spec.	157	145	329	326	13	14
	Industry Spec.	30	30	100	92	22	21
	Utility	375	319	1,152	752	25	15
Total Processing		$562	$ 494	$ 1,581	$1,170	23%	16%
Software Products	Systems	260	239	950	1,447	25	35
	Applications	6	9	14	26	15	19
Total Software		$266	$ 248	$ 964	$1,473	25%	35%
Professional Services		650	1,179	1,367	4,866	13	27
Grand Total		$1,478	$1,921	$ 3,912	$7,509	17%	26%

EXHIBIT C-14

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN STATE AND LOCAL GOVERNMENT BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 21	$ 20	$ 70	$ 64	22%	21%
	Industry Spec.	10	10	38	36	25	24
	Utility	35	31	108	89	21	19
Subtotal		66	61	216	189	22	21
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	12	8	43	37	24	29
	Utility	33	20	53	47	8	15
Subtotal		45	28	96	84	13	21
Batch	Function Spec.	16	17	26	27	8	8
	Industry Spec.	17	19	43	36	17	11
	Utility	41	41	47	47	2	2
Subtotal		74	77	116	110	8	6
Total Processing	Function Spec.	37	37	96	91	17	17
	Industry Spec.	39	37	124	109	21	20
	Utility	109	92	208	183	11	12
Total Processing		$185	$166	$ 428	$ 383	15%	15%
Software Products	Systems	92	85	276	324	20	25
	Applications	17	26	39	70	15	18
Total Software		$109	$111	$ 315	$ 394	19%	24%
Professional Services		386	742	1,010	3,380	17	29
Grand Total		$680	$1,019	$1,753	$4,157	17%	27%

EXHIBIT C-15

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN SERVICES BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$132	$125	$ 271	$ 279	13%	14%
	Industry Spec.	300	300	1,163	1,099	25	24
	Utility	63	57	238	199	25	23
Subtotal		495	482	1,672	1,577	22	22
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	6	4	15	15	17	25
	Utility	0	0	0	0	0	0
Subtotal		6	4	15	15	17	25
Batch	Function Spec.	60	63	165	170	18	18
	Industry Spec.	155	175	256	221	9	4
	Utility	20	20	20	20	0	0
Subtotal		235	258	441	411	11	8
Total Processing	Function Spec.	192	188	436	449	15	15
	Industry Spec.	461	479	1,434	1,335	21	19
	Utility	83	77	258	219	20	19
Total Processing		$736	$744	$2,128	$2,003	19%	18%
Software Products	Systems	33	30	163	195	30	37
	Applications	36	54	145	237	26	28
Total Software		$ 69	$ 84	$ 308	$ 432	28%	31%
Professional Services		30	22	81	101	18	29
Grand Total		$835	$850	$2,517	$2,536	20%	20%

EXHIBIT C-16

RECONCILIATION OF INFORMATION SERVICES FORECASTS IN OTHER INDUSTRY SECTORS BETWEEN 1980 AND 1981 ANNUAL REPORTS

INFORMATION SERVICE		1980 FORECAST OF 1980 MARKET ($ millions)	1981 REPORT OF 1980 MARKET ($ millions)	1980 FORECAST OF 1985 EXTENDED FOR 1986 MARKET ($ millions)	1981 FORECAST OF 1986 MARKET ($ millions)	AAGR FORECAST IN 1980 REPORT (percent)	AAGR FORECAST IN 1981 REPORT (percent)
MODE	TYPE						
Remote Computing Services	Function Spec.	$ 47	$ 44	$ 123	$ 114	17 %	17 %
	Industry Spec.	172	172	545	522	21	20
	Utility	71	64	210	182	20	19
Subtotal		290	280	878	818	20	19
Facilities Management	Function Spec.	0	0	0	0	0	0
	Industry Spec.	11	8	21	23	12	19
	Utility	6	4	11	11	11	18
Subtotal		17	12	32	34	11	19
Batch	Function Spec.	91	96	207	211	15	14
	Industry Spec.	107	121	239	182	14	7
	Utility	21	21	25	24	3	2
Subtotal		219	238	471	417	14	10
Total Processing	Function Spec.	138	140	330	325	16	15
	Industry Spec.	290	301	805	727	19	16
	Utility	98	89	246	217	16	16
Total Processing		$526	$530	$1,381	$1,269	17%	16%
Software Products	Systems	27	25	162	251	35	47
	Applications	34	51	163	282	30	33
Total Software		$ 61	$ 76	$ 325	$ 533	33%	38%
Professional Services		155	116	519	560	22	30
Grand Total		$742	$722	$2,225	$2,362	21%	22%

APPENDIX D: INFORMATION SERVICES INDUSTRY PERFORMANCE, 1970-1986

APPENDIX D: INFORMATION SERVICES INDUSTRY PERFORMANCE, 1970-1986

- Clients have requested a historical perspective as well as forecast on the information services industry. This section has been prepared in response to these requests.

- The historical perspectives have been produced using the following methodology:

  - 1981 data have been reconciled with INPUT's first 1976 market assessment, then extrapolated from 1976 back to 1970.

  - Data for each year have been made compatible with current definitions of information services type and mode of delivery.

  - Each year's data have been adjusted backwards based on:

    . Knowledge of the information services industry market today.

    . Knowledge of previous years' markets.

- In 1976, INPUT first estimated a base of $5.4 billion for the computer services industry; this was subsequently adjusted from additional research and market definition changes to a base of $7.6 billion. The five-year growth rate originally forecasted was 16% per year through 1981, compared to a four-year

experienced growth rate of 19%. This difference is explained largely by inflation rate differences.

- INPUT assumed an inflation rate of 5% to 7% for the 1975-1981 forecast.

- The actual inflation rate was in the range of 8% to 10% for that period.

- This shows that INPUT's long-range forecast of the information services industry was reasonably accurate.

- The inflation rate of 9.8% for the current forecast is very important since the forecast is in current dollars.

- Major changes in the inflation rate and other economic conditions will be reflected in major changes in the rate of growth of the information services industry.

- In any event, the industry will continue to enjoy significant real growth over the next five years.

- The historical and forecast data are presented in several formats in Exhibits D-1, D-2, and D-3.

EXHIBIT D-1

INFORMATION SERVICES INDUSTRY
PERFORMANCE SUMMARY,
1970-1981

INFORMATION SERVICE	INFORMATION SERVICES MARKET		
	1970 ($ million)	1981 ($ million)	1970-1981 AAGR (percent)
Processing Services			
RCS	$ 540	$ 4,994	22%
Batch	1,060	3,344	11
FM	390	1,353	12
Total Processing	$1,990	$ 9,691	15%
Software Products			
Systems	150	1,906	26
Applications	100	1,670	29
Total Software	$ 250	$ 3,576	27
Professional Services	930	4,762	16
Grand Total	$3,170	$18,029	17%

EXHIBIT D-2

TOTAL INFORMATION SERVICES MARKET,
1970-1986

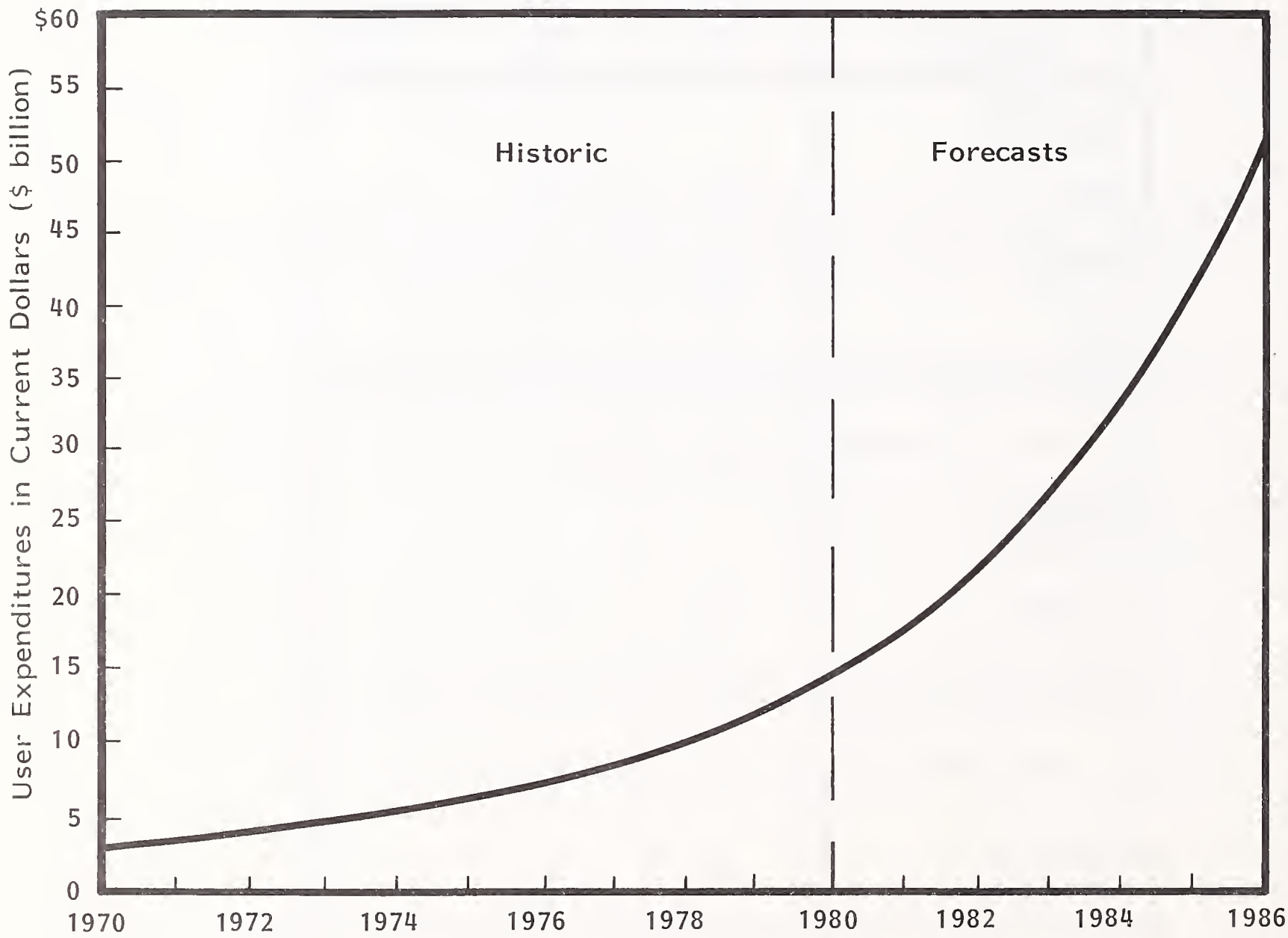

EXHIBIT D-3

INFORMATION SERVICES INDUSTRY YEARLY PERFORMANCE AND FORECAST,*
1970-1986

INFORMATION SERVICE	($ million)									
	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Processing Services RCS	$ 540	$ 670	$ 840	$1,030	$1,260	$1,560	$1,980	$2,390	$2,940	$3,528
Batch	1,060	1,170	1,290	1,410	1,560	1,710	1,880	2,020	2,300	2,486
FM	390	450	510	590	670	770	880	1,030	1,230	1,223
Software Products Systems	150	210	270	330	390	490	4740 590	5440 720	6170 890	7237 1,152
Applications	100	140	170	210	270	320	390	480	590	720
Professional Service	930	1,070	1,190	1,340	1,500	1,690	1,910	2,160	2,480	2,932
Total	$3,170	$3,710	$4,270	$4,910	$5,650	$6,540	$7,630	$8,800	$10,430	$12,041

* 1981-1986 IS FORECAST

Continued

EXHIBIT D-3 (Cont.)

INFORMATION SERVICES INDUSTRY YEARLY PERFORMANCE AND FORECAST,*
1970-1986

INFORMATION SERVICE	($ millions)							AAGR 1970-1986 (Percent)
	1980	1981	1982	1983	1984	1985	1986	
Processing Services								
RCS	$ 4,126	$ 4,994	$ 6,004	$ 7,231	$ 8,720	$10,529	$12,732	22%
Batch	3,091	3,344	3,619	3,926	4,276	4,674	5,129	10
FM	1,121	1,353	1,635	1,979	2,395	2,898	3,514	15
Software Products	8335	9691						
Systems	1,401	1,906	2,621	3,611	4,983	6,887	9,535	30
Applications	1,325	1,670	2,104	2,662	3,381	4,310	5,516	28
Professional Services	3,751	4,762	6,102	7,836	10,088	13,006	16,797	20
Total	$14,815	$18,029	$22,085	$27,245	$33,843	$42,305	$53,227	19%

*1981-1986 IS FORECAST

APPENDIX E: RELATED INPUT REPORTS

APPENDIX E: RELATED INPUT REPORTS

1977-1981 INFORMATION SERVICES INDUSTRY MANAGEMENT PLANNING PROGRAM (ISIP)

ANNUAL REPORTS

	Year
• Computer Services Industry 1980 Annual Report	1980
• Computer Services Industry 1979 Annual Report	1979
• Computer Services Industry 1978 Annual Report	1978
• Computer Services Industry 1977 Annual Report	1977
• Computer Services Industry 1976 Annual Report	1976

ISIP REPORTS

1981 ISIP REPORTS
MARKET STUDIES

- Opportunities in Business Graphics Services and Software
- The Merging of Hardware/Software/Services Offerings
- Computer Services Opportunities in Energy Markets
- The Impact of Communications Developments on RCS

- Market Trends in Professional Services
- Personal Computer Use in Large Companies

MANAGEMENT BRIEFS

- Information Services in 1990.
- Banking and Finance Industry Trends: Impact on Computer Services
- Directory of Leading U.S. Computer Services Firms
- Information Services Industry Opportunities in Hardware Services

1980 ISIP REPORTS

- Computer Services Markets For Insurance Agents and Brokers
- Market Opportunities for Data Base Services
- Marketing Application Software, 1980-1985
- Trends In Computer Services Pricing
- Trends In Modes of Delivery of Remote Computing Services
- Improving Sales Productivity in the Computer Services Industry
- Strategic Market Planning in the Information Processing Industry

1979 MAS REPORTS

- Sales and Sales Support Training
- Computer Services Markets in Banking and Finance
- Opportunities in Education Services
- Opportunities in Marketing Systems Software Products
- Computer Services Opportunities in Insurance Companies
- Computer Services Opportunities in Government Funded Health Insurance
- Office of The Future: Opportunities for Services Companies
- Turnkey Systems Opportunities, 1979-1984

1978 MAS REPORTS

- Acquisition Strategies for Computer Services Companies
- Financial Management and Planning Services and Software Markets

- Opportunities in User Site Hardware Services
- Distributed Data Processing Systems: Applications, Performance, and Architecture
- Trends in Services and Software Pricing
- Computer Services Markets in Hospitals
- Data Base Management Systems Software Markets
- Remote Computing Services Markets in Europe
- Computer Services in Federal Government Energy Programs

1977 MAS REPORTS

- Computer Services Markets in Correspondent Banking
- Small Business Computers: Their Impact on Processing Services
- Plug Compatible Mainframes: The New Hardware Economics
- Impact of Sales Compensation Plans in the Computer Services Industry
- Computer Services Markets for the Savings and Loan Industry
- Computer Services Markets in the Wholesale Industry - Petroleum, Petrochemical, Food, and Electrical/Electronic
- Computer Services Markets in the Discrete Manufacturing Industry
- Opportunities for Investment in the Computer Services Industry
- Remote Computing Services Markets Based on Data Base Management Systems

1976 MAS REPORTS

- EDP Plans and Budgets for 1977
- Computer Services Markets in the Services Industries. Part I - Accountants, Lawyers, Consultants
- Computer Services Markets in the Services Industries. Part II - Architects, Engineers, Research and Development
- Remote Computing Services Markets for Economic and Financial Data Bases
- Computer Services Markets in the Food Processing Industry

INDUSTRY SURVEYS

• Fifteenth Annual ADAPSO Survey of the Computer Services Industry - 1981	7/81
• Fourteenth Annual ADAPSO Survey of the Computer Services Industry - 1980	7/80
• Thirteenth Annual ADAPSO Survey of the Computer Services Industry - 1979	7/79
• Twelfth Annual ADAPSO Survey of the Computer Services Industry - 1978	7/78

1981 MULTICLIENT STUDIES

• Improving the Productivity of Engineering and Manufacturing Using CAD/CAM	12/81
• International Market Opportunities for On-Line Data Base Services	6/81

1980 MULTICLIENT STUDIES

• Strategy for Competing in the IBM Compatible Marketplace	2/80
• Services Opportunities in Distributed Data Processing, 1980-1984	3/80
• The Market for Personal Computers in Large Corporations	10/80
• Productivity Improvement, 1980-1983, Survival Strategies for EDP Executives	12/80
• Opportunities in Communications Services For Digital Information: A Study of User Networks and Needs	11/80

OTHER INPUT SUBSCRIPTION PROGRAMS

- Company Analysis and Monitoring Program (CAMP) for the Information Services Industry
- Field Service Program (FSP)
- Management Planning Program in Information Systems (ISP)
- Residual Value Forecasting Program
- Technology and Management Issues Program