THE MERGING OF

HARDWARE, SOFTWARE AND SERVICES

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mendations and innovative id

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1 INTRODUCTION

I INTRODUCTION

A. PURPOSE AND SCOPE

- This report, produced by INPUT as part of the 1981 Information Services Industry Program (ISIP), previously called Market Analysis Service, analyzes trends within the processing services segment of the computer services industry to integrate hardware as part of a services offering.

- The topic was selected by a majority of current ISMP clients as being of high interest.

- INPUT has selected the term "hardware services" to identify a product concept which includes one or more of the following:

  - Turnkey systems.

  - User site hardware.

  - Intelligent terminals.

- The objectives of this study are to:

  - Forecast revenue growth of hardware services.

- Identify the forces causing change within vendor traditional markets.

- Analyze vendor target markets for hardware services.

- Identify current and future hardware services trends.

- Analyze end-user and data processing (DP) management requirements.

- Identify in-house computer service trends.

- Recommend product and marketing strategies for hardware services based upon user requirements.

- The scope of this study is limited to hardware services provided by processing services vendors of the computer services industry.

B. RESEARCH AND METHODOLOGY

- The research for this study was obtained from two sources:

  - Previous INPUT research.

  - Research tailored specifically for this study.

1. PREVIOUS INPUT RESEARCH

- Research findings and data from previous INPUT studies were incorporated in this study in order to quantify emerging trends and to integrate relevant information. INPUT studies utilized included:

  - Annual Report Computer Services Industry, 1980-1985 Dec. 1980

- Annual Report, 1980 User Planning Service — Nov. 1980
- Improving the Productivity of Systems and Software Implementation, Multi-Client Study — Nov. 1980
- Personal Computers in Large Companies, Multi-Client Study — Sept. 1980
- Turnkey Systems Opportunities 1979-1984 — Jan. 1980
- ADAPSO - 1980 Annual Report — July 1980
- Opportunities for User Site Hardware Services — Feb. 1979

2. CUSTOM RESEARCH

- Three sets of questionnaires were developed for this study and used during telephone interviewing with:
  - Vendors.
  - EDP managers
  - End users.
- The vendor interview sample was constructed to provide a cross-industry perspective of markets served and vendor reputation for innovation or conservation. Fifteen vendors were interviewed:
  - Ten processing services vendors.
    - Eight remote computing companies.
    - Two batch services companies.

- Five software product vendors.

  . Three system product companies.

  . Two application product companies.

- The user sample consisted of 20 companies and was selected on the basis of industry and membership in the Fortune 1300.

Industry	Number in Sample
- Banks	4
- Insurance	3
- Manufacturer	
. Discrete	5
. Process	3
- Transportation	1
- Retailing	1
- Communications	2
- Utility	1

C. BACKGROUND

- Remote computing services (RCS) vendors are integrating hardware, software and services in their offerings.

  - Many vendors offer on-site computers and intelligent terminals.

  - Vendors can be found who sell terminals, turnkey systems and computer hardware.

- Some vendors sell or lease software products for use on in-house systems including timesharing software.

- Vendors also offer services based on proprietary data bases and functional knowledge.

- RCS vendors may also sell consulting services to study, plan or develop applications.

- Distinctions between RCS vendors have been disappearing. RCS vendors generally have remote batch capabilities and many batch vendors have moved or plan to move to remote entry and output.

- RCS vendors may also offer disaster planning, computer layout design, data entry/conversion services, facility management, etc.

- Many software vendors offer hardware as part of a turnkey solution and offer software packages through hardware and RCS vendors.

- Hardware vendors are offering software products and capabilities that provide direct competition to RCS vendors.

  - Hardware vendors, particularly minicomputer vendors, are offering and developing data base, communications and application packages that compete with RCS vendors.

  - Minicomputer vendors have helped software vendors to fund software development for work that may appeal to an industry segment (DEC, Wang, Prime, etc.).

  - Hardware vendors have been developing equipment capabilities that compete with software packages. This includes communications front ends, data base machines, chips that provide compatibility with other

machines or offer other firmware capabilities, and interpretive compilers for smaller machines.

- Hardware vendors offer timesharing systems and aid in helping companies to move timesharing in-house or in setting up timesharing suppliers.

- IBM revenues include an increasing percentage from the sale of software products, and IBM may be moving back into the RCS business. Service offices have been opened in Europe, and offices could be opened in the U.S. in the near future.

- Vendors of some communications services are offering storage and processing capabilities that could be competitive with offerings of hardware and RCS vendors.

- A division of ATT has developed a computer, operating system, programming language and word processing and system development packages that are being marketed through vendor representatives.

- Companies that are in the information business such as McGraw Hill, Dun and Bradstreet and other publishers are offering proprietary data base capabilities, software products and new hardware/software approaches to problem solving (e.g., a limited financial application on a personal computer).

- From the standpoint of RCS vendors, this presents a complex competitive situation, which is further compounded by movement of a substantial amount of timesharing in-house and the appearance of many small vendors who will compete for any type of information processing work.

- The situation has one ingredient that should be kept in mind however. One of the reasons there has been an expansion of offerings by RCS, hardware, software and other vendors is that there is a rapidly growing market for information services. This is one of if not the fastest growing industry in the country.

II EXECUTIVE SUMMARY

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A. MAJOR CONCLUSIONS

- Traditional distinctions between and among batch services vendors and remote computing services (RCS) vendors are changing due to declining computer hardware costs and increasing customer demands for improved information services.

  - Vendors of commercial batch services are enhancing their standard products and services with interactive and communications-based hardware.

- Batch vendors who do not migrate their commercial customer base to interactive systems will not maintain current profit margins during the 1980s.

  - Increasing labor-intensive operational costs will impact vendor profit margins.

  - Minicomputers have lowered the pricing threshold of commercial applications.

    . General ledger.

    . Accounts receivable.

  - Payroll.

  - Accounts payable.

- The major role of intelligent terminals and minicomputers for RCS vendors will be to facilitate the growth of revenues on vendor mainframes and to provide existing customers with more cost-effective alternatives to converting to in-house systems.

  - The traditional RCS end-user terminal is evolving to an intelligent workstation which will emerge as an integral component for vendor distributed applications.

  - Minicomputer offerings are being sold primarily to existing large users of traditional products and services and secondarily to new accounts.

- Processing services vendors are targeting new distributed data processing (DDP) markets for their hardware services. Applications and software development by nonspecialized vendors for hardware services is being developed on a per customer basis.

- Many leading edge vendors have not realized their original expectations of hardware services due to poorly planned product capabilities, ill-conceived marketing and pricing strategies, and poorly executed sales efforts.

  - A good defense is not as effective as a good offense.

  - Hardware services vendors possess software superiority which they must rapidly capitalize upon to meet the increasing threat from in-house alternatives.

- Despite increasing user defection to turnkey systems, personal computers, DDP systems and word processing systems, in-house computer service remains the preferred vendor.

- Processing services vendors who target large companies must develop product strategies which are supportive of in-house data processing (DP) management objectives and goals.

B. MARKET FORECASTS

- In March 1978, ADP Network Services announced "ONSITE...the beginning of a new era in computing services," which resulted from over 50 man-years of research and development by marketing and technical people. In the same year, NCSS announced the NCSS 3200 series and GE announced the Marklink System.

- Three years have passed since ADP's historic announcement, and during that time most major RCS firms have announced some form of hardware services.

  - CSC announced their Distributed Network Services in the spring of 1980 and Tymshare recently announced System XX.

- Traditional batch services vendors are entering the remote computing marketplace with user-site minicomputers or communications based intelligent terminals.

- INPUT still believes that the trend to merge hardware into traditional services offerings is driven primarily by cost and increasing cost-effective user alternatives to processing services.

- INPUT forecasts the 1980 morket for hardware services is $670 million, growing to $1.9 billion by 1985.

  - Revenues from hardware services will represent 8% of total 1980 processing services revenues.

- Revenue growth will not accelerate until 1983-1984 due to the division of sales force selling time between pursuit of traditional business opportunities and reselling the base of major accounts to procure hardware services.

  - The sales cycle is averaging five months, ranging up to 24 months for larger systems.

  - Significant amounts of valuable sales time will be spent "reselling" senior management on the benefits of going "outside."

- By 1983-1984, vendor sales and support organizations will have gained sufficient confidence and experience in selling hardware services so that higher growth rates can be anticipated.

  - Separate sales organizations will not accelerate revenue growth for distributed minicomputer based hardware services.

  - Turnkey systems sales will benefit from specialized sales and support organizations.

C. VENDOR TRENDS

- A 1980 ADAPSO survey of 102 computer services vendors with annual sales of over $2 million indicated that 46% currently offered a mini/micro system as part of their product line, and 26% were selling turnkey systems.

  - INPUT believes that the 1981 ADAPSO survey will indicate an even higher percentage of computer services vendors participating in the hardware services market.

- As Exhibit II-1 indicates, the most frequent reason for developing a hardware services offering, as reported by vendors, was to enhance their existing products and services in order to better address user requirements.

  - Competitive forces received the second most frequent mention and were described primarily as in-house minicomputer alternatives.

  - Pursuit of new DDP markets received the fewest mentions from vendors interviewed.

- Vendor investments in developing a hardware services offering were about evenly split between spending less than $500,000 for initial product development, and spending more than $2 million.

  - Investments of under $500,000 were for intelligent terminals.

  - Investments of over $2 million were for a family of hardware services ranging from intelligent terminals to minicomputer enhancements or extensions of their standard offerings.

- Vendors interviewed for this study indicated that the most limiting factors in the acceleration of their revenue growth from hardware services were the lack of experienced technical and sales personnel, closely followed by the need to develop and enhance software for their offering.

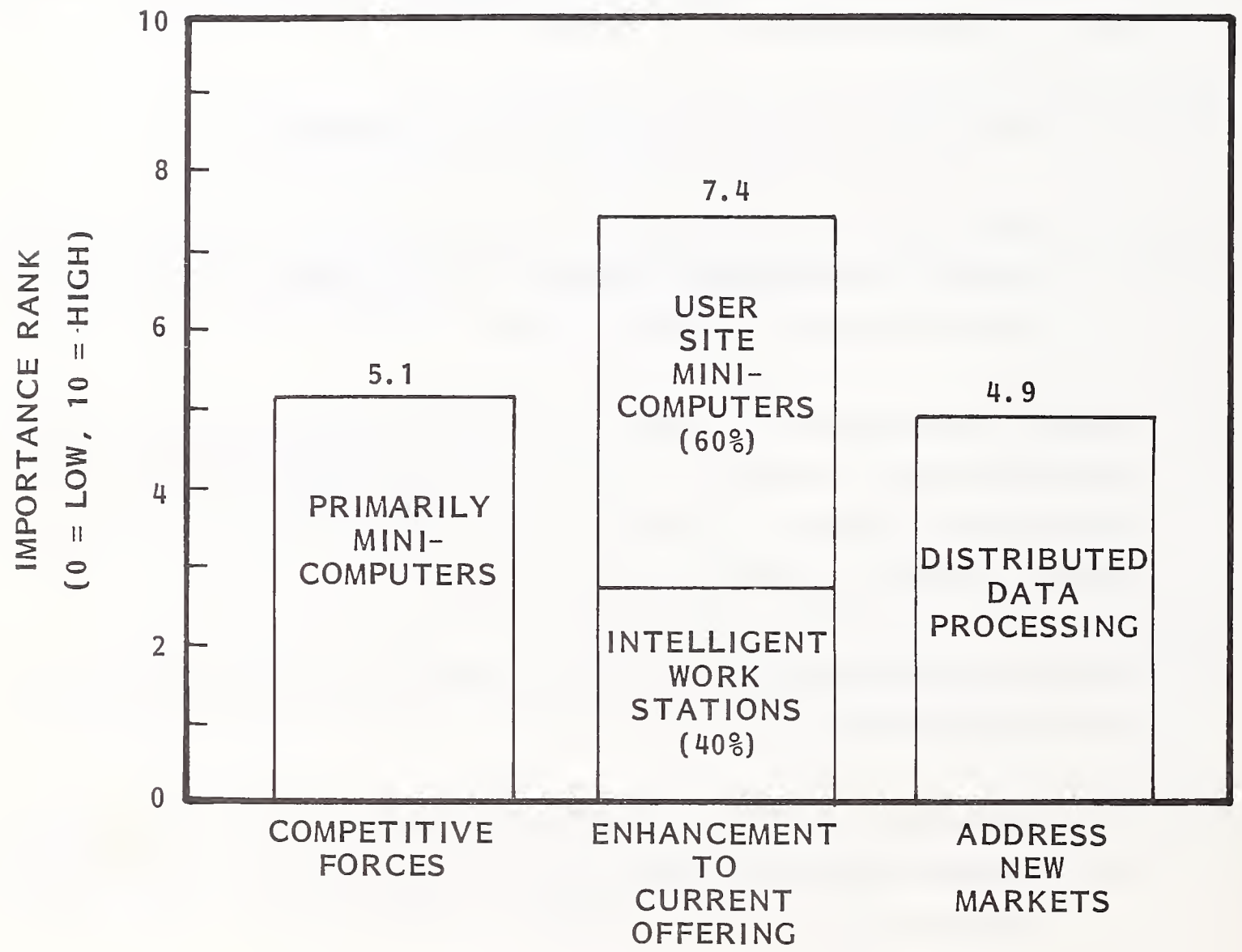
- Target markets for hardware services are identical to existing markets served by vendors interviewed.

  - This finding is consistent with vendors' statements that hardware services represent enhancements or extensions to their existing products and services.

- The selection of a particular hardware vendor by processing services firms did not reveal any significant characteristic or trend.

EXHIBIT II-1

PROCESSING SERVICES VENDORS' REASONS FOR MERGING HARDWARE INTO SERVICES OFFERING



- Product design and function as seen by vendors varied by vendor type.

  - RCS vendors believed that local data entry and validation were the most important features for hardware services dependent upon the vendor's host computer.

  - Batch services vendors ranked applications software as being the most important requirement for their hardware services offering, with improved data entry methods second.

  - Software product vendors indicated that establishing interfaces to in-house mainframes and being able to increase application usage without a major increase in costs were of equal importance.

D. RECOMMENDATIONS

- RCS vendors can no longer have an independent attitude toward terminal selection by end users.

  - Terminal and minicomputer vendors have emerged as potential threats to RCS vendor account control and expansion.

  - Many, if not all, terminal vendors can offer processing alternatives to end users.

  - RCS firms should actively initiate plans to convert their existing multi-terminal customers to their own hardware service.

  - New account strategies should include RCS company-supplied terminals.

- Due to the increasing nature of user RCS expenditures over time, vendor supplied terminals should be upward compatible and expandable to local storage, multiterminal configurations, and main memory capacities.

- Host computer operating systems and software systems should be enhanced to capitalize upon improved data entry and validation methods.

  - Vendor data base management systems (DBMS) products should be enhanced to support menu-driven CRT displays for data entry.

- Pricing strategies for hardware services should be unbundled, fixed price and flexible. Software investments in hardware services should be regained from increased processing revenues on the host.

  - Some vendors have tried to "bury" the cost of the hardware as part of a bundled resource package. This pricing strategy forces sales representatives to defend premiums associated with systems software, host processing and network communications.

  - Vendors of "mini-versions" of their standard offering theoretically are not "host" dependent and therefore should be competitively priced in comparison to minicomputer manufacture, and not in terms of equivalent discounted host resources. Mini-versions must be cost justified on a standalone basis.

- Target markets for hardware services, in the short term, should be in industries and companies where there is application knowledge.

  - New market opportunities should be planned on the basis of current competitive advantages and projected revenue gap analysis.

III TRENDS AFFECTING THE MERGER OF HARDWARE, SOFTWARE AND SERVICES

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A. INTRODUCTION

- The structure and segmentation of the computer services industry are changing in response to key market forces and requirements.

  - Lower costs of hardware.
  - Advancing data communications technology.
  - Increasing customer and prospect sophistication and involvement in information processing.
  - Increasing backlog of new application requirements.
  - Shortage of experienced DP professionals.
  - Increasing labor costs.

- As a result of these key trends, distinctions among leading computer services vendors have blurred in their pursuit of market and revenue opportunities.

  - Is ADP a batch services vendor or an RCS vendor?

- Is Tymshare an RCS vendor or a telecommunications vendor?

- Is CSC a professional services vendor on an RCS vendor?

- Is NCSS an RCS firm or a software products vendor?

- The economics of the marketplace are forcing vendors to reexamine the cost-effectiveness of their products and services.

  - Competitive forces are lowering pricing thresholds.

  - Fixed price alternatives to services with variable pricing strategies are becoming attractive to large users of outside services.

  - Hardware vendors are increasing their software and services to address the end-user market.

B. COMPETITIVE FORCES IN TRADITIONAL MARKETS

1. BATCH SERVICES VENDORS

- Batch services vendors have seen their market share of the computer services industry decline from 26% in 1975 to 19% during 1980.

  - INPUT forecasts that in 1985 batch services will have a 12% share of the market, as shown in Exhibit III-1.

- This reduction in revenue growth can be attributed to both internal and external forces.

  - Internal forces include:

EXHIBIT III-1

TRADITIONAL COMPUTER SERVICES INDUSTRY REVENUE
DISTRIBUTION BY SEGMENT AND VENDOR TYPE

	1975			1980			1985		
	TOTAL REVENUES ($ THOUSAND)	PERCENT SEGMENT	PERCENT CS INDUSTRY	TOTAL REVENUES ($ THOUSAND)	PERCENT SEGMENT	PERCENT CS INDUSTRY	TOTAL REVENUES ($ THOUSAND)	PERCENT SEGMENT	PERCENT CS INDUSTRY
PROCESSING SERVICES									
• BATCH	$1,710	42%	26%	$ 2,680	32%	19%	$ 4,180	23%	12%
• RCS	1,560	39	24	4,270	51	30	11,450	62	33
• FM	770	19	12	1,390	17	10	2,780	15	8
SUBTOTAL	$4,040	100%	62%	$ 8,340	100%	59%	$18,410	100%	53%
SOFTWARE PRODUCTS									
• SYSTEM	490	60	7	520	63	11	5,740	68	17
• APPLICATION	320	40	5	880	37	6	2,650	32	8
SUBTOTAL	$ 810	100%	12%	$ 2,400	100%	17%	$ 8,390	100%	25%
PROFESSIONAL SERVICES									
• SERVICES	N/A	N/A	-	3,030	88	21	7,130	92	21
• FM	N/A	N/A	-	400	12	3	640	8	2
SUBTOTAL	$1,690	100%	26%	$ 3,430	100%	24%	$ 7,770	100%	23%
TOTAL	$6,540	-	-	$14,170	-	-	$34,570	-	-

- Profit margins are being reduced by high, labor-intensive costs associated with data collection, entry, validation and control.

- Investments made in software have been based upon "old" hardware and software technologies - therefore, major software and systems enhancements cannot be made without investments in new hardware and software.

- External forces include:

  - Users have become dissatisfied with turnaround times and vendor-imposed processing schedules.

  - Minicomputers are imposing new and lower pricing thresholds for application services.

  - Users are requesting interactive access for ad hoc reporting and decision-making.

- Major batch vendors interviewed for this study have made substantial investments to defend their current markets.

  - Hardware enhancements have ranged from intelligent terminals for data entry and printback to minicomputer systems with communications capabilities.

  - Software enhancements have been oriented toward improving customer service levels, and reducing the labor intensive components of operations.

2. REMOTE COMPUTING VENDORS

- Remote computing vendors have traditionally had little competition for either new or existing clients due to their targetting of interactive applications and

increasing user demand for decision-support systems. However, in recent years many RCS vendors have been confronted with the realities of their own success.

- A high percentage of RCS expenditures are concentrated in large multilocation and multidivisional companies, primarily the Fortune 1300.

- Companies interviewed spent more than a total of $21 million per year on outside processing services, each using from three to six vendors.

  . Respondent usage ranged from $400,000 to $10,000,000 per year. The average was $2,190,000.

- INPUT believes that among the major RCS vendors, revenue and customer distributions follow the "80/20" rule, i.e. 80% of their revenues are derived from 20% of their customers.

  - This concentration in revenues is due, in part, to the emphasis within RCS firms on compensating sales personnel on Net Increase in Revenue (NIR).

  - Traditionally, the "easiest" source of revenue growth has come from existing clients. Consequently sales people tend to direct their selling efforts to expand and increase existing client expenditures at the expense of broadening the customer base with new name accounts.

    . This "large account" dilemma has forced many RCS firms to reexamine their product and pricing strategies for major accounts.

    . INPUT believes that a major reason for vendors' merging hardware into their service offering is to provide a pricing umbrella

in order to protect their existing base of major accounts and provide a more flexible product line for customer expansion.

- The NCSS 3200, ADP ONSITE and Tymshare System XX are "mini-versions" of their standard offerings designed to protect major accounts, and secondarily to seek new business.

- The trend toward fixed pricing on the part of some vendors is an attempt at creative discounting, which is not a long-term solution to the increasing number of lower price in-house alternatives.

- In September 1980, INPUT concluded a study, Selling Personal Computers To Large Companies, where personal computers were defined as systems selling for under $15,000.

  - INPUT estimated that by the end of 1980 there were 85,000 systems installed in large companies, and forecasted growth to 600,000 systems by 1985.

  - Applications implemented on very small systems are down-sized versions of many of the same applications that users are currently buying from RCS vendors.

  - INPUT believes that very small systems will erode current and potential utility processing applications revenues.

  - There is little doubt that very small systems will emerge as a significant competitive force in RCS traditional utility (basic language programming) and information analysis markets.

  - Exhibit III-2 illustrates, by functional department, the type of applications now running on personal computers.

EXHIBIT III-2

SAMPLE OF CURRENT APPLICATIONS INSTALLED ON PERSONAL COMPUTERS

FUNCTIONAL DEPARTMENT	APPLICATION
MARKETING	• SALES ANALYSIS • LOAN ACCOUNT ANALYSIS • CUSTOMER BASE ANALYSIS • MAILING LABELS • PRICE FORECASTING • RISK ANALYSIS
MANUFACTURING	• INVENTORY CONTROL • MATERIALS ESTIMATING • PRODUCTION SCHEDULING AND REPORTING • PRODUCT MIX CALCULATIONS • BILL OF MATERIALS
ENGINEERING	• STRUCTURAL ANALYSIS • NUMERICAL CONTROL • COMPUTER-AIDED DESIGN • THERMAL STRESS ANALYSIS
FINANCE	• PAYROLL • BUDGETING • COST ACCOUNTING • CAPITAL EQUIPMENT INVENTORY AND • DEPRECIATION ANALYSIS • GENERAL FINANCIAL REPORTING
PERSONNEL	• SALARY ADMINISTRATION • VACATION TIME ACCOUNTING AND SCHEDULING • VENDING MACHINE ACCOUNTING • WORKMEN'S COMPENSATION REPORTS
LEGAL	• STOCK TRANSFER ANALYSIS • PATENT PAYMENTS • LITIGATION REPORTING AND DOCKETING • CUSTOMER FILES FOR LEGAL MATTERS

3. MINICOMPUTER VENDORS

- Another significant competitive force operating within vendor markets is the minicomputer.

  - Close examination of the PRIME 750 revealed software and processing capabilities that rival most RCS capability for a fraction of the equivalent RCS resource pricing.

  - The HP 3000 and DEC PDP 11 series minicomputers received frequent mention as replacements for outside services by our interview sample of users.

- INPUT forecasts that turnkey systems installed by hardware and turnkey vendors which, during 1980 were valued at $5.2 billion, will grow to $12.7 billion by 1984.

  - There are currently twice as many turnkey or systems houses as there are processing services vendors: 4,500 versus 2,140.

- The market for turnkey systems is divided into two segments: smaller turnkey systems, generally microprocessor based, and larger systems utilizing multiple terminals which can process multiple concurrent tasks.

  - The small turnkey systems are targetted to small, first-time business users, and small groups in large companies.

- Turnkey systems range from general business applications with cross-industry forces to highly specialized products targetting a vertical market in the manufacturing, distribution and professional services industries.

  - Digital Equipment and Data General are the dominant suppliers of hardware used in turnkey systems, with IBM increasing its market share rapidly.

4. SOFTWARE VENDORS

- Software product vendors, whose offerings are combined with hardware manufacturer offerings, represent another competitive force.

- On-line program development aids, historically the domain of RCS vendors and primary contributors to the improved implementation speed experienced by users of outside processing services, are increasingly available for in-house installation from a variety of vendors.

  - Programmers' Workbench (PWB) operating under the Unix operating system was developed by Bell Laboratories and is marketed by Western Electric (WE) on an "as-is" basis with no support and relatively minimal documentation.

    . However, several firms, such as Interactive Systems Corp. of Los Angeles, are licensed by WE to resell PWB/Unix and have added features, documentation, support and a word processing and electronic mail capability.

  - The PWB/Unix offers the following features:

    . Hierarchical, tree-structured file/directory system.

    . A user friendly command system which provides a set of commands to facilitate the storage, updating and retrieval of source code and/or documents by date or version number.

    . Full screen editor with symbolic debugging aids for testing.

    . Remote job entry (RJE) facility for the submission of jobs and retrieval of output to and from IBM System/370 hosts via HASP, ASP or JES2.

- MAESTRO, developed in Germany by Softlab GmbH, is a packaged system utilizing hardware from Four Phase Systems intended to operate as a "front end" to an IBM 370 CPU or any other facility that supports the 3270 protocol. Computations and executions take place in the host mainframe. MAESTRO offers the following features:

  . Programmer's Workstation (PWS) from Four Phase Systems with features similar to PWB/Unix.

  . Advanced program documentation aids.

- CMS (Conversational Monitor System) supplied by IBM and operating under VM/370. This provides an on-line program development environment which is quite similar NCSS VP/CSS operating system. By running multiple "CMS Virtual Machines" each user is provided with his "own" development machine and allowed to select his own operating system (i.e., OS, MVS, DOS, etc.).

- More recently developed operating systems from Prime and Wang are entirely interactively oriented, and assume that each user has a CRT workstation.

- With the advent of interactive operating systems for in-house installation, many users can now have access to their in-house data bases without having special COBOL/IMS programing written ad hoc. Many DBMSs developed by software product vendors such as Mathematica, RAMIS II, Intel/MRI, System 2000, Informatics, Mark IV are available in-house and provide users with powerful interactive retrieval and report writing capabilities.

C. ENHANCEMENTS TO CURRENT OFFERINGS

- A majority of respondents to this study indicated that the primary reason for merging hardware into their current offerings was to enhance their existing products and services.

I. BATCH SERVICES VENDORS

- These vendors have, in most cases, rewritten their software to exploit the benefits and flexibility of interactive data entry and reporting.

  - Major vendor costs associated with data collection, keypunching verification, etc. have been reduced by installing interactive display terminals for operations personnel.

  - An important by-product of these enhancements is the availability as a product for clients who have outgrown traditional services and want to buy their "own" computer.

- During the past two years ADP has spent $26.2 million on systems development and programming for both new and existing services.

  - Minicomputer based interactive systems are being developed and were available in eight of ADP's regions during 1980, with further expansion planned.

- ADP has enhanced its commercial services offering by providing new methods of delivering traditional accounting services.

- Reynolds and Reynolds has enhanced its services to small and medium-sized dealerships with VIM II, an interactive processing system based upon its own TC 1000 intelligent terminal.

- In addition to RCS vendors batch services vendors are also participating in the growing turnkey systems markets.

  - INPUT estimated that in 1980, processing services vendors sold packaged systems valued at $350 million.

- The growth rate for turnkey systems from non-processing services vendors is nearly double the growth rate for all computer services.

2. ENHANCEMENTS TO CURRENT RCS OFFERINGS

- Hardware offerings by RCS vendors fall into two categories:
  - "Mini-versions" of their standard offering designed to be primarily "in-house" systems.
  - Distributed workstations (terminals) tightly coupled to the vendor's host processor and value-added software.
- Mini-versions can be characterized by the following offerings:
  - Tymshare System XX.
  - NCSS 3200.
  - ADP ONSITE.
- Distributed workstations can be characterized by the following offerings:
  - GE Marklink.
  - Infonet DNS.
  - XCS 1350.
- Both types of hardware services are enhancements that target existing markets.
  - The mini-versions remove a great deal of the dependency on the vendor host processor.

- The distributed workstation is primarily designed to improve the cost-effectiveness of data entry and reporting.

  . Some vendors, such as ADP, are packaging PDP-11/23s as "product workstations" dedicated to a specific product offering such as project management.

  . Data base services from companies like Quotron have been enhanced with intelligent terminals.

  . Other vendors have bundled host mainframe resources along with these hardware offerings.

3. NEW RCS OFFERINGS

- Remote computing has always been dependent upon some form of user site hardware.

  - In the mid- to-late 1960s, teletypewriters with speeds under 10 cps, and local storage in the form of "off-line" paper tape were the dominant hardware devices installed at users' sites.

  - During the late 1960s, the IBM 2741 entered the user's site with printing speeds approaching 15 CPS - nearly a 50% improvement in speed and definitely a 100% improvement in appearance. In fact, when not on-line, it was often used as a standalone typewriter.

  - By the mid-1970s, most RCS vendors had advanced to the Silent T.I., and many vendors were concerned about connect "revenue erosion," due to its 100% improvement in printing speed.

  - Between the mid-1970s and 1980, terminal speeds approached 120 cps, and local storage for off-line printing and data entry was provided by cassettes.

- Today, RCS terminals have become "nodes," and have been transformed into CRT displays. In fact, many vendors now refer to the terminal as a "multifunction" workstation.

- Within the RCS market, the merging of hardware is not a revolutionary, quantum jump in technology, but a logical evolutionary process that began when a teletypewriter and 20,000 feet of paper tape containing source programs and data were burned in effigy in front of a Big Eight CPA firm by a group of frustrated "time-sharing" sales and support people.

- More recently, beginning with ADP's announcement of ONSITE and NCSS's 3200, RCS strategic planners have been using their own decision-support systems to ask, "What if?"

  - What if ADP and NCSS succeed in penetrating the market for in-house timesharing?

  - What if the GE Marklink System dominates the market for order entry?

  - What if the XCS Xerox 1350 dominates the middle-market manufacturing and distribution companies?

  - What if the Tymshare System XX using MAGNUM surpasses the capabilities of NCSS 3200 using NOMAD?

  - What if...etc., etc.

IV VENDOR ANALYSIS AND TRENDS

IV VENDOR ANALYSIS AND TRENDS

A. HARDWARE SERVICES OFFERINGS BY VENDOR TYPE

- In the 1980 ADAPSO survey of computer services vendors, 50% of the processing services vendors responding indicated that they were currently offering either a mini- or microprocessor, as shown in Exhibit IV-1. Twenty-eight percent also indicated that they were selling turnkey systems.

  - INPUT believes that within the next two years virtually all vendors with annual sales of over $10 million will announce a hardware services offering.

- Software product vendors surveyed by ADAPSO did not offer a turnkey system.

  - Two vendors out of nine surveyed, however, had announced a mini/micro offering.

- Professional services vendors are more active in the hardware services market than software product vendors.

  - Forty-two percent of those surveyed had a mini/micro offering.

  - Thirty-two percent had a turnkey system for sale.

EXHIBIT IV-1

1980 ADAPSO SURVEY OF COMPUTER SERVICE
VENDORS BY TYPE OF HARDWARE SERVICES OFFERING

VENDOR TYPE AND SIZE ($ MILLION)	NUMBER OF COMPANIES	NUMBER OF RESPONDENTS		
		TOTAL IN SURVEY	OFFERING MINI/ MICRO	OFFERING TURNKEY
PROCESSING SERVICES				
• $2-10	275	33	16	8
• 10-25	30	13	9	6
• >25	35	19	8	4
TOTAL	340	65	33	18
SOFTWARE PRODUCTS				
• $2-10	100	3	0	0
• >10	15	6	2	0
TOTAL	115	9	2	0
PROFESSIONAL SERVICES				
• $2-10	100	15	4	3
• >10	20	13	8	6
TOTAL	120	28	12	9
TOTAL	575	102	47	27

- Of the 575 computer services vendors with annual sales of over $2 million, ADAPSO's survey of 102 companies indicates that 46% currently offer a mini/micro system and 26% offer a turnkey system.

B. VENDOR REVENUE OBJECTIVES FOR HARDWARE SERVICES

- INPUT believes the major role of hardware services will be to facilitate the growth of revenues on vendor mainframes, and to protect current and planned revenues.

  - Processing services vendors are locked into profit objectives which are tightly coupled with investments in mainframe hardware, software and application systems, communication networks and professional staff.

  - This belief is supported by vendors interviewed in this study in terms of their strategies to sell hardware services as enhancements or extensions to their current products and services.

- Vendors who have developed mini-versions will impact their short-term revenue growth by providing users with excess computing resources.

  - Users of vendors' mini-versions have reported an initial 30-40% cost reduction after conversion and a return to pre-hardware service levels as a function of new applications development within six to 18 months.

- Initial revenue objectives for individual vendors are highly correlated with initial product development costs and traditional target markets.

  - Respondents to this study were evenly distributed between vendors who had invested less than $500,000 in initial product development and those who had invested more than $2 million.

- Vendor investments of under $500,000 produced a low-end data entry capability.

- Investments of over $2 million were for the mini-version of a vendor's offering.

- Vendors of industry and/or functional specialization forecasted the highest revenue growth for their hardware services offering.

  - One industry-oriented RCS vendor forecasted growth at 100% per year, primarily attributed to high customer demand for its intelligent terminal offering.

  - A batch services vendor who provides accounting and inventory management applications for small to medium sized companies also expected to double the number of customer installations each year for the next five years.

- Vendors of utility processing services forecasted an average annual growth rate of 10% between 1980 and 1985.

- In terms of profitability, seven out of ten vendors indicated that their hardware services were currently profitable. The remaining three vendors anticipated break-even between 1982 and 1984.

  - Due to the variability associated with cost-accounting for hardware services, statements about profitability should be viewed with some degree of caution.

- Vendors indicated the most significant limiting factors to their revenue growth were people and software.

- Vendors of outside computer services share a common problem with vendors of in-house computer services: a shortage of experienced DP professionals.

C. VENDOR TARGET MARKETS FOR HARDWARE SERVICES

- Processing services vendors currently derive 53% of their revenues from industry specialized applications, 26% from functional specialization and 21% from utility processing, as shown in Exhibit IV-2.

  - Based upon revenue performance during the past ten years, it appears that the most effective marketing strategy is to target vendor products and services to specific industries.

  - As shown in Exhibit IV-3, manufacturing industries are the largest users of computer services, followed by banking and finance, and the federal government.

- Respondents overwhelmingly indicated that their target markets for hardware services were not different from their traditional markets.

  - This finding is consistent with vendor statements that hardware services are an enhancement to existing products and services.

  - The primary driving force behind vendors' development of hardware services is to expand and improve penetration of existing markets - not to develop new markets.

  - INPUT believes that new market opportunities will evolve as hardware services mature and increase their market acceptance.

EXHIBIT IV-2

PROCESSING SERVICES REVENUE
DISTRIBUTION BY MARKET SEGMENT
1980 VERSUS 1985

MARKET	RCS ($ MILLION)				BATCH ($ MILLION)				TOTAL			
	1980	PER-CENT	1985	PER-CENT	1980	PER-CENT	1985	PER-CENT	1980	PER-CENT	1985	PER-CENT
INDUSTRY SPECIALIZA-TION	$2,310	54%	$6,640	58%	$1,350	51%	$2,140	51%	$3,660	53%	$8,780	56%
UTILITY	1,020	24	2,540	22	440	16	510	12	1,460	21	3,050	20
FUNCTIONAL SPECIALIZA-TION	940	22	2,270	20	890	33	1,530	37	1,830	26	3,800	24
TOTAL	$4,270	100%	$11,450	100%	$2,680	100%	$4,180	100%	$6,950	100%	$15,630	100%

EXHIBIT IV-3

1980 MARKET FORECAST BY INDUSTRY AND MODE OF DELIVERY

INDUSTRY	BATCH SERVICES ($ MILLION)			REMOTE COMPUTING SERVICES ($ MILLION)		
	IN-DUSTRY SPECI-FIC	FUNC-TION SPE-CIFIC	UTILITY	INDUSTRY SPE-CIFIC	FUNC-TION SPE-CIFIC	UTILITY
DISCRETE MANUFACTURING	$ 60	$210	$ 64	$ 246	$110	$ 76
PROCESS MANUFACTURING	122	73	46	43	117	200
BANKING AND FINANCE	480	140	10	670	79	51
FEDERAL GOVERNMENT	-	9	48	30	105	260
SUBTOTAL	$ 662	$432	$168	$ 989	$411	$ 587
OTHER INDUSTRIES	682	463	120	1,324	525	434
TOTAL	$1,344	$895	$443	$2,313	$936	$1,021

D. PRODUCT STRATEGIES

- The selection of a vendor for hardware services, according to our respondents, did not reveal any significant factors.

  - Three vendors manufactured or assembled their own hardware.

  - Three vendors selected hardware on the basis of attractive OEM discounts.

  - Three vendors believed they had no choice in selecting a hardware vendor in order to maintain existing software compatibility.

  - Two vendors selected the hardware manufacturer on the basis of maintenance support and reputation.

  - Three vendors believed that upward compatible hardware was the most important factor in selecting a hardware vendor for their hardware services.

- Excluding those who manufactured their own hardware, the vendors were evenly split between those who were and were not permitted to sell their software-only to their hardware vendors' existing customer base.

- Product strategies for hardware services are highly dependent upon vendors' existing target markets.

  - Exhibit IV-4 shows the ranking by vendor type of important features required to address their target markets.

- Remote computing vendors believe that the most important feature developed to support their hardware services strategies is to provide users with improved methods of data input and output.

EXHIBIT IV-4

IMPORTANT FEATURES OF HARDWARE SERVICES AS PERCEIVED BY VENDORS

VENDOR TYPE / BENEFIT	REMOTE COMPUTING*		BATCH SERVICES*	SOFTWARE PRODUCTS*
	INDUSTRY/ FUNCTION SPECIFIC	UTILITY	INDUSTRY/ FUNCTION SPECIFIC	
• ENHANCE APPLICATION USAGE WITHOUT MAJOR COST INCREASE	2	3	3	1
• REDUCE PROCESSING COSTS	3	4	5	2
• ENTER AND VALIDATE DATA LOCALLY	1	1	2	3
• HAVE INQUIRY AND BATCH REPORTING ON USER SITE	1	2	2	3
• USE VENDOR NETWORK	5	4	–	4
• USE UNIQUE OR SPECIAL APPLICATIONS	2	7	1	5
• INTERFACE WITH IN-HOUSE SYSTEM	6	5	4	1
• DEVELOP APPLICATIONS AT USER SITE	4	6	–	2

1 = MOST IMPORTANT

- One of the most limiting factors associated with expanding user's applications is the cost of on-line data entry and validation.

- Batch services vendors stressed the importance of designing their hardware services primarily to improve utilization of their applications software.

- Respondent software product companies, primarily DBMS vendors, indicated that merging hardware into their software offering was designed to address two equally important user requirements.

  - The ability of user locations to retrieve data from the corporate data center.

  - An increase in current software product usage without a major increase in costs.

- Vendors of software products interviewed for this study also believed that by offering hardware services, end users could reduce their dependency upon the corporate data center for new applications development.

  - Many vendors of software products "distribute" their offerings in association with RCS vendors. This practice not only generates royalty revenues but provides RCS users with a potential migration path to an in-house alternative, since most if not all software products are primarily targeted for in-house usage.

- One innovative software vendor interviewed for this study has arranged with an RCS vendor to OEM the mini-version of his hardware services offering and repackage it for sale to in-house clients.

  - To date, the software vendor has installed between 10 and 20 of these hybrid hardware services products.

- Another software vendor is planning to announce a "down-sized" version of its DBMS software on a microcomputer with communications capabilities to interface with an in-house host.

- Vendors of hardware services were asked what role professional service plays in the installation of their offering.

  - Industry specialists believed little if any customization will be required as a result of their merging hardware into the applications software.

- Nonspecialized vendors of intelligent data entry hardware indicated that they expected 75-100% of customer installations to require custom programming to fully utilize the benefits.

V MARKET FORECASTS

V MARKET FORECASTS

A. HARDWARE SERVICES MARKET FORECAST METHODOLOGY

- Revenue forecasts for hardware services between 1980 and 1985 are based on:
  - Vendor expectations, derived from 3,000 interviews during 1980.
  - 1980 user panel data from over 900 EDP managers.
  - User data from 3,800 telephone/on-site interviews in 1980.
  - Judgement and experience of INPUT's senior staff.

B. EXPECTED IMPACT OF INFLATION

- As shown in Exhibit V-1, price increases due to inflation calculated at 7% per year will add approximately $3.5 billion in processing services revenue during the 1980-1985 forecast period.

EXHIBIT V-1

ADJUSTED PROCESSING SERVICES INCREMENTAL REVENUE
FORECAST 1980-1985

	1980-1985 INCREMENTAL	7% PER YEAR INCREASE*	ACTUAL GROWTH*
	($ BILLION)		
BATCH			
• INDUSTRY SPECIFIC	1.2	0.4	0.8
• FUNCTION SPECIFIC	0.6	0.2	0.4
• UTILITY PROCESSING	0.07	0.02	0.05
SUBTOTAL	$1.5	$0.5	$1.0
RCS			
• INDUSTRY SPECIFIC	$4.3	$1.5	$2.8
• FUNCTION SPECIFIC	1.3	0.4	0.9
• UTILITY PROCESSING	1.5	0.5	1.0
SUBTOTAL	$7.1	$2.5	$4.6
PROCESSING FM			
• INDUSTRY SPECIFIC	0.8	0.3	0.5
• FUNCTION SPEICIFC	0.024	0.008	0.016
• UTILITY PROCESSING	0.16	0.05	0.11
SUBTOTAL	$1.4	$0.5	$0.9
TOTAL PROCESSING SERVICES			
• INDUSTRY SPECIFIC	6.4	2.2	4.2
• FUNCTION SPECIFIC	1.9	0.7	1.2
• UTILITY PROCESSING	1.7	0.6	1.1
TOTAL	$10.0	$3.5	$6.5

*NUMBER MAY NOT TOTAL DUE TO ROUNDING.

C. INCREMENTAL REVENUE GROWTH

- INPUT has forecasted that processing services revenues will increase from a 1980 base of $8.4 billion to $18.4 billion in 1985.

  - Exhibit V-2 provides a historical view of incremental processing services revenues, and Exhibit V-3 illustrates the dramatic revenue growth of RCS vendors.

- The incremental revenue growth of $10 billion from 1980 to 1985 is forecasted to be distributed as follows:

  - Industry specific 64%
  - Function specific 19%
  - Utility processing 17%

D. HARDWARE SERVICES REVENUE FORECAST BY MODE OF HARDWARE SERVICE DELIVERY

- INPUT forecasts the 1980 market for hardware services from processing services vendors to be $670 million growing to $1.9 billion by 1985, as shown in Exhibit V-4.

  - Hardware services revenues will represent 10.3% of total 1985 processing services revenues of $18.4 billion.

- Hardware services revenues are categorized as shown in Exhibit V-5.

- Minicomputer revenues are categorized as either USHS or standalone turnkey systems as a function of vendor supplied application specific software solutions.

EXHIBIT V-2

HISTORICAL AND FORECASTED INCREMENTAL PROCESSING SERVICES REVENUES

1970-1985

TYPE	PROCESSING SERVICES REVENUES 1970-1985 ($ BILLION)		
	INCREMENTAL REVENUE		FORECAST
	1970-1975	1975-1980	1980-1985
BATCH SERVICES	$0.6	$1.0	$1.5
REMOTE COMPUTING SERVICES	1.1	2.7	$7.1
FACILITIES MANAGEMENT	0.4	0.6	1.4
TOTAL	$2.1	$4.3	$10.0

EXHIBIT V-3

PROCESSING SERVICES REVENUES
1970-1985

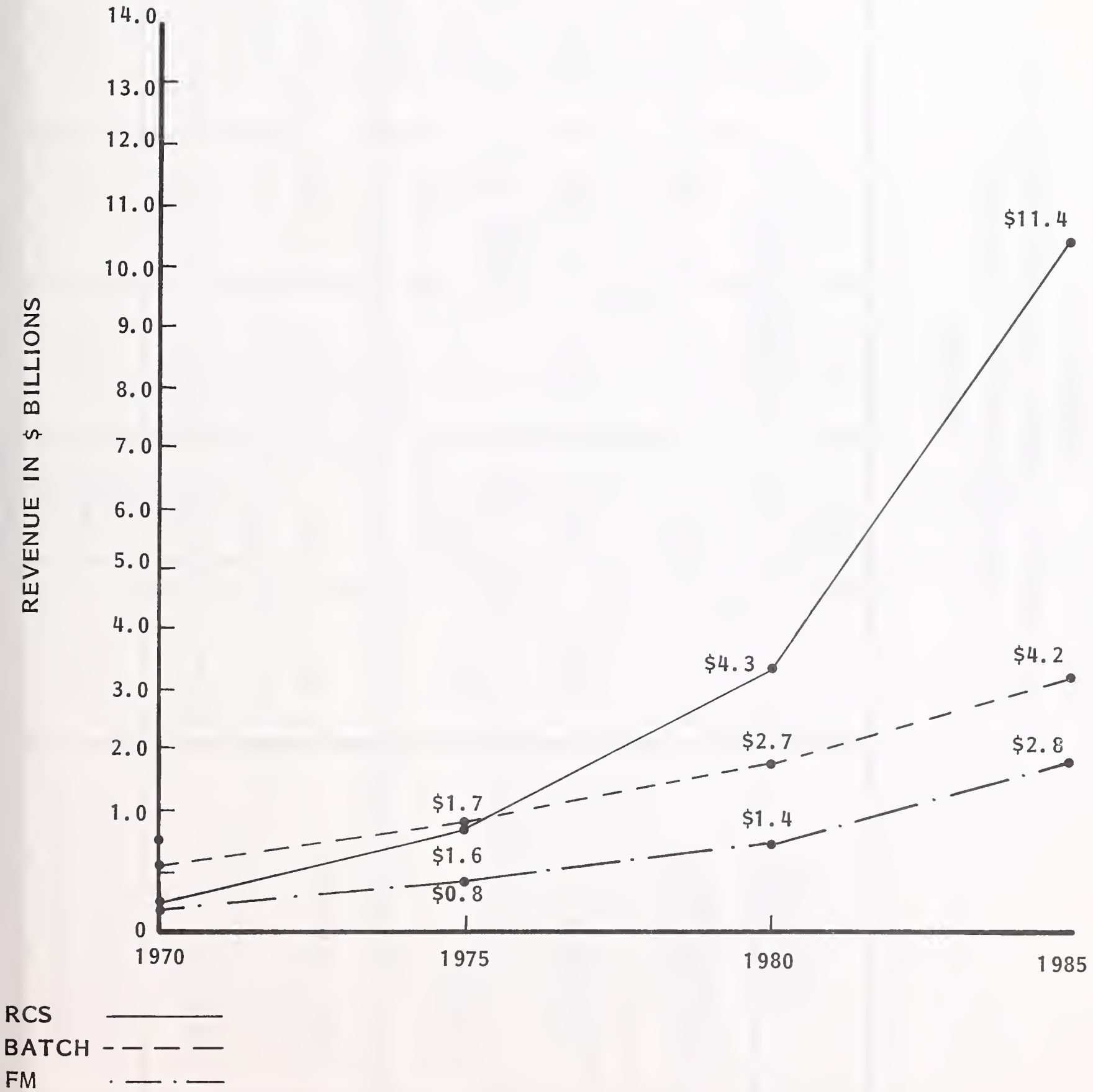


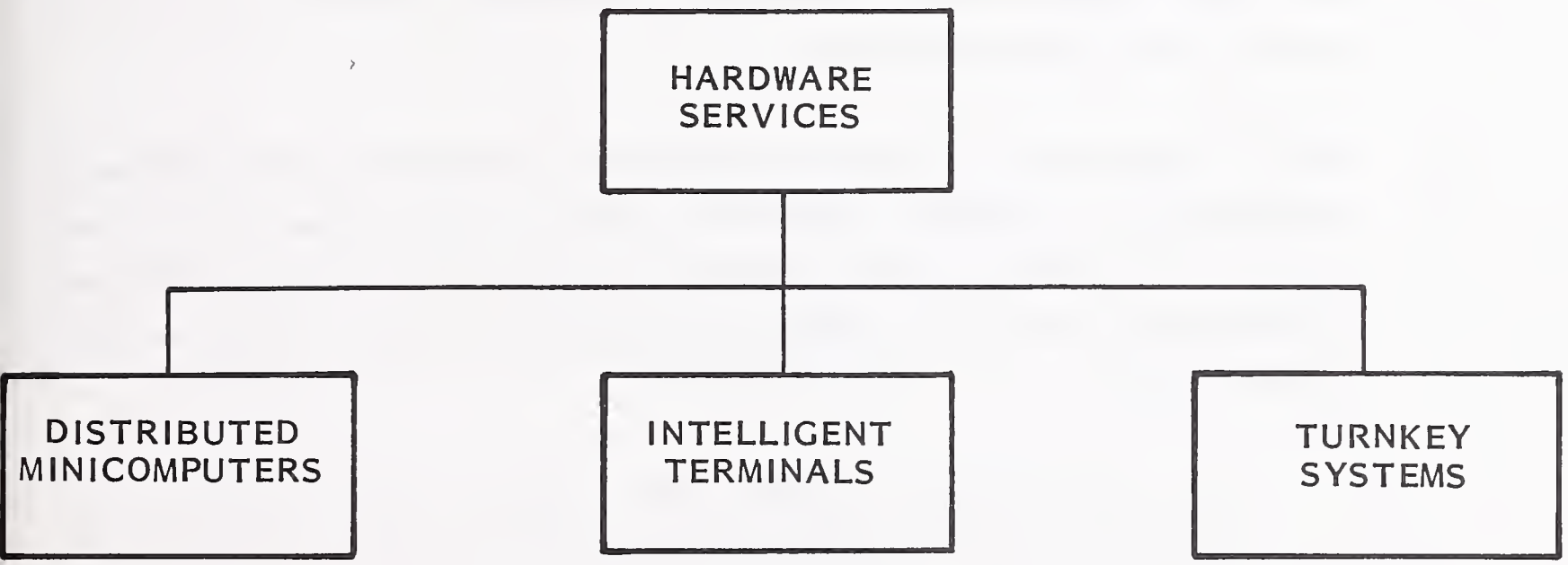
EXHIBIT V-4

U.S. HARDWARE SERVICES MARKET FORECAST FOR
PROCESSING SERVICES COMPANIES
1980-1985

HARDWARE SERVICES	1980	1981	1982	1983	1984	1985	AAGR 1980-1985 PERCENT
	($ MILLION)						
DISTRIBUTED MINICOMPUTERS	$ 120	$ 145	$ 175	$ 200	$ 250	$ 310	21%
INTELLIGENT TERMINALS	200	250	310	390	510	660	27
TURNKEY SYSTEMS	350	420	500	615	760	930	22
TOTAL HARDWARE SERVICES	$ 670	$ 815	$ 985	$ 1,205	$ 1,520	$ 1,900	23%
TOTAL PROCESSING SERVICES	$8,340	$9,700	$11,360	$13,280	$15,570	$18,410	17%
HARDWARE SERVICES PERCENT OF TOTAL PROCESSING SERVICES	8.0%	8.4%	8.7%	9.1%	9.7%	10.3%	-

EXHIBIT V-5

HARDWARE SERVICES SEGMENTATION



- Revenues which are derived from user expenditures for vendor supplied standalone minicomputer hardware which is integrated with vendor supplied application specific software are classified as turnkey systems.

- Revenues which are derived from application development, maintenance and production from a vendor supplied dedicated mincomputer which requires access through a communications network for processing or remote diagnosis on the vendor's computer center are classified as distributed minicomputers.

- Revenues which are derived from user expenditures for processing services in the vendor computer center from vendor supplied programmable terminals are classified as intelligent terminals.

- INPUT believes that net revenue growth from minicomputer based hardware services will not accelerate until 1983 to 1984 as vendors spend the next two years, 1981 to 1982, dividing sales force time between pursuing traditional business opportunities and reselling selected major accounts to procure hardware services.

  - Based upon previous research, INPUT believes that the procurement decision process is taking an average of five months, ranging up to 24 months, from initial contact to final decision with an additional two to three months for installation.

  - Eighty percent of the final decisions for computer procurement are made by corporate management. Management looks at the procurement as a capital acquisition, and generally does not delegate authority to the end user or EDP manager. Significant sales time will be spent educating senior management on the benefits of going "outside" for processing services.

- By 1983 to 1984, vendor sales and support organizations will have gained sufficient confidence and experience in selling minicomputer based hardware services so that accelerated growth rates can be anticipated.

  - Separate sales organizations will not accelerate revenue growth for distributed minicomputer based hardware services.

  - Turnkey systems sales will benefit from specialized sales and support organizations.

VI USER REQUIREMENTS AND ANALYSIS

VI USER REQUIREMENTS AND ANALYSIS

A. 1980 IN-HOUSE COMPUTER SERVICES OBJECTIVES

- According to INPUT's 1980 user panel survey of over 900 organizations, the most important objective for 1980, as shown in Exhibit VI-1, is the installation of on-line applications. Respondents ranked this objective approximately twice the relative importance of the next most popular objective. It is also important to note that on-line applications installation has ranked as one of the top three in previous INPUT surveys.

  - User application requirements can be segmented into two major categories: enhancements to existing applications and new applications.

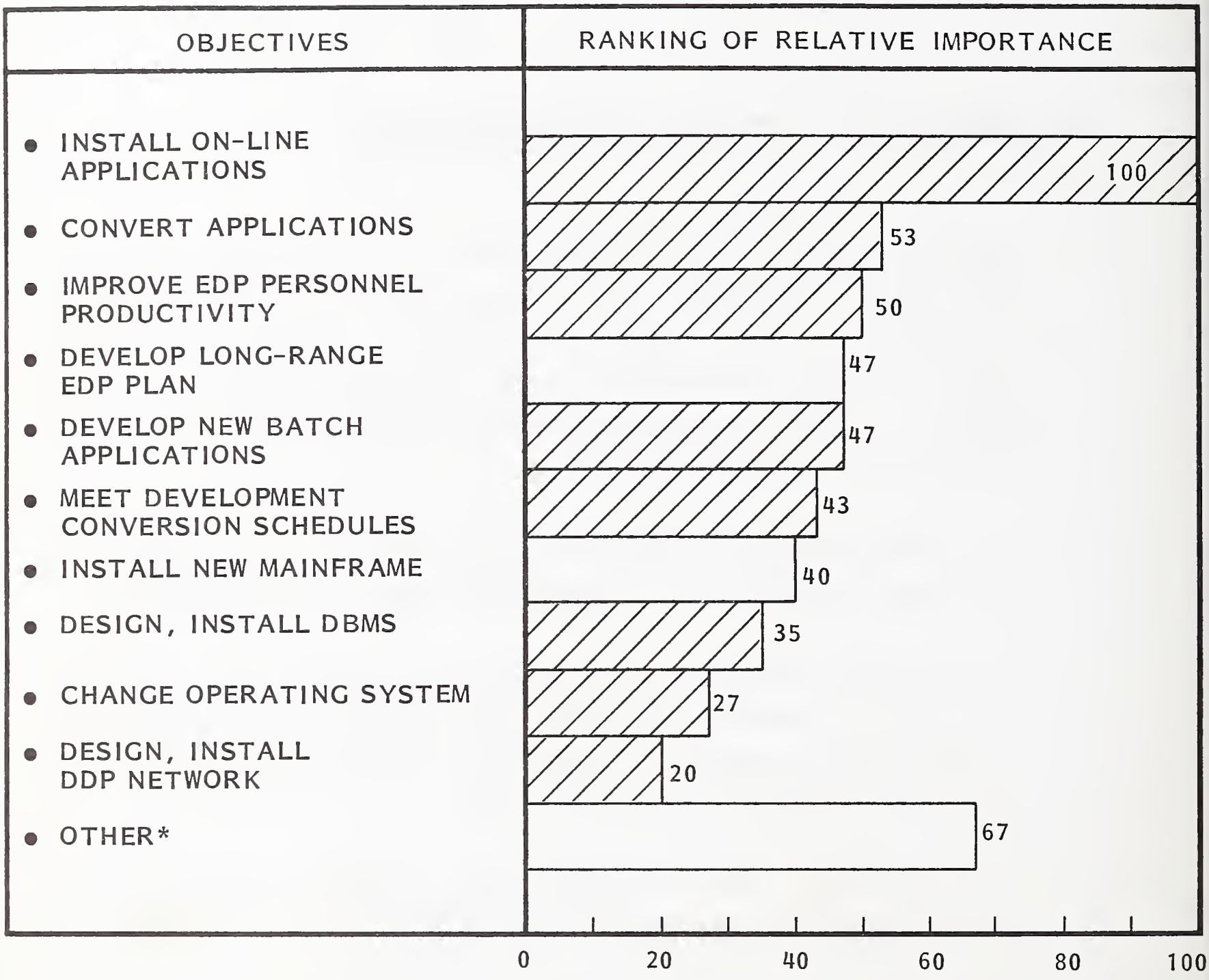
  - As shown in Exhibit VI-2, 55% of in-house DP programming resources across all industry sectors were used for maintenance and enhancement of existing applications, while 79% of in-house computing resources were allocated to existing applications.

  - Conversely, 17% of available in-house computer resources were allocated to new application development.

- A cursory examination of EDP objectives for 1980 reveals an increasing need for software development. Therefore, it is not illogical to expect that the

EXHIBIT VI-1

1980 EDP OBJECTIVES:
AVERAGE FOR ALL INDUSTRY SECTORS



*SPECIFIC RESPONSES UNDER "OTHER" INCLUDE:

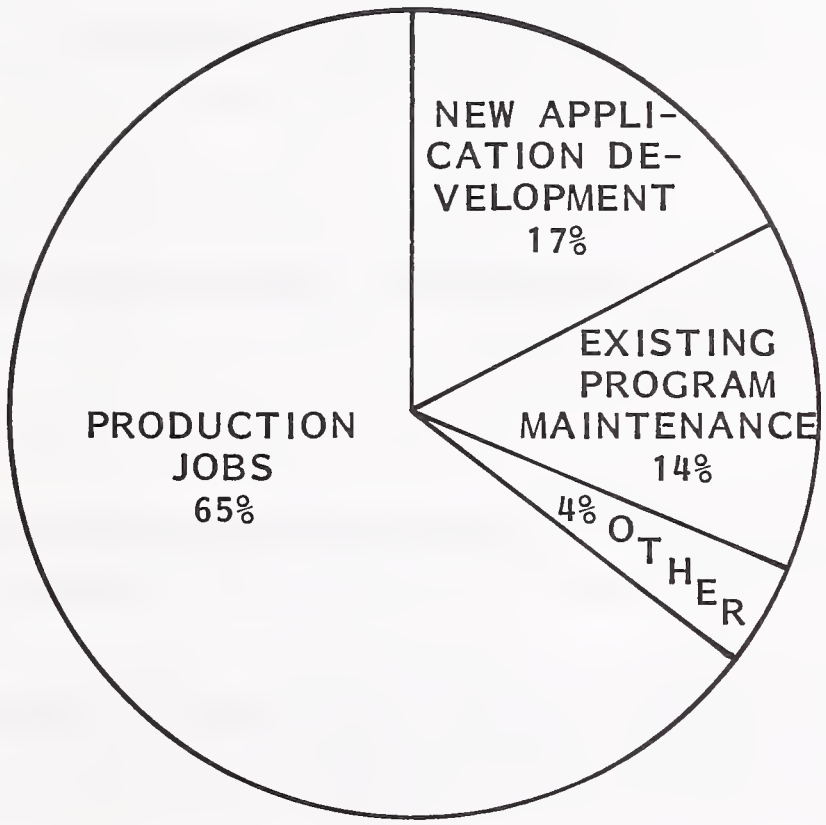
	RELATIVE IMPORTANCE
• INSTALL MINICOMPUTERS	17
• INSTALL PERIPHERALS	19
• INTEGRATE OFFICE AUTOMATION WITH EDP	10
• CENTRALIZE EDP CONTROL	8
• DECENTRALIZE EDP CONTROL	3

▨ PRIMARILY SOFTWARE RELATED

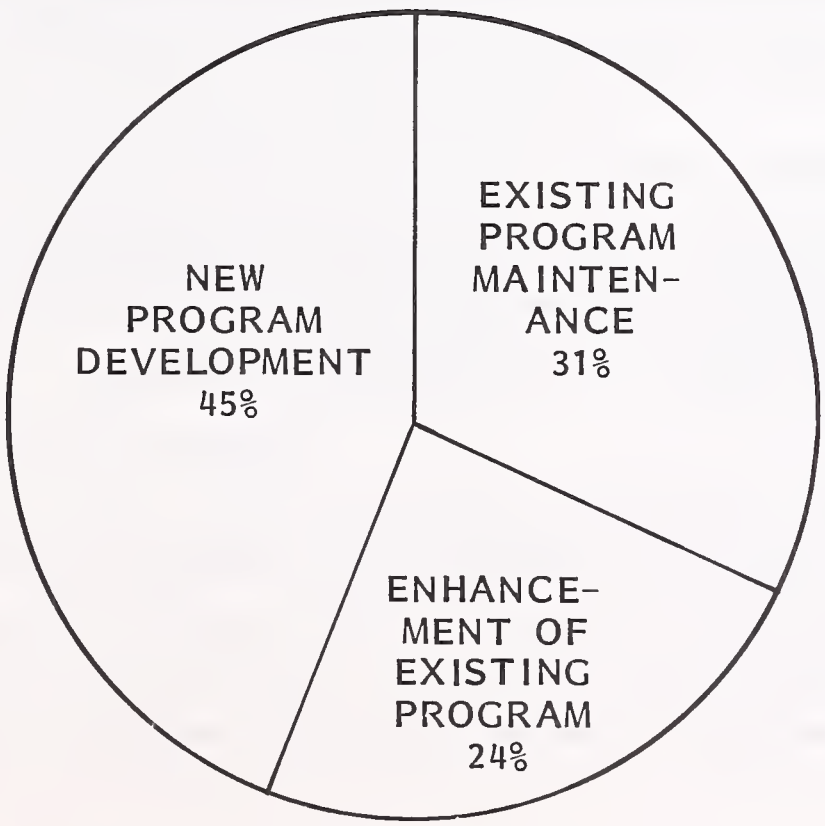
□ NOT PRIMARILY SOFTWARE RELATED

EXHIIT VI-2

EDP RESOURCE USAGE



COMPUTER EQUIPMENT



PROGRAMMING PERSONNEL

most significant problem that respondents face in 1981 is the availability of EDP personnel.

- Based upon EDP objectives for 1980, it would appear that many on-line applications will have to be deferred.

- This growing backlog for on-line applications is a key driving force contributing to the growth of the computer services industry.

B. DATA PROCESSING MANAGEMENT: OBSTACLE OR CONDUIT TO HARDWARE SERVICES SALES

- In order to more effectively penetrate large companies, vendors must change their traditional attitudes toward in-house DP management.

- Vendors of "full-service" offerings must initiate planning activities to remove the traditional barriers between "outside" and "inside" computer services.

- Vendors of hardware services must design their product offerings to be supportive of both end-user and DP management requirements.

- All DP managers interviewed for this study have made substantial investments in IBM compatible software systems and applications. As a result of this software investment, DP managers "own" most of the data that end users require to implement mainstream applications.

- Vendors targetting applications which require mainstream data must offer communication interfaces to IBM mainframes.

- Standalone applications which utilize and collect their own source data are available to vendors without IBM compatible interfaces.

- A more immediate threat to hardware services vendors is the proliferation of minicomputer installations within large companies, and the expanding rate at which in-house batch systems are being enhanced to support remote computing via intelligent terminals.

- According to the INPUT 1980 user panel of DP executives, the growth rate of minicomputers and communications terminals is projected to accelerate:

  - Minicomputers: up 61%.

  - Micro/personal computers: up 72%.

  - Intelligent terminals: up 106%.

  - Non-intelligent terminals: up 49%.

- In order for processing services vendors to aggressively participate in the growth of hardware services within large companies, DP managers must be included in any account-based sales and marketing strategies.

  - DP managers interviewed indicated that they are actively involved in all procurements of hardware ranging from identification of potential vendors to approving user procurements.

  - INPUT believes that vendors of hardware services should aggressively establish their roles as suppliers of high-value application development "tools" designed to be supportive of in-house application standards, procedures and policies.

  - Despite increasing user defection to turnkey systems, personal computers, and DDP, in-house DP remains the preferred vendor.

- Despite vendor opinions to the contrary, DP managers understand their role as a service organization and are increasingly providing users with the necessary applications to achieve their business objectives.

- As shown in Exhibit VI-3, respondent companies have recognized the benefits of "time-sharing" systems and have installed them using a variety of hardware vendors.

- During the fall of 1980, INPUT completed an important multi-client study, Improving the Productivity of Systems and Software Implementation.

  - An important finding of the study is that in-house data processing productivity and effectiveness are functions of their organizational maturity, and, as with children, pass through clearly identifiable stages of development on their way toward maturity.

- INPUT believes that vendor understanding of in-house DP stages of development will permit the astute vendor to develop a more effective marketing strategy for its hardware services offering.

- Exhibit VI-4 shows five stages in the progression of in-house DP organizational development.

  - Chaos is self-descriptive: a constant state of crisis that demands efforts to bring it under control. User requirements are out of control as each business function determines its own DP direction. The EDP management role focuses on operations and the head of DP is seen as a user pawn.

  - The control stage emerges as a reaction to "chaos." The DP organization establishes centralization to regain technical control. The backlog of user requirements begins to grow as the user is "locked out" of the centralized corporate data center. The head of DP is seen as a manager. Focus is on coordination, working toward quality.

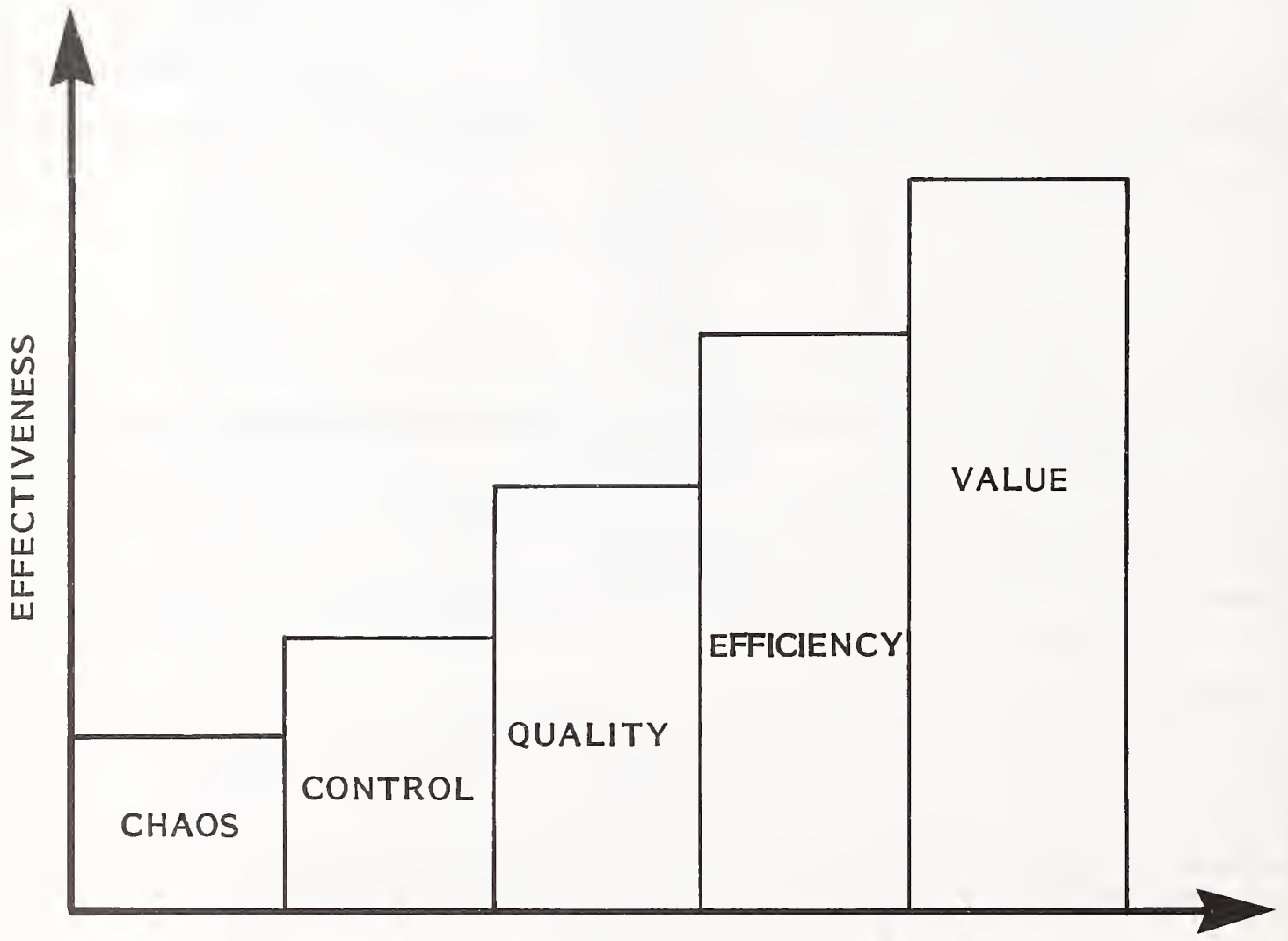
EXHIBIT VI-3

RESPONDENT INSTALLED IN-HOUSE
TIME-SHARING SYSTEMS

HARDWARE VENDOR	SOFTWARE PRODUCT	NUMBER OF USERS AT COMPANY
IBM	TSO TSO VM/CMS TSO TSO TSO	200 115 350 120 500 100
AMDAHL	VM/CMS	85
PRIME 750	EXPRESS	50
HP 3000	–	150
DEC 11/70	RSTS/E RSX-11/70	110 75
HONEYWELL	DARTMOUTH	200

EXHIBIT VI-4

FIVE STAGES OF DATA PROCESSING
ORGANIZATIONAL DEVELOPMENT



- Quality represents a better resolution of user-DP tensions. The user returns as a participant in initial steering committee meetings to represent his requirements. The head of DP is seen as a director: focus is on planning, working toward efficiency. User backlog is stabilized.

- Efficiency represents a bridge between quality and value. A DP matrix organization evolves. Projects are organized by business specialization. The user becomes a strong participant throughout the system development cycle. The head of DP is a company officer; focus of DP is beyond technical issues.

- Value stage closes the cycle, since the user is again dominant, but in a totally different way than in the chaos stage. In general, the distinction between user and DP is blurred as they become partners working toward common objectives. Distributed user applications are developed within a framework of DP established standards and procedures. The head of DP serves on corporate operating committees; the focus is on the survival, growth and profitability of the entire corporation.

- An example of how hardware services strategies can evolve from an understanding of the stages of in-house development appears below:

  - Chaos provides vendors with the opportunity to establish functional application specializations within user departments such as financial reporting. Vendors should interface with DP managers instead of the end users to obtain greater visibility, and credibility.

  - During the transition to the stage of control, vendors should increase their sales of multilocation applications, such as financial consolidations which support DP's desire to impose user control through standardization and centralization of financial reporting.

- By the stage of quality, target companies will have made such substantial investments in vendor supplied application solutions that efforts to convert to in-house will not easily be accomplished.

- The efficiency stage permits DP managers to accept the complimentary role of outside services and initiate long-term contracts for services.

- By the value stage, processing vendors have assumed the role of preferred vendor, and end users are encouraged to consult with the vendor before examining other outside vendors.

- This suggested approach to developing a major account is for purposes of illustration. This approach normally requires between one to three years of sustained and continuous sales and support efforts.

  - Vendors must be prepared to make the necessary customer base investments in order to gain long-term profit and revenue rewards.

C. USER REQUIREMENTS

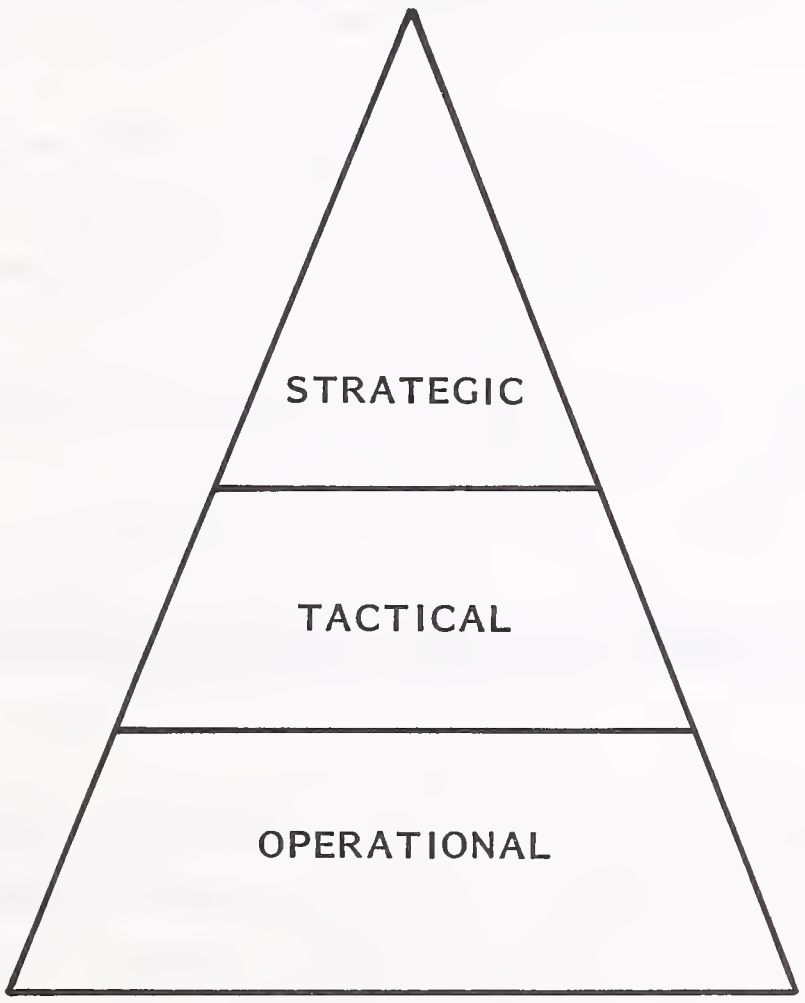
- Within business and industry, user requirements can be segmented into three broad application categories, as shown in Exhibit VI-5.

  - Operational applications are the typical "bread and butter" applications: general ledger, accounts receivable, accounts payable and payroll. The dominant mode of processing is batch, and in most cases these applications are "converted" from existing manual systems.

  - Tactical applications translate data from operational applications into management information reports to aid in decision-making. The dominant mode of processing is interactive.

EXHIIT VI-5

USER APPLICATION NEEDS



- Strategic applications operate upon highly summarized, historical operational and planning data. These applications are highly interactive and are often referred to as computer models.

- The applications pyramid can be further segmented, as shown in Exhibit VI-6, by industry and functional specialization.

  - In the final analysis, user application requirements are limited only by the imagination of the vendor and the budget of the user.

- Exhibit VI-7 is a compilation of INPUT's 1980 user panel's application requirements by industry sector and relative importance. The application with a relative importance of 100 can be thought of as being most important.

  - The most important application requirement within the manufacturing industries is inventory control.

D. REASONS FOR GOING TO OUTSIDE COMPUTER SERVICES

- End users indicated that their primary reasons for being driven to outside services were the inability of in-house services to satisfy their application requirements due to a lack of computing resources, and being low on the priority list for new applications development.

  - Users in this study significantly discounted the role of vendor's sales people in identifying and proposing a solution to satisfying their requirements, as shown in Exhibit VI-8.

- DP managers wers asked to identify the major differences between outside computer services and computer services they provided for their end users.

EXHIBIT VI-6

UNMET APPLICATION NEEDS

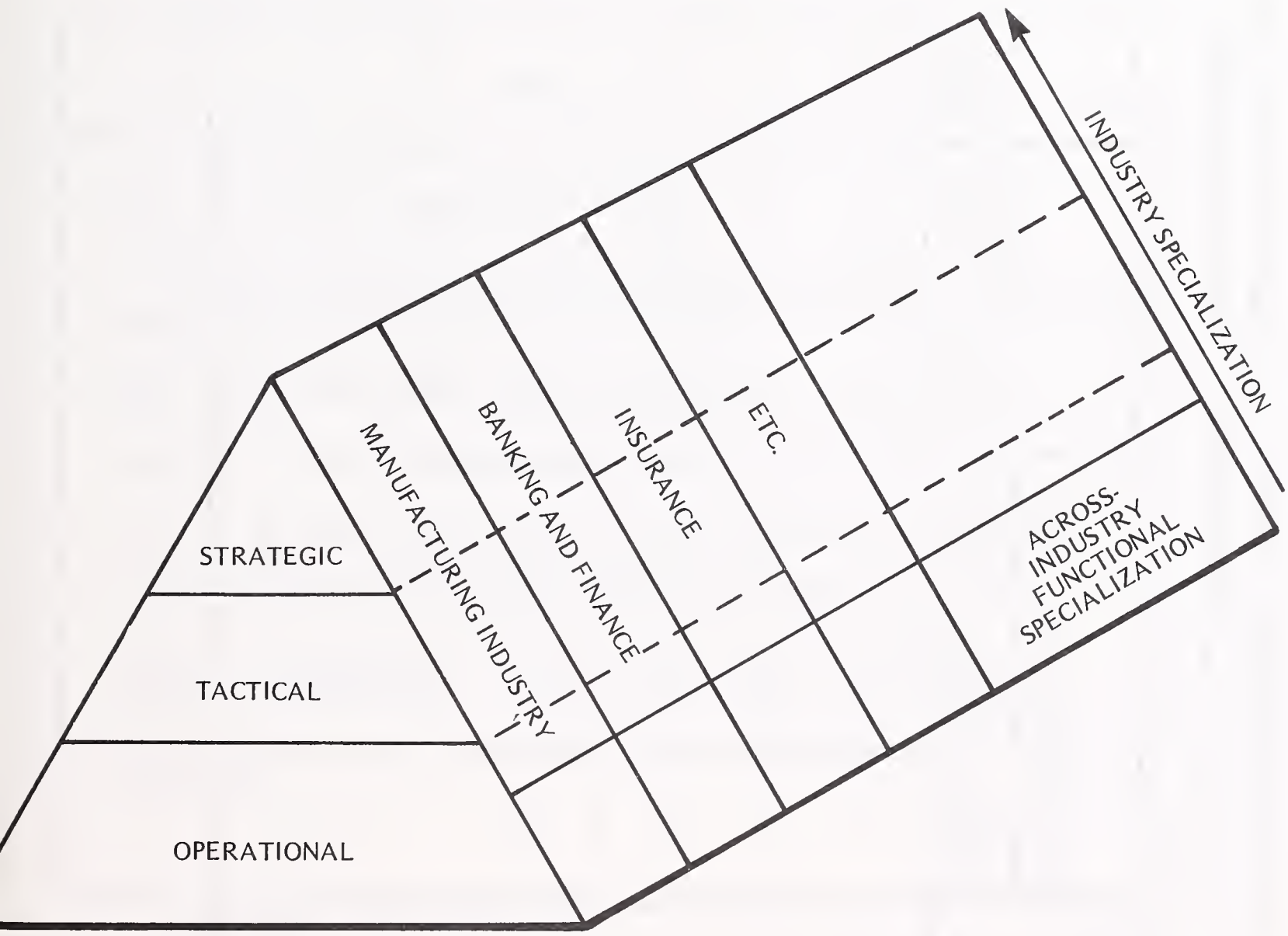


EXHIBIT VI-7

RELATIVE IMPORTANCE OF APPLICATIONS TO BE DEVELOPED BY EDP USER PANEL RESPONDENTS ACROSS INDUSTRIES*

NEW APPLICATIONS \ INDUSTRY	DISCRETE MANU-FAC-TURING	PROCESS MANU-FAC-TURING	TRANS-POR-TATION INDUS-TRY	UTIL-ITIES	DISTRI-BU-TION	INSUR-ANCE	BANK-ING AND FINANCE	GOVERN-MENT	SER-VICES	OTHER INDUS-TRIES
ACCOUNTING/ FINANCE	78	81	77	100	100	53	69	83	100	75
INVENTORY CONTROL	100	100	23	72	94	7	7	37	54	26
ORDER ENTRY/ BILLING	70	89	61	61	65	17	6	8	48	32
PURCHASING	35	26	11	38	37	-	-	16	17	31
MARKETING/ SALES	36	41	65	21	45	36	9	-	35	7
PERSONNEL		38	46	39	30	10	22	56	18	59
MODELING/ FORECASTING	35	48	45	34	23	18	20	20	30	22
OTHER (INDUSTRY SPECIFIC)	54	50	100	50	51	100	100	100	87	100

100 = MOST IMPORTANT.

EXHIBIT VI-8

REASONS FOR "GOING OUTSIDE" FOR PROCESSING SERVICES

REASON	RANK
LACK IN-HOUSE HARDWARE CAPACITY	1
IN-HOUSE APPLICATIONS DEVELOPMENT BACKLOG	2
SPEED OF SOLUTION IMPLEMENTATION	3
MORE COST-EFFECTIVE THAN IN-HOUSE	4
VENDOR NETWORK COMMUNICATIONS	5
VENDOR PROFESSIONAL SERVICES CAPABILITY	6
VENDOR INDUSTRY-SPECIFIC APPLICATIONS	7
VENDOR SUPPLIED PROPRIETARY SOFTWARE TOOLS (DBMS, MODELING)	8
SALESPERSON IDENTIFIED NEED AND PROPOSED SOLUTION	9

- Exhibit VI-9 illustrates the range of responses given by the managers of in-house computer services.

E. USER REACTION TO HARDWARE SERVICES

- Of the 20 user companies interviewed for this study, neither end users nor DP managers have been approached by vendor sales representatives to present a hardware services offering.

  - Since end users participating in the study had a cumulative expenditure on outside services of $21 million, INPUT believes their "perceptions" of hardware services, as shown in Exhibit VI-10, would be of value to vendors.

- Vendors of hardware services interviewed for this study were asked whether the profile of their sales personnel would change as a result of offering hardware and what specialized training vendors would provide their field forces in order to increase their sales effectiveness.

  - A majority of vendors indicated that their profile of sales personnel would not change as a result of offering hardware services.

  - In most cases, formalized sales training was limited to a couple of days of product training. This appeared to be ineffective based upon our limited sample of user reactions to hardware services.

EXHIBIT VI-9

EDP MANAGERS' COMMENTS
ABOUT "DIFFERENCES" BETWEEN "OUTSIDE"
AND "INSIDE" COMPUTER SERVICES

OUTSIDE SERVICES
• "... CAN OFFER UNIQUE APPLICATIONS AND SPECIALIZE IN THEM (DRI-DATABASES)."
• "GOOD FOR SHORT-TERM APPLICATIONS RATHER THAN ONGOING NEEDS."
• "THEY'VE GOT AN INTERNATIONAL COMMUNICATIONS NETWORK."
• "MAIN DIFFERENCE TODAY IS INTERACTIVE COMPUTING."

INSIDE SERVICES
• "WE OFFER TRUE ONLINE SERVICES WITH DEGREES OF SECURITY ABOVE OUTSIDE SERVICES."
• "INSIDE IS MORE TAILOR-MADE TO USER NEEDS."
• "WE HAVE THE SOURCE DATA, THEY DON'T!"
• "... NOT A WHOLE HECK OF A LOT - OUTSIDE SERVICES CAN OFFER EVERYTHING WE DO PLUS TIME-SHARING, DATA BASES, ETC."
• "IN-HOUSE PROVIDES COST/PERFORMANCE BENEFITS."

EXHIBIT VI-10

END USER COMMENTS ABOUT PERCEIVED
ADVANTAGES OF HARDWARE SERVICES
VERSUS NON-HARDWARE COMPUTER SERVICES

- "PHYSICAL PRESENCE OF HARDWARE ISN'T WHAT IS IMPORTANT. IT ALL COMES DOWN TO SUPPORT."
- "TIMELINESS. DON'T HAVE TO PACKAGE SEND DATA OUT TO BE ENTERED."
- "PRICE IS IRRELEVANT IF THIS TYPE OF SERVICE IS NEEDED."
- "KEY QUESTION IS EQUIPMENT MAINTENANCE - VENDOR HAS A VESTED INTEREST."
- "MAJOR ADVANTAGES ARE GUARANTEED RESPONSIVENESS AND AVAILABILITY."
- "LOCAL COMPUTING AT A FIXED PRICE."

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

COMPUTER 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 three 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.

- 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:

  - Application 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.

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

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

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

- System 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.

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?"

APPENDIX B: QUESTIONNAIRES

MERGING HARDWARE, SOFTWARE, AND SERVICES
VENDOR

The purpose of this interview is to determine trends in the marketing of hardware by computer services companies.

In this interview, I would like to cover the following areas:

- TARGETED MARKETS
- MARKET STRATEGIES
- MARKET REQUIREMENTS
- MARKET PENETRATION

1. Do you offer, or plan to offer hardware (mini-computers, intelligent terminals, back-end processors, etc.) as part of your services offering?

   Yes ☐ No ☐

   a. If yes, please describe your hardware offering:

   _____

   _____

   _____

   b. If no, why not?

   _____

   _____

   _____

2. Please rank your reasons for merging, or potentially merging hardware into your services offering by order of importance (scale of 0 - 10 0 = low, 10 = high)

COMPETITIVE FORCES (please describe) _____ ____

_____

_____

FUNCTIONAL ENHNACEMENT TO CURRENT OFFERING ____

OPPORTUNITY TO ADDRESS NEW MARKETS ____

OTHER (Please specify) ____

3.a. What was/will be the investment required to develop your H/S offering?

Less than $500,000 ____

$500,000 to $1 Million ____

$1 to $2 Million

More than $2 Million ____

b. Is current product profitable? ____ If profitable, how profitable? ____

If not profitable, when do you plan to break even? _____

4. Which department in your company identified the requirement for a hardware service offering?

SALES ____

MARKETING ____

SOFTWARE DEVELOPMENT ____

PLANNING ____

OTHER (describe) _____ ____

_____ ____

5. Since your announcement of an H/S offering, have you made any significant changes to this offering in the following areas? Yes ____ No ____

a. If yes, which ones?

		BRIEFLY DESCRIBE CHANGES
Market strategy	____	_____
Pricing	____	_____
Product definition	____	_____
Support	____	_____
Installation	____	_____
Operations	____	_____
Sales	____	_____
Other	____	_____

b. Since your H/S introduction, have you made significant changes in your non-H/S offerings? Yes ____ No ____

If yes, which ones?		DESCRIBE CHANGES
Market strategy	____	_____
Pricing	____	_____
Product definition	____	_____
Support	____	_____
Installation	____	_____
Operations	____	_____
Sales	____	_____
Other	____	_____

6. What percent contribution to total revenues and profits do you plan for your H/S offering?

	1980	1981	1982	1983	1984
Revenue %	____	____	____	____	____
Profit %	____	____	____	____	____

7. What do you perceive to be the limiting factors to your revenue growth from H/S (0 - not limiting, 10 - very limiting)

Product pricing ____

competition ____

Prospect sophistication ____

Professional services ____

Technical support personnel ____

In-house data processing management ____

Software ____

Hardware ____

Sales people ____

8. Please indicate the number of H/S installations to date and your forecast for the next three years.

Installations to date		Forecast 81	82	83
0-10	____			
10-20	____			
25-50	____	____	____	____
50-75	____			
75-100	____			
over 100	____			

9. Please describe your initial target markets for H/S:

COMPANY SIZE / APPLICATION	INDUSTRY GENERAL (DESCRIBE)	INDUSTRY SPECIFIC (DESCRIBE)	UTILITY (DESCRIBE)
MANUFACTURING			
. Under $10M			
. $10-50M			
. $50-500M			
. Over $500M			
FINANCE			
. Under $10M			
. $10-50M			
. $50-500M			
. Over $500M			
INSURANCE			
. Under $10M			
. $10-50M			
. $50-500M			
. Over $500M			
BUSINESS SERVICES			
. Under $10M			
. $10-50M			
. $50-500M			
. Over $500M			
OTHER (SPECIFY)			
. Under $10M			
. $10-50M			
. $50-500M			
. Over $500M			

10. What NEW markets do you plan on targeting with your H/S offering?

	Industry	Application	Company Size
1.			
2.			

11. Is the above market profile significantly different from your traditional (non-H/S) markets?

Yes ☐ No ☐

If YES, please explain differences:

_____

_____

_____

_____

12. Is your current or planned H/S offering an extension or enhancement of your present systems and/or applications? Yes _____ No _____
If Yes, please describe the added functions/capabilities:

_____

_____

_____

13. Excluding your H/S offering, how would you rate your companies overall strengths (0 - non-competitive 10 - industry leader)

PRODUCT MARKETING ____ PROFESSIONAL SERVICES ____

SOFTWARE DEVELOPMENT ____ STRATEGIC PLANNING ____

COMMUNICATIONS SOFTWARE/HARDWARE ____ PRODUCT PRICING ____

FIELD SALES AND SUPPORT ____ PRODUCT BENEFITS ____

14. How do you expect your H/S marketing strategy to evolve over the next three years?

_____

_____

_____

15. How would you characterize your strategy to migrate existing customers to your H/S offering?

Aggresive ☐ Based upon competitive activities ☐

Passive ☐ No strategy to migrate ☐

Explain: _____

16. What percent of H/S sales have been or would be targeted to existing customers?

_____%

17. For the existing customers that bought your H/S offering, what were the key factors contributing to their favorable decision? 0 = not key, 10= key

PRICE REDUCTION ☐ - Quantify if possible _____

LOWER INCREMENTAL COST TO ADD NEW APPLICATIONS ☐

VENDOR SUPPLIED PROPRIETARY SOFTWARE ☐

INABILITY TO OBTAIN EQUIVALENT SERVICES IN-HOUSE ☐

18. Is there any observable trend or profile of new and existing customers who decide on buying your H/S offering?

Application type _____ Current mo. $ _____

Industry _____ Geographic location _____

Company size _____ Other _____

19. For your H/S customers, what was their average annual expenditures on processing services before conversion?

$ _____/year

20. How many of your existing non-H/S customers are currenlty spending over $15,000/mo.?

0-10 ☐ 10-20 ☐ 20-30 ☐ 40-50 ☐ 50-75 ☐

over 75 ☐

21. Please rank the following user requirements in terms of its importance in the design of your H/S offering (0-not important, 10 - critical)

☐ ABILITY TO INTERACE WITH IN-HOUSE SYSTEM

☐ REDUCTION IN COSTS OF PROCESSING

☐ ABILITY TO DO APPLICATIONS DEVELOPMENT AT USERS SITE

☐ ABILITY TO SIGNIFICANTLY ENHANCE CURRENT APPLICATION USAGE WITHOUT MAJOR INCREASE IN COSTS.

☐ LOCAL INQUIRY AND BATCH REPORTING AT USERS SITE

☐ LOCAL DATA ENTRY AND VALIDATION

☐ OTHER (Please specify) _____

☐ UNIQUE OR SPECIAL APPLICATIONS SOFTWARE

☐ SERVICE VENDORS NETWORK

22. What percent of your H/S customers will require customization via contract programming?

None ☐ 0-25% ☐ Under 50% ☐ over 50% ☐ 75-100% ☐

23. Of the total population of new name and existing H/S customers, what percent could have been closed by providing a significant discount of your non-H/S offering and at what discount level?

DISCOUNT LEVEL	PERCENT OF H/S CUSTOMERS
0-25%	_____
under 50%	_____
over 50%	_____

24. What percent of your new business would have been unavailable were it not for your H/S offering? (i.e., due to competitive forces) additional application.

0 - 25% _____ over 50% _____

under 50% _____ 75-100% _____

25. Are you planning to develop or acquire any industry specialized applications for your H/S product?

Please specify

Develop _____

Acquire _____

26. As part of our study, we intend to interview current and prospective users of H/S, could you provide the names of two current customers of your H/S offering?

COMPANY	CONTACT	PHONE NO.
1.		
2.		

27. Please rank which factors were most important in determining your selection of a hardware vendor (1 = least, 5 = most)

Family of upward compatible hardware _____

Attractive OEM discounts _____

Maintenance support and reputation _____

Compatibility with existing software _____

Other (Please specify) _____ _____

28. To what extent do you compete with or jointly market with your hardware vendor?

Compete _____

Jointly market (Please describe) _____ _____

29. Are you permitted to sell your software to your hardware vendors existing customer base?

Yes _____ No _____

30. What is the average or standard contract term for your H/S?

One month _____ 2 years _____

2 - 6 months _____ greater than 2 years _____

one year _____

31. As a result of your H/S has your profile of field people changed?

In what way?

Sales _____ _____

Support _____ _____

Management _____ _____

32. Please describe the formal training provided for field people:

	Subject	No. of days
Sales	_____	_____
Support	_____	_____

33. Does your company plan to address the market for in-house timesharing?

_____

_____

34. Do you currently or plan to offer a turnkey product? Yes ____ No ____

Hardware vendor _____

Applictions _____

Number of installations one year after introduction and five years after?

_____

35. a. If yes, please describe your target market for your turnkey system.

_____

_____

_____

MERGING HARDWARE, SOFTWARE, AND SERVICES
END USER

1. What are the current methods and vendors used for your data processing?

_____ In-House EDP Mainframe:

_____ Mainframe vendor
&
_____ Software Package Vendor

_____ In-house mini-computer at your site

_____ Mini-computer vendor

_____ Software package

- communications oriented? _____ - turnkey system? _____

_____ Remote Computer Services vendor

	Vendor	Major Application	Annual Expenditure
1.	_____	_____	$_____
2.	_____	_____	$_____
3.	_____	_____	$_____

- Is the system networked or at a single location? _____

2. At what annual expenditure level can you as the end user select your own service or equipment?

1. Less than $1,000 _____
2. $1,000 - $10,000 _____
3. $10,000 - $25,000 _____
4. $25,000 - $100,000 _____
5. $100,000 - $500,000 _____
6. Greater than $500,000 _____
7. Not at all _____

3. How long has your department _____ Company _____ been a user of outside processing services?

Less than one year _____

1 - 2 years _____

3 - 5 years _____

more than 5 years _____

4.a. What percent of your processing is done through outside services?

0% _____ 1 - 25% _____ 26 - 50% _____ 51 - 99% _____ 100% _____

b. What percent of your in-house processing do you plan to convert to outside services (or vice versa, indicate)/in the next 1 to 2 years?

_____ In-house -→ outside 0% _____ 26-50% _____

_____ Outside -→ in-house 1-25% _____ 50-99% _____

100% _____

- If the flow is going in-house, what sort of system(s) will be involved?

---

5. Please rate how the following events would prompt you to convert to in-house processing: 0 = would not convert, 10 = would convert immediately.

Installation of an in-house time-sharing system _____

Installation of a terminal oriented, user-oriented DBMs on in-house machines _____

Installation of a mini-computer at your site _____

25% increase in the cost of outside services _____

Annual outside expenditures greater than $250,000 _____

Addition of a programmer to your staff _____

6. Please rate the following reasons why you go, or would go, outside for processing services?

(0 = would not convert, 10 = would convert immediately)

In-house applications development backlog _____

Lack of in-house hardware capacity _____

Vendor salesperson identified need and proposed solution _____

Vendor supplied proprietary software or development tools (i.e., DBMs, modeling) _____

Speed of implementation _____

More cost-effective than in-house _____

Vendor network communications _____

Vendor professional services capability _____

Vendor industry specific applications _____

7. Many processing services vendors have announced or plan to announce hardware additions to their service.

Has an RCS vendor marketing representative presented such a new product to you?

Yes _____ No _____

If yes, what was your initial reaction?

Price: Too high _____ Just right _____ Too Low _____

Software: Same as non-hardware service _____

Exceeds non-hardware service _____

Functional Capability: Same as non-hardware service _____

Exceeds non-hardware service _____

If yes or no, benefits/disadvantages over non-hardware service: Please list

1. _____

2. _____

3. _____

If no, at what price would you consider such a service?_____

8.a. Which of the following sources of application development end implementation do you utilize?

_____ Vendor professional services

_____ Third party service

_____ In-house programming

b. In which high level languages?

_____ Cobol _____ PL/1

_____ Fortran _____ APL

_____ Basic _____ DBMS

9. How would you characterize your application requirements?

_____ Historical analysis of operational summary data

_____ Transaction processing (i.e., order entry)

_____ General business (A/R, AP GL PR)

_____ Long range planning and forecasting

_____ Tracking of corporate resources, people, products, revenues, expenses

_____ Decision support systems - ad-hoc information retrieval and reporting

_____ Engineering design and development

10. What is the name of your in-house Data processing manager?

Name: _____

Telephone No.: _____

Location: _____

11. Other general comments:

MERGING HARDWARE, SOFTWARE AND SERVICES
DATA PROCESSING MANAGER

1. What are the current methods and vendors used for data processing in your company?

_____In-house mainframe

_____Mainframe Vendor

_____Software Packages and Vendors

_____

_____Operating System

_____In-house mini-computer

_____Networked

_____Mini-computer vendor

_____Number of mini-computer installation

_____Applications

_____In-house DDP. If not using do you plan to install? Yes _____

No _____

(go to next page)

When? _____

_____Vendor name

_____Applications

_____

_____

- Please rate the following reasons why your company is or will use DDP: (Scale 0 - 10: 0 = low, 10 = high)

Cost performance benefits _____

Ability to obtain more timely info _____

Increased efficiency by placing computer closer to user _____

Off-load in-house mainframe _____

Other (Specify) _____ _____

_____ _____

_____In-house time-sharing _____ Number of users

_____Hardware Vendor

_____Operating System

- If not currently installed do you plan to offer in-house timesharing services?

  Yes _____ No _____ When? _____What? _____

_____Turnkey System
If not currently using, do you plan to install?

Yes _____ No _____ When? _____

_____ Vendor

_____ Application

_____ Contract type (purchase,lease, rent)

_____ Contract term (months)

_____ Contract cost ($/month)

_____ Outside processing services

_____Vendors

_____

_____Applications

_____

_____

- Annual Expenditure:

  _____ Less than $50,000
  _____ $50-100,000
  _____ $100,000 - $200,000
  _____ $200,000 - $500,000
  _____ More than $500,000

2. What is your role in the acquisition of outside processing services?

_____ Identify vendors and capabilities

_____ Select vendor

_____ Approve vendor

_____ Approve procurement

_____ Other

- Is the cost of an outside service paid by you or the user's dept?

User _____ DDP Dept. _____

3. What are the major differences between "outside services" and "inside services"? Please rank (0 - little importance, 10 - very important)

_____ Cost of outside services are higher than equivalent vendors

_____ Outside services process non-repetitive, project applications

_____ Outside application processing requires an international communications network

_____ Proprietary software products. Which? _____

_____ On-line Interactive Applications

_____ Other (please specify) _____

4. Many processing services vendors have announced or are planning to announce a hardware component as part of their services portfolio.

Which of the following marketing strategies would be most effective? (Rate 0 - 10, 0 - low, 10 - high)

_____ Establishing IBM compatability

_____ Providing a full-service approach, i.e., hardware system and application software, network communication, applications development personnel

_____ Packaging the product as an in-house time-sharing system

_____ Establishing links within-house mainframes

_____ Jumping on the Distributed Data Processing bandwagon

5. What are the major applications you are now running in an interactive or on-line mode on an outside service (in order of importance)

1. _____

2. _____

6. What major applications are you currently developing or planned for 1982?

	IN DEVELOPMENT		PLANNED FOR 1982	
	Outside	In-house	Outside	In-house
1.				
2.				
3.				

Indicate whether major because of development effort (D) or because of importance(I)

7. What percent of your programming staff's time is allocated to software maintenance and development?

Maintenance_____% Development _____%

8. On the average, what is the elapsed time from the point data user requirements are identified to the point where the application is in a production mode? (from point need identified to the point of first deliverable)

1 - 3 months _____

4 - 6 months _____

7 - 12 months _____

13 - 24 months _____

9. How are new user requirements prioritized?

_____ Committee of Users

_____ Committee of Data Processing Staff

_____ President of Division or group

_____ Vice President of Data Processing

_____ Other (specify) _____

10. Which method of funding for new application development are used?

_____ Data Processing Budget

_____ Other _____

11. How are users charged for "inside services"?

_____

_____

_____

12. In terms of data processing philosophy or values, which is the key objective of your development operation?

_____ Complete development on schedule, at the expense of efficiency and optimize later

_____ Optimize as part of applications development

_____ Other _____

_____

_____

13. In determining the prioritization of all user requirements, which of the following is considered most important? (Scale 0 = not important, 10 = very important)

_____ Contribution to profits

_____ Providing a competitive edge

_____ Improving customer service

_____ Reducing costs of current methods

14.a. Do you use outside professional service for new application development?

Yes _____ No _____

If yes, what are your annual expenditures?

_____

_____

b. When you go outside for programming, which of the following factors are most important? (Rank 1-4, 1 most important)

_____ Operating Systems Experience

_____ General Programming experience

_____ DBMs Knowledge

_____ Industry or application specific experience

15. Which of the following application software would you/do you develop in-house, which by a combination of in-house and outside services and which by outside services alone?

	In-house Only	Both	Outside Only
Order Processing			
CAD/CAM			
Accounting (A/R, A/P, GL)			
Human Resources			
Financial Modeling			
DBMs			
Inventory Control			

16. Which of the following software vendors do you use?

PACKAGES	APPLICATIONS	PROCESSING VEHICLE*
Cincom Systems		
Cullinane		
MSA		
Mathematica		
Software ag		
Software International		
Other(Describe)		

* Outside Service: Service
Inhouse Mini: MINI
Inhouse Mainframe: MAIN