VENDOR COMPETITIVE ANALYSIS - SMALL SYSTEMS

INPUT

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

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Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

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

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INPUT
Planning Services For Management

VENDOR COMPETITIVE ANALYSIS—
SMALL SYSTEMS

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VENDOR COMPETITIVE ANALYSIS--
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SMALL SYSTEMS

EXHIBITS

1 INTRODUCTION

I INTRODUCTION

A. SCOPE

- This report was produced as part of INPUT's 1984 Customer Services Program. Its contents are reserved for clients of this study and are protected by copyright.

- The scope of the study covers vendors who manufacture and service small computer systems. The term "small systems," for the purpose of this report, includes traditional minicomputers up to but not including DEC VAX level machines. On the low end, small systems include small business systems (SBS) with multitasking capabilities such as the Burroughs B800 series.

- The key elements of this report are those factors that influence service marketing decisions among the small-system vendors in the United States. These include:

  - Technological development that affects service, such as remote support capabilities or centralized dispatching.

  - New market trends within service, such as third-party maintenance.

  - A review of user hardware/software support issues.

- In addition to the factors listed above, the report profiles the service capabilities of seven small-system vendors that have successfully introduced new or innovative service techniques.

- Finally, the report includes an extensive analysis of the service business, management, and marketing techniques of small-system vendors.

B. METHODOLOGY

- This report is the result of extensive research, data gathering, and on-site interviews. The interviews were conducted in April, May, and June of 1984 at the vendors' field service headquarters. Representatives from a total of 19 small-system vendors—including most of the major manufacturers in this market--were interviewed.

- Vendor interviews were based on the questionnaire shown in Appendix A. All vendor responses were statistically analyzed in order to present trends in the industry while assuring that company confidentiality was maintained.

- Much of the information presented in this report resulted from secondary research of publicly available information sources including vendor annual reports, 10-K reports, press releases, and other media information.

- Additional information was derived from ongoing vendor analysis conducted by INPUT in multiclient and custom research.

II EXECUTIVE SUMMARY

II EXECUTIVE SUMMARY

- This executive summary is designed in a presentation format in order to help the busy reader quickly review key research findings and provide a ready-to-go executive presentation, complete with script, to facilitate group communication.

- The key points of the entire report are summarized in Exhibits II-1 through II-5. On the left-hand page facing each exhibit is a script explaining the exhibit's contents.

- The small-system service marketplace has been called the most dynamic and competitive in the industry. This market is not dominated by any one vendor as is the large-system environment, and yet it has the service structure absent in the personal computer market.

- Competition among vendors for both equipment sales and service has been intense and has spawned a number of new services that have changed the industry.

- This report analyzes the many changes and trends in the small-system service marketplace as well as different issues that INPUT views as affecting the demand and satisfaction with service.

A. SMALL-SYSTEM TOTAL REVENUE AND SERVICE GROWTH RATE

- After several years of declining growth rates, small-system total revenue is projected to increase in 1984 at an average rate of 21%. Service revenue is becoming an increasingly important component of the small-system vendor's total revenue.

- As a percent of total revenue, service revenue has increased steadily from 16% in 1981 to a projected 22% in 1984. Some small-system vendors reported that service revenues accounted for over 30% of total revenues in 1983/84.

- The importance of customer service is further heightened when its "recession-proof" characteristics are considered. Although the growth rate of service revenues fell during 1982-1983, service has continued to grow at rates substantially above overall revenue growth.

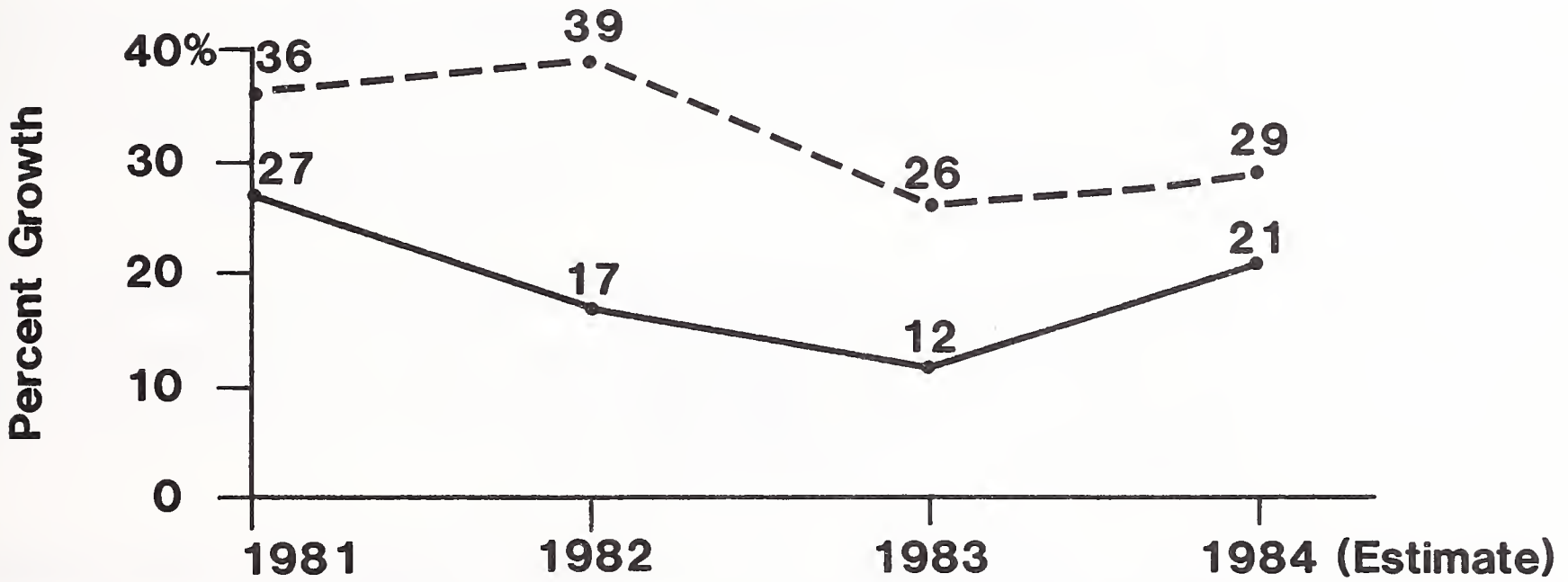
- In addition to financial consideration, small-system vendors have become increasingly aware of the strategic value of service in equipment sales. Vendors with superior service organizations, such as IBM and HP, have found that they can affect equipment purchase decisions by recognizing the critical importance of service to users.

- INPUT expects small-systems service revenues to continue to rise both in absolute terms and as a percentage of total vendor revenue. Revenue from software support and after-sales services will grow substantially in the next four years. This growth will be necessary to offset declining hardware service revenues resulting from improved equipment reliability and parts modularization.

EXHIBIT II-1

SMALL-SYSTEM TOTAL REVENUE AND SERVICE GROWTH RATE

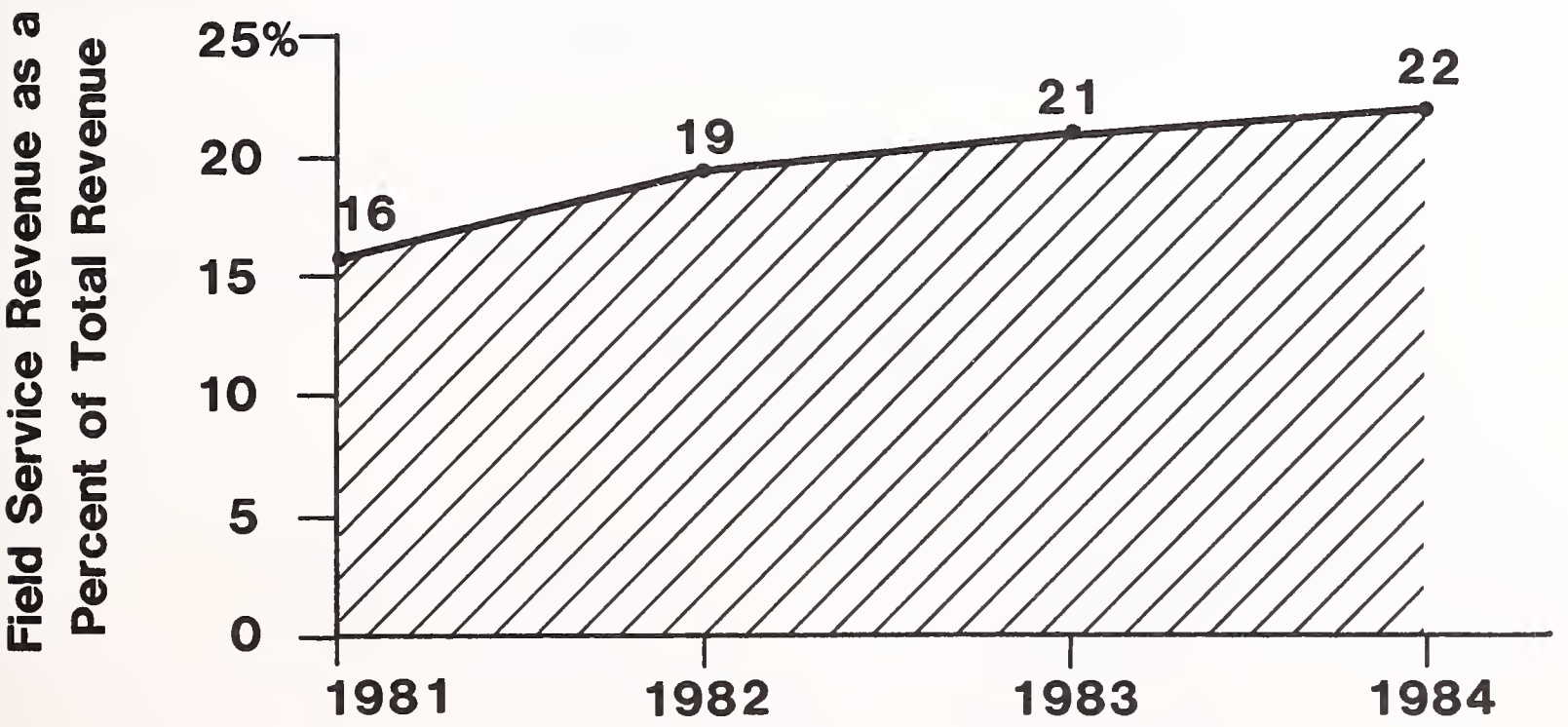
A



– – – – – Average Small-System Vendor Service Revenue Growth Rate

——— Average Small-System Vendor Total Revenue Growth Rate

B



B. TRENDS IN SMALL-SYSTEM CUSTOMER SERVICE

- User demands for improved service at a lower price and increasing competition from third-party service vendors are forcing small-system service vendors to become more efficient in order to maintain service profitability.

- All of the small-system vendors interviewed by INPUT are centralizing support facilities to some extent in order to improve efficiency. Centralizing support is most prevalent in software support, spare parts, dispatching, and remote support.

- Centralizing support facilities allows the service vendor to reduce both labor and capital expenditures. Shared facilities, such as in a centralized logistics operation, saves capital. Labor savings result from reduced on-site and travel expenditures.

- Greater flexibility on the part of the vendor in meeting user service needs is the second major trend in the small-system environment. Vendors offer a bewildering array of service options, often called a "service menu," to maintain their current user base and expand into new markets.

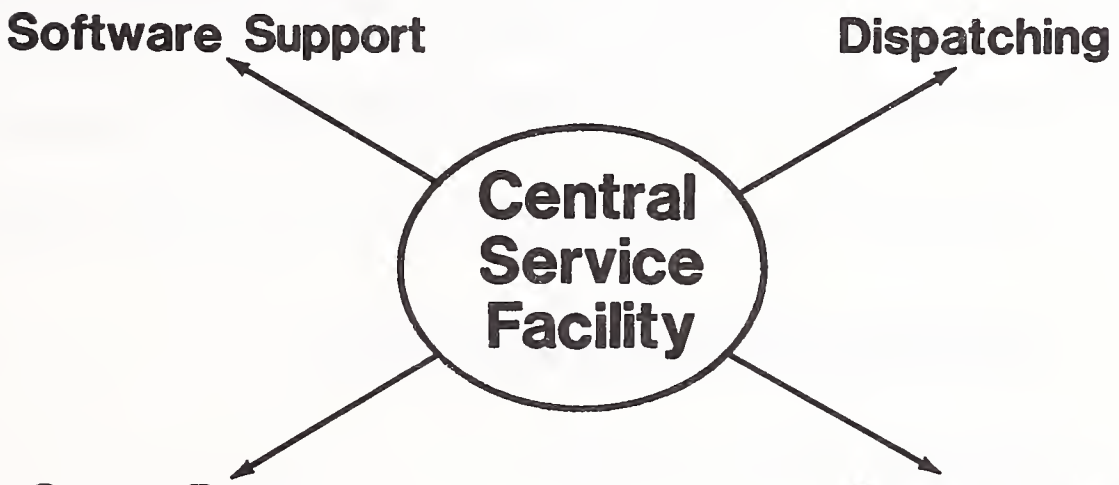
- Vendors are becoming much more tolerant of users who want to be involved in system repairs. In fact, 78% of the small-system vendors interviewed indicated that they preferred user involvement in software repairs.

- The growth in depot service for small systems is expected to continue despite user resistance. Vendors feel that the growing pressure to increase on-site service costs will ultimately result in a substantial group of price-sensitive users who will require a depot-type alternative.

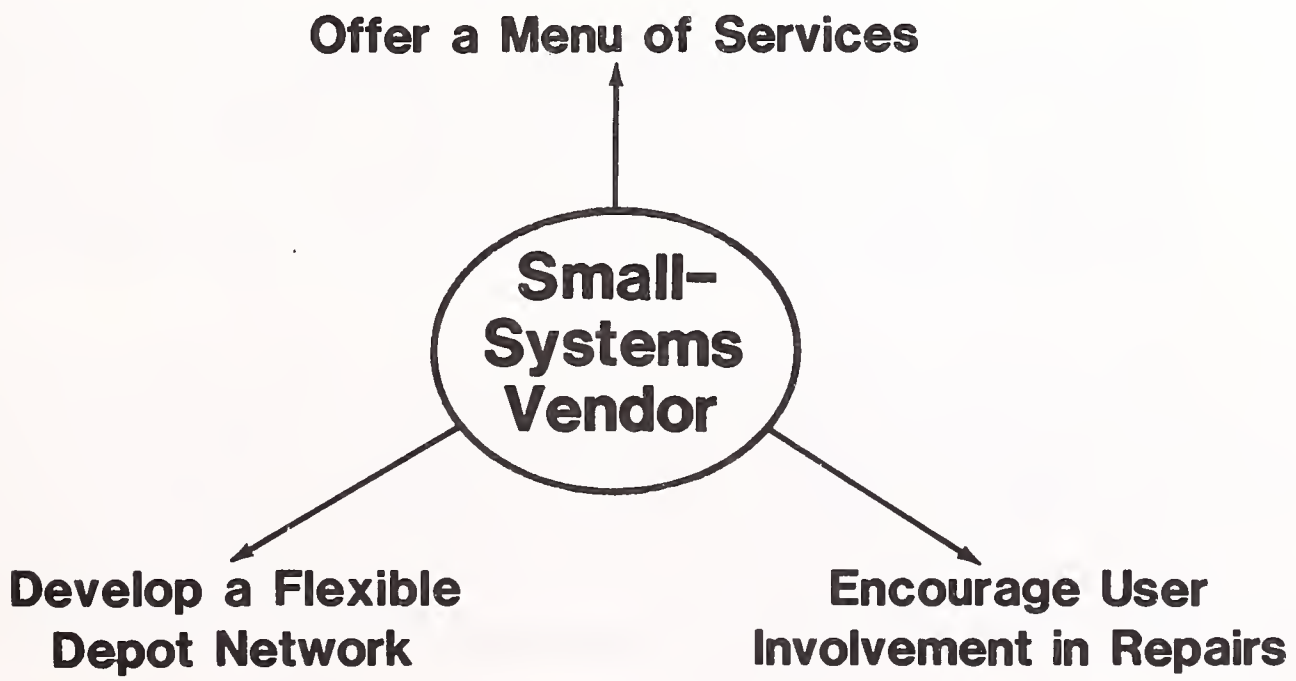
EXHIBIT II-2

TRENDS IN SMALL-SYSTEM CUSTOMER SERVICE

Centralize Service for Efficiency



Remain Flexible in Order to Meet Customer Needs



C. THIRD-PARTY MAINTENANCE IN THE SMALL-SYSTEM ENVIRONMENT

- The growth in the use of third-party maintenance by small-system users is expected to continue through 1989, increasing from $110 million in 1982 to $350 million in 1989. Similar increases in terminal and peripheral TPM markets are also expected.

- A number of small-system vendors such as DEC and Honeywell have recently entered the TPM market against such well-established competitors as SORBUS and TRW. Other small-system vendors have reported that they are seriously considering the TPM market because TPM:

  - Provides for a more efficient allocation of the vendor work force.

  - Increases user satisfaction.

  - Maximizes service revenue.

- TPM service revenues can be quite substantial, particularly in the well-established small-system market. Revenues are maximized because there is no corresponding increase in service staff—the current staff is more efficiently utilized.

- More efficient allocation of the service work force is an important feature to small-system vendors who have been forced to reduce staff due to declining workloads. Many vendors expect staff levels to fall as a result of improved equipment reliability and more efficient central support facilities.

- Increasing user satisfaction is an important result of TPM activity by small-system vendors. Many users, intent on saving money, have migrated away from the single vendor shop only to find that "finger pointing" among service organizations has resulted in lower system availability. These users definitely prefer TPM from a major vendor because it reduces finger pointing.

EXHIBIT II-3

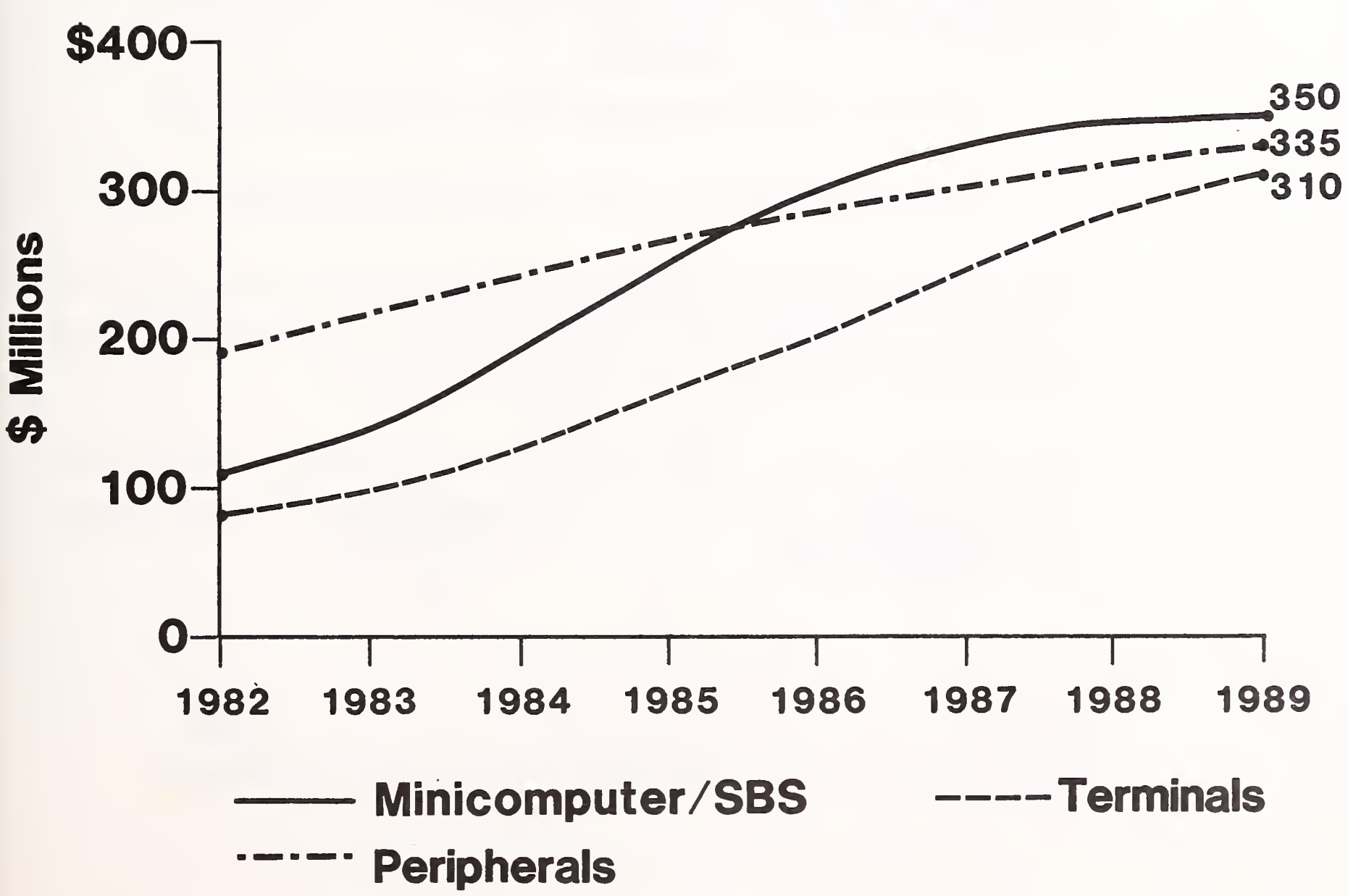
THIRD-PARTY MAINTENANCE IN THE SMALL-SYSTEM ENVIRONMENT

Efficient Allocation of Service Work Force

Increased User Satisfaction

Revenue Maximization

TPM Revenue Forecast



D. SERVICE MARKETING VERSUS PRODUCT ORIENTATION

- Service product orientation currently dominates service management thinking for small-system vendors. Product orientation, however, isolates vendors, cutting them off from market forces that affect customer demand.

- The marketing approach to service recognizes that customer needs and market characteristics are of primary importance. Service products must be developed and changed to meet user preference; vendors should not attempt to mold user preferences to service products (although they may elect not to offer some of the services users say they need).

- The service marketing approach is predominantly strategic in nature.

  - It identifies and targets market opportunities, not individual sales opportunities.

  - It focuses on long-term service trends, not just short-term goals.

  - It stresses profit planning rather than sales revenue growth.

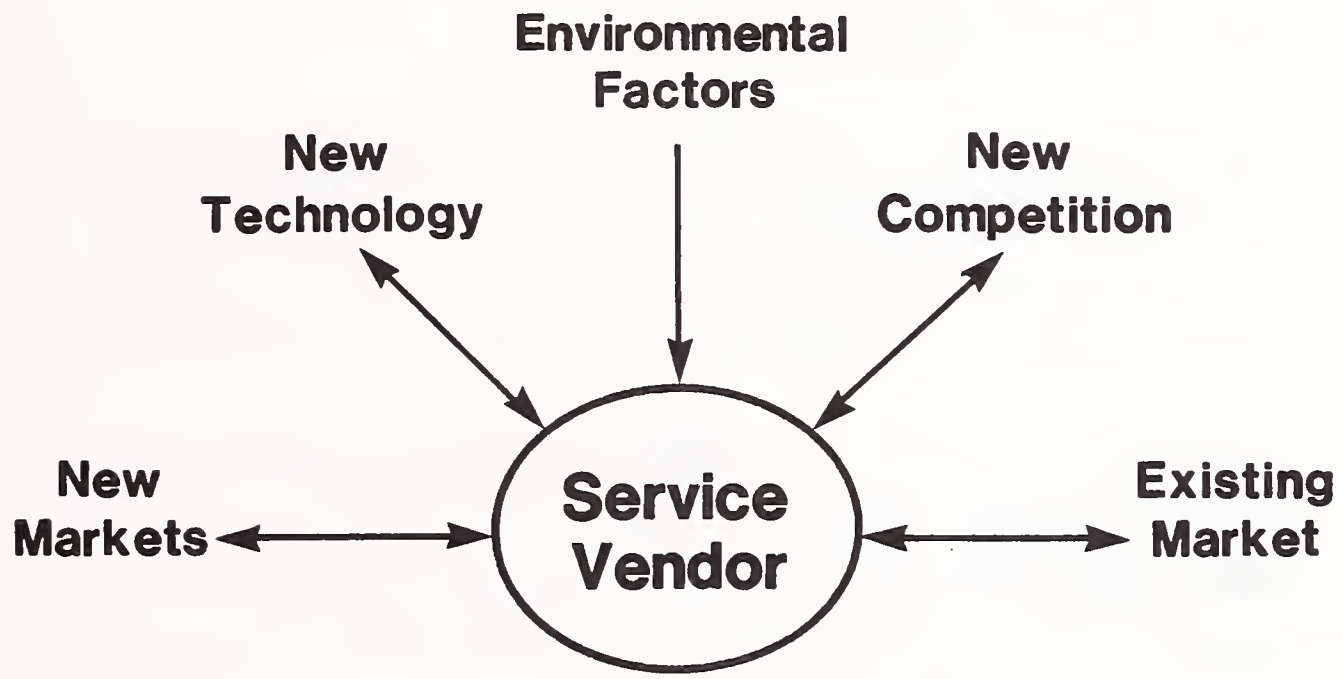
- By maintaining a market orientation, the service vendor is continually aware of new forces that may affect existing markets (such as remote diagnostics) or open up new markets (such as third-party maintenance).

- This approach encourages service vendors to design services which they are realistically able to provide but are also targeted toward the highest possible sales and profitability.

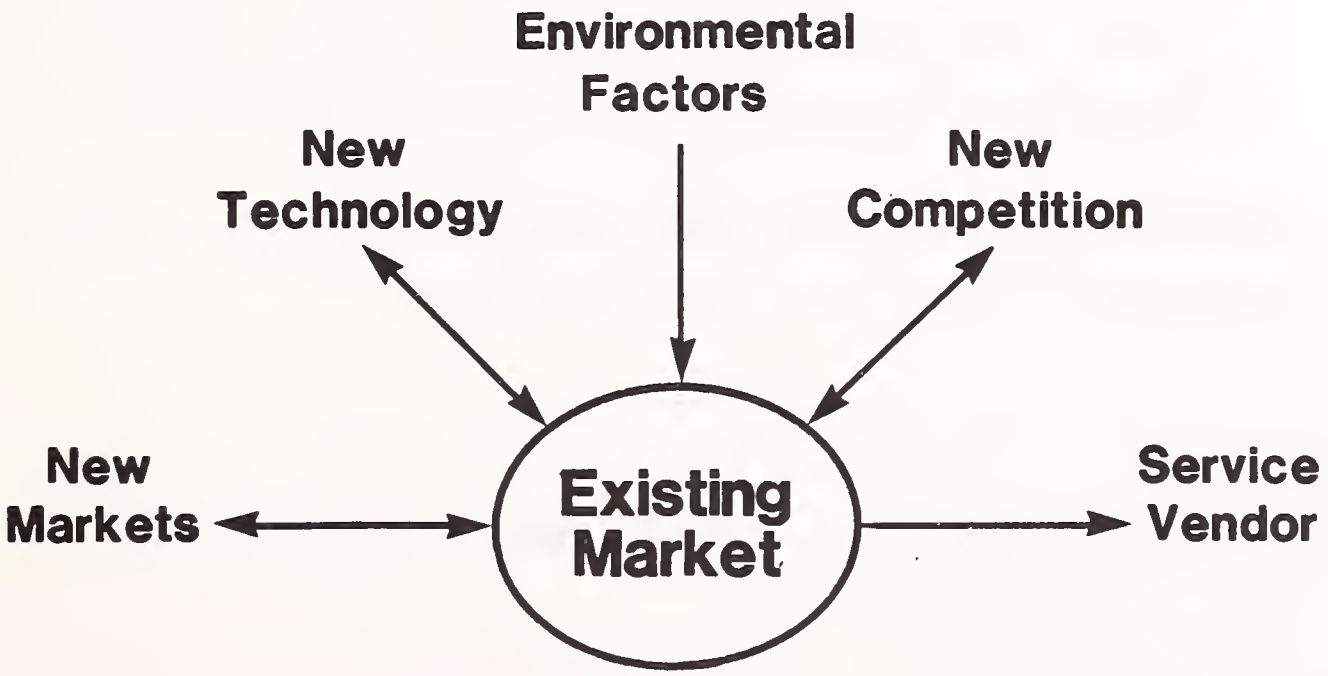
EXHIBIT II-4

SERVICE MARKETING VERSUS PRODUCT ORIENTATION

Market Orientation



Product Orientation



E. DEVELOPMENT OF A CUSTOMER SERVICE MARKETING PLAN

- The adoption of a marketing approach is founded on the application of seven basic activities, which are listed in Exhibit II-5.

- Fundamental to all service marketing is the need to establish realistic goals and objectives, such as increased penetration in existing service markets or new market development.

- Once service goals are established, the vendor should research the market, identify and analyze opportunities, and target particular market segments. All of these preliminary activities should be analyzed from a marketing perspective to ensure a well-rounded rather than a product-dominated plan.

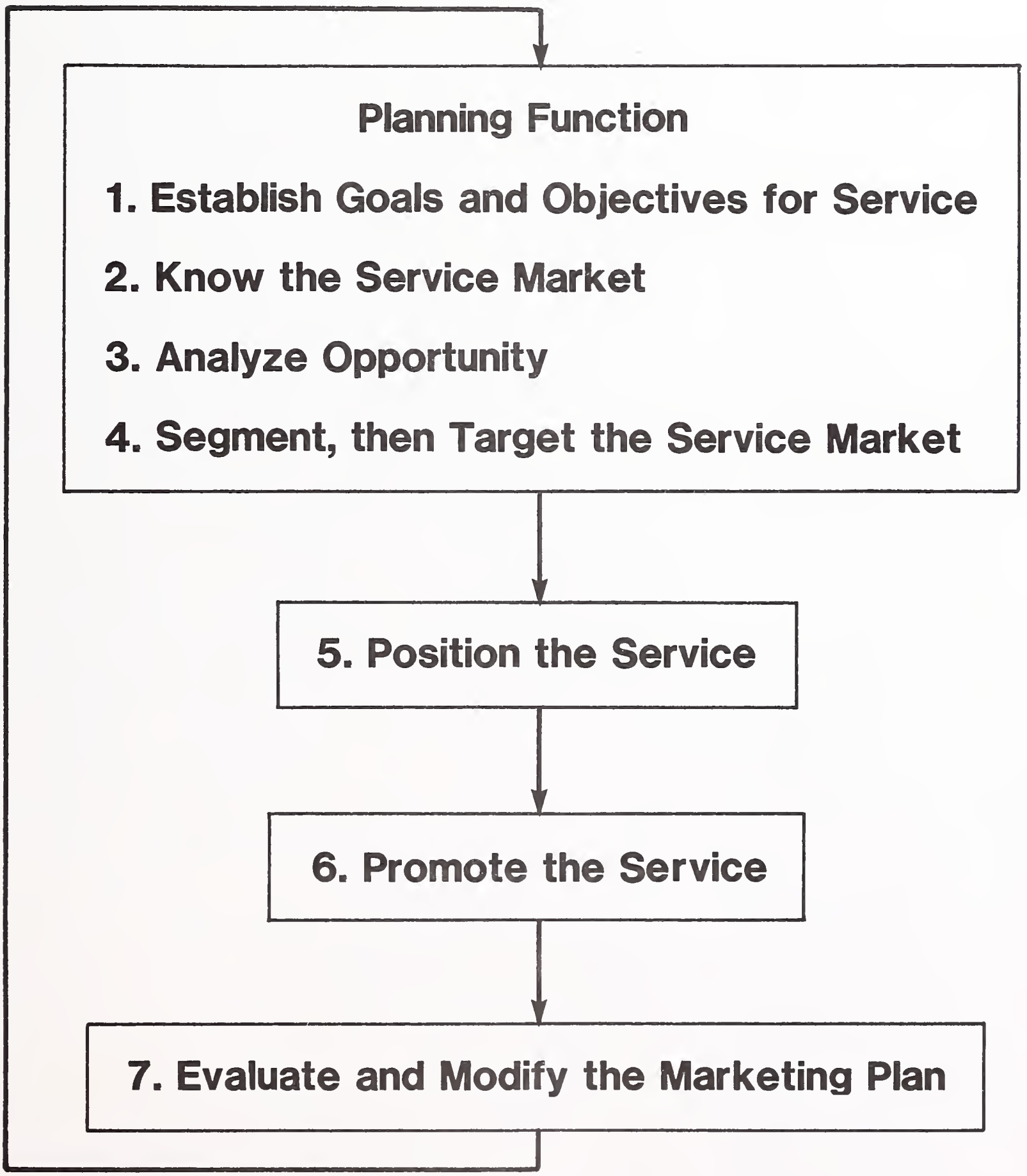
- The position, or the way in which the service will be presented to the user, must be carefully considered. Many vendors have experienced unnecessary user resistance to new services such as remote diagnostics and centralized dispatch because the service was positioned poorly. Service product positioning must consider competition, user requirements, price, and size of the market; these are the most important considerations in positioning new services.

- Service promotion is currently one of the most neglected areas in the service market environment. Telephone marketing and direct mail are becoming increasingly important components of the marketing process as service departments take a more active role in sales and marketing of service.

- Evaluation and control constitute the seventh vital stage in marketing and are necessary to "fine-tune" the marketing program.

EXHIBIT II-5

DEVELOPMENT OF A CUSTOMER SERVICE MARKETING PLAN



III SMALL-SYSTEM VENDOR PROFILES

III SMALL-SYSTEM VENDOR PROFILES

A. DATA GENERAL

- Data General has struggled in the last few years: total revenue growth rates fell from 29% in 1980 to 3% in 1983. Net income fell from over $54 million in 1980 to just $23 million for fiscal 1983.

- The company's uninspiring financial results were caused in large part by capital requirements resulting from a major transition in Data General's marketing philosophy. In 1980, the company began moving away from what was termed "a narrow market sector" and toward the "broad spectrum" of the data processing market.

- Data General has committed substantial financial resources in order to access these new markets. New products resulting from this plan include:

  - Eclipse MV/10000, Data General's top-of-the-line, high-performance (2.5 MIPS) 32-bit supermini costing between $150,000 and $700,000.

  - Eclipse MV/4000, a new low-end 32-bit machine costing between $25,000 and $80,000.

  - Eclipse MV/8000 (II and C), two new mid-range minis with substantially greater main memory capacity (up to 12MB) than the MV/4000.

- Desktop generation line of personal computer, ranging from the low-end Model 10 ($5,000, 128K memory) to the minicomputer-like Model 30 ($17,000, 256K-1.5M memory).

- INPUT believes that, as Exhibit III-1 demonstrates, Data General's new market strategy and line of products will be successful. Estimated 1984 revenue is $970 million, a 17% increase over 1983 revenue.

- Field service has been a major contributor to Data General's bottom-line growth. Service revenues increased from $126 million in 1981 to nearly $250 million (INPUT estimate) in 1984--an almost 100% increase in just four years. In addition, field service revenues are growing as a percentage of total revenues, from 17% in 1981 to an estimated 26% in 1984.

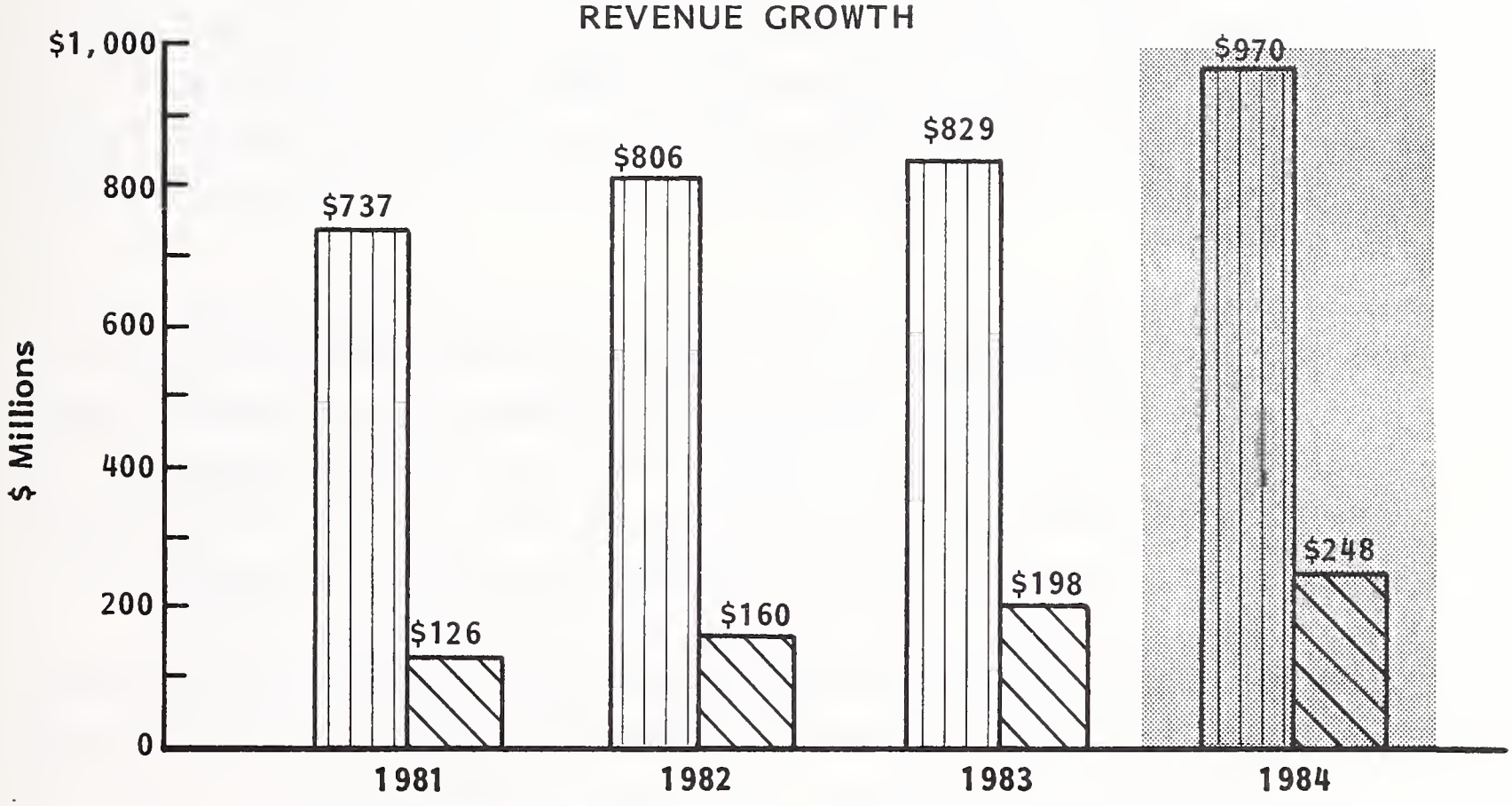
- Field service managers at Data General attribute the increase in service revenues to a number of factors, one of the most important of which is increased efficiency within the service group. Paul Phaneuf, director of marketing and business planning for Data General's customer services organization, has indicated that the financial drain in setting up a service network has been virtually eliminated and the company can use service revenue for improving and streamlining the organization.

- Data General, like many service vendors, has found that use of remote diagnostics is one of the most efficient streamlining methods. Data General currently offers remote support on the MV/10000, MV/4000, and MV/8000. The company tries to encourage selection of this service by offering a 5% discount on monthly maintenance when remote support is in use. Data General indicated that greater efficiency results from a reduction in call-backs and increased preparation (primarily with regard to parts) before the FE travels on-site.

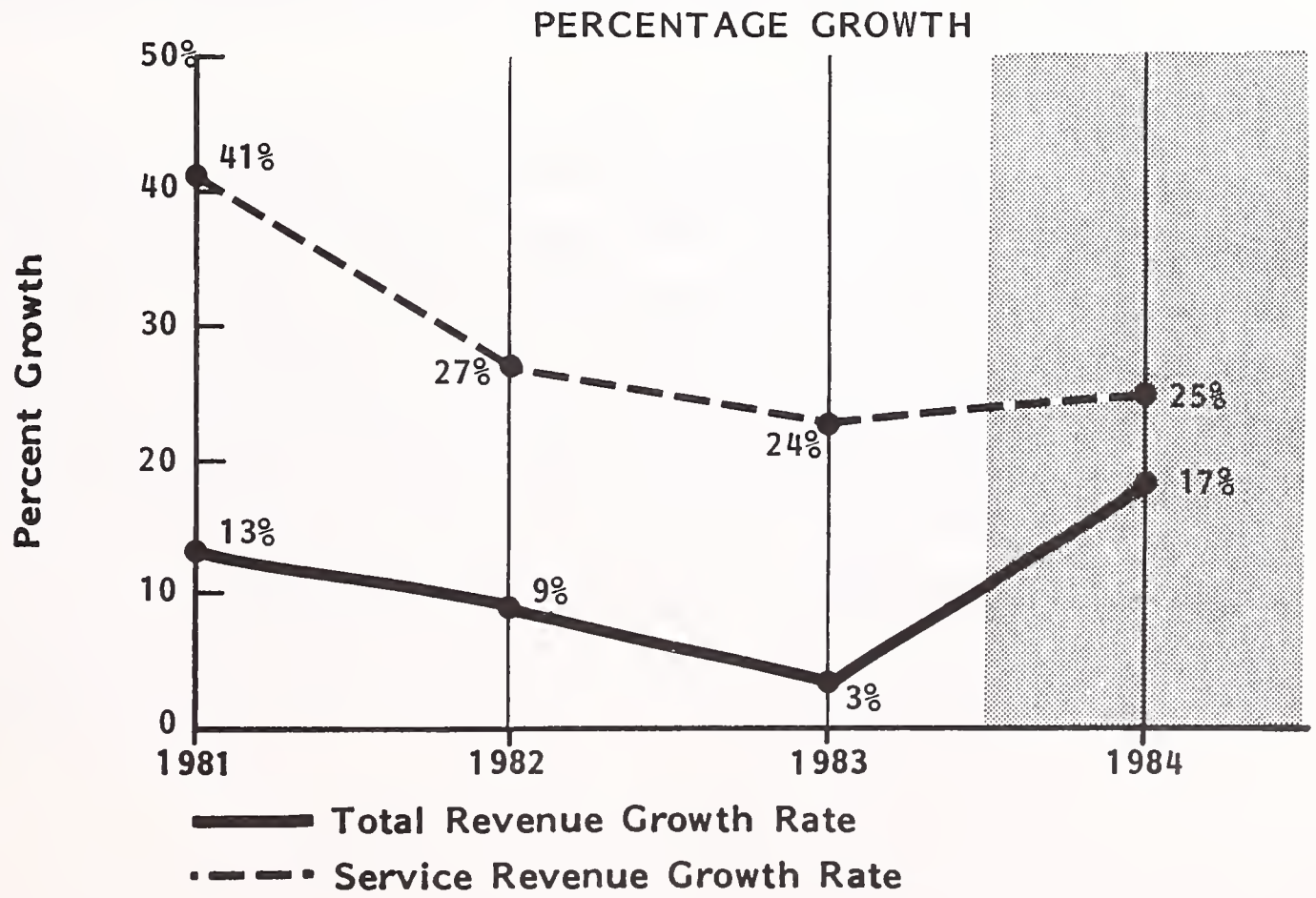
EXHIBIT III-1

DATA GENERAL

REVENUE GROWTH



PERCENTAGE GROWTH



- One of the most important benefits of remote support, according to Data General officials, is that it reduces the labor factor of the typical field service call. As more and more users employ remote support, demand for on-site service and service personnel has been reduced. Data General's total field force has now stabilized (at about 3,350 total staff) after a growth rate in the early 1980s of 20%, and the number of system engineers actually dropped by 13% in 1983 primarily as a result of centralizing remote support facilities.

- Software support has been one of the prime beneficiaries of the growth in remote service. Data General has established a remote software support center in Atlanta that is available through a toll-free telephone service. The company offers remote patches and a data base describing a variety of software purchases as part of the "Software Product Service Agreement."

- Because of the technical orientation of its users, Data General expects a great deal of user involvement in software support. At the PC level, Data General has an "Application Help Line" to assist inexperienced users with application programs that the company has licensed or sponsored. They will not service nonlicensed software. (Approximately 50 independent software firms are currently participating in Data General's Independent Software Vendor program.)

- Replacement of failed parts rather than in-the-field repair continues to be Data General's policy. This policy requires a substantial parts investment since most branch service locations will be forced to maintain inventories (Data General currently has over 100 branch locations). In 1983, the company stocked $60 million in spare parts, an increase of 117% over 1980. It should be noted, however, that inventories have not grown as fast as the customer base. Yet inventory turnover has improved in the last year--a clear indication of improved efficiency within the logistics operation.

- Data General offers two guaranteed uptime options, called "Maximum Uptime Service," which provide for 96% or 99% guaranteed availability. Field service representatives have confirmed that guarantees are important primarily in the pre-sale environment. Customers may not choose to select the guarantees, but they believe it indicates a commitment on the part of the company. Data General's experience in this area is similar to that of most other small-system vendors.

- Sales of supplies and other "consumables" have increased substantially since Data General began its aggressive use of telemarketing. The supplies service, called Data General Direct, offers a wide variety of supplies, furniture, and some equipment.

- Company officials have indicated that, although there is a demand for mail order supplies and equipment, the customers tend to be very price sensitive. This requires constant attention to both prices and service in order to maintain an active customer base.

B. DATAPOINT CORPORATION

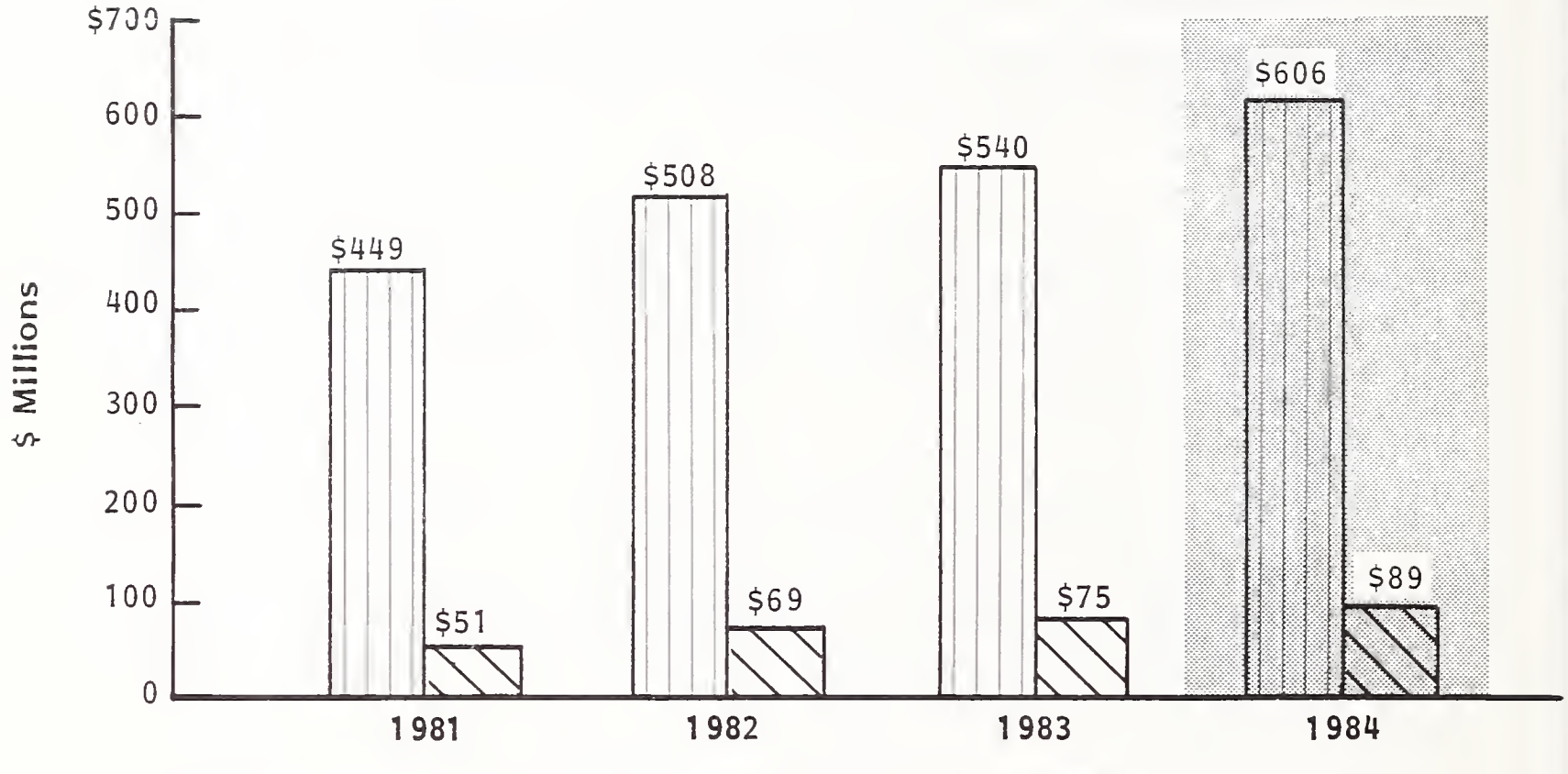
- Datapoint reported $540 million in total revenues for fiscal 1983--a disappointing 6% increase over 1982. However, the company was profitable, posting earnings of over $13 million in 1983, compared with a loss of almost $8 million in 1982. Revenues for fiscal 1984 (ending in July) are very promising and indicate a continuation of the turnaround begun in 1983. Revenues for the third quarter (ending in April 1984) reached a record $155 million and were almost 14% above the comparable period in 1983.

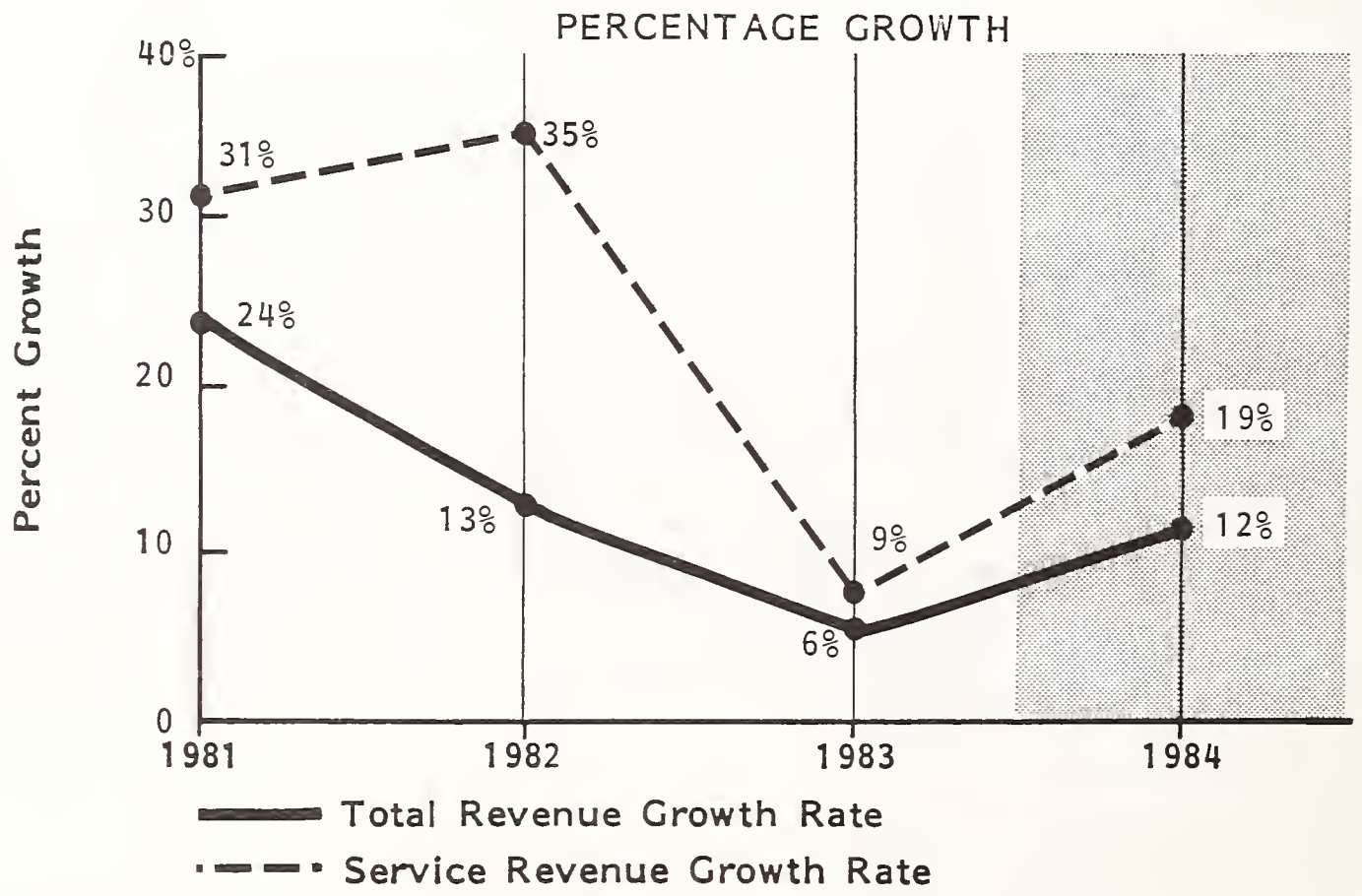
- As Exhibit III-2 indicates, INPUT projects a healthy growth in both total revenues and field service revenue for 1984. Datapoint field service revenue has been resistant, but not immune, to the company's financial plight. The

EXHIBIT III-2

DATAPOINT

REVENUE GROWTH





growth rate for field service revenue fell sharply (along with total revenues) in 1983, but INPUT projects an above-average recovery in 1984, fueled by the large installed base and the expected introduction of new products.

- The company suffered a self-inflicted wound as a result of a Securities and Exchange Commission lawsuit accusing Datapoint of overstating revenue and net income in 1981. Although the company did not admit to any wrongdoing, the resulting inquiry led to an executive shakeup and a decline in investor confidence.

- Datapoint, best known for its ARC (Attached Resource Computer) and RMS (Resource Management System) networks, went for almost a year before introducing a variety of office automation products in June of 1984. New products include the company's first personal computer (a private-label version of Convergent Technologies's 16-bit N-Gen system), as well as new hardware designed to allow direct integration of the IBM PC into the ARCnet system.

- The new product announcements signal two trends that will directly affect field service at Datapoint:

  - An increasing emphasis in the office automation environment.

  - A move away from technology development and toward a strategy of reselling other vendors' equipment.

- With 230 service centers in the U.S. (40 of which are extended coverage centers), Datapoint is well positioned to service new products and increase service revenue significantly. INPUT estimates that service revenue has increased from 11.4% of total revenue in 1981 to a projected 14.7% in 1984.

- Basic Datapoint service begins with an advanced centralized/automated dispatching system based in Texas. Toll-free calls are immediately routed to

the company's customer support center and assigned to FEs who are contacted through a national communications system. A variety of response times is available to Datapoint users, including a two-hour response time that requires a 20% "Priority Response" premium.

- Time and material (T&M) rates for noncontract customers are $75/hour (basic), $90/hour (overtime), and $120/hour (holiday). Response time is significantly slower for noncontract customers.

- Like many small-system vendors, Datapoint has established a marketing section for supplies and accessories. Customers can call the toll-free customer support center number and receive catalogs or order supplies directly. The company reports that 80% of all orders are shipped the next business day. Emergency orders are shipped the same day with a 10% handling fee charged.

C. DIGITAL EQUIPMENT CORPORATION

- DEC performance in 1983 must have been a disappointment to both stockholders and managers. The company's growth rate continued to slide--total revenue was only 10% higher in 1983 than in 1982, considerably lower than the 35% growth rate the company experienced from 1980 to 1981.

- Overall revenue for fiscal 1983 (ending in June 1983) was just over $4 billion--enough to maintain DEC's number-two position in the industry, but not by a wide margin. Although the company's small-system base is secure for now, revenues were hurt by a variety of factors. Several new products, such as the Venus mainframe, fell behind production schedule at a time when customers had become increasingly concerned about a replacement for the aging VAX superminicomputer.

- Revenue problems also developed at the other end of the product line--with the microcomputer. Sales of micros have been poor and the company has been criticized for its multisystem marketing approach. By introducing three separate microcomputer systems (the Rainbow 100, Decmate II, and Professional 300), the company appeared to be unfocused and unsure of which market segment to target.

- Fiscal 1984 revenue figures have been much more promising than those of 1983. Revenues for the second quarter of 1984 (ending December 1983) were up 40% over the same period in fiscal 1983, and third-quarter revenues were up 31%. Fourth-quarter revenues were not available at time of printing, but INPUT estimates fiscal 1984 revenue at $5.4 billion, an increase of 26% over 1983.

- Exhibit III-3 shows both total revenue and field service revenue growth from 1981 to present.

- Field service revenue was instrumental in improving bottom-line growth, mainly because it was resistant to the recessionary trends that hurt sales and overall revenues. Although the overall service revenue growth rate has fallen slightly, it is still growing as a percentage of total revenue. INPUT estimates that field service revenue grew by 29% in 1983 and by 30% in 1984 and now represents over 25% of the company's total revenue.

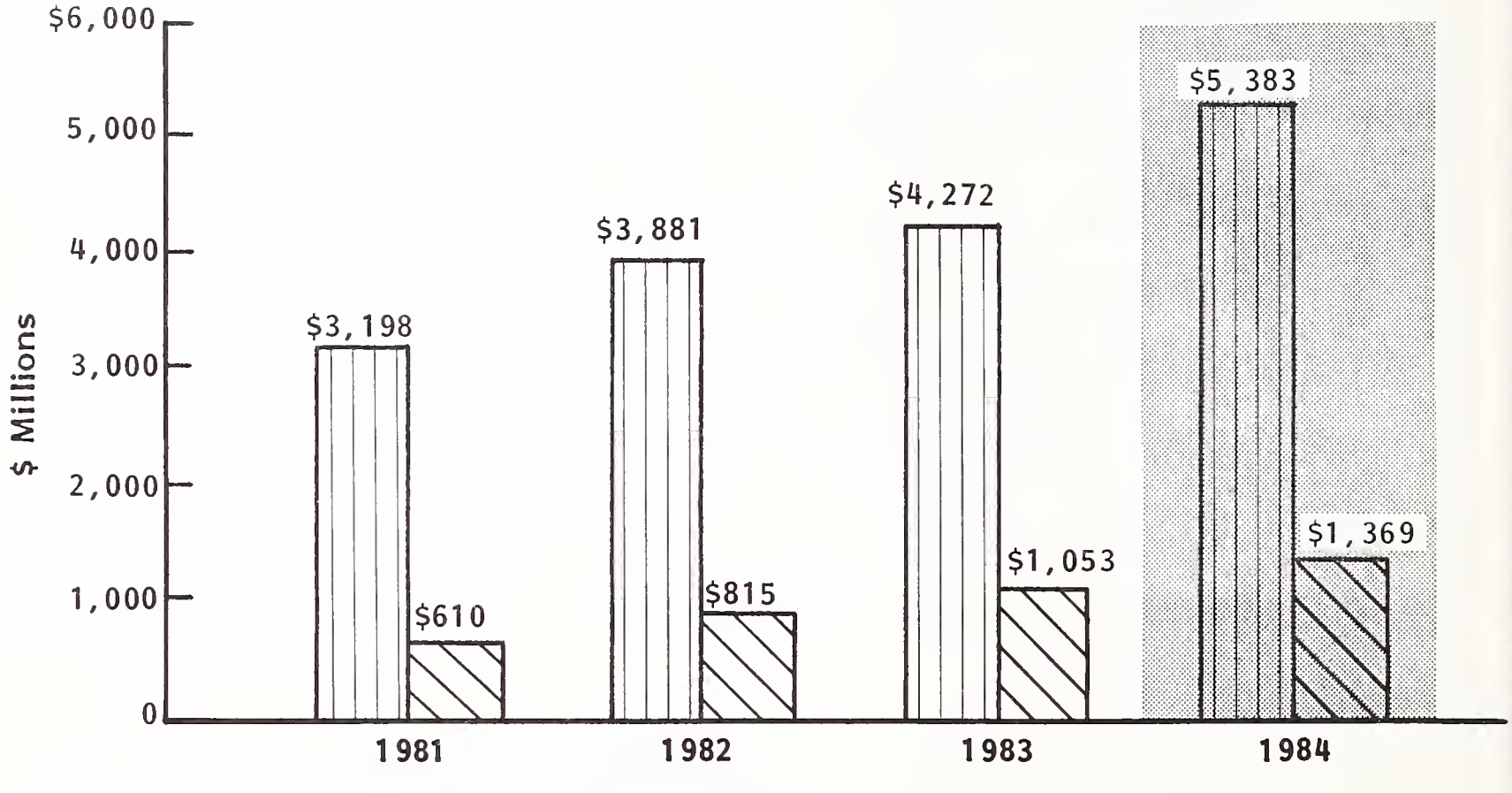
- Over 60% of DEC's field service revenue was derived from U.S. sources, and the remainder was derived from foreign sources.

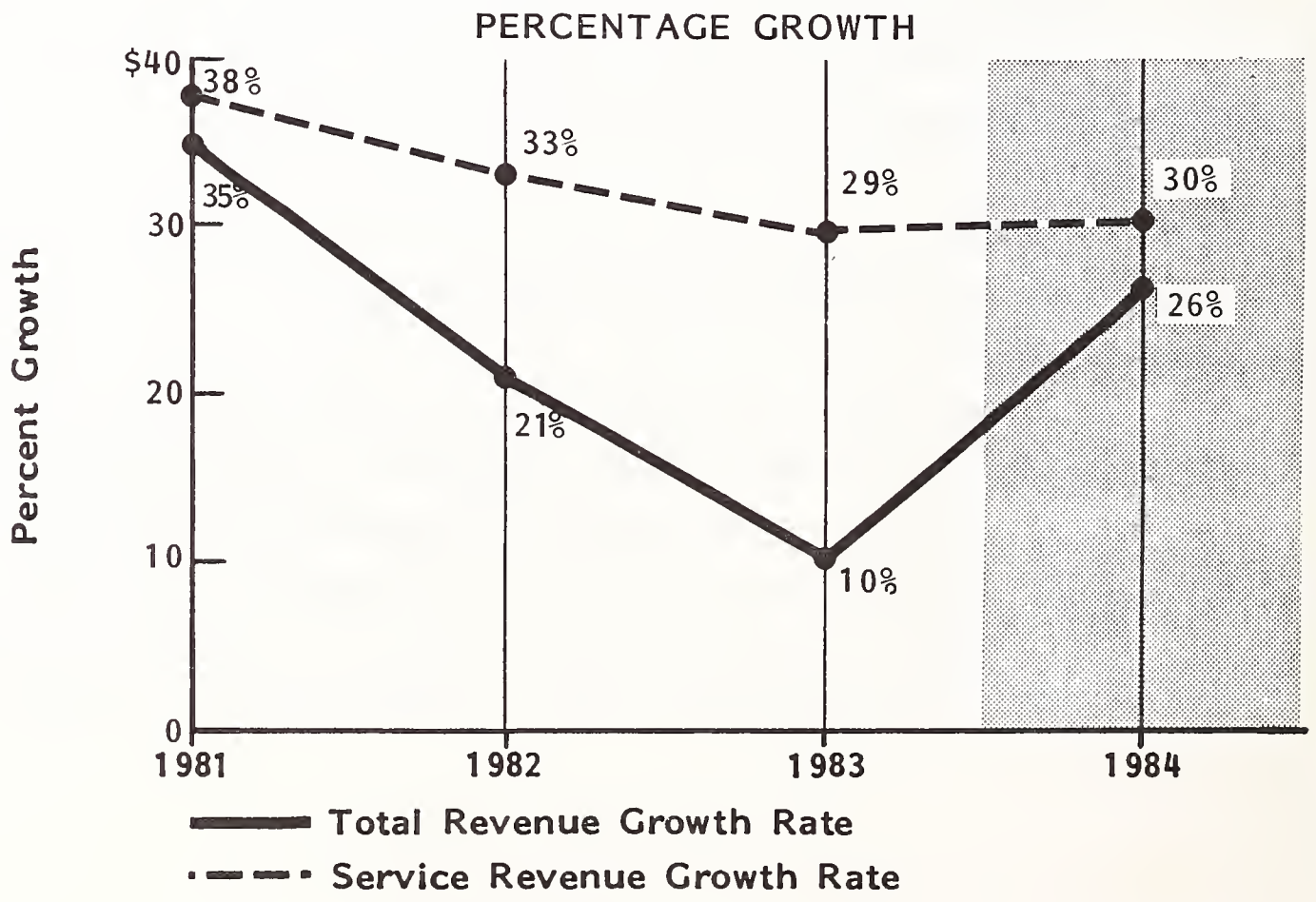
- DEC has been extremely aggressive--and successful--in marketing new services to both current and new customers. An example of services provided to new markets is the company's Records Management Service (RMS). This new service is currently being tested in Boston, Los Angeles, and Chicago and is designed to provide off-site storage of a variety of magnetics, photographic, and hard copy media. The RMS program is based on an internal

EXHIBIT III-3

DEC

REVENUE GROWTH





storage program and may be extended to include a computer disaster back-up service.

- In addition to appealing to new market segments, DEC has introduced a variety of new services to satisfy older customers. One of the most popular of these new services signifies the company's entry into the third-party maintenance (TPM) market.

- DEC has recognized the high profit potential in servicing non-DEC equipment attached to DEC CPUs. Currently, over 40% of the company's CPUs have foreign equipment attached that DEC does not service. By capturing even a portion of this market, DEC could generate millions in added service revenues.

- Two TPM plans are currently offered by DEC: (1) an OEM service agreement (under which DEC provides service to an OEM that may purchase hardware from another vendor), and (2) a vendor service agreement (under which DEC is promoted by peripheral vendors as their source of services). Nearly 100 products are now serviced by DEC under this pilot program begun in the fall of 1983.

- The DECdirect and DECmailer--two successful and innovative programs introduced late in 1983 and early in 1984--were designed to speed parts and supplies to users. DECdirect allows customers to order everything from 5-1/4-inch diskettes to computer furniture. The company has an almost "retail" attitude about supplies as evidenced by its advertising brochures, catalogs, and charge accounts (Digital Accounts).

- DECmailer is a mail-in parts service for users who do their own maintenance. The company keeps over 1,100 parts subassemblies in stock which are usually shipped within one working week but can be ordered on an emergency basis.

- The DECmailer is important because it is an integral component of DEC's advanced user self-maintenance program. In addition to supplying parts, DEC will provide the user with a full complement of self-maintenance support, including documentation, maintenance aids, and training.

- It is obvious that the importance of service is on the rise at DEC. Not only are revenues increasing, but the field service division is being given an increasing amount of responsibility and flexibility within the company. Given the company's huge installed base and the recent success field service has had in marketing new maintenance products, overall lack of growth in 1983 may have been a blessing in disguise because it emphasized the ongoing value of service even during recessionary and transition periods.

D. HONEYWELL INFORMATION SYSTEMS (HIS)

- The Information Systems division generated about 29% of Honeywell's total revenues in 1983, helping the company to an overall increase of 5% on total revenue. HIS is still recovering from a disastrous period in 1981-82 when more than 2,500 employees were laid off and extensive cost-cutting measures were instituted.

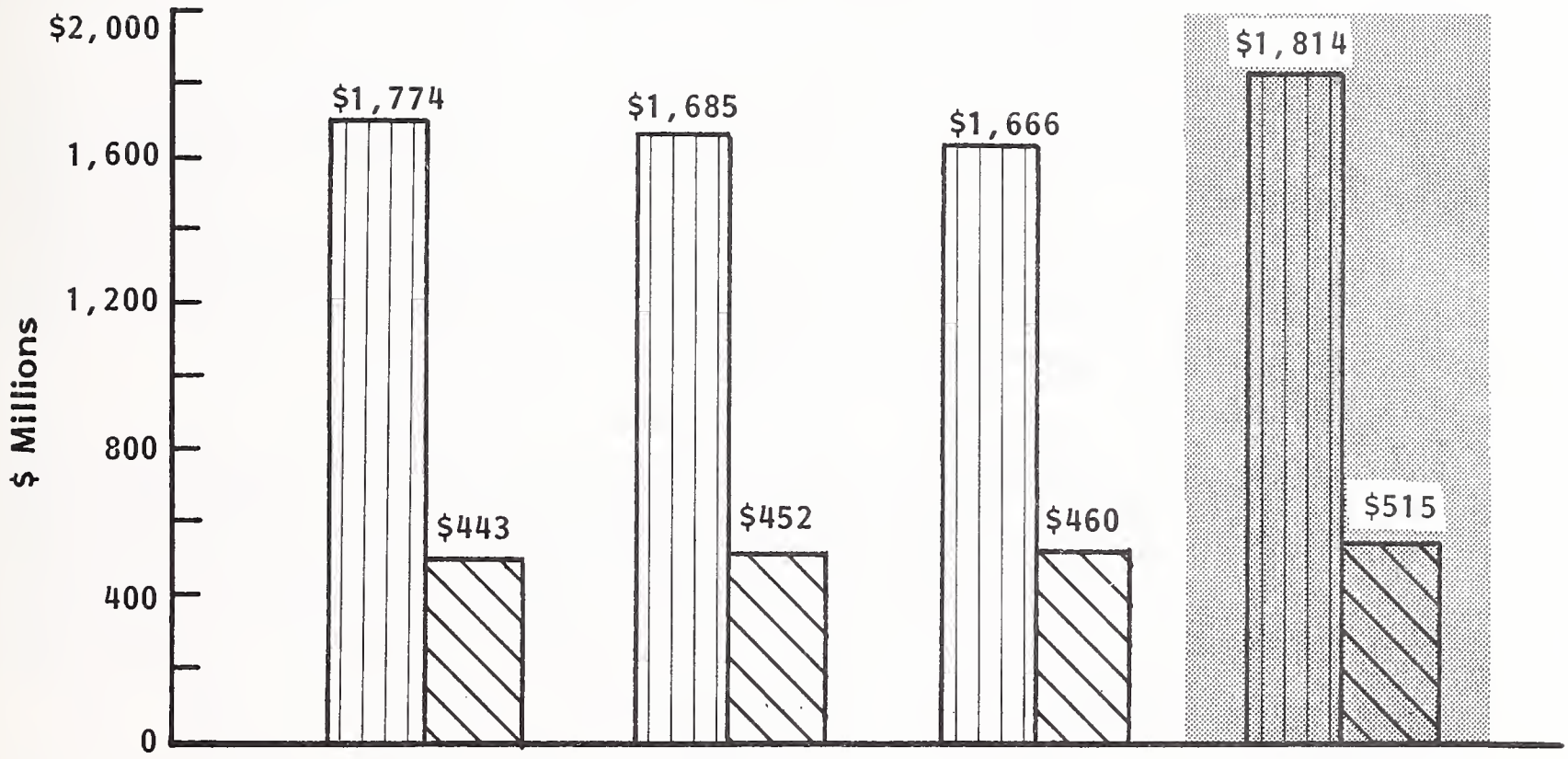
- HIS financial results for 1983 and 1984 (partial) have been encouraging to company officials. Although overall revenues for the division declined slightly (by 1%, to $1.7 billion) in 1983, as shown in Exhibit III-4, net profit increased by 64% to $131 million.

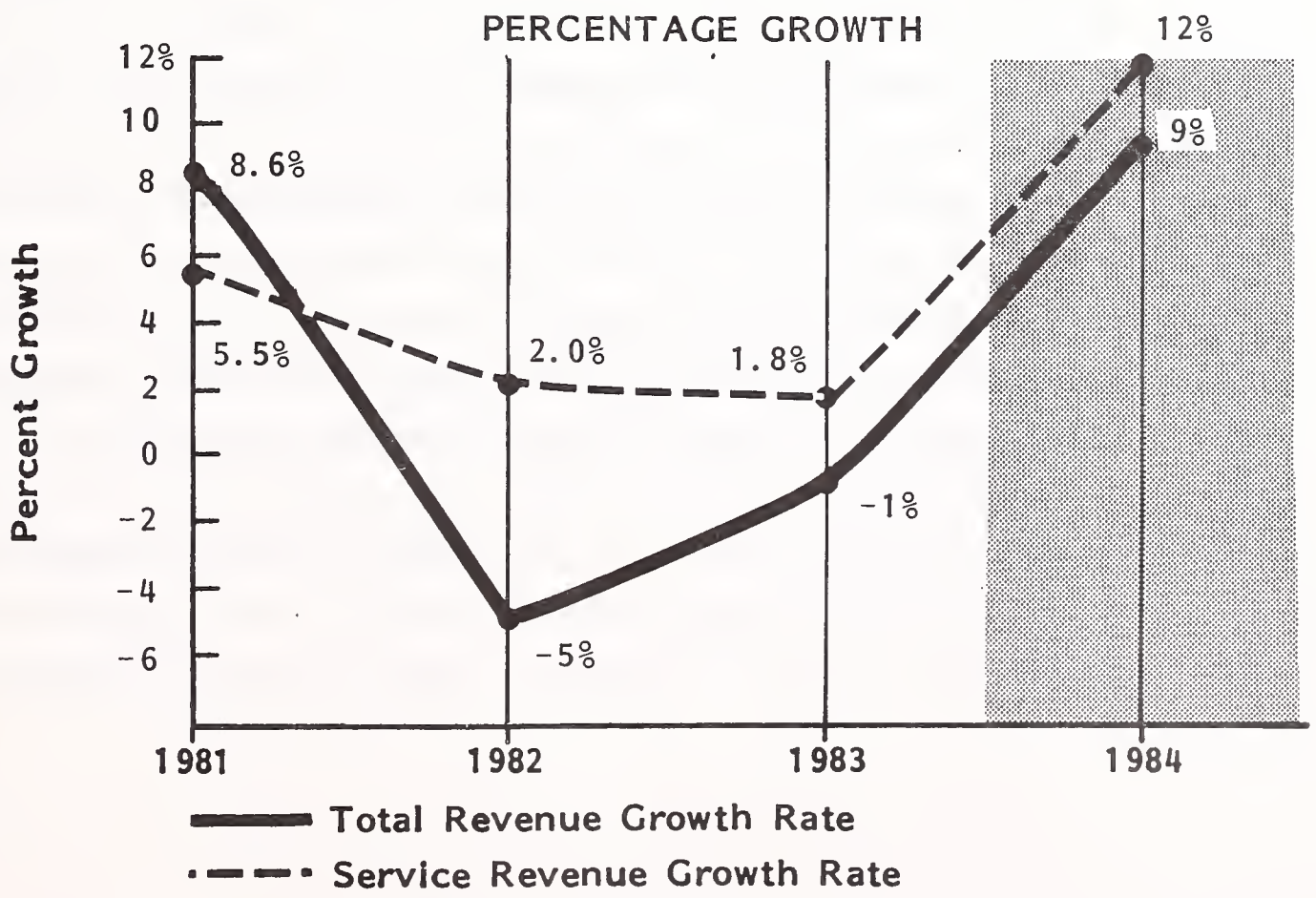
- The Customer Service division within HIS has been a major contributor to the company's overall growth, supplying $460 million in 1983, 28% of the Information System division's total revenue. INPUT estimates that the Customer Service growth rate was 1.8% between 1982 and 1983.

EXHIBIT III-4

HONEYWELL INFORMATION SYSTEMS

REVENUE GROWTH





- The Customer Service division of 1983 is a leaner, more centralized organization. Today, HIS has about 4,000 service and support personnel in the U.S., the same number as in 1980, but these personnel work much more closely with central Technical Assistance Centers (TACs) for small systems such as the DPS6 and Level 62.

- Technical Assistance Centers are located in Massachusetts, Arizona, and Georgia and provide extensive remote support services. In addition, users have the convenience of calling one central support number when problems do arise. The extent to which Honeywell involves the user in both initiation and ongoing use of remote support is unique.

- Control of spare parts is another area that has benefited from reorganization and centralization. The company has advertised that it has "over 1,000 points of supply for parts"--a sales dream, but a logistics nightmare. In order to control this vast network, Honeywell introduced the Logistics Inventory Data System (LIDS).

- The overall organization of LIDS includes two central parts depots (in Texas and Massachusetts), 80 regional depots, local office parts supplies, and Customer Service Vehicle program supplies. LIDS manages all of these stocking points and allows the vendor to set a goal of parts delivery within four hours, considerably better than most other small-system vendors.

- As noted above, Honeywell has made a significant commitment to user self-maintenance and the Customer Service Vehicle program has been instrumental to success in this area. The company maintains truck-vans (fully stocked with spare parts) in high-density metropolitan areas. These vans can provide the user with extremely rapid access to commonly needed parts.

- Working in concert with the Customer Service Vehicle program is an extensive network of service depots developed by HIS. The company has 250 service locations in the U.S., two-thirds of which provide full customer support. In

addition, Honeywell plans to open as many as 25 walk-in service centers geared primarily to microcomputer service and supplies sales trade.

- The company has recognized that many customers, particularly corporate clients, may be reluctant to use depot service. Consequently, Honeywell has established a variety of parts exchange and delivery/pickup programs to assist customers who wish to provide at least some of their own maintenance.

- Perhaps the most significant service development at Honeywell in the last year is the introduction of the company's new Total Care Third-Party Service (TPS). Under this plan, Honeywell has agreed to provide nationwide service for a select group of microcomputer, workstation, and printer manufacturers. Third-party maintenance agreements have been announced with Zentec, Formative Technologies, Racal-Redac, Coleco, Printronix, and Pencept. Additional contracts are currently under negotiation.

- One of the primary reasons Honeywell entered the third-party maintenance market was to utilize its current field engineering staff more efficiently. Increased machine reliability had reduced the requirement for field service staff, and company officials reasoned that TPM would increase the shrinking workload.

- A second reason that Honeywell entered the TPM market is that there is a demand for this type of service, particularly among peripheral manufacturers that are too small to provide a national service network for their equipment.

- Like most other small-system vendors offering third-party maintenance services, Honeywell is concentrating primarily on "complementary" products (i.e., products not in direct competition with Honeywell products). In this way, the company hopes to avoid spare parts and training problems that have or could beset other TPM vendors.

E. INTERNATIONAL BUSINESS MACHINES

- Once again, IBM reported record net income and total revenues, and the company appears to be asserting itself throughout the major market sectors including the small-system market. Total revenues for 1983 were more than $40 billion, an increase of almost 20% over 1982 revenues. Net income in 1983 ($5.5 billion) was greater than any other computer vendor's total revenue. Net income grew by 24% in 1983. The company has continued to surge ahead in 1984--first-half earnings were 20% higher than in 1983. Total revenues for the first six months increased 22% to $2.83 billion.

- INPUT estimates IBM's 1983 small-system revenue at $2.5 billion. (IBM does not break out small-system revenues in its financial reports.) Growth in the small-system market was promoted by the introduction of several new products.

  - System/36, IBM's long-awaited System/34 replacement, was introduced in the spring of 1983. The machine is so popular that in July 1984, IBM reported a ten-month delivery delay.

  - System/38 Model 6, introduced early in 1984, is a 32-bit minicomputer that replaces several older versions of the System/38. The 38 model line is expected to be expanded again in the summer/fall of 1984.

  - 8150 Models A and B are upgrades to the popular 8100 distributed processing system now available with up to 3MB of main memory.

  - Series/1 offers up to 20% greater performance with an expanded main memory of up to one-million characters.

- The company also introduced a variety of new products in the microcomputer line (PC AT, PC-XT, 3270-XT, and PC-XT/370) as well as in the mainframe

line (upgrades to the 4300 series and the "X" model of the 3080 series) both of which "squeezed" the small-system market.

- IBM's field service operations are divided into two separate divisions: Field Engineering and Customer Services. Field Engineering is part of the Information Systems Group and services primarily large and intermediate systems (down to and including the 4300 series). Customer Service supports small systems, office products, and telecommunication devices. Each division is semi-autonomous, although they do share some administrative functions.

- The Customer Service division is divided domestically with numerous regions and has 160 branch offices. The Field Service division is similarly divided and has 180 branch offices. Overall, the two divisions have 23,000 engineers among the total of 35,000 service personnel.

- Service revenues, which are not broken out by division, are shown in Exhibit III-5. In 1983 service revenue increased by 14% to $7.3 billion. INPUT projects a 27% increase in service revenues (to $9.2 billion) in 1984 as a result of increased efficiency in the service divisions (e.g., parts distribution and remote support) as well as an increased customer base. Service revenue as a percentage of total revenue should remain constant at 18-19%.

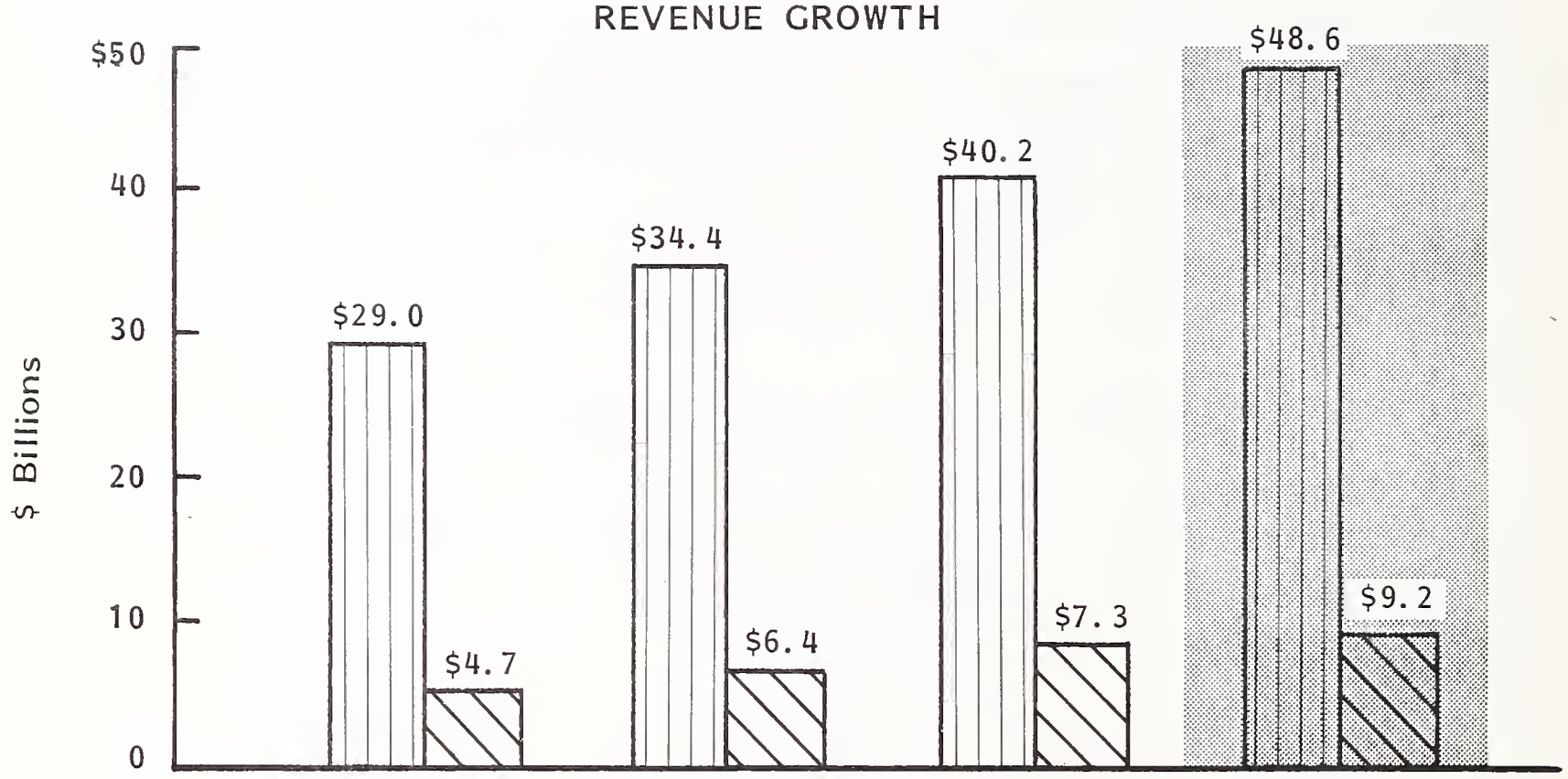
- Because IBM is such a dominant force in the market, many observers attribute the company's success simply to economies of scale. IBM is criticized as not being technically innovative but rather being motivated by marketing considerations. Although criticism may be applicable in same areas, it is certainly not true in the service environment. IBM's stated goal to become the most "efficient" vendor in the industry applies in the service environment.

  - IBM anticipated the steep increases in the cost of on-site support and designed a number of remote services to supplement and reduce on-site calls.

EXHIBIT III-5

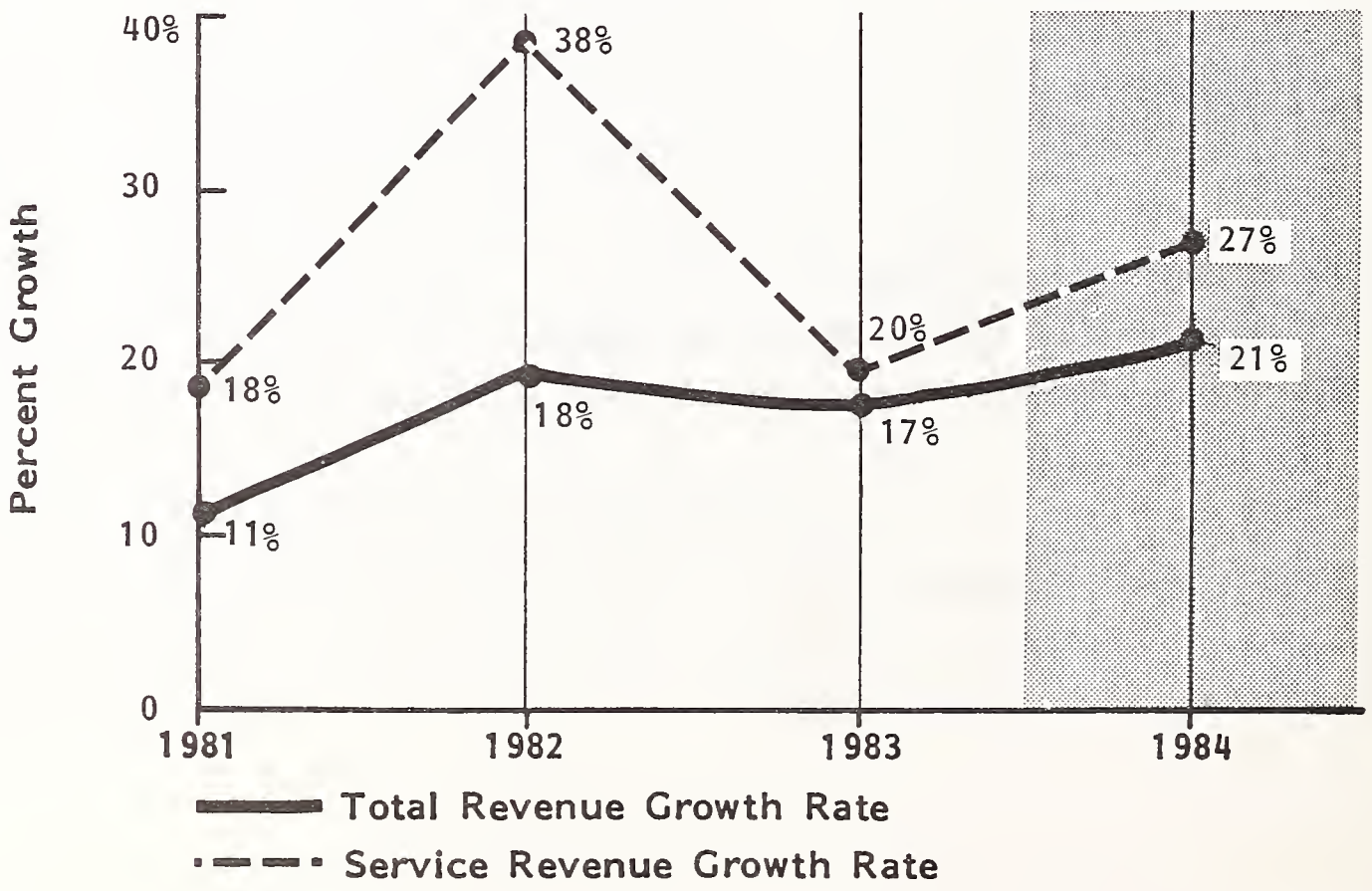
IBM

REVENUE GROWTH



Total Revenue Service Revenue INPUT Estimate

PERCENTAGE GROWTH



- A sophisticated digital communications system has been developed by IBM in order to improve response time and reduce paperwork. Although the system currently is restricted to the large-system environment, INPUT expects the technology to be transferred to the small-system environment within the next 12-18 months.

- The company has established an extremely efficient parts distribution network with one central depot, 21 regional distribution centers, and hundreds of branch office stocking points. INPUT interviewed small-system users of IBM equipment who expressed an overwhelming approval of this distribution system.

- IBM has been particularly successful and innovative in software support. IBM small-system users report that software problems are solved in an average of 22 hours (including both response and repair time). This is less than half the industry average.

- Improved software support is the result of several factors:

  - The company was one of the first to recognize the need for remote, as opposed to on-site, software service. Currently, IBM reports that almost 90% of software service calls for mid-range systems are solved over the telephone.

  - IBM expects a good deal of small-system user involvement in the software support process. The company claims this has improved both response and repair time for software problems.

  - A central "hot line" for software support increases the ease and efficiency of direct problem calls. Although not now the case, it is likely that applications and system software support will be merged in the future.

- It appears unlikely that IBM will venture into the third-party maintenance market for small systems. Currently and in the past, the company has leveraged sales by promoting its excellent service capabilities. Users were often willing to pay considerable premiums to maintain a complete "IBM environment." It is unlikely that IBM will change this policy unless its user base is seriously threatened. The vast array of new products in the small system environment, and anticipated announcements in new areas such as LANs, preclude any outside threat to the company's customer base. As before, IBM's main competition comes from . . . other IBM products.

- The price of IBM service will continue to decrease in absolute dollars and in relation to system performance. Maintenance prices on the IBM Series/1 Model 4955, for example, actually fell 8% between 1981 and 1984; at the same time, system performance increased substantially. INPUT expects IBM to continue to pressure small-system competition through the use of aggressive maintenance pricing.

F. PRIME COMPUTER

- Prime Computer had a respectable financial 1983, with sales of $517 million--19% better than in 1982 ($436 million). Unfortunately, although total revenues are up, net earnings fell by 27.6%, from $44.9 million in 1982 to $32.5 million in 1983.

- The earnings drain is the result of a variety of factors including inadequate cost controls and new product development. In addition, Prime is a major player in what is currently one of the most competitive computer market segments--the superminicomputer. The company must maintain its position against stiff competition from Data General's MV/10000 and DEC's soon-to-be-released supermini.

- Prime has resorted to specialization in order to effectively compete with its generally large competitors. (Data General revenues, for example, are 40% greater than Prime's, and DEC's are almost ten times greater than Prime's.) The company has focused on selected markets, such as the CAD-CAM market and interactive transaction processing. In addition, Prime has introduced a number of new products designed to compete effectively in the company's chosen market segments. Some of these products include:

  - The 9950, the latest top-of-the-line system possessing 50% greater performance than the system it replaced, the 850.

  - The 2550, an extremely powerful system aimed primarily at the office automation environment.

  - Workstations, including the microcomputer-based Producer 100, PW150, and PW200.

  - Applications software programs running on Prime systems increased 43% in 1983 (to 1,000) and were produced generally by independent software houses.

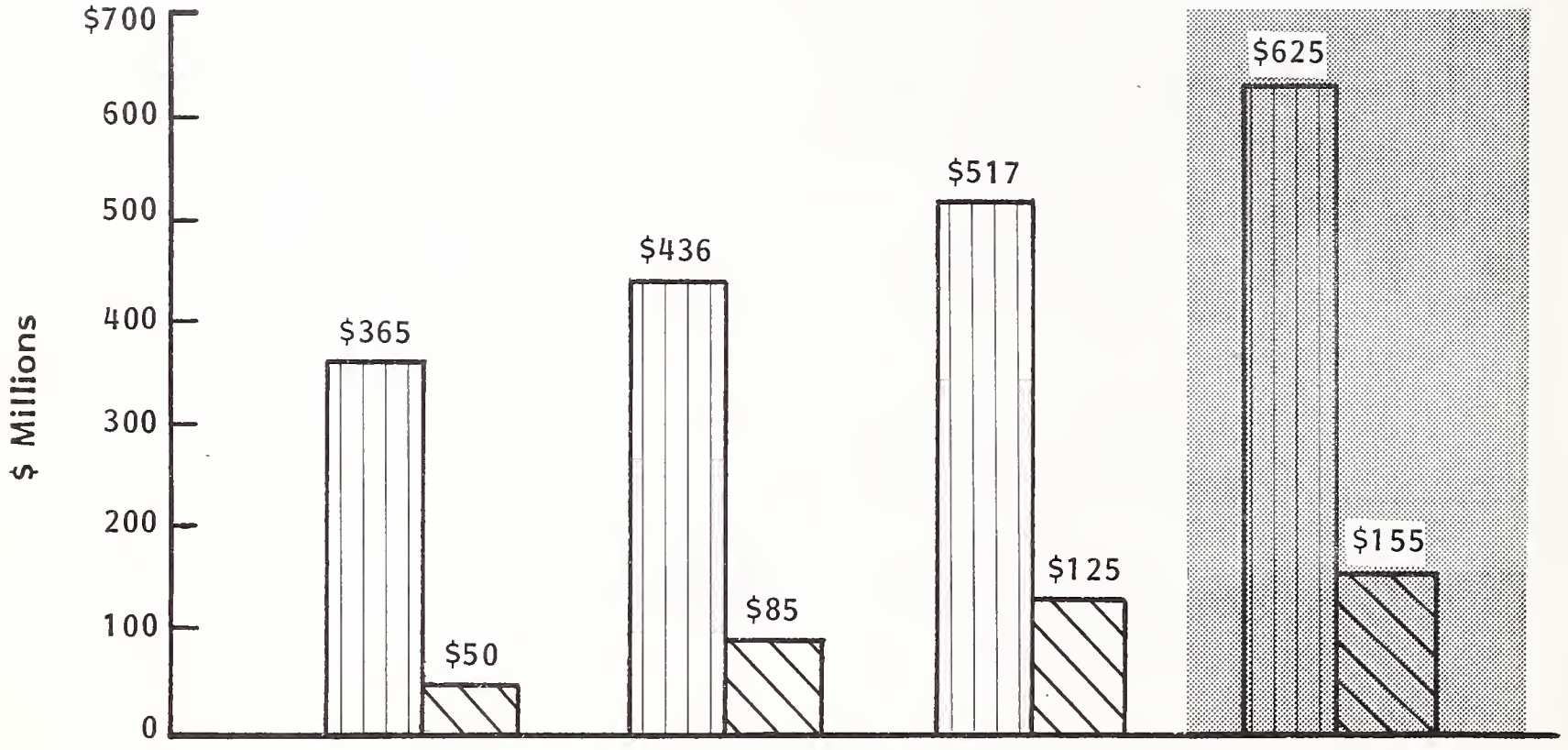
- The 9950 and 2550 have been well received; hence, INPUT projects a continued and even slightly accelerated growth at Prime in 1984, as a result of these new products and of extensive cost-cutting measures. As Exhibit III-6 shows, total revenue should increase by approximately 21% to $625 million in 1984.

- The customer services organization within Prime has been instrumental in improving the company's bottom-line growth. Service revenues have increased both in absolute numbers and as a percentage of total revenues. In 1981 service revenues accounted for just over 13% of the company's total revenues, but this figure has increased to over 24% in 1983 and will continue to increase in 1984.

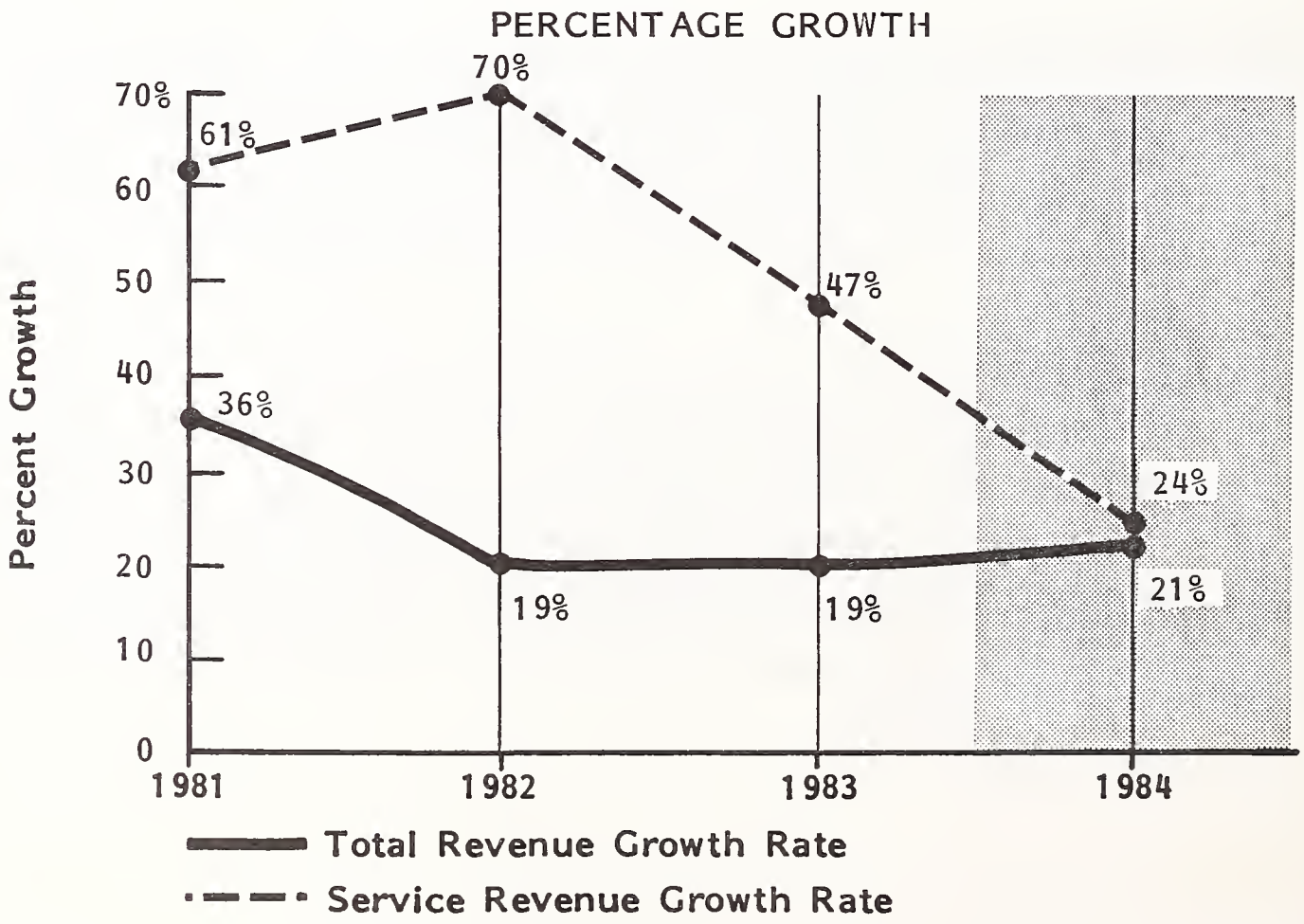
EXHIBIT III-6

PRIME

REVENUE GROWTH



Total Revenue Service Revenue INPUT Estimate



- One of the main reasons for service revenue growth at Prime is the company's increasing emphasis in the area of service. For example, the number of service employees increased by 37% from 1982 to 1983 and by 17% from 1983 to the present. Service employees now comprise 25% of the company's total staff. Since 1979, the number of service employees has increased by 500%.

- Prime currently has over 170 service locations throughout the world, up from 158 in 1983. Approximately 60% of these service locations are in the United States. Service is organized into three districts, thirteen regions, and sixty-five branches in addition to metropolitan service locations.

- Application of centralized remote diagnostics continues to be an important growth area at Prime. Mr. Joe Henson, president of Prime, recently reported that more than 5,000 domestic systems had access to remote support. The company's remote support center is located in Natick (MA) and supports both hardware and software. Over 80% of software calls and over 30% of hardware calls reportedly are handled via remote support.

- A guaranteed uptime plan (called the Preferred Services Plan) is offered by Prime. Like most other vendors, though, the company has reported only a limited interest on the part of users. The plan guarantees a two-hour response time/ remote access and is offered on the entire "50" series of computer systems.

- The High Availability Option (HAO) within the Preferred Services Plan guarantees a 99% level of uptime. Perhaps one of the reasons the uptime guarantees have not been more in demand by users is the fact that the company reports an average uptime (without guarantee) of 99.4%. (Users responding to INPUT's surveys reported a 93.6% availability/uptime).

- Ian Edwards, vice-president of customer service at Prime, indicated that software service is going to have an increasingly important impact on service

revenues and priorities. Prime has committed itself to working with independent software houses in the development of applications software. As noted above, there are now more than 1,000 application programs running on Prime systems, the vast majority of which were written by independent software houses.

- Supporting applications programs is proving to be a difficult task. In some cases, Prime will actually acquire the marketing rights for a program--as it did with PDGS, a graphics program developed by Ford Motor Company. In other cases, Prime will only supply the necessary protocols so an independent vendor can write software for a Prime system. In most cases, Prime will not support applications software developed by independent vendors; but, in the eyes of the users, this is complicated when Prime markets a software package.

- Third-party maintenance is an area that Prime has expressed an interest in and that could be very profitable. The company already services some Convergent Technologies workstations and CDC disk drives (for which Prime was originally an OEM). Like most other TPM vendors, Prime is particularly concerned about parts and training and will probably restrict itself to complementary rather than competitive products.

- Post-sales support, particularly of ancillary services such as supplies and education, is a low priority in Prime's customer service operations. Supplies, for example, are still sold through the sales department rather than through customer service. There appears to be a strong emphasis on improving basic services first and then investigating other service-related opportunities.

G. WANG LABORATORIES

- Wang continued a very rapid rate of growth in fiscal 1983, increasing total revenues by over 33% to $1.5 billion. Although somewhat off their record-setting pace of a few years ago (58% growth in 1981, for example), revenues and earnings appear to be in line with management goals.

- Almost half of Wang's revenues are derived from the sale of small systems, including superminicomputers. These include the 32- and 16-bit VS series, which range in price from $20,000 to over $500,000 (system price).

- Office automation equipment and personal computers make up the remainder of the company's hardware line. These products include the Professional Computer (16-bit, 640K personal computer) and the 2200 series (8-bit, multi-user office system). It is in the office product environment that Wang has been most active in 1983-84. The company has developed:

  - An emulation board permitting the Professional Computer to emulate the IBM PC.

  - Integration of IBM PCs into a Wang System Network.

  - VS300, a new high-end supermini to replace the aging VS100.

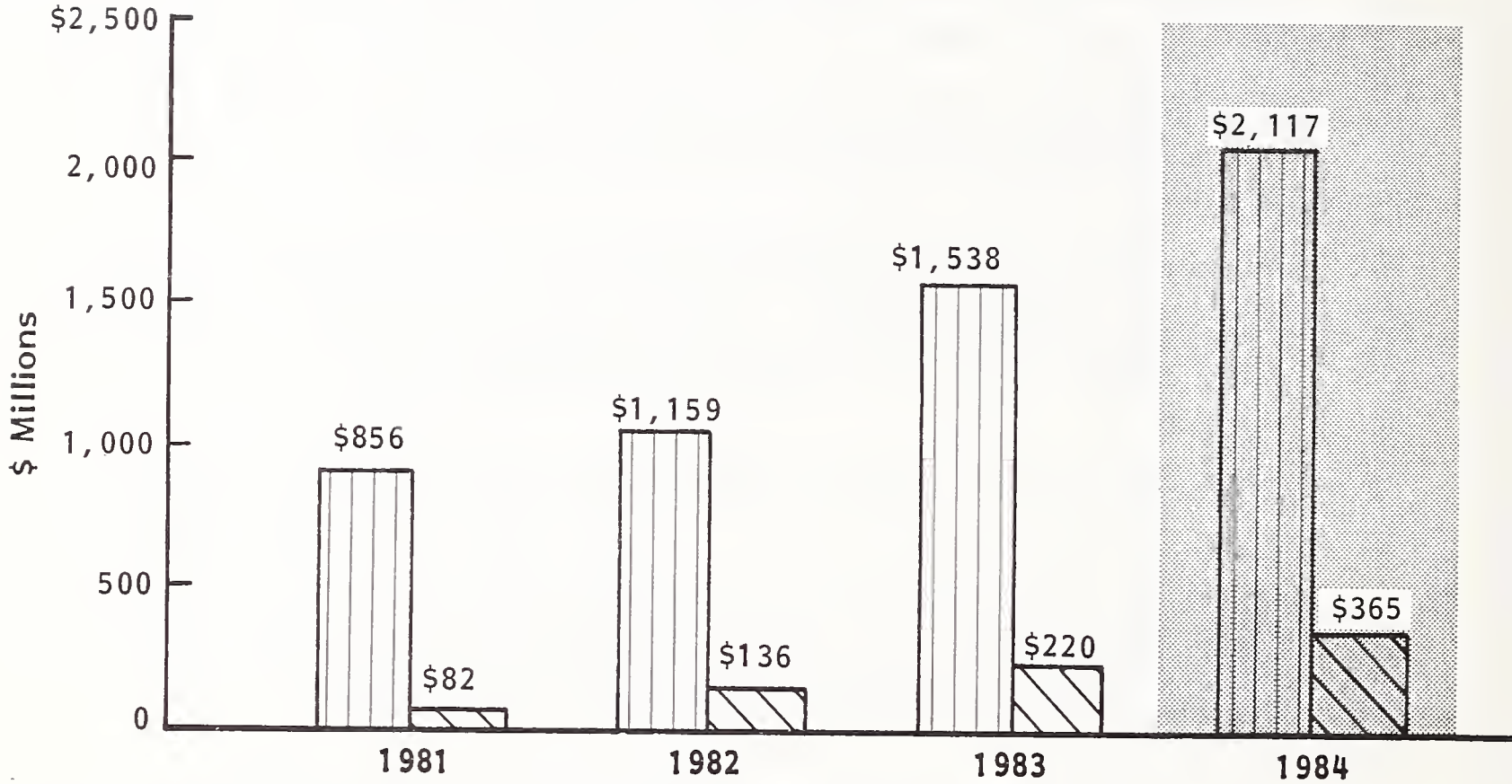
  - Software to facilitate communication between Wang office systems and an IBM mainframe.

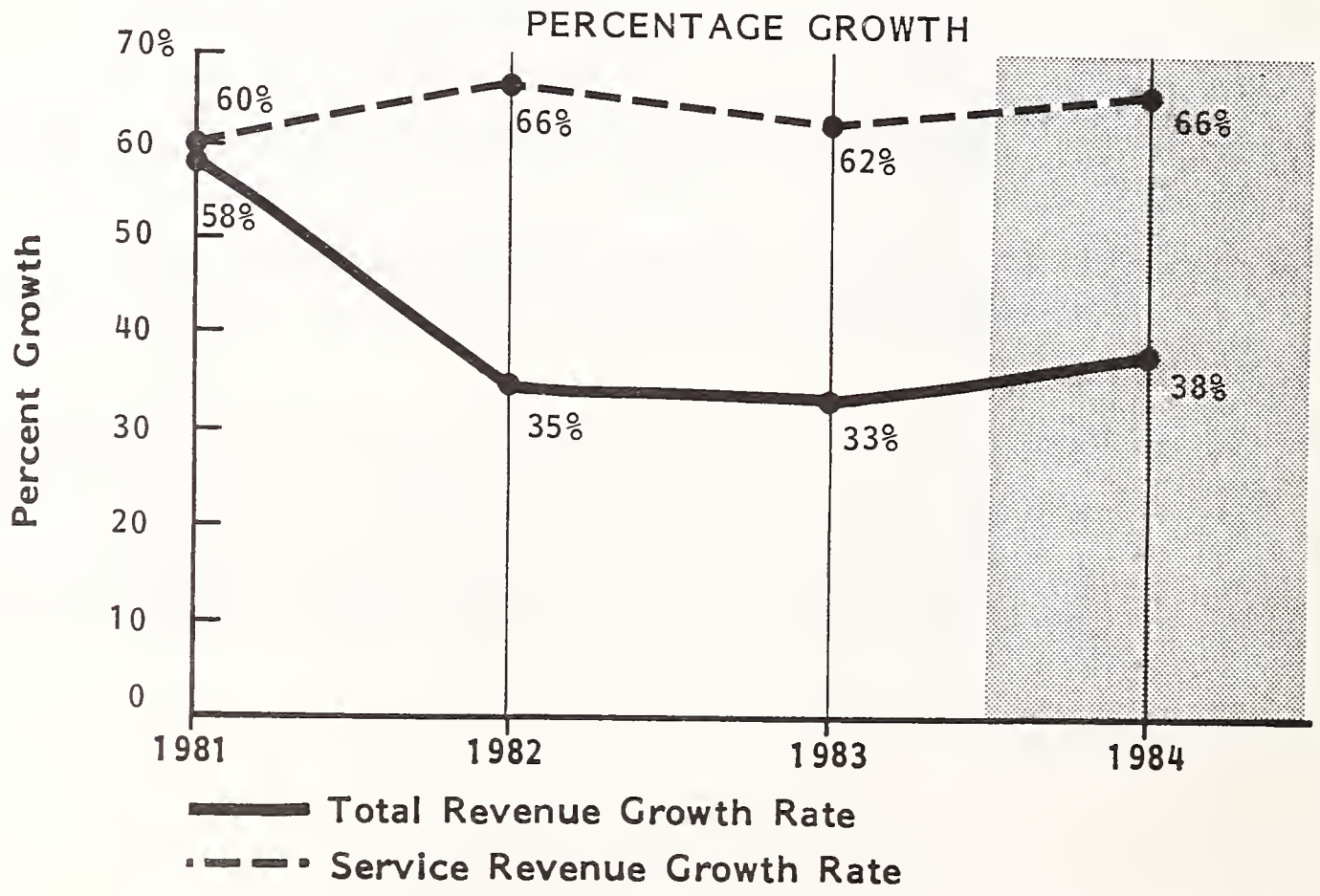
- Exhibit III-7 shows that field service revenue has been increasing as a percentage of total revenue--9.6% in 1981 to a projected 17.2% in 1984. In addition, field service revenues at Wang have maintained growth rates of over 60% for the last four years, one of the highest averages in the industry.

EXHIBIT III-7

WANG

REVENUE GROWTH





- Growth in field service revenues is due in part to a continuing increase in the installed base of Wang systems. However, a much more significant cause of the growth rate is the turnaround that has taken place in the service department itself.

- In the late 1970s, Wang recognized the need to address and overcome a variety of growing pains that had hurt service and service profitability. 1980 service profitability was down 43%; however, by 1984 the marketing services operation was reporting 18% profitability. This remarkable turnaround was accomplished by a number of factors.

  - Service staff turnover was reduced from 21.4% in 1980 to 4.8% in 1983.

  - The service staff was increased from less than 5,000 to 8,000.

  - Dispatching was centralized into six regions--a reversal from the decentralization represented by the more than 150 regions previously used for office systems.

  - After-sales support services were included in the service department's group of responsibilities.

- Remote support has been a priority area at Wang, although it is available only on the VS system line. Like most other vendors, Wang values remote support mainly because it will reduce on-site expenditures. Remote Maintenance Centers are available through toll-free telephone numbers and are part of an overall TAC (Technical Assistance Center).

- Sales of supplies have been a very profitable service function. In the late 1970s, supplies accounted for less than $2 million total revenue, but by 1983 it had expanded to almost $55 million. Part of the increase in revenue resulted from an expanded list of supplies including office furniture and some peripherals. Telemarketing was also reported to have been an effective method of improving supplies revenue.

- Wang currently offers a guaranteed uptime program, called WangCare Guarantee, that allows for a 95% or 99% uptime level. Although this is primarily a sales/marketing promotion technique, it is also used as an incentive to field service employees to maintain higher system availability. The company has indicated that staff productivity has improved as a result of positive incentives tied to guaranteed uptime availability.

- It is probable that parts availability will be an area of growth at Wang in the next year. Although the logistics organization, now based in six regional parts centers, is much more efficient than the decentralized, office-based system, continuing centralization and coordination of spare parts is likely.

IV SMALL-SYSTEM CUSTOMER SERVICE OPERATIONS

IV SMALL-SYSTEM CUSTOMER SERVICE OPERATIONS

- In an attempt to increase demand for their services, and consequently to improve profitability, small-system vendors are trying to identify the composite mix of services that will maximize user satisfaction. In most cases, this mix includes key service features such as response time, repair time, and spare parts availability.

- Although INPUT acknowledges the importance of individual service features such as the ones mentioned above, it is important for vendors to recognize two key factors related to user satisfaction with service:

  - Users are often motivated by a variety of service factors, some of which are normally considered quite unimportant in the service environment. Vendors must be sensitive to the individual requirements of their users.

  - User attitudes about particular services are likely to change rapidly; there does not appear to be any "absolute" level of service that will always satisfy the user.

- Most vendors feel that the bottom line for service is overall system availability. A high level of availability is important to the vendor because it generally means fewer and less expensive service calls. Users obviously require high availability so they can maximize use of their systems. The question that small-system vendors must confront is: What is the most cost-

effective level of service to provide to the user, short of the 100% availability many users say they want?

- Exhibit IV-1 demonstrates small-system user requirements for system availability. This exhibit is important because it indicates that users do not have unusually high expectations for system availability and that these expectations can be influenced by a variety of factors. In addition:

  - Over 75% of the vendors provide higher levels of system availability than is required by the users.

  - User requirements for system availability fell from 1983 to 1984, by an average of 3.3%.

- The data in this exhibit is important because it shows that users are not being motivated exclusively by system availability, as many vendors had assumed. Other factors may have a significant impact on service-related customer satisfaction. The remainder of this chapter identifies and discusses the most important of these factors.

A. DISPATCHING

- Almost all of the small-system vendors interviewed by INPUT have established centralized, automated dispatch centers in order to improve overall response/repair time. Exhibit IV-2 demonstrates that only two small- system vendors, Cambex and GenRad, are not currently using some form of centralized dispatch.

- Small-system vendors are particularly sensitive to the dispatching process because of the limited amount of on-site contact they have with the user. Unlike large-system vendors, it is unusual for small-system vendors to main-

EXHIBIT IV-1

USER SYSTEM AVAILABILITY REQUIREMENTS VERSUS ACTUALS

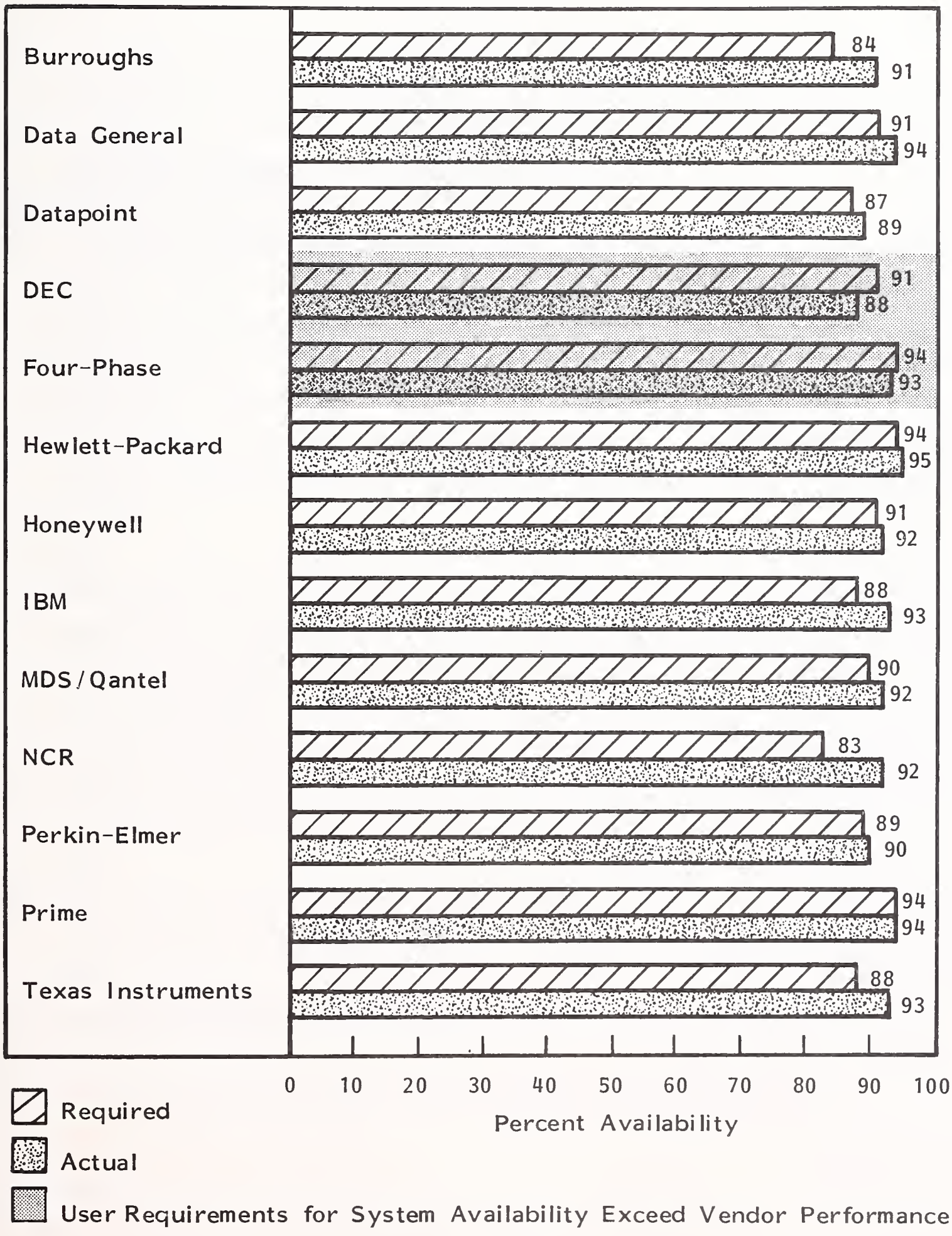


EXHIBIT IV-2

SMALL-SCALE SYSTEMS DISPATCHING METHODS – BY VENDOR

VENDOR	CENTRALIZED DISPATCHING (REGIONAL OR NATIONAL)	LOCAL DISPATCH	USER RATING* OF DISPATCHING
Burroughs	X		7.8
Cambex		X	N/A
Compugraphic	X		N/A
Control Data	X		N/A
Data General	X		7.7
Datapoint	X		7.8
DEC	X		7.6
Four-Phase	X		7.9
GenRad		X	N/A
Hewlett-Packard	X		8.4
Honeywell	X		7.6
IBM	X	X	7.8
MDS/Qantel	X		8.2
Perkin-Elmer	X		6.3
Prime	X		7.0
Reynolds and Reynolds	X		N/A
Stratus	X		N/A
Texas Instruments	X		6.7
Wang	X		N/A

*Rating: 1 = Low, 10 = High

tain permanent on-site support at the user's location. Dispatching is important because it is the first personal contact the vendor has with the user when the user's system is down. A poor impression of service developed at this initial stage is likely to affect overall customer satisfaction with service.

- A second factor that increases the importance of dispatching is that it promotes an efficient allocation of both human and capital resources. This is particularly true when dispatching is combined with other services such as remote support and logistical support (discussed below).

- The actual level of dispatching support varied tremendously among respondents. Stratus's "XA" systems, for example, are designed to automatically notify the company's central dispatch center in the event of a serious system degradation or shutdown. Stratus officials noted that, in many cases, an engineer is dispatched without the user ever knowing there was a problem. Cambex, on the other hand, still uses a localized, manual dispatching system that is entirely dependent on adequate communication between the FE and the user.

- Four-Phase and Compugraphics are examples of companies that have made substantial progress in dispatching. Both companies initiated the automation and centralization of dispatching more than five years ago, and both have included other support features, such as parts tracking, as a component of an integrated dispatching system. Wang, a third vendor to substantially revise its dispatching system, went from local dispatching out of 154 offices several years ago to a highly automated "call control center" today.

- A number of small-system vendors indicated that in terms of performance there was no alternative to centralized dispatch. One vendor went so far as to suggest that even a regional dispatch system--currently used by over 50% of the respondents--would be inadequate.

- Dispatching productivity can be improved by the following factors:

- A reduction in the number of unnecessary on-site calls.

- An increase in the number of calls processed per day.

- A reduction in staff (generally clerical).

- Improved management reports.

- Despite the fact that most of the small-system vendors interviewed by INPUT have automated, centralized, and generally improved dispatching services, user ratings of dispatching fell for 8 out of the 13 vendors listed in Exhibit IV-3. At first, user responses may seem inconsistent, but the reader must understand that the user is expressing dissatisfaction with the overall service--not just with performance. Users generally acknowledge that dispatching is more efficient and that particularly in software, response time has improved; but there are other factors that cause user dissatisfaction with dispatching.

- Users downgrade dispatching primarily because they feel they are losing control over the dispatch process. Users no longer have direct access to "their FE," but instead must be routed through a dispatch center. One vendor that has offered centralized dispatching for several years noted that when the centralized system was first introduced there was a great deal of user resistance but that now, customers overwhelmingly prefer the centralized approach.

- INPUT found another reason, besides loss of local control of the FE, that causes users to downgrade centralized dispatching: the user does not understand or appreciate the benefits inherent in a centralized system.

- It is important for small-system vendors to realize that users must be "sold" on new services such as centralized dispatch. Users must appreciate benefits such as improved response time or parts availability resulting from an inte-

EXHIBIT IV-3

USER RATINGS OF VENDORS' DISPATCHING

1984 RANK	1983 RANK	VENDOR	USER RATING	PERCENT OF 1983-1984 CHANGE (Decrease)
1	7	Hewlett-Packard	8.4	9.1%
2	N/A	MDS/Qantel	8.2	N/A
3	6	Four-Phase	7.9	1.3
4	2	IBM	7.8	(7.1)
5	3	Datapoint	7.8	(7.1)
6	8	Burroughs	7.8	2.6
7	1	Data General	7.7	(10.5)
8	12	Honeywell	7.6	10.1
9	4	DEC	7.6	(8.4)
10	9	NCR	7.3	(2.7)
11	5	Prime	6.9	(16.9)
12	10	Texas Instruments	6.7	(10.7)
13	11	Perkin-Elmer	6.3	(13.7)

grated centralized dispatch system. Like large-system vendors, small- system vendors that effectively promoted the benefits of centralized dispatch reported an easier conversion than those doing no promotion. However, the smaller service organizations do not have the product loyalty of the large vendors and cannot afford to alienate their customers over an avoidable issue like dispatching.

- Exhibit IV-4 lists the various advantages and disadvantages of centralized as opposed to local control of dispatching. Despite its recognized efficiency, the centralized system receives consistently poor ratings with regard to its overall ability to satisfy customers. It is up to the vendor to promote user acceptance of centralized and automated dispatching.

B. SPARE PARTS

- Increasing the efficiency of parts distribution without sacrificing parts availability is a major problem reported by most of the small-system vendors interviewed by INPUT. Vendors reported that the solution to the problem is influenced by three factors outside the normal logistics environment:

  - Reliability of equipment is increasing, thereby reducing parts demand.

  - Increased modularization of parts results in rising inventory costs.

  - Tolerance by users for delayed parts delivery time is increasing, particularly when on-site spares are available.

- The demand for a logistically and financially efficient parts distribution system has caused most small-system vendors to centralize their logistics operations. Exhibit IV-5 demonstrates that 89% of the vendors interviewed had a national parts depot to support parts distribution. This amount jumps to

EXHIBIT IV-4

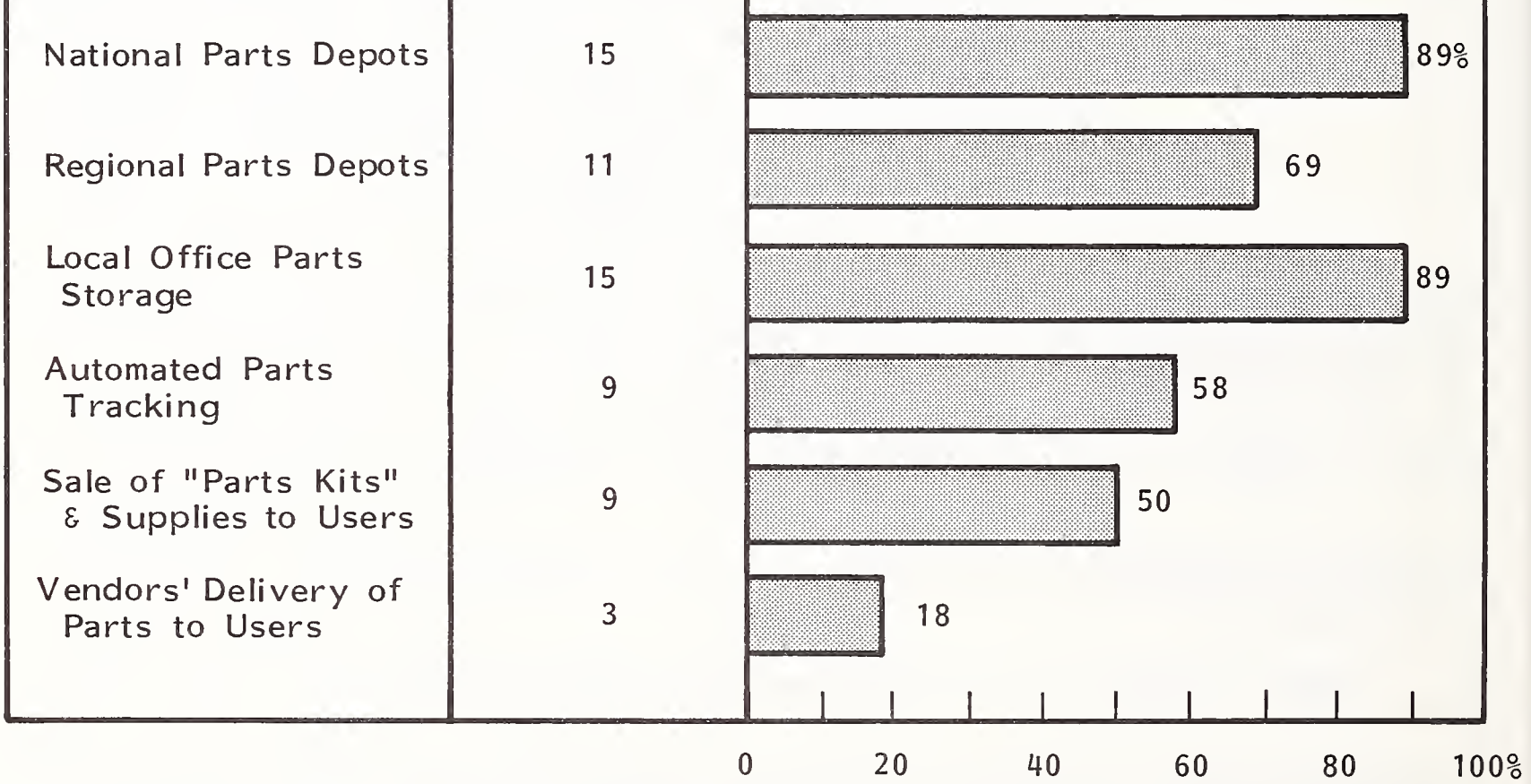
COMPARISON OF DISPATCH METHODS

OPERATIONAL CRITERIA	DISPATCH ALTERNATIVES		
	BRANCH	DISTRICT	CENTRAL
Field Management Control of FE	High	Moderate	Low
HQ Management Control of Daily Operations	Little	Moderate	Considerable
Call Escalation (Alert) Procedures	System alerts in sequence: Area/ branch office, district office, regional office headquarters	System alerts dispatcher who contacts area/branch office; and subsequently district manager, regional office, and headquarters are alerted by FEs.	System alerts only dispatcher; dispatcher alerts in sequence area/branch office, district office, regional office, headquarters.
Ability of District Management to Affect Customer Satisfaction	Good	Very Good	Poor
Ability to Calm Irate Customer	Very Good	Good	Poor
Awareness of Local Conditions Affecting FE Dispatching	Good	Fair	Poor
Knowledge of Customer	Good	Good to Fair	Fair to Poor
Response of Dispatcher to FE Question	Fast: Branch Phones are Continually Staffed	Fast: District Phones are Adequately Staffed	Fast: Large Number of Dispatchers
Hardware & Communications Cost	High	Low to Moderate	Low
Off-hour Dispatch	Poor	Poor to Good	Same as Regular Shift
Protection from Loss of Dispatch Center	Adjacent Area Assumes Lost Center's Activity	Redundant Hardware	Redundant Hardware
Manual Backup	Easy	Moderate	Very Difficult

EXHIBIT IV-5

SMALL-SYSTEM VENDORS'
SPARE PARTS/LOGISTICS OPERATIONS

PARTS SERVICE	NUMBER OF VENDORS INTERVIEWED OFFERING SERVICE*	PERCENT OF RESPONDENTS OFFERING SERVICE*
National Parts Depots	15	89%
Regional Parts Depots	11	69
Local Office Parts Storage	15	89
Automated Parts Tracking	9	58
Sale of "Parts Kits" & Supplies to Users	9	50
Vendors' Delivery of Parts to Users	3	18



* Not all small-system vendors that responded to the questionnaire would comment on spare-parts-related questions.

100% when regional distribution centers are included. In addition, almost all of the vendors stocked a limited supply of parts at local or branch offices.

- Honeywell is a good example of a highly centralized/hierarchical parts distribution system. The company has two centralized warehouses--one in Dallas (TX) and one in Lawrence (MA)--to service 80 parts depots. The parts depots in turn stock over 1,000 points of supply throughout the country. The company has an on-line, inventory-tracking system called "Logistics Inventory Data System" (LIDS) to control access and exchange parts from hundreds of stocking locations nationwide.

- Other small-system vendors that have highly structured, centralized parts distribution systems include:

  - Data General, having two central warehouses and 100 branches.

  - Datapoint, having one national warehouse and 23 regional depots.

  - Four-Phase with one warehouse, 11 district depots, and 180 field depots.

  - IBM, with one national warehouse and 21 regional depots.

  - MDS/Qantel, having two warehouses and district depots.

  - Stratus, having one national warehouse and three regional depots.

- Some small-system vendors have chosen not to centralize their logistics operations because they feel this will reduce parts availability. These vendors usually have smaller, geographically dispersed customer bases. As a consequence, vendors that do not centralize parts distribution must incur substantially higher inventory costs to maintain complete inventories at many different service locations. Small-system vendors with a large installed base can

more evenly distribute inventory costs and therefore have a competitive advantage over vendors with a small installed base.

- Exhibit IV-6 demonstrates the relationship of sparing levels to the installed base.

- Although centralizing the logistics operations may result in a more efficient organization, it does not necessarily improve parts availability to the user. The customer's requirement for parts availability becomes increasingly stringent as the user becomes more dependent on the equipment. Small-system vendors have been active in identifying new methods to improve parts availability such as:

  - Computerized parts tracking.

  - Vendor supplied parts delivery.

  - "Kitting" of parts for sale to users.

  - Self-diagnosing parts technology.

- More than 50% of the vendors interviewed indicated that they are currently using a computerized parts-tracking system on a regional or national basis. Vendors cited the following advantages to such an on-line data base:

  - Increased access to parts at different locations.

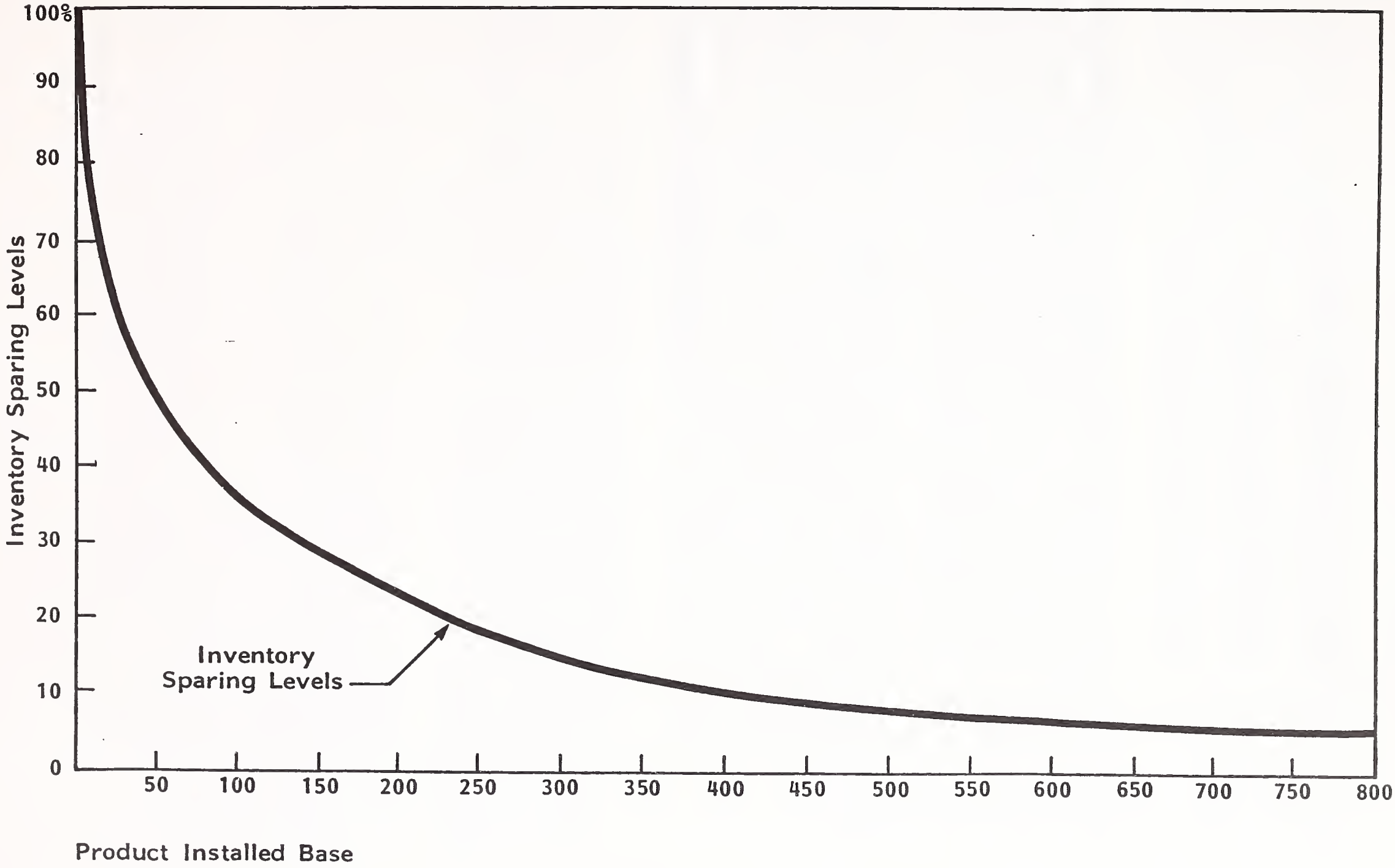
  - Improved control over "give-aways."

  - More accurate billing procedures.

  - Increased accounting control over costing methods.

EXHIBIT IV-6

SPARE PARTS INVENTORY LEVELS



- Facilitated parts performance tracking.

- Improved stock level forecasting.

- Improved management logistics reports.

- In addition to improving parts availability, a computerized parts tracking system can be included in an integrated service support data base. Vendors report that this type of data base has a tremendous profit potential, since users would have access to a number of services such as parts, remote support, and supplies all through one service call.

- A number of vendors are taking responsibility for delivery of parts to a user's site through such means as pickup and delivery vans and the use of courier services. This is particularly effective when the user does some self-maintenance and the failed component is easily transportable (such as a terminal or circuit board). Honeywell currently has 30 "Customer Service Vehicles"--vans that act as small spare parts centers in high-density metropolitan areas.

- The use of "parts kits" is gaining popularity among vendors, primarily because it shifts the burden of inventory costs from the vendor to the user. Approximately 60% of the small-system vendors interviewed said they offer either service discounts or discounts on parts kits to users who stock their own spare parts on site.

- Several vendors indicated that parts kits would not be sold because such sales would "invite third-party maintenance competition." At least one vendor currently tracks user-owned spares to avoid parts stocking by TPM competition.

- Improved technology was cited by many small-system vendors as the ultimate solution to parts inventory problems. Several vendors reported that they are already designing and installing "self-diagnosing" circuit boards. This will

result in a tremendous savings for the average vendor that finds that 20-30% of the circuit boards sent in for service are diagnosed as nondefective. This type of technology not only will avoid replacement of functioning parts, but also will allow the user to be knowledgeable about failed parts and potential repairs.

- Despite the increasing trend toward centralization of parts distribution, small-system vendors must not neglect the market for on-site spares. Exhibit IV-7 lists small-system user requirements for on-site spares. Overall, 29% of all small-system users said they have a requirement for on-site spares and are willing to pay an average premium of 9.1% over their basic monthly maintenance fee for this extended service. Users are demonstrating a certain level of sophistication in understanding the value and costs of spare parts. This has not been lost on many of the small-system vendors currently seeking new methods for reducing expenditures related to spare parts.

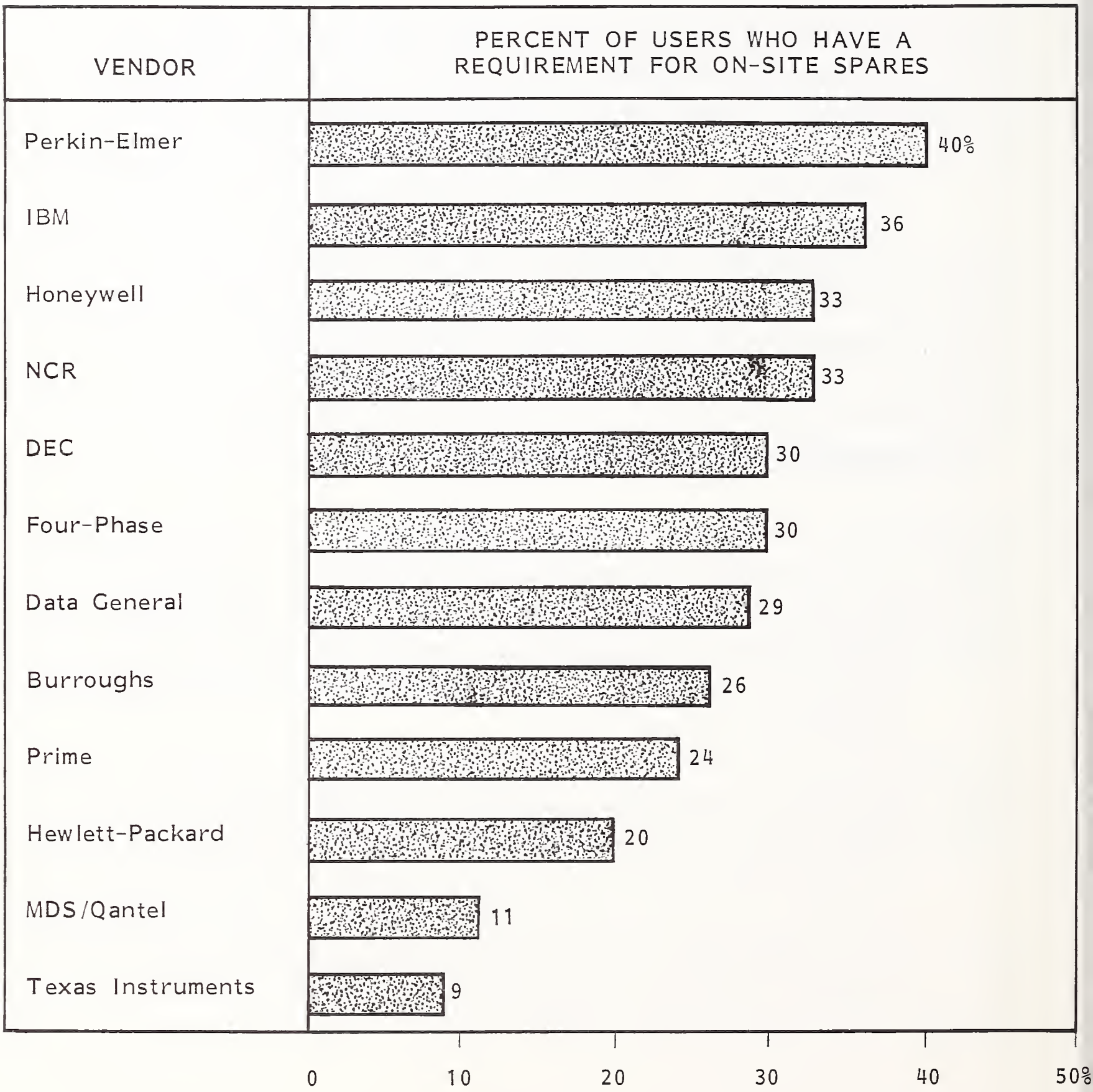
C. REMOTE SUPPORT SERVICES

- Seventy-seven percent of the small-system vendors interviewed by INPUT currently offer some form of remote support services (RSS) to their users. Although the level of support is not as sophisticated as in the large-system environment, small-system vendors expressed a definite commitment to the development of remote services.

- The primary reason small-system vendors are developing RSS capabilities is to reduce service costs (particularly on-site expenses). One vendor noted that more than 80% of all software problems and 30% of all hardware problems are now being corrected via remote support. In addition, vendors report that as a result of RSS, FEs are better prepared with parts and/or testing equipment when they are required to perform on-site maintenance.

EXHIBIT IV-7

SMALL-SYSTEM USER REQUIREMENTS FOR ON-SITE SPARE PARTS



- Besides cost-effectiveness, several other advantages of remote support were mentioned by small-system vendors. They included:

  - Improved response/repair time.

  - Increased FE productivity.

  - Improved geographic coverage.

  - Decreased FE work force levels.

  - Vendor protection from third-party maintenance competition.

- Exhibit IV-8 discusses the impact of RSS on field service. As the exhibit demonstrates, a very high percentage of vendors (50-75%) reported significant productivity improvement in the areas of response time, repair time, and uptime as a result of RSS.

- The importance of RSS could take on additional significance in the future as it affords the vendor protection from TPM competition. This protection will be based primarily on proprietary software developed for the diagnostic/repair process. Several vendors noted that TPM competition would have to expend substantial sums of R&D capital in order to develop an RSS capability. This provides the vendor a considerable competitive advantage over TPM vendors.

- Although small-system vendors are in almost total agreement about the value of remote services, users are considerably more reserved. Most users, according to Exhibit IV-9, report they do not require remote diagnostics. On the average, only 41% of small-system users say they have a requirement for this service. User responses varied significantly from vendor to vendor. Almost 63% of DEC users, for example, said they had a requirement for remote diagnostics, while only 20% of NCR users claim to have the same requirement.

EXHIBIT IV-8

IMPACT OF RSS ON FIELD SERVICE AS REPORTED BY VENDORS

RSS COMPONENT	PERCENT OF VENDORS	
	IMPROVEMENT	UNCHANGED
Response Time	63%	13%
Repair Time	75	13
Uptime	50	-
Increased FE Skill Levels	25	13
Decreased FE Work Force Levels	25	25

EXHIBIT IV-9

SMALL-SCALE SYSTEMS USER ATTITUDES TOWARD REMOTE DIAGNOSTICS

VENDOR	PERCENT OF USERS WHO SAY THEY HAVE A REQUIREMENT FOR REMOTE DIAGNOSTICS	USER RATINGS* OF CUSTOMER INVOLVEMENT IN REMOTE DIAGNOSTICS	
		HARDWARE	SOFTWARE
Burroughs	32.4	6.5	6.0
Data General	40.5	5.9	5.3
DEC	62.8	6.4	5.1
Four Phase	30.0	4.7	5.2
Hewlett-Packard	51.3	6.7	6.7
Honeywell	40.7	4.5	5.2
IBM	43.4	6.6	6.5
MDS/Qantel	21.1	4.5	5.0
NCR	20.0	5.6	4.5
Perkin-Elmer	30.0	3.9	2.0
Prime	47.6	5.9	5.2
Texas Instruments	27.3	5.5	5.1

*Rating: 1 = Low, 10 = High

- Perhaps even more significant than the low user requirement for service are the user attitudes toward becoming involved in remote diagnostics. Generally, users rated customer involvement in remote diagnostics as not desirable. Users expressed a good deal of resistance to becoming involved in the RSS process.

- The reason stated for liking or disliking RSS are shown in Exhibit IV-10. The most frequently stated reason for disliking RSS is that RSS reduces communication between the vendor's FE and the user. This is a particularly serious problem because not only does it result in customer dissatisfaction with service, but it also reduces revenue-generating opportunities for the vendor. (Lost opportunities will result because the FE will no longer be on hand to offer advice and, more importantly, to pass on potentially valuable sales leads.)

- The second most frequently stated reason for disliking RSS is that it offers inadequate security for the user's data. Although at least one vendor has discounted user resistance based on concerns about security, several other vendors have taken pains to develop RSS, which requires or at least facilitates user interaction and observation of the RSS process.

- It is interesting to note that users with remote support experience express a much lower level of concern for the security issue than do users with little or no RSS experience. This tends to confirm the attitude of one vendor that security is just a "smokescreen" used by customers with little or no understanding of the remote support process.

- The exhibit also lists user reasons for liking RSS. Considering the importance users place an overall system availability, it is not surprising that timeliness and increased support levels are the most important positive features of RSS. The vast majority of vendors interviewed (90+%) indicated that timeliness of service was a key feature in promoting RSS.

EXHIBIT IV-10

USER ATTITUDES OF RSS SERVICE COMPONENT

SERVICE COMPONENT	PERCENT OF USERS
User Decisions for Opposing RSS	
Lack of Person-to-Person Communications	33%
Insufficient Software Support	18
Takes Too Long to Diagnose Problems	11
Does Not Keep User Informed	7
Insufficient Security	31
User Decisions for Favoring RSS	
Timeliness	46
Increased Support Level	26
Convenience	12
Increase Efficiency	9
Ease of Use	7

- Market trends in RSS--as reported by service vendors--are shown in Exhibit IV-11. As the exhibit demonstrates, most vendors believe there will be extensive growth in remote services in the next five years and that users will become more involved in RSS at all system levels (mainframe as well as mini-based systems).

- Several vendors indicated that RSS must be made easier for users before it would ever "catch on" in the small-system environment. Vendors must communicate the benefits of RSS to users and allay their fears of inadequate security. Most vendors believe that the policy of charging a premium for RSS is counterproductive and will serve to inhibit growth in this area.

D. ALTERNATIVE METHODS OF MAINTENANCE

- The increasing cost of providing on-site service has caused many small-system vendors to look for alternative methods of maintenance, which will be more cost effective in the eyes of the user. Remote support service, discussed in the previous section, is one such alternative to the traditional on-site service. Other alternatives include:

  - A "menu" of service products from which users may select.

  - User involvement in system repairs.

  - Depot maintenance.

  - Third-party/single-source maintenance.

- Vendors have reported that there are several reasons why the small-system environment is particularly cost conscious with regard to service pricing.

EXHIBIT IV-11

MARKET TRENDS IN RSS AS REPORTED BY VENDORS

TRENDS	PERCENT OF VENDORS AGREEING
Extensive Growth in RSS	63%
More User Involvement in RSS	63
Small Systems Only	13
Medium/Large Systems Also	50
More Discounting	13
Time Frame	
1 - 2 Years	13
2 - 3 Years	13
3 - 5 Years	38

First, supermicrocomputers and increasingly flexible mainframe computers are squeezing both ends of the small-system market. Price and performance competition have increased, making the cost of service disproportionately higher than it was in the past. Second, users are becoming increasingly cost conscious and are looking for new methods to reduce service-related expenditures.

- Despite offering a variety of service alternatives, small-system vendors interviewed by INPUT hastened to add that on-site service, at least for hardware, will continue to be the service method of choice for most users. Consequently, 100% of the vendors interviewed said they would continue to offer traditional on-site service.

- Exhibit IV-12 lists some alternative methods of maintenance being used by small-system vendors. Eighty-three percent of those vendors now offer the user what is commonly known as a "menu" of service products from which to choose. Users are allowed to select the quantity and level of service they require. DEC was one of the first small-system vendors to define service "products" and now offers a wide variety of menu options ranging from 24 hours X 7 days per week for on-site service, to training users who want to maintain their own equipment.

- Many vendors reported that they prefer the menu offerings over a standard maintenance contract not only because it better accommodates the user's service needs, but also because it affords the vendor more planning flexibility. For example, vendors can more accurately plan for response time or parts dispersion if they have accurate data on the number and location of users who pay a premium for improved service in these areas. On the other hand, many vendors also offer a "relaxed response time" discount to users who do not require the standard level of performance in this area. In both cases, a menu of services permits a better understanding of the user's service needs and results in an improved allocation of service resources to meet those needs.

EXHIBIT IV-12

ALTERNATIVE METHODS OF MAINTENANCE

SERVICES	PERCENT OF SMALL SYSTEM VENDORS CURRENTLY OFFERING SERVICE†	USER ATTITUDES* TOWARD SERVICE**
Traditional, On-Site Maintenance (User Not Involved)	100%	8.1
Vendor Offers a "Menu" of Service Products	83	N/A
Remote Diagnostics/Support	77	5.6
Depot Maintenance	55	4.3
User Involvement in System Repairs	27	6.0
Third-Party Maintenance	21	N/A

*Rating: 1 = Low, 10 = High

†Includes Services Offered As Part of Standard Maintenance Contracts, but Not Individually

** Averages User Attitudes toward Hardware and Software Maintenance

- Besides remote diagnostics/support (which was discussed earlier), depot maintenance was the most popular alternative method of maintenance offered by small-system vendors. More than 55% of these vendors offered depot maintenance despite the fact that this is one of the least popular service options among users. Users ranked use of depot centers at only 4.6 on a scale of one=low, ten=high, shown in Exhibit IV-13.

- Vendors reported that they were encouraged by the growth of depot service, despite continuing customer resistance, for a number of reasons:

  - It avoids costly on-site service calls.

  - It provides more efficient access to parts and other support services.

  - It is easier to schedule work.

- Users reject the depot alternative because:

  - They don't have adequate staff or facilities to transport equipment.

  - The equipment is not transportable.

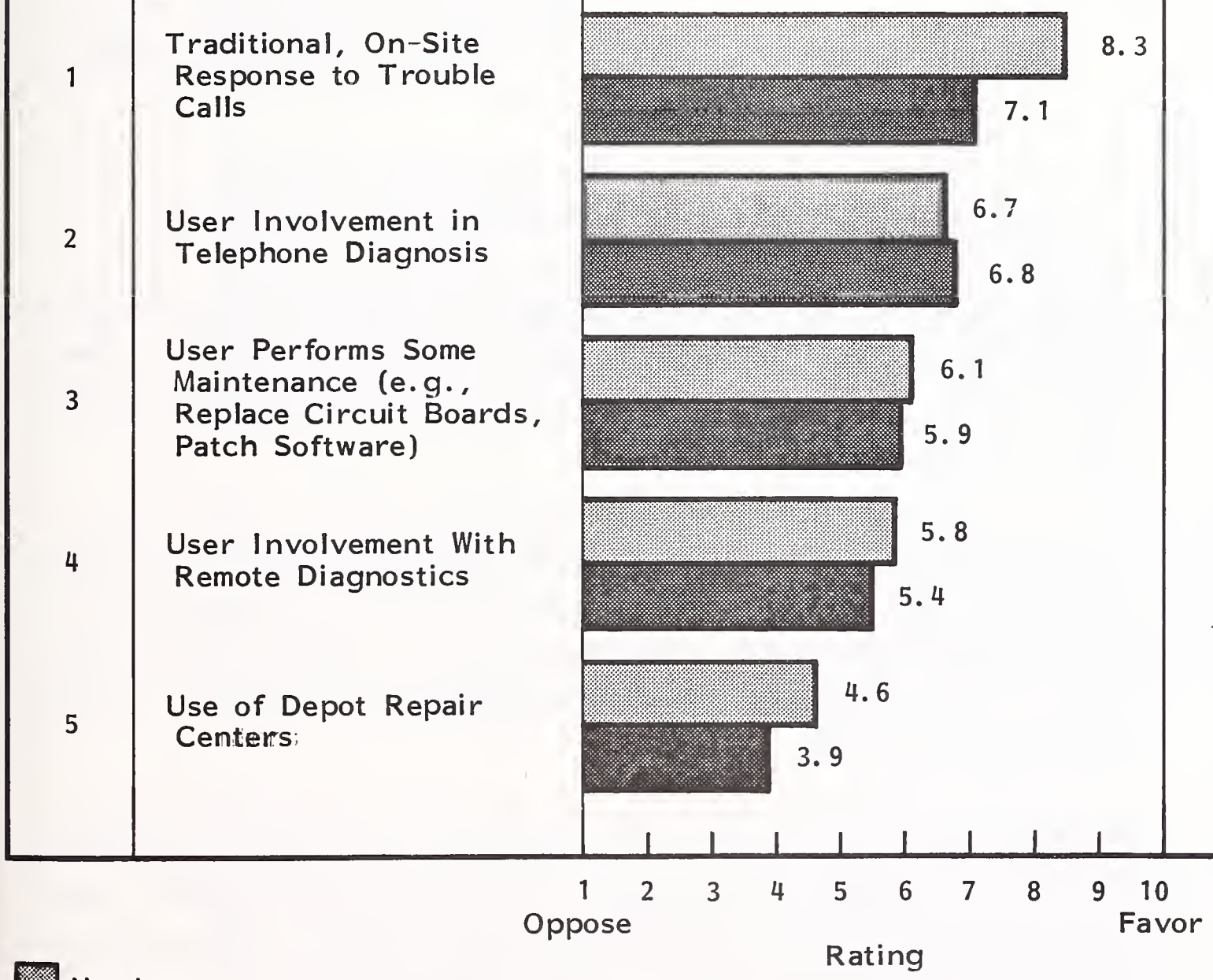
  - Depot service is too slow.

- Recognizing that users are resistant to depot service, vendors are offering enhancements to this service in order to encourage its use. Burroughs, for example, offers a depot service on only a few selected products such as terminals, and it reports an average three-day turnaround time. Stratus, DEC, Data General, and many other vendors have parts exchange programs for users willing to perform some self-maintenance functions. Honeywell's Customer Service Vehicle program is used occasionally to deliver or pickup parts at the user's site.

EXHIBIT IV-13

USER ATTITUDES TOWARD
ALTERNATIVE DELIVERY MODES

RANK	MAINTENANCE DELIVERY MODE	RATING	1983-1984 PERCENT CHANGE
1	Traditional, On-Site Response to Trouble Calls	8.3 7.1	(4%) (4)
2	User Involvement in Telephone Diagnosis	6.7 6.8	12 6
3	User Performs Some Maintenance (e.g., Replace Circuit Boards, Patch Software)	6.1 5.9	42 7
4	User Involvement With Remote Diagnostics	5.8 5.4	(11) (24)
5	Use of Depot Repair Centers	4.6 3.9	10 30



- These and other enhancements to depot service are temporary measures designed primarily to maintain the organizational structure until depot service is accepted by the user and, ultimately, is profitable. Several vendors indicated they believed the success of depot service hinged on four major factors:

  - The increased cost of on-site service, forcing users to consider alternative methods of maintenance.

  - The continued growth in modular design of equipment.

  - The exchange rather than repair of failed components (by vendor) in order to shorten turnaround times.

  - User acceptance of being involved in the maintenance process.

- User involvement in system repairs is being encouraged by only 27% of the small-system vendors (see Exhibit IV-12). Users, on the other hand, seem more receptive to this option than to any of the other alternative service delivery modes (see Exhibit IV-13).

- User interest in performing minor repair tasks such as replacing circuit boards increased by 42% from 1983 to 1984 (from 4.3 to 6.1—for hardware—on a scale of one=low, ten=high). This results primarily from two factors, users' need to maintain high levels of system availability and the desire to keep maintenance costs down.

- Despite the fact that users are more receptive to performing maintenance, they are still reluctant since they risk seriously damaging equipment. Many vendors, such as DEC, have recognized this fact by offering to train users in a variety of maintenance functions. (DEC even distributes a free 100-page booklet, Self-Maintenance Handbook, for interested users.) Other vendors like Stratus plan for and expect a fair amount of user interaction in repairs. The

company has clearly labeled components and provides individualized instruction in component replacement and other minor repairs.

- Although most vendors (almost 80%) do not currently encourage any extensive user involvement in maintenance, they acknowledge that this is an area that will probably change in the future. Improved equipment design and user training are the most immediate problems to overcome if user self- maintenance is to become a viable maintenance alternative.

E. THIRD-PARTY MAINTENANCE

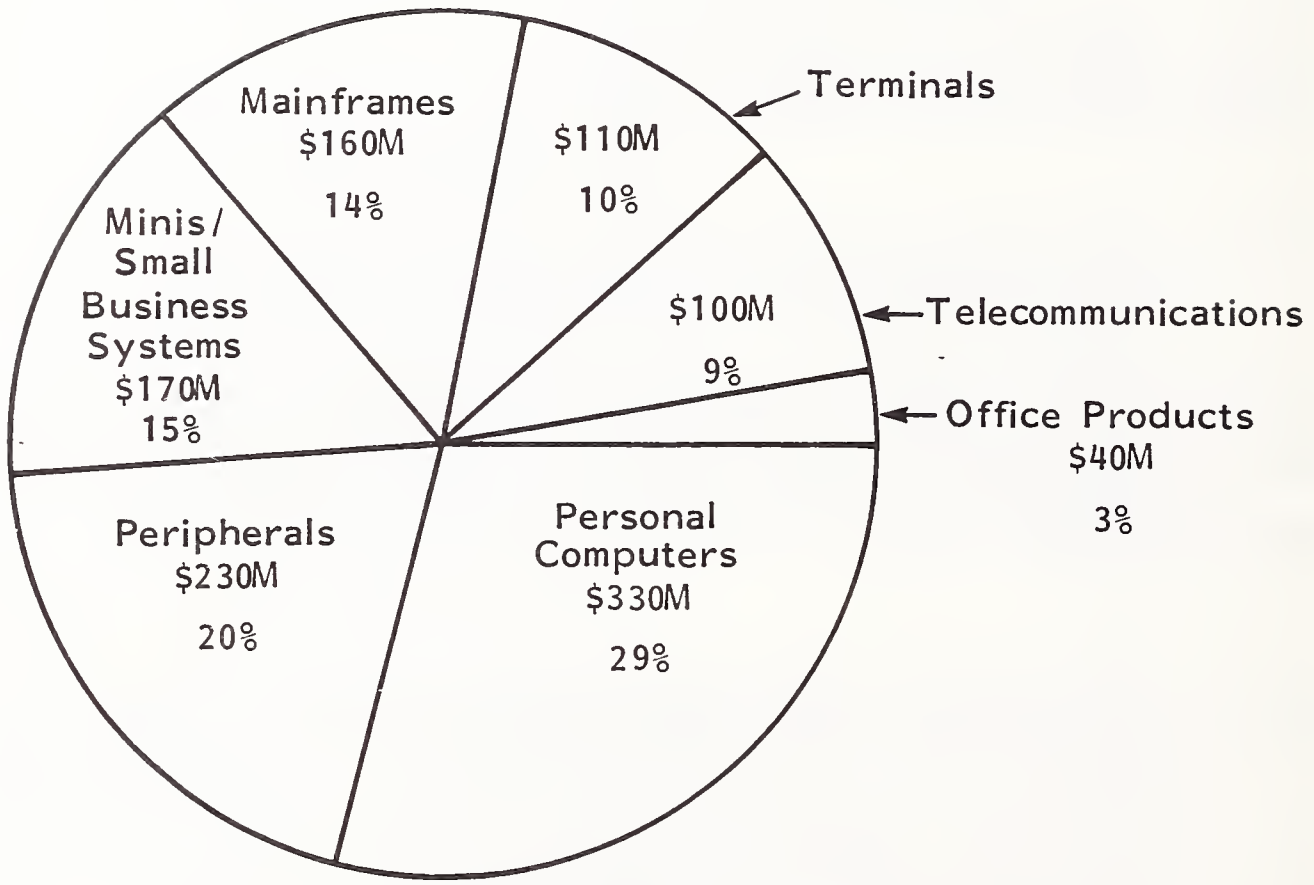
- Third-party maintenance (TPM) is defined as maintenance service provided by a supplier that is not the manufacturer of the equipment being serviced; it is the fourth alternative method of maintenance listed in Section D. The overall market for TPM services currently is relatively small--less than $1 billion in 1983--but revenues will increase dramatically in the next five years (to $2.48 billion).

- INPUT projects that the overall growth rate from 1984 to 1989 will be at an average yearly rate of 16.8%. As Exhibit IV-14 demonstrates, the market for minicomputers and small business systems is $170 million, 15% of the total TPM market. The minicomputer market is a traditional TPM market and is growing at 24% as shown in Exhibit IV-15.

- Growth in personal computer TPM (currently 42%) is expected to continue to drive the TPM market for the next few years. It would be a mistake, however, to ignore the older minicomputer market with its very large installed base. Exhibit IV-16 shows that by 1989 the small-system computer market will generate $350 million in revenue, third behind personal computers and telecommunications.

EXHIBIT IV-14

THE 1984 TPM MARKET SECTORS

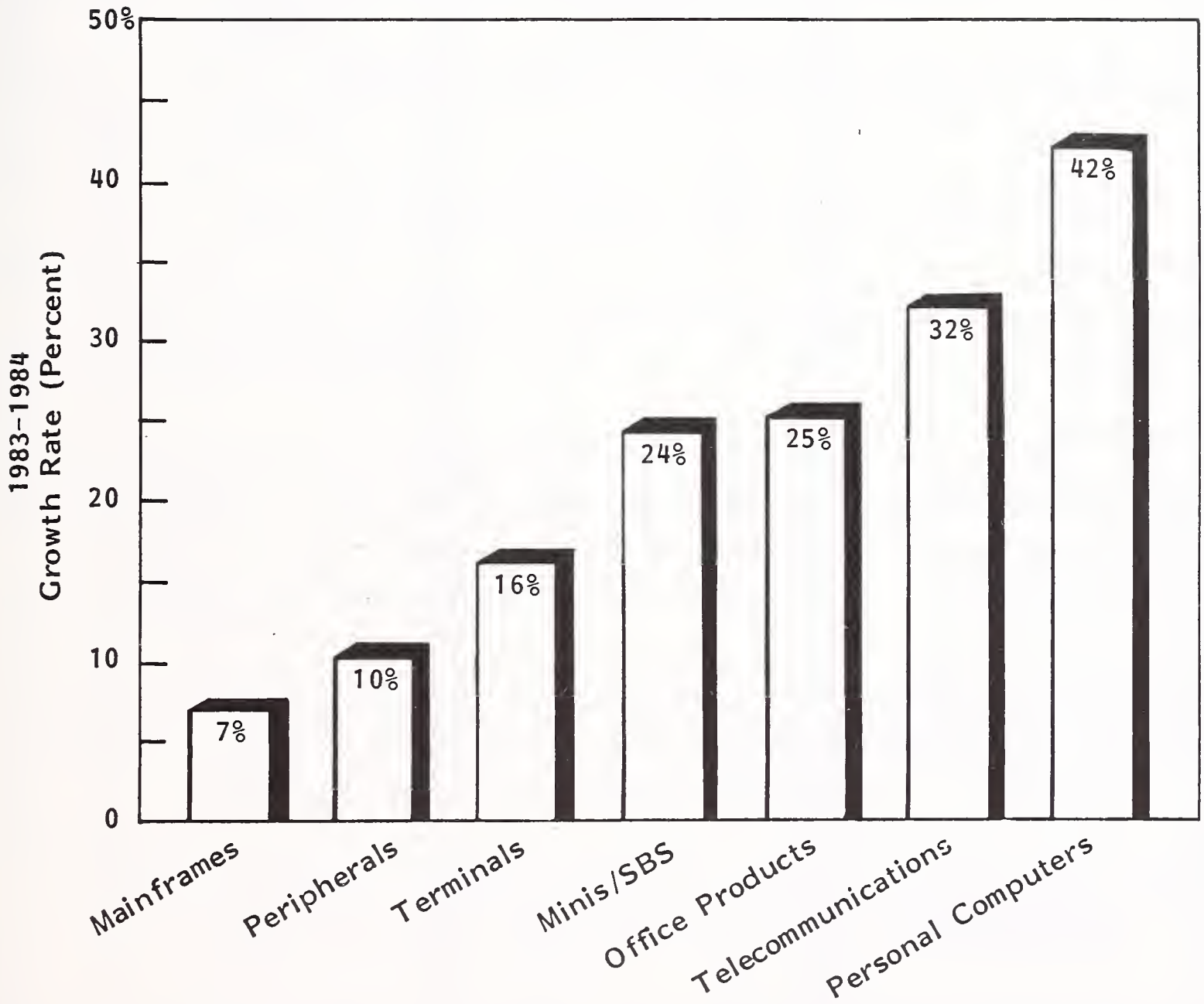


$1,140 Million

Source: INPUT's 1984 Third Party Maintenance Multiclient Study

EXHIBIT IV-15

TPM MARKET SECTOR GROWTH RATES,
1983-1984



Source: INPUT's 1984 Third Party Maintenance Multiclient Study

EXHIBIT IV-16

TPM REVENUE FORECAST BY SECTOR, 1984-1989

PRODUCT CLASS	REVENUE ($ Million) 1982	1983	REVENUE ($ Million) 1984	1989	1984-1989 AAGR (Percent)
Mainframes	$140	$152	$160	$195	4%
Minis/SBS	110	140	170	350	16
Peripherals	190	210	230	335	8
Terminals	85	95	110	310	23
Personal Computers	205	255	330	805	20
Office Products	25	32	40	95	19
Telecommunications	60	76	100	390	31
Total TPM	$815	$960	$1,140	$2,480	16.8%
Total Customer Service	$9,000	$10,200	$11,600	$26,000	17.5%
TPM as Percent of CS	9.0%	9.4%	9.8%	9.5%	N/A

Source: INPUT's 1984 Third Party Maintenance Multiclient Study

- Exhibit IV-17 shows that TPM vendors currently service about 9% of the small business system (SBS) market. This level of market penetration is expected to continue through 1989.

- By 1989 the small-system TPM market will be dominated by service on DEC equipment, comprising 43% of the market. DEC will dominate the TPM market for small systems because:

  - DEC equipment dominates the minicomputer market.

  - DEC encourages OEMs and VARs to compose mixed vendor hardware systems.

  - DEC entered the TPM market in 1983, before most other vendors.

- IBM and Data General are two other vendors whose equipment will be serviced substantially by TPM.

- Although many of the small-system vendors interviewed by INPUT assume that price of service is the main competitive advantage of TPM support, this does not appear to be the case. Exhibit IV-18 lists the most prominent factors affecting the user's choice of TPM as follows:

  - Hardware support--the user chooses a TPM vendor that can supply complete service coverage for a wide variety of products. The actual quality of service is considered very important.

  - Geographic accessibility/response time--users consistently express concern for response time and rate accessibility as essential.

  - TPM vendor reputation--personal referral, particularly within user groups, is very important in the initial transition between manufacturer-supplied service and TPM service.

EXHIBIT IV-17

MINICOMPUTER/SBS TPM MARKET

MANUFACTURER	1984 ($ Millions)	1989 ($ Millions)	AAGR (Percent)
DEC	$90	$150	11%
IBM	37	80	17
Data General	14	40	23
Others	29	80	23
Total TPM Market	$170	$350	16%
Total Service Market	$2,000	$4,100	15%

Source: INPUT's 1984 Third Party Maintenance Multiclient Study

EXHIBIT IV-18

USER RATINGS OF IMPORTANT FACTORS IN CHOOSING THIRD-PARTY MAINTENANCE

RANK	FACTOR	USER RATING*
1	Hardware Support	8.8
2	Geographic Accessibility/ Response Time	8.3
3	TPM Vendor Reputation for Service	8.2
4	Price of TPM	7.9

* Rating: 1 = Low, 10 = High

Source: INPUT's 1984 Third Party Maintenance Multiclient Study

- Price--often promoted as the major advantage of TPM, price is rated as the least important selection criteria by many users. However, price is still promoted by the TPM vendor to attract the user.

- Overall, user satisfaction with TPM vendors is quite high, in some cases higher than the user's satisfaction with the manufacturer's service. Users of Burroughs equipment, for example, rated their satisfaction with TPM vendors at 9.2, considerably above their rating of Burroughs service.

- Exhibit IV-19 lists the major advantages and disadvantages of TPM as cited by small-system vendors interviewed by INPUT. Profit maximization (or at least an incremental increase in revenue) was a major goal of most vendors offering TPM service. This advantage is closely allied to more efficient use of the service work force, because the vendor expects to increase revenue by more efficiently allocating service personnel.

- More efficient use of the work force is a crucial advantage to some small-system vendors who otherwise may have been forced to reduce service staff as the manufacturer's own equipment became more reliable and required less service.

- Account control is seen by most small-system vendors as another major advantage of TPM. Most vendors are not in a position to demand product loyalty from their users, but rather they must cater to the users' needs. Because of increasing micro and mainframe competition, many small-system vendors are attempting to commit the user to their company's CPU and then to try to win the user over on peripheral products.

- DEC, Prime, HP, and other small-system vendors have been forced to accept at least some third-party maintenance from increasingly sophisticated users who compare peripheral purchase and service prices--particularly when the vendor simply sells but does not manufacture the peripheral. For example,

EXHIBIT IV-19

VENDOR COMMENTS REGARDING THIRD-PARTY MAINTENANCE

ADVANTAGES	DISADVANTAGES
1. More Efficient Use of the Service Work Force	1. Parts Supply and Logistical Support
2. Profit Maximization, i.e., the Result of an Incremental Increase in Revenue	2. Increasing Competition of Large Manufacturers and TPM Vendors
3. Account Control	3. Added Expense Due Too: - Training - Documentation - Inspection/Certification of Equipment
4. Increased User Satisfaction with Service	4. Potential for User Demand of Support for Competitive Products
5. More Flexibility in Supporting Local Area Networks	5. Loss of Control over Scheduling of Upgrades, Change-Orders, etc.

one user interviewed by INPUT indicated that a small-system CPU vendor acted as an OEM for CDC disk drives. Purchase price from the CPU vendor for the CDC disk drive was 15% higher than if the user bought directly from CDC. After a great deal of negotiation, the vendor agreed to service the drive purchased from CDC. The vendor was forced into third-party maintenance in order to maintain account control.

- One of the main disadvantages of TPM listed in this exhibit is inadequate parts supply and logistical support. Seventy-three percent of the vendors questioned indicated that parts would be their major concern if they offered TPM. Currently, vendors avoid TPM parts supply problems in one of two ways.

  - The vendor (such as DEC or Honeywell) services only complementary products for which it has contracts and a guaranteed parts supply.

  - The vendor depends on the owner of the equipment to purchase the necessary part, which is then installed by the vendor's FE.

- As vendors begin to service competitive products, logistical support will become increasingly important. Vendors responding to INPUT's survey were generally in agreement that the TPM vendor would be forced to maintain its own logistic supply lines in order to ensure timely access to parts. One vendor speculated that maintenance of extensive parts depots would considerably reduce the TPM vendor's potential profits.

- Another disadvantage of TPM is a possible loss of account control. In the CDC example given above, the user initiated the vendor's service policy. Users who are sophisticated enough to compare pricing and product models will influence competitive service vendors. In addition, the vendor that offers TPM-related services will lose control over scheduling of upgrades, order changes, etc.

- Despite the disadvantages to TPM, it is clear that many small-system vendors are influenced by a substantial user demand for these services. Exhibit IV-20 lists customers who are currently using or considering the use of TPM at their site. In 1984, almost one in three small-system users (32.3%) are either using or considering using TPM. Users of some equipment report a very high TPM usage level. For example, 65% of Datapoint users and 94% of Texas Instruments users report that they use or are considering the use of TPM.

- A number of small-system vendors indicated that the expected growth of Local Area Networks (LANs) would have a significant impact on vendor attitudes about offering third-party maintenance. Although some vendors such as IBM, DEC, and Burroughs can offer their own networking products, many of the smaller vendors acknowledged the need to service many different vendors' products on LAN if they were to control the LAN account.

- Overall, vendors expect substantial growth in the small-system TPM market (16% annually) with revenues expected to reach $350 million per year by 1989. Vendors believe that this growth will be fueled by increasing geographic dispersion of equipment, a greater number of mixed-vendor small-systems environments (including LANs) and a continued user need for improved service. Obstacles to growth will be lack of parts availability, support, and competition from established TPM vendors.

F. SINGLE-SOURCE MAINTENANCE

- The use of third-party maintenance in the small-system environment has been growing primarily because of the increase in mixed-vendor small-system sites. This increase is the result of cost- or performance-conscious users who no longer feel they must buy from just one vendor to ensure compatibility.

EXHIBIT IV-20

USER CONSIDERATION OF THIRD-PARTY MAINTENANCE

VENDOR	CURRENTLY USING TPM (Percent) 1984	NOT CURRENTLY USING TPM BUT CONSIDERING IT (Percent) 1984
Burroughs	14.7%	10.3%
Data General	23.8	21.9
Datapoint	31.8	33.3
DEC	19.0	32.3
Four-Phase	15.0	5.9
Honeywell	3.7	7.4
Hewlett-Packard	2.5	7.7
IBM	11.3	28.3
MDS/Qantel	5.3	0.0
NCR	0.0	13.3
Perkin-Elmer	11.1	25.0
Prime	9.5	36.8
Texas Instruments	36.4	57.1

Over 50% of Users Are Currently Using or Considering Using TPM

- Although a mixed-vendor site may cost less than an integrated, one-vendor site, users complain bitterly about finger-pointing between vendors in the mixed-vendor environment. Also, many users have indicated that it is inconvenient dealing with several different vendors at one site.

- A single source of maintenance for equipment in a multivendor site is by far the most convenient of all the service options from the user's standpoint. This does not mean, of course, that the vendors would be required to actually service all types of equipment. Rather, the user would like one vendor to accept the responsibility for service on all the equipment; brokering is an acceptable means of off-loading service that cannot be provided directly.

- Many users are favorably disposed to having the CPU manufacturer act as the single-source vendor. Users prefer this for a number of reasons:

  - The CPU manufacturer generally has a well-developed service network--better than most peripheral manufacturers.

  - The CPU is the center of the system and is most likely to be affected by any failure.

  - Many of the smaller (typically peripheral) manufacturers have no desire to provide single-source maintenance.

- Exhibit IV-21 shows that avoiding finger-pointing is a major factor in the user's evaluation of single-source maintenance. Other important features include reputation of the single-source vendor and the vendor's capacity to improve response time.

- Small-system vendors such as DEC and Honeywell have begun to recognize the tactical and strategic value of providing single-source maintenance. From a vendor's perspective, the advantages of single-source maintenance, as listed in Exhibit IV-22, include:

EXHIBIT IV-21

IMPORTANCE OF SINGLE-SOURCE MAINTENANCE FEATURES

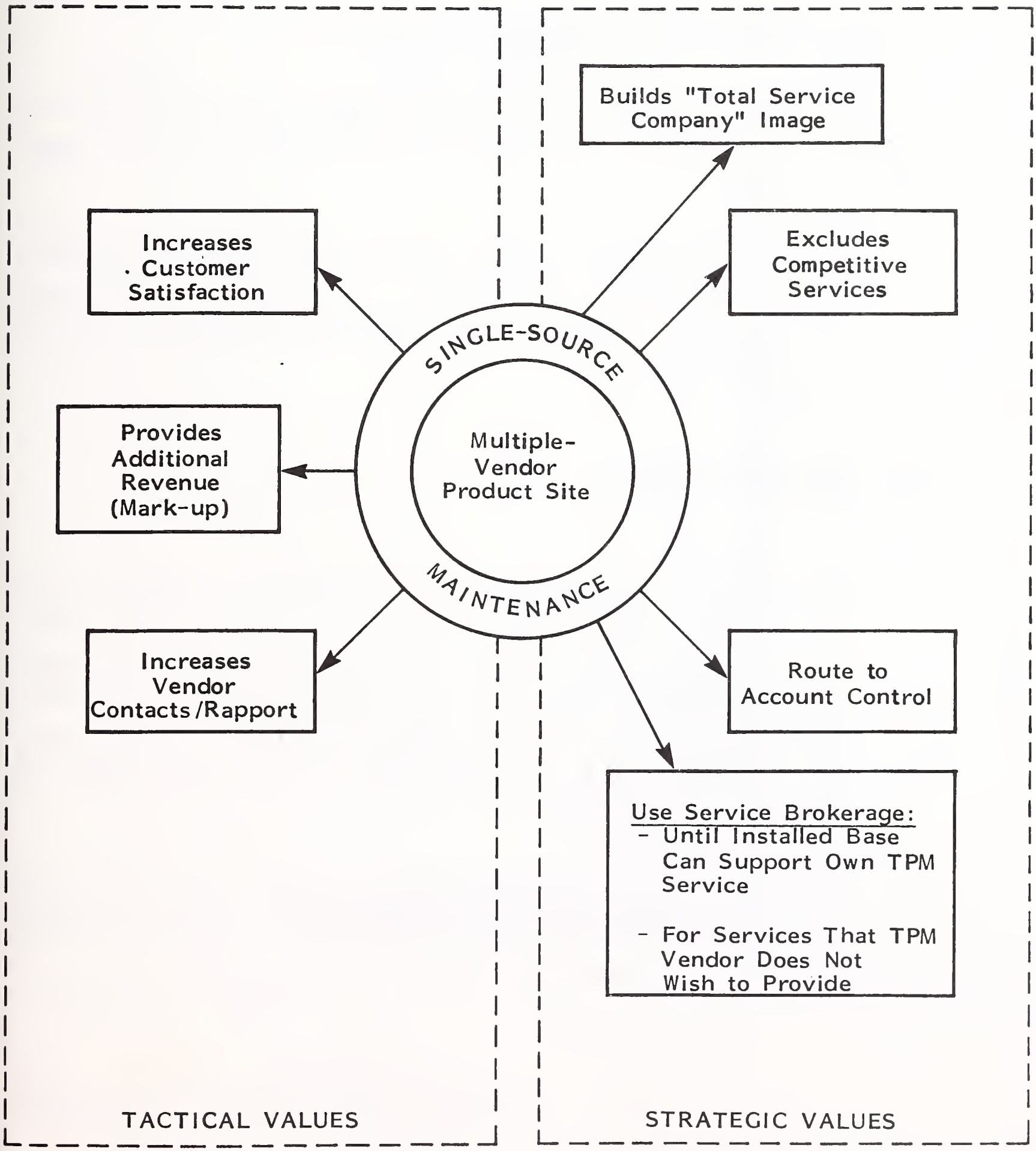
FEATURE	MEAN*	STANDARD DEVIATION	NUMBER OF RESPONSES
Avoiding "Finger-Pointing"	8.5	2.1	341
Improved Response Time	8.1	1.9	344
Knowledge of Site	8.1	2.0	342
Reputation of Single-Source Vendor	8.1	1.9	344
Improved Convenience	7.9	1.9	344

▒ Represents the Major Reason Users Select Single-Source Maintenance Vendors

*Rating: 1 = Low, 10 = High

EXHIBIT IV-22

STRATEGIC AND TACTICAL ADVANTAGES OF SINGLE-SOURCE MAINTENANCE



- Maintaining the vendor's service options using service brokerage, until the service revenue generated by a given site or product is sufficient to warrant the vendor gearing up to offer direct service.

- Enhanced vendor visibility at the user's site.

- The development of a total service image in the eyes of the user and the opening of new opportunities, particularly in post-sales support areas.

- An improved vendor revenue base; even when services are brokered, a 10% surcharge is usually levied, so when the vendor performs the maintenance, existing staff and diagnostic facilities are used more efficiently.

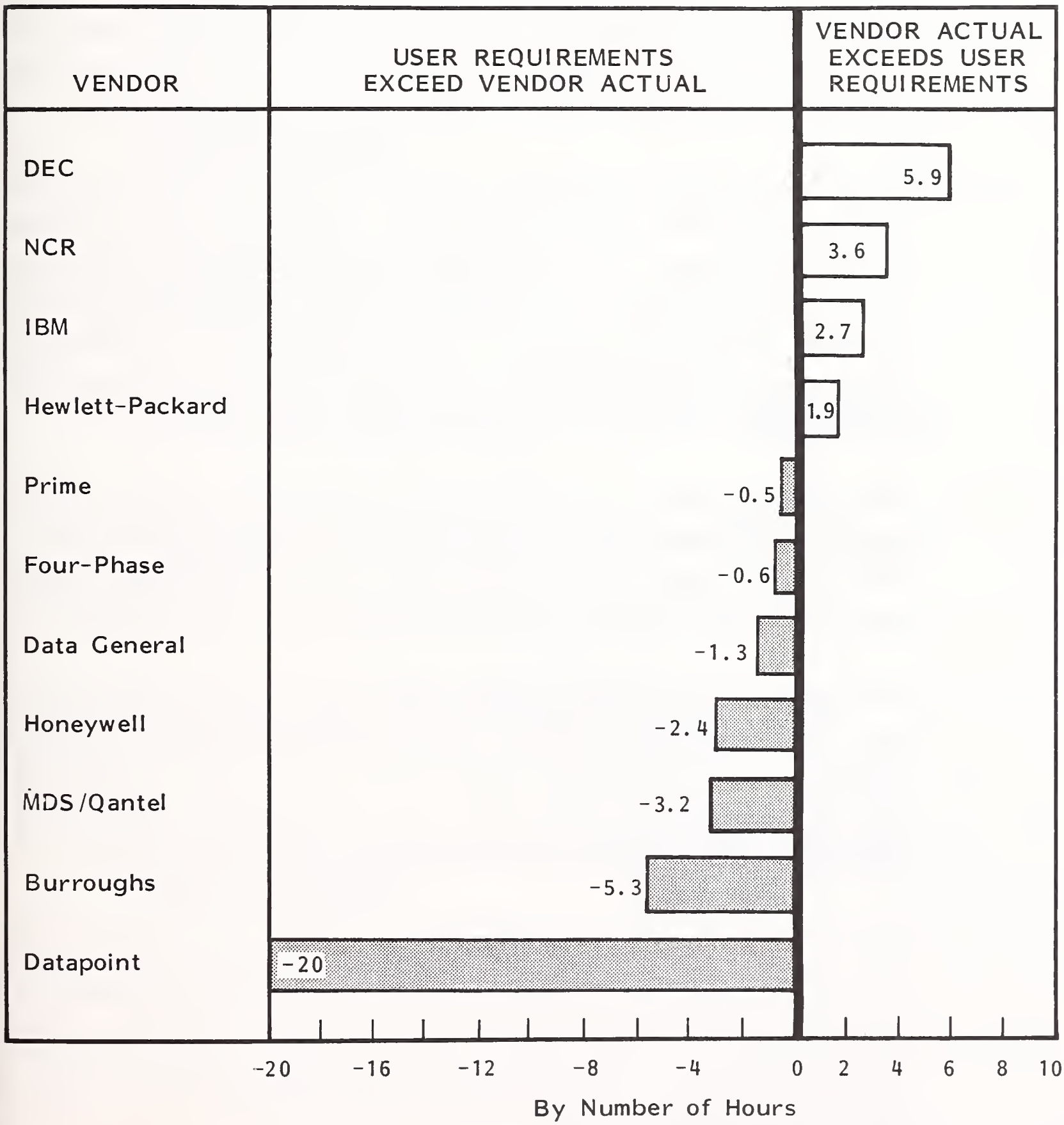
G. SOFTWARE SUPPORT

- Improving software support has become a crucial issue among most small-system service vendors. Software has taken on a new level of importance in the maintenance market, primarily because users are becoming increasingly dependent on software performance. User expectations for software service have increased in direct relation to their dependence on the software. Unfortunately, many small-system vendors have not been able to meet user demands for software service.

- Exhibit IV-23 shows the discrepancy between what users require for software service and what they receive. Seven of the eleven vendors listed do not offer the level of software service required by the user.

EXHIBIT IV-23

USER REQUIREMENT FOR SOFTWARE SERVICES* VERSUS
USER-PERCEIVED VENDOR ACTUALS



* Service Includes Total Repair Time = Response + Repair Time

- User demands for increased software support are not the only factors motivating vendors to improve software service. Another equally important factor is the skyrocketing cost of providing software support. Vendors have became increasingly concerned about service profitability and are looking to alternative delivery methods for software support in order to hold down costs. Methods such as remote support and user self-maintenance help to reduce the single most expensive component of maintenance, on-site service personnel costs.

- A third factor that is encouraging change in the way software service is offered is the current undersupply of software engineers available to respond to user service needs. At one time, small-system vendors could cross-train their hardware engineers in some operating system repairs, but the current complexity of application and system software eliminates cross-training as an option. Vendors have been forced to look for new solutions to software work force problems.

- Although each vendor interviewed by INPUT had its own individual plan for improving software service, a number of similarities within the small-system market became evident. Exhibit IV-24 lists the six major trends in software support derived from the various vendors' software service goals and plans.

- The most pronounced trend is probably the integration of software maintenance into the customer service department rather than the marketing department. Some small-system vendors such as Prime and Four-Phase are still in the transition process, but 89% of the vendors interviewed have now placed software service in the service department.

- Despite the fact that software maintenance has been integrated into the vendor's service department, little or no effort has been made to integrate the hardware and software functions within field service. Only 17% of the vendors provided some cross-training for their engineers (primarily software training for hardware engineers) and there was virtually no interest in combining the two groups completely.

EXHIBIT IV-24

SOFTWARE SUPPORT TRENDS

- Integration of Software Maintenance into Customer Support Program
- Increased Remote Support
- Greater User Involvement in Software Maintenance
- Development of Software Data Bases for Access by Users
- Increasing Support for Applications Software
- Consolidation of Software Support into National Service Centers

- The primary reasons given by small-system vendors for integrating hardware and software maintenance into one department were:

  - To avoid finger-pointing between service departments.

  - To provide a single-point access for customer support.

  - To improve efficiency through shared facilities.

- Eighteen of the 19 small-systems vendors interviewed have centralized software support on a national or regional basis. Of those 18 that are centralized, 72% reportedly offer some type of remote diagnostic or remote fix service for software. (The remaining 28% of vendors with centralized software support offer person-to-person telephone support.)

- As implied above, the level of remote software support varies widely between small-system vendors. Companies such as Perkin-Elmer restrict support mainly to operating system software and even then have limited remote capabilities. Reynolds and Reynolds, and Stratus, on the other hand, offer extensive remote support capabilities. Reynolds and Reynolds can upgrade software for its entire user base from a central remote support facility in Dayton. Stratus reports that software problems are immediately directed to an applications specialist and that the second escalation is to the original programmer.

- In addition to being more efficient, several vendors are promoting remote software support because the number of software products is growing too rapidly to permit decentralized support. Even if there were enough engineers to provide local service, the increasing use of vendor-licensed third-party software makes training of engineers crucial. HP, Honeywell, Prime, and Stratus (among others) now license independently written software. These vendors have indicated that adequate support could not be offered on the local level and must be centralized.

- It is important to note that none of the small-system vendors interviewed would service nonlicensed application or systems software. In addition, vendors said that they had no intention of offering this service in the future.

- Almost all the small-system vendors interviewed felt that users should be involved in the software support process. Some vendors, such as Data General, have a technically oriented user base and require a great deal of user interaction. Other vendors, such as Reynolds and Reynolds, do not require user involvement in software repairs, but they do encourage involvement from interested users by providing informal discounts. Only four of the vendors interviewed (22%) indicated that they did not plan to increase user involvement in software support. Forty-four percent of the vendors indicated that they would require increased involvement. The remaining 34% of vendors said that they would encourage but not force users to be involved in software repairs.

- Several vendors such as GenRad, Prime, and Stratus have established software "data bases" that users can access. Typically, these data bases will provide information about software releases and patches as well as answers to frequently asked questions about the vendor's software. Some data bases also include an electronic mail function for users to communicate with each other and with the vendor. Vendors said that there were a number of advantages to a software service data base.

  - It provides very efficient access to patches and new releases and requires a minimum of the vendor's staff time.

  - It helps the vendor to disseminate answers to frequently asked questions.

  - When used in conjunction with published information, it improves overall software repair time.

H. HARDWARE SUPPORT

- Most of the small-system vendors interviewed agreed that increasing performance and reliability of computer hardware will have a dramatic effect on service departments in general and on hardware support groups in particular. As equipment becomes more reliable and less expensive, users are expected to put tremendous pressure on vendors to reduce service prices and at the same time maintain high support levels.

- Unbundling of service features is being used by many service vendors to maintain high support levels for those who need it and at the same time to reduce service-related costs overall.

- As unbundling increases, many of the services that were considered part of the standard "Basic Monthly Maintenance Charge" (BMMC) are now being added to an increasing list of extra-charge services. The most common unbundled services include:

  - Planning services.
  - Consulting.
  - Training.
  - Site audits.
  - Relocation services.

- Some vendors, such as DEC, seem to be moving away from the entire concept of "standard maintenance" by offering users a bewildering combination of service products. Other vendors have taken the discount approach. For example, the vendor will provide a discount if the user maintains a "parts kit"

because the user (rather than the vendor) must bear the burden of the cost of parts. More and more vendors are offering discounts for "relaxed response times" of six and eight hours rather than the normal four hours.

- Many vendors resist pushing hardware support beyond the point of diminishing returns. As Exhibit IV-25 indicates, some user expectations will never be met. No matter how well the vendor performs, the user will expect improved service. (A number of small-system users said that they do not expect their system to fail at any time and that they should receive 100% availability for the life of the machine.)

- Exhibit IV-26 shows a disproportionately high number of vendors not meeting user requirements for hardware service. It should be pointed out, however, that most users reported an improved response/repair time rate in 1984, and their overall satisfaction with hardware service increased.

- As noted previously in the chapter, overall hardware support has improved as a result of a number of factors, including remote support, improved parts distribution, user involvement in repairs, and increased modularization of equipment. Vendors reported that their prime motivation in introducing these technological innovations was to reduce the number and duration of on-site problem calls.

- Vendors reported that they expect fault-tolerant and redundant design techniques to be common throughout the small-system market in the next five to seven years. In this case, system reliability will approach the realistic 100% goal of many users. Hardware service is expected to change dramatically as the vendors move away from individualized on-site service to a more standardized, assembly-line type of service.

- Several vendors indicated that as the transition from individualization to standardization service is made, the importance of hardware-related service revenues will fall dramatically, and software support and individually priced after-sales services will take on much greater importance in service revenue generation.

EXHIBIT IV-25

SMALL-SYSTEM USER EXPECTATIONS FOR HARDWARE SERVICES

HARDWARE RESPONSE TIME REQUIREMENT	USERS* REQUIRING (Percent)
One Hour or Less	30%
1.1 to 3.0 Hours	32
3.1 to 6.0 Hours	20
6.1 Hours and Above	18

HARDWARE REPAIR TIME REQUIREMENT	USERS† REQUIRING (Percent)
1 Hour or Less	25%
1.1 to 3.0 Hours	32
3.1 to 6.0 Hours	24
6.1 Hours and Above	19

PERCENT SYSTEM AVAILABILITY REQUIREMENT	USERS** REQUIRING (Percent)
99% and Above	22%
95% to 98.9%	38
90% to 94.9%	19
90% and Less	21

* User Sample Size = 314

† User Sample Size = 317

** User Sample Size = 270

EXHIBIT IV-26

USER REQUIREMENTS FOR HARDWARE SERVICES VERSUS USER-PERCEIVED VENDOR ACTUALS

VENDOR	USER REQUIREMENTS EXCEED VENDOR ACTUAL	VENDOR ACTUAL EXCEEDS USER REQUIREMENTS
Hewlett-Packard		3.5
MDS / Qantel		1.2
Prime		1.2
Burroughs		1.0
Perkin-Elmer		0
Texas Instruments	-.9	
IBM	-1.3	
Honeywell	-1.5	
Data General	-2.3	
Four-Phase	-2.3	
Datapoint	-2.7	
DEC	-4.2	
NCR	-4.8	

-5 -4 -3 -2 -1 0 1 2 3 4 5

By Number of Hours

V IMPACT OF CUSTOMER SERVICE MARKETING

V IMPACT OF CUSTOMER SERVICE MARKETING

A. THE NEED FOR SERVICE MARKETING

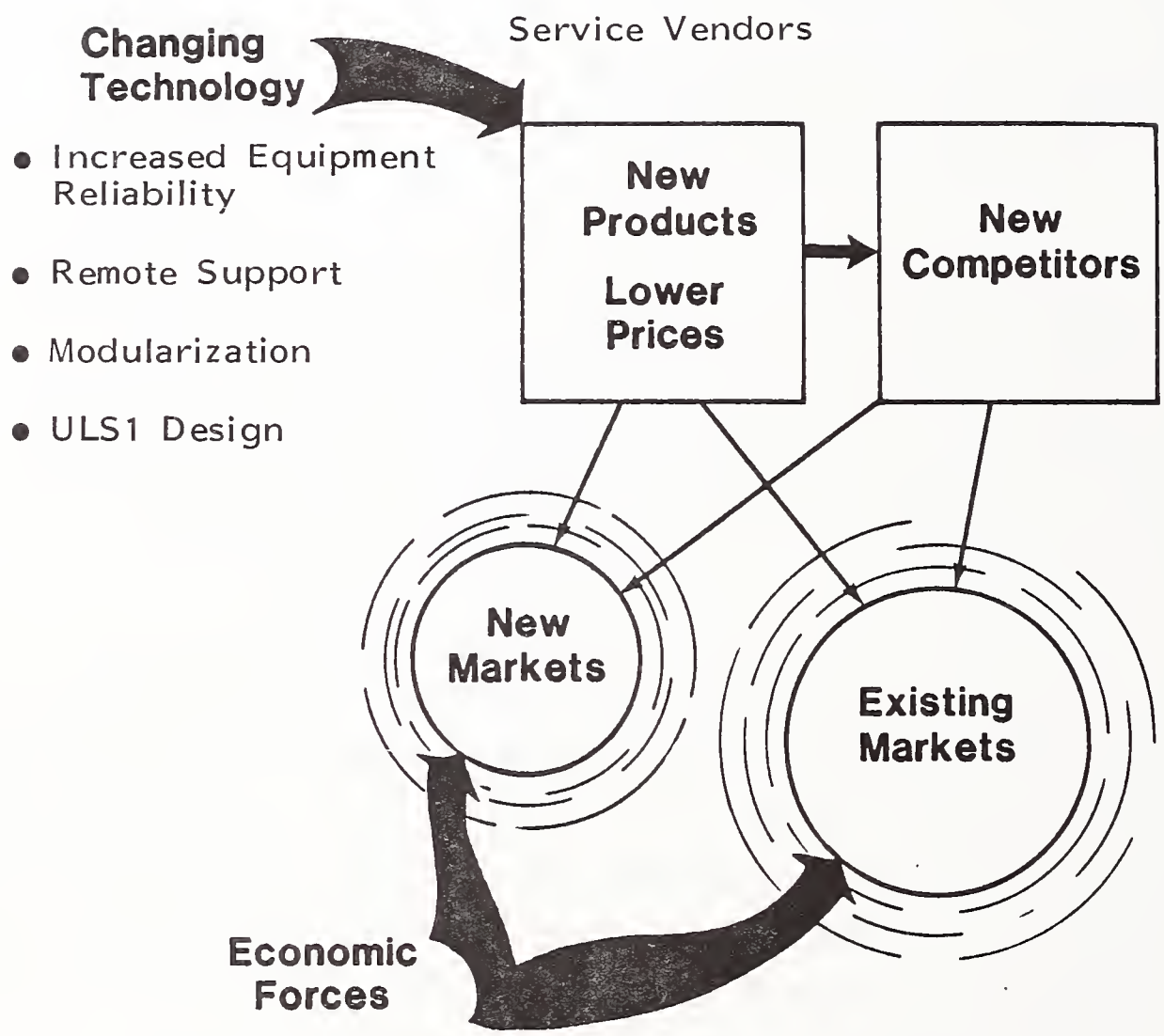
- Marketing of customer support is essential primarily because of the rapid changes taking place in the industry. This approach allows the vendor to stay in touch with the market, to take advantage of new service opportunities, to continually reexamine the relationship between vendor and user, and to develop a more efficient and profitable method of selling service and support products.

- Exhibit V-1 demonstrates the numerous factors influencing customer service. One of the primary factors is "technology push," i.e., an accelerating rate of change resulting from technological advances. The major technological changes affecting field service include the trend toward modularization of parts, the increasing use of remote support, and generally more reliable equipment. These factors have an overall effect of holding down or even reducing service prices.

- Technological change may also result in new products and consequently in new competition. Stratus and Tandem are examples of companies formed as a result of new technology in fault-tolerant design. In some cases, competition impacts the existing market. In other cases, such as in the personal computer industry, an entirely new market evolves.

EXHIBIT V-1

THE DYNAMICS OF CUSTOMER SERVICES



- Increased Equipment Reliability
- Remote Support
- Modularization
- ULS1 Design

- Regulation
- Recession
- Competition
- Technical Change

- Another factor influencing service vendors will be environmental forces. This category includes economic forces such as recession and growth, government regulations, and general economic trends as well as other factors beyond the control of the vendor, e.g., competition.

- Besides environmental and technological factors, one of the most important reasons to institute a marketing program for customer service is to better understand the needs of the user. Marketing is, after all, the process of understanding what the customer needs, meeting those needs, and thereby achieving increased sales and profits. Many of the vendors interviewed by INPUT have recognized the need to understand user requirements. To this end, these vendors periodically interview or survey their own users. In most cases, however, surveys initiated by the vendor are not part of an integrated marketing program, and the survey's effectiveness is not optimized.

- Overall, the three major reasons for establishing a customer service marketing program are:

  - To stay in touch with rapid technological changes in the service industry.

  - To recognize and adapt to environmental factors.

  - To understand user needs and develop service products to meet those needs.

B. EVOLUTION OF CUSTOMER SERVICE MARKETING

- Marketing of support services is a relatively recent phenomenon. Progressive companies such as Hewlett-Packard and Data General have already established service marketing programs, but most vendors interviewed by INPUT are still in the beginning stages of creating service marketing organizations.

- Although there are unique aspects to the service industry, customer service will generally follow a similar pattern of progression toward a marketing orientation. This progression can be divided into three basic stages:

  - Product orientation stage.

  - Sales orientation stage.

  - Marketing orientation stage.

- Most small-system service organizations are still in the product orientation stage. The vendor concentrates on the product in this stage--service is considered necessary to the success of the overall product but is generally not considered an attribute to be marketed. The product orientation stage is generally characterized by two factors.

  - The individual product is in the growth stage.

  - Competition focuses on product performance characteristics such as computing speed or networking capabilities, rather than on service.

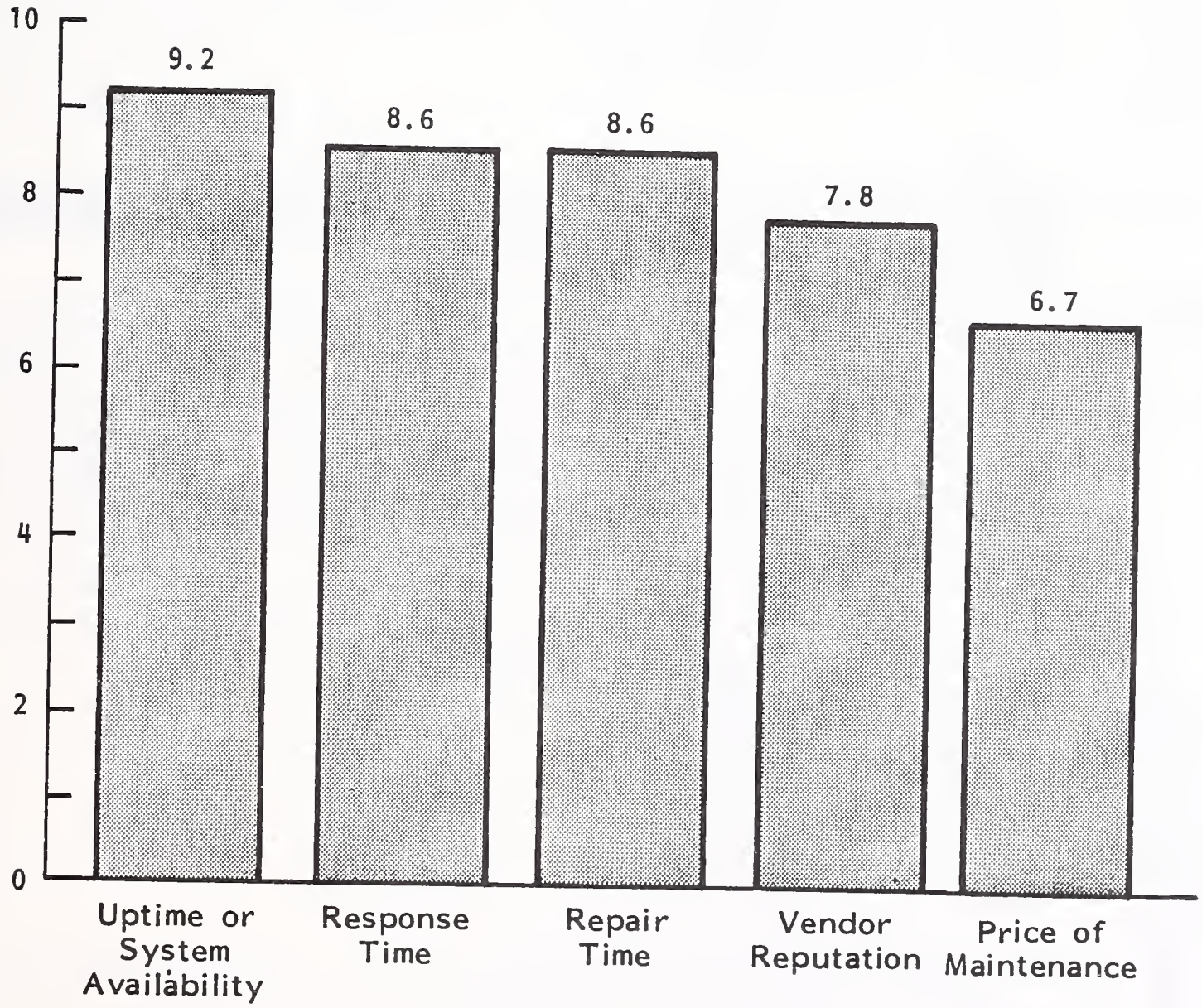
- The sales orientation stage follows as the company starts to meet active competition. Service is emphasized as the vendor attempts to distinguish its product from similar competitive modules. In addition, once there is a choice of suppliers, buyers tend to become more discriminating.

- Users consistently rate service the most important product selection feature after product performance. Exhibit V-2 demonstrates the importance users place on service features such as uptime and response time.

- An increasing number of small-system vendors have been forced into the sales orientation stage by the two factors mentioned above: competition and the

EXHIBIT V-2

IMPORTANCE OF MAINTENANCE FACTORS
IN SMALL-SYSTEM PURCHASE DECISIONS



Rating: 1 = Low, 10 = High

need for product identification. In this stage, management will tend to concentrate on what it needs to do to sell its product, but management will not take the next step: an actual evaluation of the service needs and requirements of users.

- The third and final stage in the evolution of customer service marketing is the marketing orientation stage. This stage is typically reached when a vendor realizes that a "reactive" approa h to service is inadequate and that a "proactive" approach is necessary to ensure continued success. The company will set up a formal marketing system in order to keep in touch with its customers and their changing needs. The market becomes the dominating influence rather than the product.

C. SERVICE MARKETING PROGRAM IMPLEMENTATION—ORGANIZATION DEVELOPMENT AND GOAL SETTING

- The transition between the sales orientation stage and the market orientation stage will not be easy for most small-system vendors. The marketing process, as shown in Exhibit V-3, requires the vendor to develop skills in three crucial areas:

  - Organization development and goal setting.

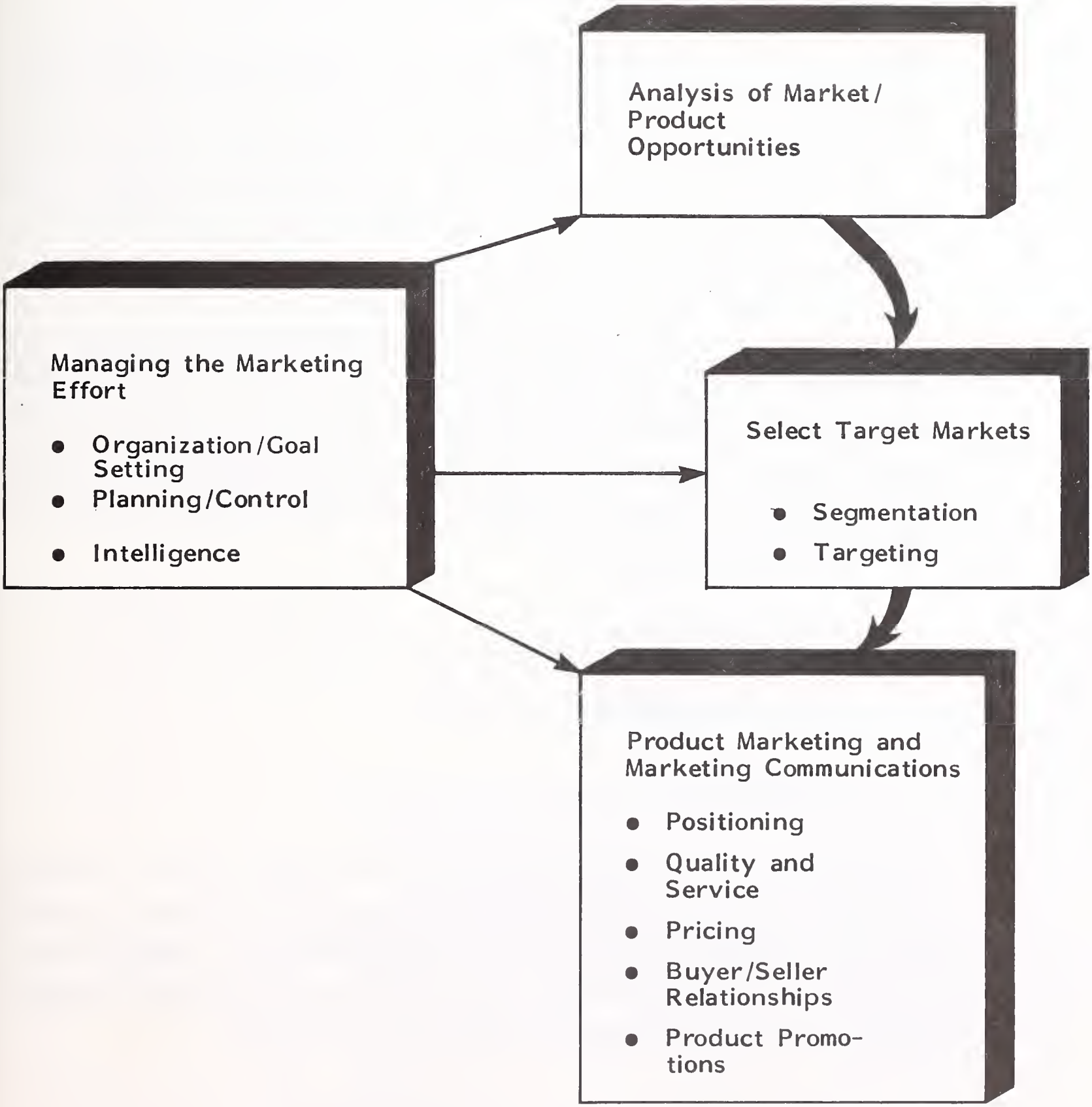
  - Planning and control.

  - Market intelligence.

- Any company will probably be active in some of these three areas. For example, all of the small-system service vendors interviewed by INPUT utilized some type of formal or informal user satisfaction survey. However, only the marketing-oriented company applies the full marketing process with the overall goal of meeting the customers' needs.

EXHIBIT V-3

THE MARKETING PROCESS



- Organization development is the first crucial area in the implementation of a service marketing program. Product-dominated vendors typically organize service marketing as part of the sales department, as shown in Exhibit V-4. As service revenues grow in importance, the sales-dominated vendor begins to integrate some service marketing functions into the service organization. The increasing importance of service will ultimately result in department-level status for service and service marketing, as the exhibit illustrates.

- Several service vendors interviewed by INPUT indicated that service control of support-related marketing was being promoted by yet another factor: the continuing reluctance of sales departments to "sell" service. This reluctance is the result of the sales attitude that service is not a "positive" sales feature. To emphasize service is to admit that the equipment will fail--not an appealing admission for a salesperson.

- The development of service-related goals is an integral part of organizational development. If a service vendor's goal is simply to support product development, then the organization of the service department will be totally different than the organization for a vendor seeking to expand service revenues by market penetration in new markets. Three basic strategies or marketing goals can be defined for service:

  - Market penetration.

  - Market development.

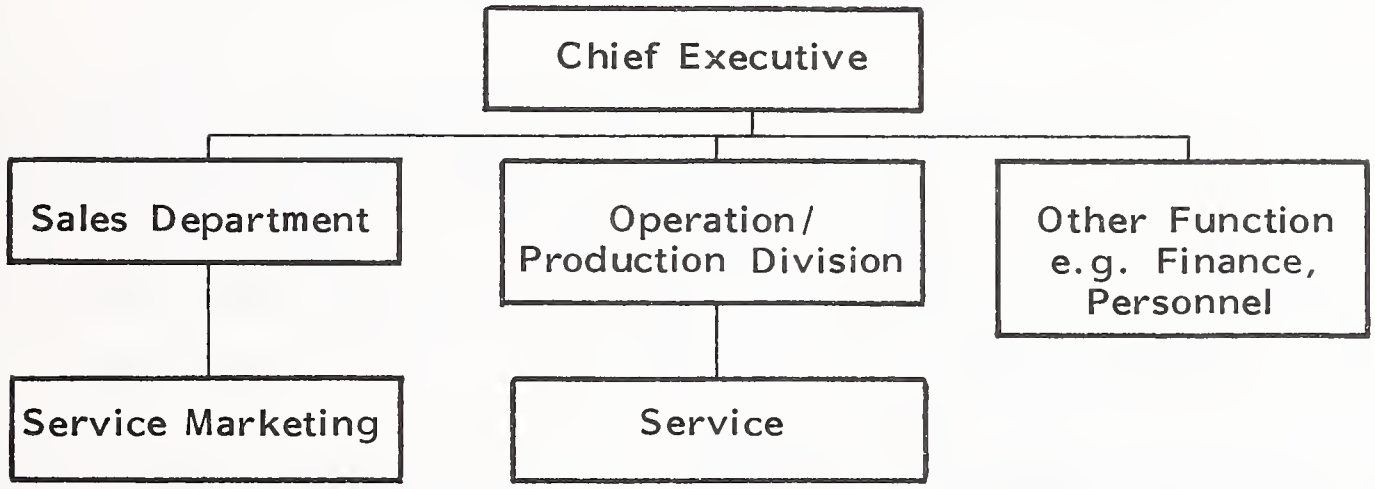
  - Diversification.

- Diversification is currently one of the most popular service marketing strategies. Companies such as DEC and Honeywell are diversifying service outside the normal confines of their own product offerings. Diversification is generally considered to be the most risk-prone strategy since it involves tackling both new markets and new products simultaneously.

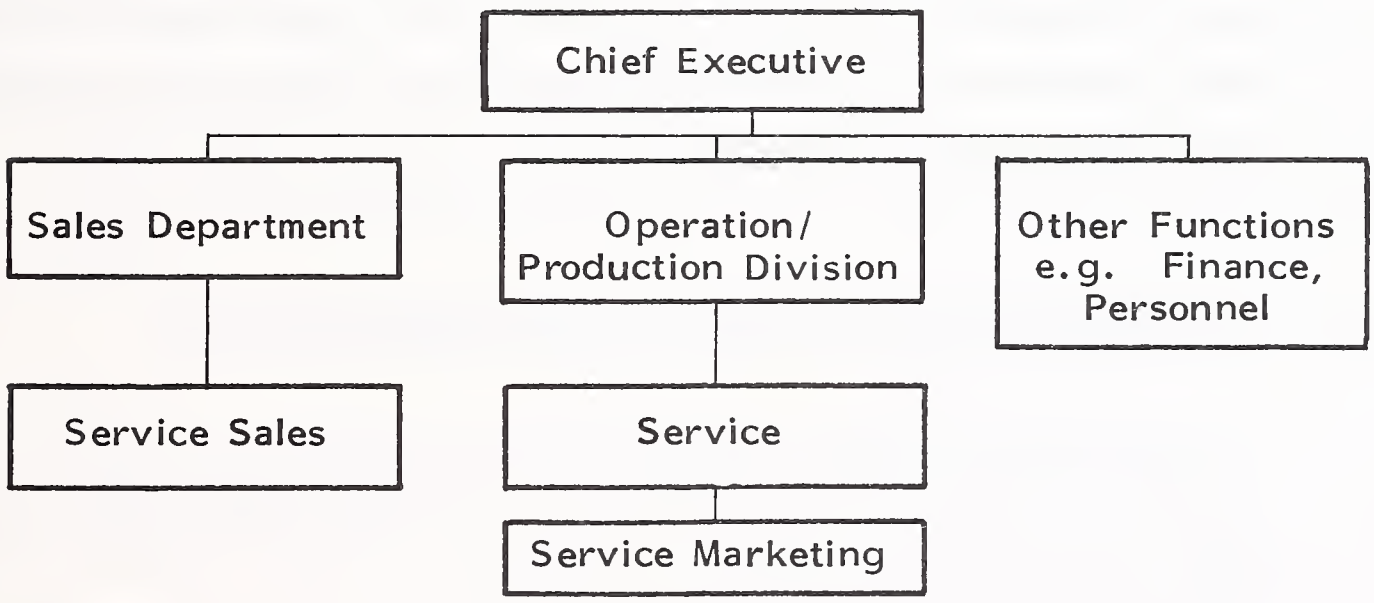
EXHIBIT V-4

SALES AND MARKETING ORGANIZATIONS

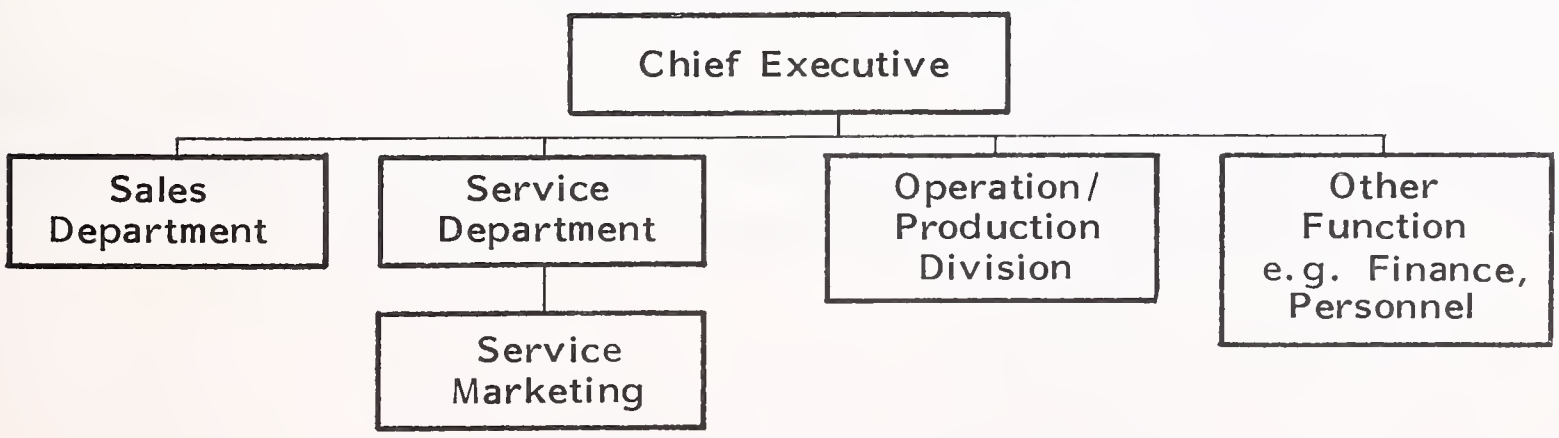
A. PRODUCT-DOMINATED VENDORS



B. SALES-DOMINATED VENDORS



C. MARKET-DOMINATED VENDORS



- Penetration of selected service markets is a second strategy which is increasingly popular as the vendors themselves promote vertical integration of product marketing. Burroughs's activity in the banking industry and Reynolds and Reynolds's in the automobile market are examples of vertical integration preceding market penetration.

- Market development of service is usually dominated by product sales. For example, if a vendor chooses to sell equipment in a certain geographic market, service generally must follow. A marketing dominated company, however, would determine its service market goals first and promote sales within those goals.

- The development of well-structured service goals by a marketing-oriented service vendor will provide the necessary foundation for a coordinated marketing effort. The importance of organizational development and goal setting cannot be overemphasized, since it is the marketing foundation that supports the two remaining components of the marketing effort--planning and control, and market intelligence.

D. PROGRAM IMPLEMENTATION--PLANNING AND CONTROL

- Planning and control is the second key component of the service marketing program primarily because this is the only way for a vendor to measure marketing's effectiveness in achieving increased sales and profits. Despite the importance of planning and control, very few small-system vendors have instituted any sort of formal marketing planning program.

- Most service vendors considered market planning a completely informal activity. These vendors typically regard the planning process as flexible depending upon environmental and economic conditions.

- Of those companies that use formal marketing planning processes, most have adopted a goals-down, plan-up approach. This planning method stresses the importance of goal setting mentioned in the previous section.

- One of the most commonly used control techniques is formal financial review of sales figures. This review typically includes sales analysis on a monthly basis; marketing costs analysis on a monthly, quarterly, or annual basis; and market position assessment on an annual basis.

- The tendency to emphasize sales figures and to neglect market position assessment is common because of the historic dominance of sales. Management should be extremely wary, however, of adopting planning processes or of putting effort into formulating coherent strategies for the marketplace if they do not follow through with effective control systems.

- The major advantage of an effective control system is that it provides an early warning of potential problems when performance does not measure up to expectations or plans. This early warning allows the vendor to make adjustments in the marketing strategy in order to ensure completion of performance goals.

E. SERVICE MARKETING PROGRAM IMPLEMENTATION—MARKET INTELLIGENCE

- The vital link between the service vendor and the service market is the market intelligence system. It is the means by which management can listen to the changes in product needs and customer wants. Small-system vendors are usually more effective in developing an intelligence system because their market is small and they can utilize informal techniques such as periodically calling the user to identify market trends.

- Large-system service vendors have been forced to develop formal marketing intelligence systems because:

  - There is a greater tendency to get out of step with the market, since the market is larger and more diversified.

  - Large vendors' product domination results in rapid technological changes that reduce the effectiveness of informal market intelligence systems.

- Service vendors must take a three-point approach in developing a market intelligence system:

  - "Desk" research--analysis of secondary research sources such as annual reports, published data, and trade publications.

  - Market research--development and analysis of primary research data such as user surveys.

  - Internal accounting--use of internal data such as lost business analysis and field engineer contact reports.

- Once market intelligence data has been compiled, it must be synthesized and, most importantly, integrated into the control review process, as shown in Exhibit V-5. This last step is most important because there is a tendency to underutilize market intelligence information. Review of this data should be formalized throughout the market planning process.

- Although almost all small-system vendors have reported some form of market intelligence activity, work in this area tends to be done on an ad hoc basis. Many companies do not consider it appropriate or necessary to review market intelligence activity on a regular basis along with sales performance,

EXHIBIT V-5

LIST OF MARKET INTELLIGENCE ACTIVITIES

APPROACHES	
• Desk Research • Market Research • Internal Accounting System	
SOURCES	
Field Data	**Published Data**
Sales Force (Win and Loss) Company Employees New Personnel Professional Meetings Trade Associations Market Research Organizations etc.	Articles in Trade Magazines and Newspapers Industry Yearbooks Catalogs Annual Reports (Financial) Advertisements Published Surveys etc.
ACTIONS	
• Collection of Data • Classification • Synthesis • Integrated in Control Review	

revenues, and other important business measures. Exploitation of market intelligence data can, however, be an important factor in the search for increased sales and profits.

F. MARKETING DECISIONS

- Once the basic service goals and planning organization have been established, the small-system service vendor is faced with specific marketing issues such as which services to offer and how to present them to the marketplace. The key service product marketing issues can be grouped under three headings:

  - Positioning service products.
  - Satisfying customer needs.
  - Pricing.

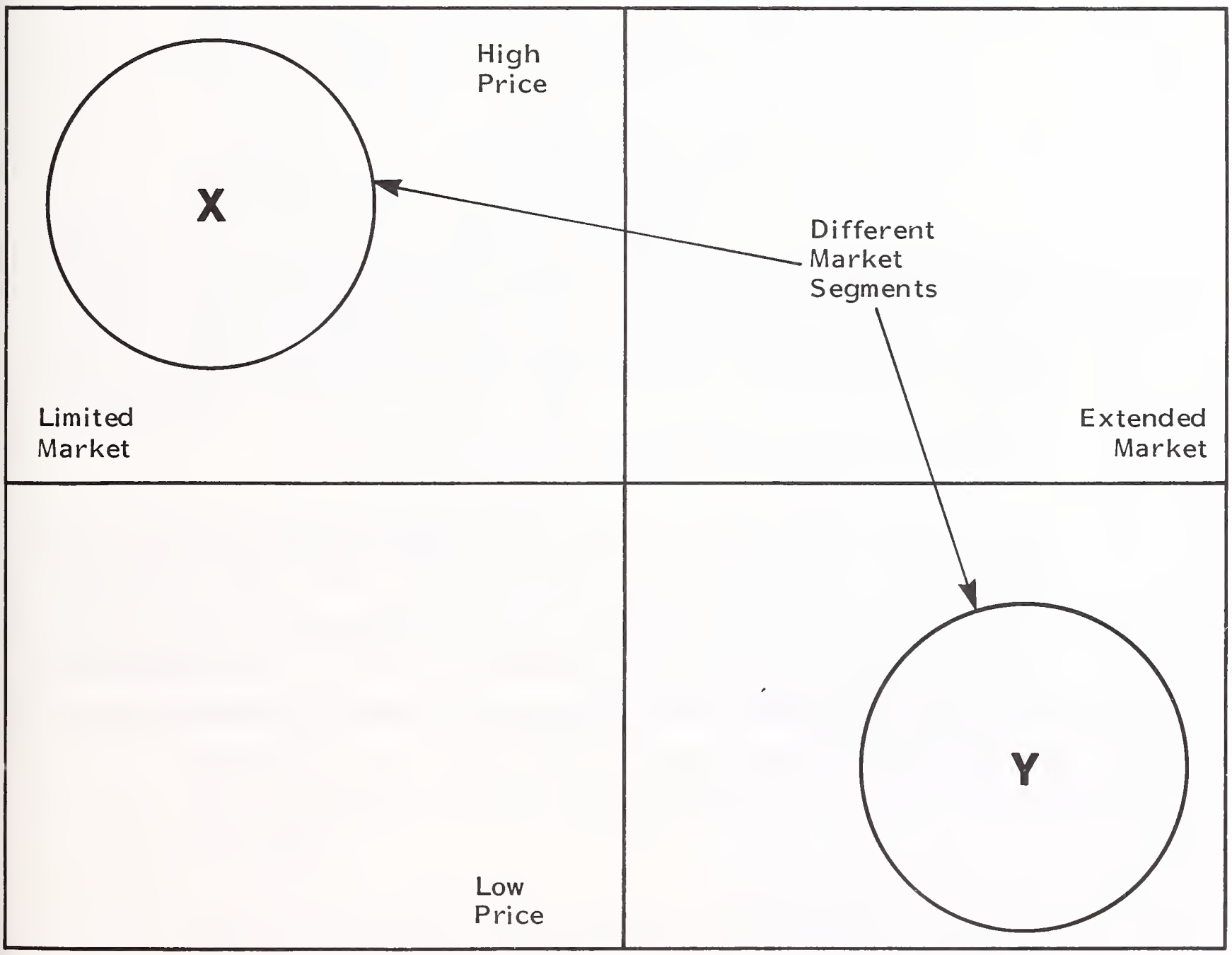
- Positioning of service products is used to target a particular market segment. As shown in Exhibit V-6, a vendor may position a service--such as extended coverage--to a high-priced/limited market (position X) or to a low-priced/extended market (position Y).

- Service positioning becomes increasingly important in competitive markets such as third-party maintenance, in which differentiation between the various competitive services becomes necessary. In general, it is unwise to enter a market segment head-on against a well-established competition. The service product position map is a useful tool to enable marketing managers to gain insight into the relative position of their product vis-à-vis competitors.

- The real advantage of a position map is that it forces the vendor to compare a number of factors against competitive products. (Exhibit V-6, with only two

EXHIBIT V-6

EXAMPLE OF A SERVICE PRODUCT POSITION MAP



factors, is an extremely simplified example.) Generally, this analytical effort is well repaid by the resulting insights into relative service market positions.

- Overall, clear product position analysis provides the services vendor with the benefits of:

  - Sharpened definition of the business.

  - Detection of shifts in the market.

  - Definition of differences between market segments.

  - Highlighting of gaps in the market.

- The second major service marketing discussion concerns the extent to which the vendor will attempt to meet the needs of the market. In some cases, such as with on-site software support, it may not be possible for the vendor to profit, despite a substantial customer demand for this type of service. In such cases, the vendor must have a clearly defined method of identifying and evaluating service opportunities.

- Overall service goals such as market penetration or diversification will be instrumental in evaluating service opportunities. Both market and company criteria must be taken into account when evaluating opportunities. Service marketing should consider what the competition is like, the distinctiveness of the service, and whether the company has the necessary resources to support the planned activities.

G. PRICING OF SERVICE

- Another major marketing decision is pricing of service. Most of the small-system vendors interviewed by INPUT set service prices according to cost or competition factors rather than by appraisals of demand; in general, when assessing price, vendors make little attempt to estimate the value of service to a customer.

- The pricing of service has become infinitely more complex in the last 10 years as the trend toward profitability has become more pronounced. Almost 90% of the small-system vendors report that, for all practical purposes, their customer service operations are now profit centers. Most of these vendors still rely, however, on a cost-plus method of pricing service.

- Like other components of the service marketing program, the pricing decision should be based on the company's overall goals for service. Once these goals are established, the vendor can organize pricing policies in three key areas:

  - Aims of the pricing policy.

  - Price setting.

  - Pricing techniques.

- For most small-system vendors, the overall pricing aim is profitability. However, in some cases such as market penetration or new market development, the vendor is willing to defer profitability until the market share can be increased.

- Market skimming has been mentioned by some vendors as a pricing aim. This covers those situations in which a company can charge relatively high prices for services on the basis that a small section of the market has a very strong

need for those services. Vendors who practice market skimming usually have a substantial competitive advantage in key areas such as parts supply or geographic proximity of service staff.

- The manner in which prices are set is the second major component of the pricing decision. Cost and competition continue to be the dominant factors in service price setting. Demand for service does not appear to be a great influence in setting prices except in those few cases where market skimming is practiced.

- A general picture appears of a basically unsophisticated approach to price setting, on the one hand attempting to undercut competition and on the other hand attempting to preserve margins.

- Small-system vendors must recognize the value of customer demand in their service price-setting decisions. Exhibit V-7 shows that almost two-thirds of all small-system users interviewed by INPUT had a requirement for preventive maintenance during off-prime hours. These users were willing to pay more than 10% extra (over and above the basic monthly maintenance charge) for this service. This is just one example: users were willing to pay more than 10% extra for seven of the ten extended services listed in the exhibit.

- Exhibit V-8 demonstrates the wide variance in user responses with regard to the actual premium paid for extended services. For example, 22.7% of small-system users were willing to pay up to a 5% premium for stand-by coverage during critical periods. Significantly, almost 1% of the users interviewed were willing to pay a premium as high as 50% of their monthly maintenance charge for stand-by coverage.

- Although vendors certainly cannot ignore cost and competition factors in setting service prices, neither can they ignore the profit potential resulting from increased customer demand for selected services. As shown in Exhibits V-7 and V-8, the revenue derived from demand-based service price setting can be quite substantial.

EXHIBIT V-7

USER REQUIREMENTS FOR EXTENDED SERVICES AND ATTITUDES TOWARD PREMIUMS

EXTENDED SERVICE	USERS RESPONDING YES TO REQUIREMENT		REASONABLE PREMIUM AS PERCENT OF BASIC CHARGE FOR MAINTENANCE
	Number	Percent of Users	
Stand-By Coverage During Critical Periods	110	30.1%	12.1%
Guaranteed Uptime	126	34.6	10.5
Guaranteed Response Time	209	57.3	11.8
On-Site Spare Parts	106	29.0	9.1
Remote Diagnostics	151	41.5	7.8
Preventive Maintenance and Field Changes During Off-Prime Hours	228	62.5	10.2
Occasional Shift Coverage (Versus Fixed Schedule)	127	35.0	10.2
Full-Time, On-Site Service Engineer	37	10.1	12.0
Guaranteed Repair Time (Hardware)	165	45.3	9.5
Guaranteed Turnaround on Software Fixes	103	31.2	11.8

EXHIBIT V-8

CUMULATIVE DISTRIBUTION OF REASONABLE PREMIUMS FOR EXTENDED SERVICES

EXTENDED SERVICE	PERCENT OF USERS WHO REQUIRE EXTENDED SERVICE AND WHO ARE WILLING TO PAY A PREMIUM OVER BASIC MAINTENANCE CHARGE									
	PREMIUM GROUPS									
	0%	1-5%	6-10%	11-15%	16-20%	21-25%	26-30%	31-40%	41-50%	51 +
Stand-by coverage during critical periods	77.3%	22.7%	13.6%	7.2%	6.3%	2.7%	1.8%	1.8%	0.9%	-
Guaranteed uptime	77.8	22.2	12.7	4.8	4.0	2.4	0.8	0.8	0.8	-
Guaranteed response time	77.8	18.9	14.4	6.3	5.8	2.5	1.5	1.0	1.0	-
On-site spare parts	84.8	15.2	0.5	0.4	0.3	0.2	0.1	-	-	-
Remote diagnostics	83.4	16.6	7.9	1.3	1.3	1.3	-	-	-	-
Preventive maintenance and field changes during off-prime hours	82.9	17.1	8.7	5.2	3.0	0.8	0.4	0.4	0.4	-
Occasional shift coverage (versus fixed schedule)	74.0	26.0	15.0	5.6	3.2	1.6	0.8	0.8	0.8	-
Full-time, on-site service engineer	86.5	13.5	5.4	5.4	2.7	2.7	-	-	-	-
Guaranteed repair time (hardware)	76.4	23.6	10.8	6.6	4.2	2.4	-	-	-	-
Guaranteed turnaround on software fixes	80.6	19.4	9.7	5.8	4.8	2.9	1.0	-	-	-

- The third, and last, component of the pricing decision is pricing techniques. The three major pricing techniques used by small-system vendors include:

  - Discounting.

  - Unbundling.

  - Price differentiation/value analysis.

- Discounting is by far the most commonly used pricing technique. Vendors reported using a wide variety of discounts including prepayment, relaxed response requirement, volume, and parts discounts. Not surprisingly, the level of discounts varied tremendously. Typically, the largest discounts were informal, based on a large sales volume, and were offered primarily to induce sales. Formal discounts, such as a 3% prepayment discount, were generally not subject to negotiation.

- Unbundling of service prices is increasing in popularity as the menu of service options grows. More and more small-system vendors are treating individual services such as software support or remote diagnostics as separate, identifiable components of the service contract. Users are allowed to choose from a "menu" of service offerings, only those services they required. Subsequent service selections are unbundled and priced individually.

- Unbundling is an effective service pricing technique because it more accurately coordinates prices with service needs. Users have generally reacted favorably to the menu-of-service-products approach and to the unbundling of service prices.

- The third pricing technique, price differentiation/value analysis, is directly related to price setting according to customer demand. Using the price differentiation technique, the price for service is not as close as possible to

the estimated value of that service to the customer. Some of the most commonly used parameters for differentiation include:

- Response/repair time.
- Geographic location.
- Size of company.
- Product density.

- Many companies see considerable difficulties in implementing value analysis/price differentiation because of the inherent difficulty in establishing values. More consideration should, however, be given to overcoming these difficulties, because value-based pricing is at the root of profitable service pricing.

H. MARKETING COMMUNICATIONS--VENDOR/USER INTERACTION

- All service organizations must in some way create means of communicating with their existing and potential customers. Small service vendors can rely on informal communication methods such as word of mouth, but most established small-system service vendors have been forced to create sales forces to be their principal buyer/seller intermediary.

- Although sales departments have traditionally controlled service marketing, several factors are challenging sales dominance in the area:

  - Vendors are becoming increasingly concerned about the cost of employing salespeople.

- The larger and more widespread markets are getting more and more difficult to reach effectively with traditional sales methods.

- Standardization of service products and increased sophistication of users are calling into question the attitude that a trained salesperson is needed to explain the highly complex nature of service.

- In many cases, sales departments are viewed as being committed more to selling the "box" rather than the service.

- Exhibit V-9 demonstrates that in addition to the traditional sales force, the vendor/user interaction is also being encouraged by account managers and field engineers. It is important to recognize that none of the service vendors interviewed by INPUT plans to introduce the FE into a direct sales role. Instead, the FE is thought of as a necessary conduit between direct sales and the user.

- There are several reasons why the FE should be involved in the sales process (although not in direct sales).

  - The FE has an excellent understanding of the user's service requirements and can provide "leads" to the sales force.

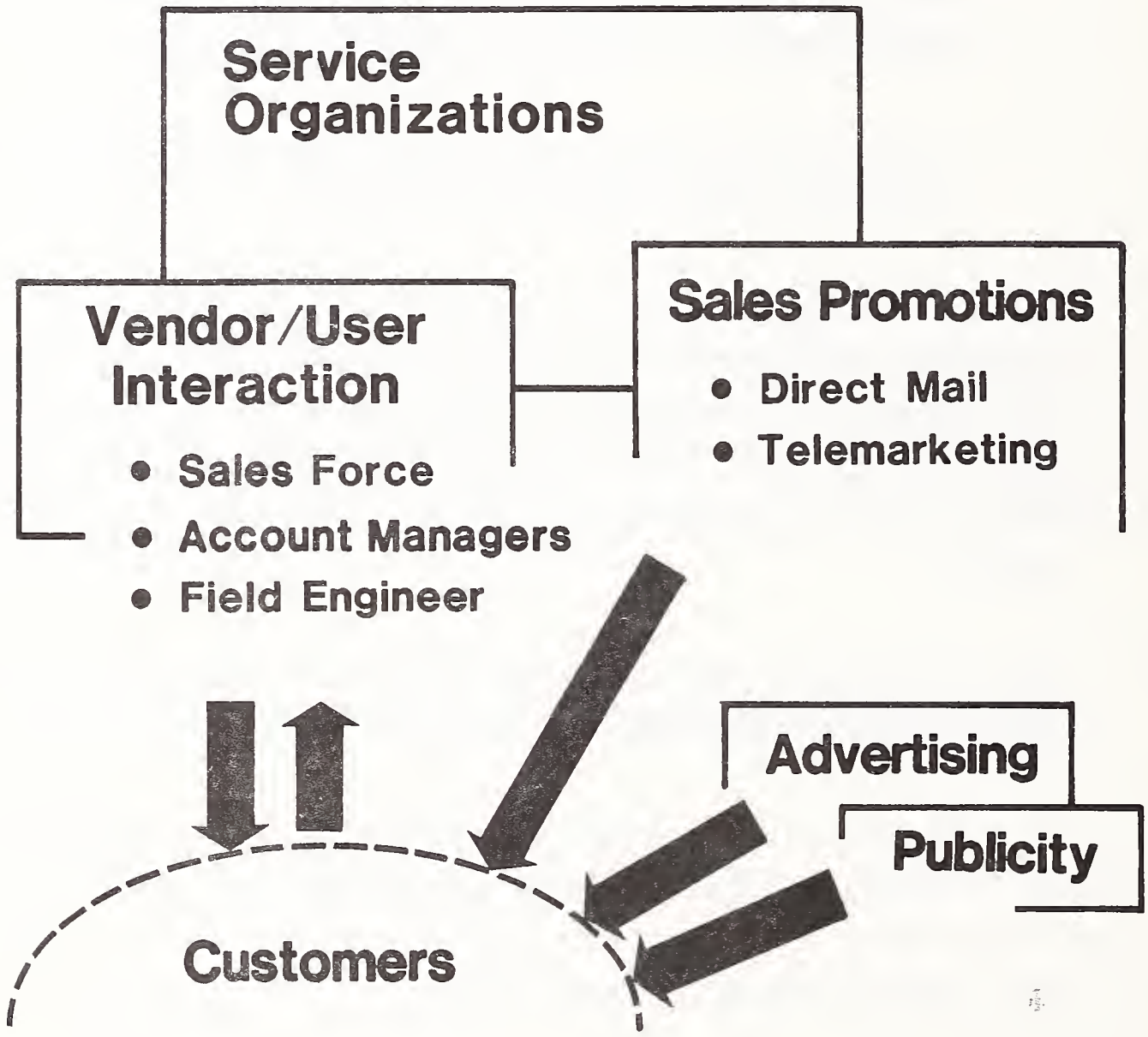
  - The FE knows the equipment on-site.

  - Users respect the FE's judgment with regard to equipment purchase.

- Despite the advantages, vendors recognize that putting FEs in a direct sales role would alienate many users. Exhibit V-10 demonstrates that most users are strongly opposed to having field engineers in any sales role. Users feel that there may be a conflict of interest, particularly when FEs might be selling equipment that they would also be responsible for servicing.

EXHIBIT V-9

MARKETING COMMUNICATIONS



CHALLENGES

- Control Costs of Selling
- More Emphasis on Promotional Methods
- Creative Use of Marketing Communications
- Establish Objectives and Measure Performance
- Increasing Emphasis on Advertising

EXHIBIT V-10

1984 USER ATTITUDES TOWARD HAVING THE FIELD ENGINEER IN A SALES ROLE

FIELD ENGINEER'S SALES ACTIVITY	FAVOR	NEUTRAL	OPPOSE
Supplies	31.3%	27.8%	40.9%
Add-On Equipment	38.8	19.3	41.9
New Models	32.8	18.2	49.0
Upgrades	44.4	15.4	40.2
Service Contracts	44.5	16.9	38.6
Software	25.2	15.9	58.9

- There was a certain amount of user acceptance of FEs selling upgrades and/or service contracts. Users indicated they did not view selling upgrades or contracts as sales because these would be part of a preestablished plan.

- A second reason vendors are reluctant to employ FEs in a sales role is the engineer's inability to adequately communicate with the user. Exhibit V-11 lists user ratings of the communication between the user and the hardware/software engineer. User ratings of software engineer communication is particularly low, 6.4 on a scale of one=low, ten=high. Hardware engineers receive a somewhat higher rating (7.9). This still is not acceptable to customers used to a much higher level of communication from a salesperson. Vendors must remember that communication also means listening to users and understanding/interpreting their needs.

- All of the small-system vendors interviewed by INPUT recognized the problems involved in trying to convert the FE into a salesperson. As Exhibit V-12 demonstrates, none of these vendors intend to put the FE in a sales role, but 100% of the vendors report that the FE is involved in some form of support sales.

- Almost all of the vendors encourage the FE to make goodwill calls on customers. This is seen as essential in promoting user satisfaction with service. Ten of the twenty small-system vendors reported that they encourage FEs to attend sales meetings. Vendors see this process as a way to help the FE to understand the needs of the users and the requirements of the sales departments. The role of the FE is expanded not to sales, but rather as a source of information and communication between the user and the vendor's traditional sales force.

- Account managers are currently a small but increasingly significant part of the overall buyer/seller relationship. The account manager, unlike the salesperson, has the responsibility for all activity at a site, including both sales and service.

EXHIBIT V-11

USER RATINGS OF ENGINEER COMMUNICATION

VENDOR	USER RATING	1983-1984 PERCENT INCREASE (DECREASE)
Burroughs	7.4 / 6.3	(4%) / 7
Data General	8.0 / 6.4	1 / N/A
Datapoint	7.9 / 7.0	(3) / (7)
DEC	8.0 / 6.1	(5) / (6)
Four-Phase	7.5 / 6.9	(5) / 13
Hewlett-Packard	8.4 / 7.2	2 / 4
Honeywell	8.3 / 6.2	N/A / 2
IBM	8.2 / 7.3	(2) / 3
MDS/Qantel	7.6 / 6.9	N/A / N/A
NCR	7.7 / 7.5	(6) / 23
Perkin-Elmer	6.3 / 4.0	(14) / (9)
Prime	7.9 / 4.9	N/A / (27)
Texas Instruments	6.6 / 5.7	(17) / (11)

1 2 3 4 5 6 7 8 9 10

Poor Excellent

Hardware FE

Software FE

EXHIBIT V-12

VENDOR ATTITUDES TOWARD THE FIELD ENGINEER IN SALES-SUPPORT ROLES

SALES-SUPPORT FUNCTION	VENDORS INVOLVING FE IN THIS FUNCTION (Percent)
Making Goodwill Calls	61%
Attending Sales Meetings	50
Negotiating Maintenance Contracts	13
Selling Hardware/Software	0
FE Performs Some Sales Functions	100

- The major advantage of an account manager over both the traditional sales force and the FE is the manager's ability to meet a full range of customer sales and service requirements. Vendors commented on some of the major advantages in establishing an account-manager-based sales system.

  - Since the manager would only supervise service, the unique relationship between the FE and the user would not be threatened.

  - The manager would have a better understanding of the user's requirement for sales and service than the salesperson.

  - The account manager system is well suited to single-soruce maintenance described in Chapter III.

- In the short term, sales departments will continue to enjoy substantial control over marketing of all products and service; however, a greater involvement on the part of field service in marketing service products is inevitable. Field service offers the technical expertise and the motivation to market service and will experience substantial benefits from growth in this area. Other factors that will promote the growth of field service control of field service marketing include:

  - The increasing profitability of service.

  - The expanding service market which is unrelated to equipment sales (i.e., third-party maintenance and service).

  - Expanded methods of marketing that do not require an extensive sales force (telemarketing, direct mail, etc.).

I. PROMOTION OF SERVICE

- Promotion of service is becoming one of the most dynamic components of the marketing plan. Small-system vendors have been aggressively searching for new or proven methods to promote their service offerings. These promotions can be divided into two general areas:

  - Sales promotions.

    . Direct mail.

    . Telephone sales (telemarketing).

  - Advertising and publicity.

- Sales promotion via direct mail is not a new technique in service, but its use has expanded as a result of the need to reach an increasingly dispersed user population. Companies such as DEC and Honeywell have been particularly effective in using direct mail to promote a variety of new services including parts, supplies, and support services.

- Direct mail often has a poor image as a sales promotion tool because of its low response rate (often under 5%) and because of the relatively poor quality of responses. These problems generally occur as a result of bad planning and a failure to clearly identify target market segments. Lack of experience with the method and an inability to communicate an effective selling message are other frequent problems.

- Direct mail can be a powerful marketing method for boosting sales of service if the effort is properly managed. Management considerations should include:

  - The proper targeting of markets.

- The development or application of mail lists.

- The development of a clear sales message.

- The use of salespeople to follow up within a meaningful time frame.

- Telemarketing is a generally effective way for salespeople to follow up on direct mail leads. Telemarketing offers several advantages over other forms of sales promotion.

  - Telemarketing is less expensive than on-site sales.

  - Telemarketing of service is often combined into an integrated remote support services center.

- There are, however, major drawbacks to telemarketing.

  - Technical knowledge and experience is often required to explain various service features.

  - The traditional sales force may see telemarketing as a threat rather than as a help.

- The efficiency of a telemarketing service is the major cause of growth in this area. Vendors report that telemarketing has been particularly successful for routine sales of items such as supplies and upgrades. Frequently, these were neglected areas because of low profit margins and/or sales incentive. The use of telemarketing has lowered sales expense and permitted more efficient centralized dispatch of products, which in turn has improved profit margins.

- Customer satisfaction with telemarketing has been improved due to the vast array of products and services now offered. DEC, for example, offers hard-

ware and software documentation, spare parts, and terminals as part of its "DECdirect" telemarketing effort. Users enthusiastically support telemarketing at companies such as IBM, DEC, and Control Data because it provides them with a fast response time on orders, and the user (not the salesperson) chooses when to order equipment or supplies.

- The third (and potentially most important) reason why the use of telemarketing has expanded is the growing user acceptance of remote customer services including diagnostics, repairs, and sales. Users have been educated about the benefits of remote customer services in a number of ways: improved response time due to the remote diagnostics and centralized dispatching, software fixes via remote downline loading, and now the use of telecommunications to improve marketing and the sales of services. Small-system vendors explained that even in their market, which is heavily devoted to on-site support, telemarketing is accepted and even preferred when the benefits of timeliness and lower prices are effectively demonstrated.

- Advertising and publicity make up the second major component of customer service promotion. Although this is a rapidly growing area, it is usually beyond the experience level of the typical field service manager. Growth in this area is usually the result of corporate influence in service marketing.

- Although service-related advertising is increasing, it has not even started to approach the advertising expenditures of such items as personal computers, which can represent as much as 7% of total revenues. Despite the dominance of affordability as a major influence on budget setting for service, ad expenditures have been increasing. Generally, these ads can be classified into one of two major groups:

  - Ads placed in the general literature. These are designed more to promote name recognition and customer interest in the vendors service offerings.

- Ads placed in trade publications. These ads are more specific, usually address particular issues, and are aimed at field service decision makers.

- General media advertisements rarely deal with specific field service issues and, as noted above, usually concentrate on building service name recognition. A recent Burroughs advertisement tries to create service product awareness by quoting typical service platitudes such as "service is our middle name" and "trust me." The ad then goes on to emphasize that "talk is cheap" and that Burroughs has a proven service record.

- Trade press advertisements are typically directed much more to specific issues than to fostering general awareness. In a recent ad, for example, DEC emphasized lower prices for VAX diagnostics. Included in the ad was a list of price discount percentages, media required, and specific systems served. This type of advertisement is clearly designed to inform the field service manager of new service-related products.

- Publicity is often ignored as a good source of nonpaid advertising space. The most prevalent publicity activity among service vendors is in press releases typically covering some new service offering. Technical articles published in the trade press are also a popular form of publicity.

- Besides the fact that publicity is usually cost-effective, there may also be a value added in that a publication may expand the original copy with additional information.

VI CUSTOMER SERVICE REVENUE AND PROFITABILITY ANALYSIS

VI CUSTOMER SERVICE REVENUE AND PROFITABILITY ANALYSIS

A. INTRODUCTION

- The purpose of this chapter is to analyze the financial performance and strategic goals of small-system service vendors. Generally speaking, the customer service operations of most small-system vendors are profitable. However, there are substantial differences between vendors as a result of differing service goals and implementation plans.

- Exhibit VI-1 summarizes the customer service revenue and total information services revenue growth for leading small-system manufacturers in 1983. As the exhibit demonstrates, small-system service continues to be a high-growth market. In addition, most vendors report that customer service revenue is increasing as a percent of total information services revenue--continuing a trend begun in the late 1970s.

- Service revenue growth varied widely, from 62% for Wang to only 1% for Texas Instruments. Average service revenue growth for small-system vendors interviewed by INPUT was 26% in 1983. Variability in small-system service growth rates was the result of numerous factors including:

  - Increased emphasis on service at the corporate level (e.g., at Burroughs and Wang).

EXHIBIT VI-1

SMALL-SYSTEM VENDOR SERVICE REVENUE, 1983

	Total Information Systems Revenue ($ Millions)	Estimated Customer Service Revenue Worldwide ($ Millions)	Customer Service Growth Rate 1982-1983 (Percent)	Customer Service as a Percent of Total Information Services Revenue 1983
Burroughs	$4,390	$1,073	4%	24%
Control Data	3,508	303	6	9
Data General	829	198	23	24
Datapoint	540	75	8	14
DEC	4,272	1,053	29	25
Hewlett-Packard	2,420	460	12	19
Honeywell	1,666	460	2	28
IBM	40,200	7,300	14	18
MDS/Qantel	364	102	16	28
NCR	3,731	1,171	8	31
Perkin-Elmer	214	35	8	16
Prime	517	125	47	24
Tandem	418	58	49	14
Texas Instruments	1,069	160	1	15
Wang	1,538	220	62	14

- Reorganization and centralization of service (e.g., at Prime).

- Growth in the user base (e.g., at Tandem).

- Reduction in the user base (e.g., at Texas Instruments).

- Development of new service products (e.g., at DEC).

- Service revenue continues to grow in importance as a component of total information services revenue, representing from 9% to 31% of the IS revenues in 1983. Small-system service revenue averaged 21% of total information services revenue in 1983. INPUT projects continued service revenue growth through 1988, increasing to an average of 27% of total revenue for small-system vendors.

B. FACTORS INFLUENCING SMALL-SYSTEM SERVICE PROFITABILITY

- Revenues derived from services have become an important component to all of the small-system vendors interviewed by INPUT. Most of these vendors indicated that service was at least marginally profitable. Only two of the small-system vendors interviewed have indicated that they continue to lose money on service.

- Profitability goals in the small-system environment are difficult to define for two basic reasons:

  - Profitability data is sensitive information that is closely guarded by most vendors.

  - The term "profitability" has different meanings for different organizations.

- Whereas many of the large system vendors have a rigid definition of profitability, most of the small-system vendors were much more flexible in assigning profitability status. Several organizations indicated that their overall service departments were profit/loss (P/L) centers but that several service regions within the service department were cost centers. One vendor indicated that its service department was a cost center for accounting purposes but a P/L center for corporate reporting purposes.

- It is common for small-system vendors to initially operate new regions or service products as cost centers and then to turn them into P/L centers later.

- Actual service profitability figures are rarely publicized for obvious reasons; however, there have been some notable exceptions:

  - When Wang customer service executives turned the service division around (financially and organizationally), their 18% profitability rate in 1983 was publicized extensively.

  - Data General officials have promoted service expansion (from $42 millions in 1978 to $233 million in 1983) as a result of continuing vitality in the industry.

- Service profitability is influenced by a variety of environmental and organizational factors. Some of these factors include:

  - Organizational goals for service.

  - Installed base of equipment.

  - Organizational structure of the service department.

- Probably the most important factor affecting profitability is the vendor's overall goal for service. Goals can include market penetration, market development, or diversification. Profitability will vary depending on which goal or combination of goals is chosen.

- As Exhibit VI-2 shows, each of the service goals mentioned above will have a distinct affect on profitability. Market penetration, for example, can be an excellent source for long-term service profits. However, vendors will frequently experience short-term losses as service networks are established, staff is trained, and logistics supply lines are opened.

- Market development will probably have the most immediate positive impact on service profitability. Vendors such as DEC and Wang have developed their current service markets to include not only traditional services, but also a variety of new services such as sales of supplies and furniture, and storage of computer tapes/disks. By developing an existing market, vendors can realize substantial increases in revenue and profitability.

- One drawback to market development is that in some already well-developed markets, expansion will be difficult and growth may be slow or nonexistent.

- Diversification offers the riskiest but potentially the most profitable option open to small-system service vendors. This option involves risk because the vendor is often moving into a new service area with which it has little or no hands-on experience. To be successful, diversification requires a great deal of research and preplanning.

- Diversification can be profitable particularly when it allows a vendor to move from a slow-growth service market to a high-growth market. Many small-system service vendors, for example, are experiencing little or no growth in hardware service, but they see a substantial market if they diversify into the third-party or single-source markets.

EXHIBIT VI-2

EFFECT OF SERVICE GOALS ON PROFITABILITY

Market Penetration →

- Initially Unprofitable
- Long-Term Results:
  - Increased User Base
  - Improved Profitability

Market Development →

- Improves Profitability Immediately
- Profitability Limited by Market Growth

Diversification →

- Riskier than Market Penetration
- Requires Extensive Research
- Subject to Long-Term Unprofitability if Competition is Well Developed
- Potentially Very Profitable

- The organizational structure of customer service departments also has a great deal to do with service profitability. In the past, many vendors provided administrative support to service departments from corporate level divisions such as marketing, personnel, and planning. Service departments are now becoming more autonomous and have their own administrative support agencies.

- Administrative autonomy has resulted in a more profitable service operation for most service vendors. This is caused by increased efficiency in allocating capital resources at the local department level. In addition, the allocation for "general and administrative" charges at the corporate level is reduced when administrative support is handled at the department level.

- Small-system service vendor administrative functions are allocated in the following manner:

  - Data systems is usually controlled by service.
  - Logistics is usually controlled by service.
  - Personnel is in transition from corporate to services.
  - Marketing is in transition from corporate to services.
  - Financial planning is usually controlled by corporate.
  - Strategic planning is usually controlled by service.

- The last factor influencing service profitability is the size of the installed base. Obviously, larger and more concentrated installed base allows vendor to be efficient. Some vendors, such as Honeywell, have entered the new markets (TPM) in order to maintain a substantial base and efficiently utilize their service staff.

- In addition to staff, a large installed base reduces the incremental costs of spare parts, administrative support, travel time, etc. A large installed base provides an immediate competitive advantage to service vendors such as DEC, IBM, and Data General that smaller vendors will find hard to match.

C. SERVICE PROFITABILITY

- As mentioned earlier, it is very difficult to interpret service profitability because of the numerous definitions of "profit" and "loss" used by vendors. It is certain, however, that revenue and profit are increasing as a result of two major factors:

  - Growth in the installed base.

  - User insensitivity to increases in service pricing.

- The traditional small-system market, minicomputers and small business systems, is expected to grow from $11.1 billion in 1983 to $19.8 billion in 1989. Service on these systems will increase from $1.6 billion in 1983 to $4.1 billion in 1989--an average annual growth rate of 17%.

- In addition to the fact that the service market for small systems is growing, users are also becoming more dependent on their computing equipment. Increased dependence on the equipment has resulted in a relative price insensitivity relating to service. A recent survey conducted by INPUT indicated that users were willing to pay up to 30% service premiums for selected services such as stand-by coverage.

- Service profitability has increased as a result of growth in the installed user base and increases in service prices. Exhibits VI-3 and VI-4 show the average breakdown of revenues, expenses, and profit for service vendors.

EXHIBIT VI-3

AVERAGE EXPENSE AND PROFIT PROFILE FOR CUSTOMER SERVICE ORGANIZATIONS

ITEM	1983 PERCENT OF REVENUE
• Labor	37%
- Direct, Hardware	24
- Direct, Software	10
- Remote Support	3
• Management/Supervision	6
• Benefits	6
• Parts	19
- Usage	16
- Inventory Depreciation	3
• Overhead/Miscellaneous	8
• Travel/Other	7
• Net before Tax Profit Margin	17
Total	100%

EXHIBIT VI-4

AVERAGE REVENUE AND PROFIT PROFILE FOR CUSTOMER SERVICE ORGANIZATIONS

REVENUE	PERCENT OF TOTAL
Contract	77%
Warranty	5
Installation/Deinstallation	6
Time and Materials	10
Change Order	2
Total	100%
Service Related Expenses	83%
Profit	17%

- Exhibit VI-3 shows overall service-related expenses.

  - Labor is by far the most expensive component of service, totaling 37% of all service expenses. Significantly, this figure is falling as a result of growth in remove support services and the increasing use of support staff rather than on-site FEs.

  - Benefit expenses include medical, pension, and cars.

  - Spare parts usage is hard to value as an expense, but it is usually 3% of the total value of the installed base.

  - Depreciation of parts is usually over the useful life of the part. Because of product/model obsolescence, parts may become obsolete overnight and are immediately written off. Depreciation is usually 2-4% of expenses.

  - Overhead includes corporate allocations.

  - Travel, averaging 7-8% of total revenue, will be reduced significantly as a result of remote support.

- Exhibit VI-4 shows the average breakdown of service-related revenues.

  - Maintenance contracts account for the vast majority of service revenues (77%), most of which was derived from CPU-related service.

  - T&M revenue (representing 10% of total revenue) is particularly important to most small-system vendors because it allows the vendor to target price-sensitive users as a market segment.

- Change orders do not represent a major component of service revenue (2%), but the potential for revenue can be quite substantial. For example, one field change order costing $150 over an installed base of 2,000 systems gives rise to an internal transfer of $300,000. Considering that many service organizations routinely handle ten or more such orders, a total cost of $3 million per year for internal transfer is not out of the ordinary.

- Total service-related expenses average 83% of total service revenue, resulting in an average profit margin of 17%.

D. STRATEGIC VALUE OF SERVICE

- Besides increasing revenue, customer service is of strategic importance to most of the small-system vendors interviewed by INPUT. Users view service as an identifiable component of the equipment purchase decision, and because of increasing dependence on system availability, that user's value of service has increased to the point where it is critical to equipment-selection process.

- The strategic value of service is most pronounced in three sectors of the computer industry:

  - The impact service exerts on the original purchase of equipment.

  - Revenue derived from service.

  - Service-related account/site management.

- Service is having a greater impact on purchase of equipment, primarily because small-system users are becoming much more sophisticated in analyzing the value of service as it relates to the cost of equipment. Recent

INPUT studies have shown that users rank service features as one of the most important equipment selection criteria, second only to system capability/performance.

- Exhibit VI-5 demonstrates that small-system users value service performance over price. Value of service is consistent throughout the large- and small-systems market, although it is not quite as pronounced as in the office-system environment. Uptime received a user rating of 9.2, whereas price received a substantially lower rating of 6.7.

- Small-system users are, in many cases, just as dependent on their equipment as large-system users are, and they are willing to pay substantial premiums to receive high-quality service. Fifty-seven percent of small-system users, for example, are willing to pay extra premiums for stand-by coverage. Excellent service is a major reason that IBM can successfully charge as much as 20% more than competitive products cost.

- The lack service performance in such critical areas as hardware and software maintenance is one of the major reasons that users have placed such a high value on service. It is not, as some have suggested, simply a matter of improving the image or marketing of service. In order to take advantage of the customer's willingness to pay premium equipment and service price, the vendor must offer substantially improved services.

- The second major strategic value of service relates to the overall revenue derived from services. Exhibit VI-6 demonstrates that small-system service revenue is growing in relation to total revenue both in absolute terms (29% in 1984) and as a percentage of total growth (22% in 1984).

- In addition to the overall importance of service, its noncyclical nature of this revenue source enhances its strategic value. Although Exhibit VI-6 shows a downturn in service revenue growth in 1983 (primarily as a result of the recession in 1982-1983, reducing system sales), overall service revenue growth

EXHIBIT VI-5

SMALL-SYSTEM USER RATINGS OF MAINTENANCE IN COMPUTER PURCHASE DECISION MAKING

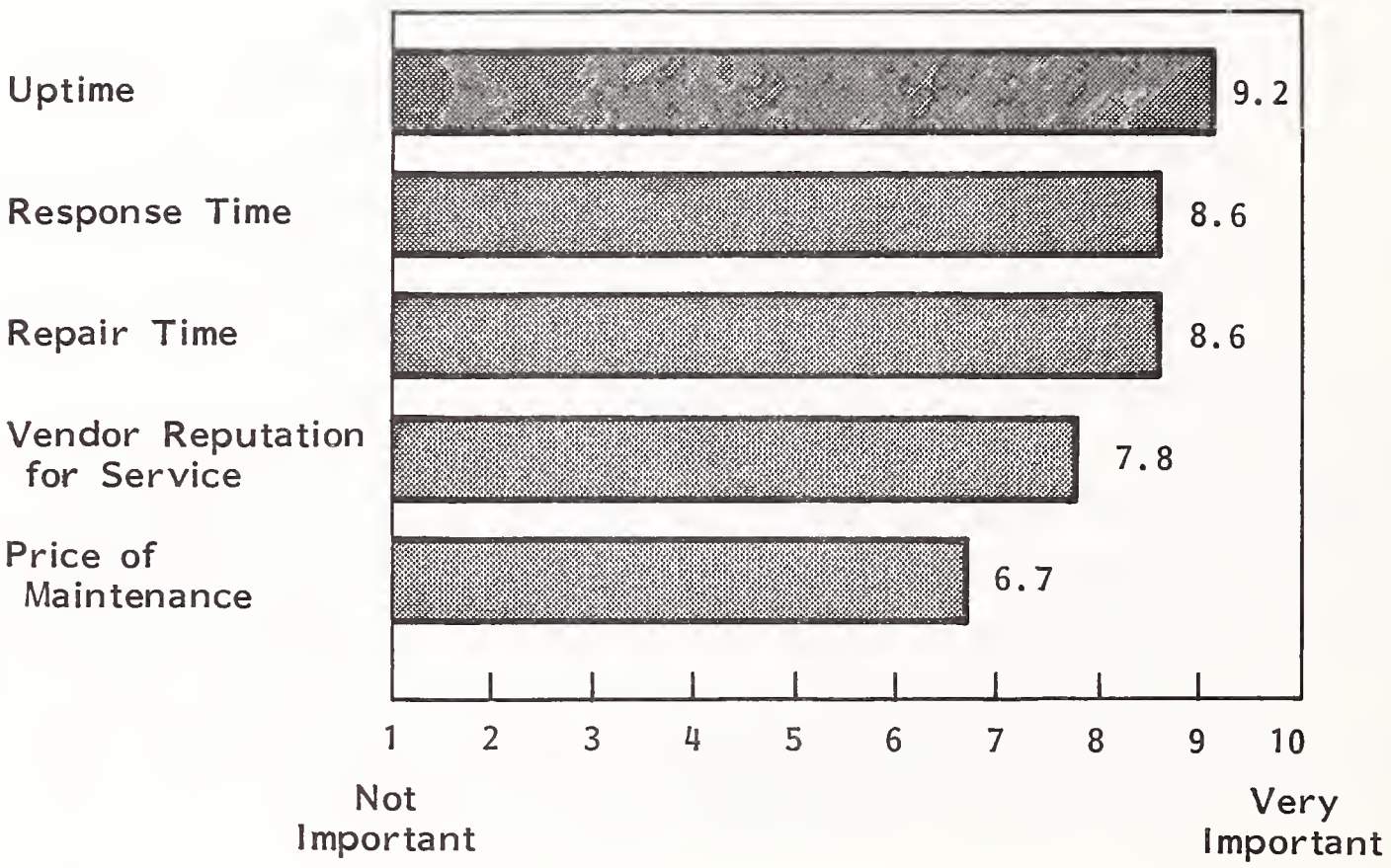
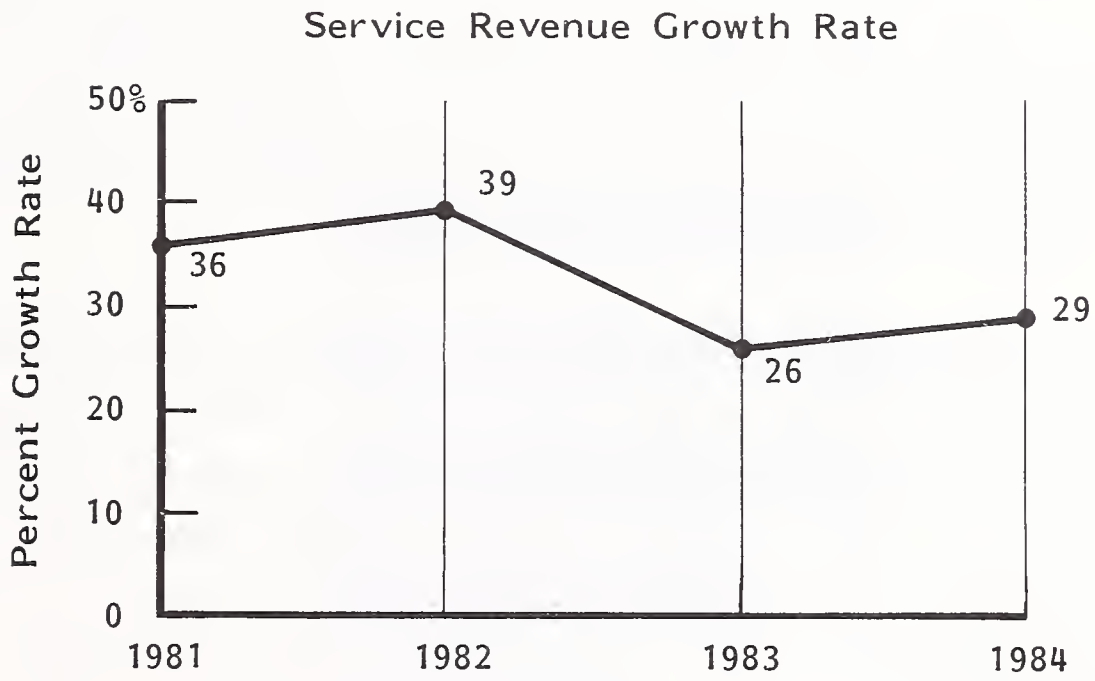
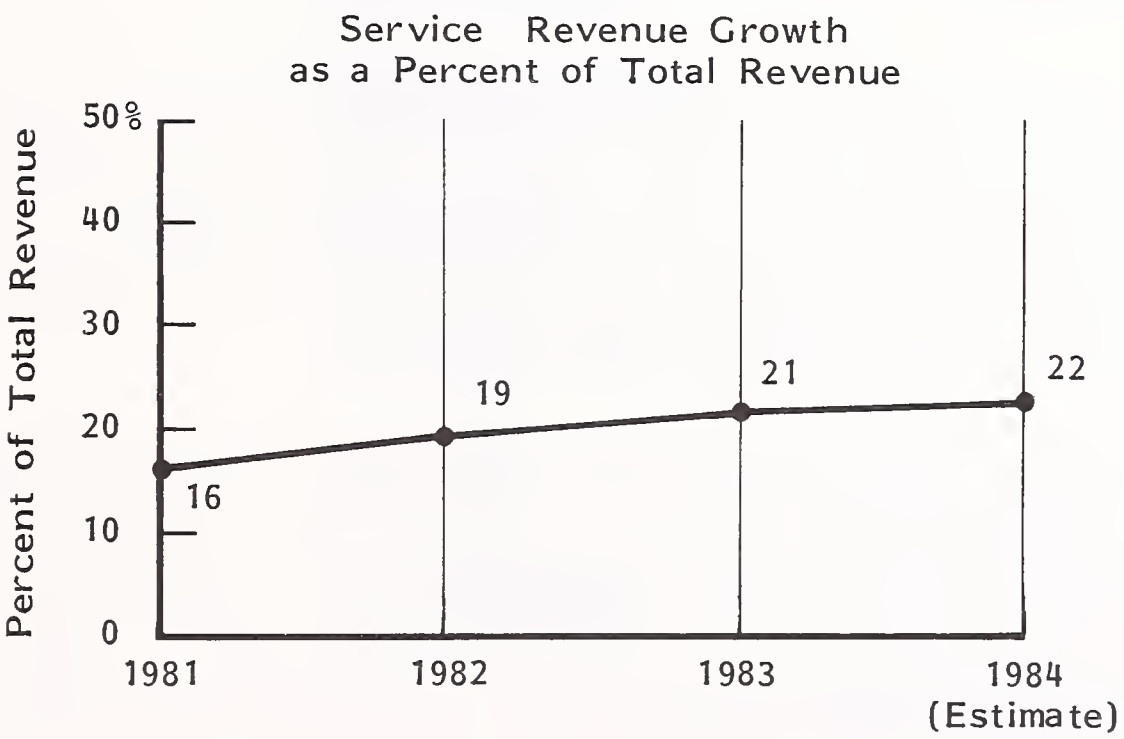


EXHIBIT VI-6

AVERAGE SERVICE REVENUE GROWTH OF
LEADING SMALL-SYSTEM VENDORS





has increased consistently since the late 1970s. Numerous small-system vendors such as DEC and Data General report that service revenue has been instrumental in improving botton-line growth, especially during the recession and during transition periods.

- The third and potentially most important strategic value of service is that it provides the vendor with the ability to influence data processing decisions at the user's site--to act as an account/site manager. By maintaining an on-going relationship with the user and an understanding of the user's needs, the service department is in the position to identify and capitalize on a wide variety of post-sales user requirements.

- Exhibit VI-7 lists user requirements and user satisfaction with a variety of post-sales services, support, and equipment. The chart clearly demonstrates that the greater the user's requirement, the higher the level of dissatisfaction with the service provided. For example, small-system users ranked hardware maintenance as their most important service requirement (8.9 rating). However, 52% of the users were dissatisfied with the hardware service they received.

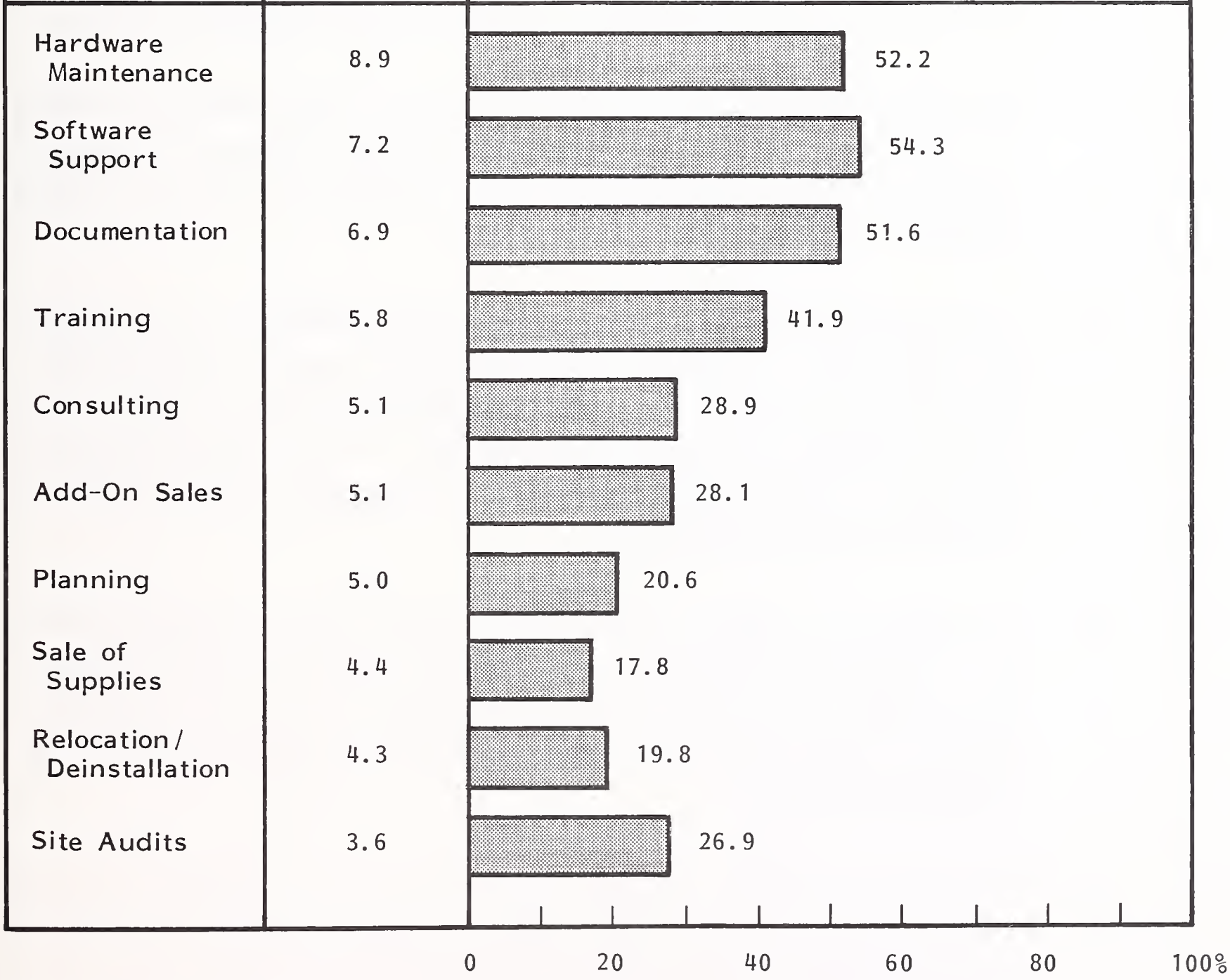
- On the other hand, relatively unimportant services, such as sales of supplies (user rating of 4.4), had a very high satisfaction rate (82%). Users clearly expressed a need for service vendors to redefine service priorities in order to better meet important service requirements and spend less time on the relatively unimportant service features.

- Despite limited user interest in some after-sales support areas, vendors see a potentially huge market for new services such as sales of supplies, consulting, and site management. The success of such new services as DECdirect has other small-system manufacturers scrambling to find market niches of as-yet-unfulfilled service needs.

EXHIBIT VI-7

SMALL-SYSTEM CUSTOMER REQUIREMENTS FOR SERVICE

SERVICE COMPONENT	LEVEL* OF SERVICE REQUIRED BY USER	PERCENT OF USERS DISSATISFIED WITH SERVICE
Hardware Maintenance	8.9	52.2
Software Support	7.2	54.3
Documentation	6.9	51.6
Training	5.8	41.9
Consulting	5.1	28.9
Add-On Sales	5.1	28.1
Planning	5.0	20.6
Sale of Supplies	4.4	17.8
Relocation / Deinstallation	4.3	19.8
Site Audits	3.6	26.9



* Rating: 1 = Low, 10 = High

- Several small-system vendors are in the process of designing a new service-related position, the customer service representative, in order to reconcile the needs of both users and vendors. The representative will be empowered to offer a wide variety of services as required by the user. Because the representative would be in constant communication with the user, the vendor will have a better overall understanding of the user's needs.

- The customer service representative will not necessarily have a technical background. One vendor indicated that the ability to communicate with the user was far more important than knowledge of rapidly changing technology.

- The representative's primary job will be to act as a liaison between the vendor and the user. This position will become increasingly necessary as the user becomes physically isolated from regular contact as a result of remote support.

- Communication skills will be essential if the representative is to understand the user's needs. In addition, the representative must have sufficient technical expertise in order to promote the integration of software, hardware, and telecommunication products at the user's site. A certain level of technical knowledge is also necessary in order to communicate with FEs and SEs working on the user's equipment.

- One of the most important traits of the customer service representative will be a strong service orientation. Since it will be the representative's primary job to improve both user satisfaction with service and service profitability, success of this program will hinge on increasing account revenues by leveraging satisfied users.

- Although the customer service representative should be able to improve revenues at the site level almost immediately, the real benefit to the vendor will come when site level service profitability is accomplished. The representative will be in a unique position to design and implement a profitable support package that is tailored to the individual needs of the user.

- Effective determination of profitability at the site level will make possible the equitable distribution of administrative costs of service. Only when this is done can service be priced to ensure both profitability and efficiency in service.

APPENDIX A: QUESTIONNAIRE

APPENDIX A

QUESTIONNAIRE

1. Many of the small-system service vendors are increasing the number of services offered to customers as a way to increase revenues and to improve user satisfaction. What type of post-sales support services does your department now offer or plan to offer in the next 3 years?

	Current	1987	Please Describe
- Planning	___	___	_____
- Consulting	___	___	_____
- Documentation	___	___	_____
- Training	___	___	_____
- Site Audits	___	___	_____
- Software Support	___	___	_____
System	___	___	_____
Application	___	___	_____
- Remote Diagnostics	___	___	_____

2. a. Dispatching technology has advanced very rapidly in the last few years. Do you see these changes in dispatching helping your field services group?

_____

_____

_____

b. Do you offer or plan to offer centralized dispatching?

_____

_____

_____

2. (Cont.)

c. Does your company have local, regional, or national dispatching?

d. Please rate your dispatching performance.

e. Has new technology increased performance?

f. Describe the organization structure of your dispatching unit

g. Is parts tracking a function of dispatching?

3. a. Spare parts inventory is usually the second largest budget item for customer service organizations (coming right after personnel expenditures). Controlling these parts inventories is a major goal of most service vendors. Is your capital investment in spares growing?

b. What factors influence your parts investment?

c. Do you have parts depots on a national or regional basis?

3. (Cont.)

d. How many parts depots does your company have? _____

_____

e. Are parts depots at repair depots? _____

_____

f. What impact have parts depots had on productivity improvements in your company?

_____

_____

4. a. Please describe the remote support services that your company offers.

_____

_____

b. Does the customer receive a discount or a premium for using remote support?

_____

_____

c. What systems or products are covered by RSS? _____

_____

d. What was the impact of remote support services on customer support?

_____

_____

e. What trend do you see in remote support? _____

_____

5. a. We have noticed that in the last 2 or 3 years many of the major service vendors have been building up their depot service networks. Do you think that depot service will significantly impact on-site service?

_____

_____

b. Do you offer T&M or contract rates at depots? _____

_____

c. What products are covered by depot service? _____

_____

d. What channel of distribution do you use? _____

_____

e. How do you market depot service? _____

_____

f. How do you price depot service? _____

_____

6. a. Users have indicated to us that the number of call-backs has been growing, particularly as the number of experienced FEs has decreased. Is your customer services group tracking the problem of call-backs and, if so, how do you plan to reduce call-backs?

_____

_____

b. What percent of completed fault calls are completed in the first call?

_____

6. (Cont.)

c. What percent of call-backs have you experienced? _____

_____

d. Are you achieving goals for MTTRepair? (Y/N) _____

MTTResponse _____

MTBF _____

System Availability _____

7. a. Software support, in the minds of many users, has already become as important as hardware support. How do you see this trend toward increasing software support requirements affecting your customer services department and what is your department doing to meet these requirements?

_____

_____

b. Does your company offer:

	YES/NO	DESCRIBE
- System Software Support	____	_____
- Application Software Support	____	_____
- Training on Software	____	_____
- Support Centers	____	_____
Regional	____	_____
National	____	_____
- Rothnis	____	_____
- On-Site Support	____	_____
- User Involvement	____	_____
- Software Consulting	____	_____

8. a. Single-source maintenance and third-party maintenance is becoming increasingly popular among the small service vendors. Honeywell, DEC, and NAS all have just recently announced major expansions in this area. How do you see this affecting your field service options?

_____

_____

b. Will you offer these services? _____ Describe: _____

_____

c. On what products? _____

d. Please describe TPM or Single Source as it relates to:

- Parts _____
- Pricing _____
- Training _____
- Documentation _____
- Software Support _____

9. a. Customer service is becoming more and more competitive with the growth of TPM, single-source vendors, and new service vendors such as AT&T. How is this going to affect your pricing policies for field service?

_____

_____

b. When and why do you change service prices? _____

_____

9. (Cont.)

c. Do you offer discounts for any of these features?

	Yes/No	PLEASE DESCRIBE
- User Involvement in Maintenance	____	_____
- User Delivery of Plug-in Modules	____	_____
- Relaxed Requirements on Response Time	____	_____
- Remote Diagnostics	____	_____
- Volume Discounts	____	_____
- User Purchase of Parts Kits	____	_____
- Invoice Prepayment	____	_____

10. Where do you see field service prices going in the next 2-3 years?

_____

11. Service guarantees such as guaranteed availability and guaranteed response time are an attractive option to many users. Where do you see guarantees fitting into the future role of your field service group?

_____

_____

12. a. Personnel costs are the most significant portion of field service expenditures. Improving staff productivity is one method vendors are using to improve their competitive position in service. How do you measure the field engineer's productivity and do you foresee any major changes in overall service staff productivity?

_____

_____

12. (Cont.)

b. Are FEs becoming more productive? _____

_____

c. Do you measure:

	Yes/No	PLEASE DESCRIBE
- Revenue per Engineer	____	_____
- Personnel per Equipment	____	_____
- Expense to Revenue	____	_____
- Down Time	____	_____
- Number Call-Backs	____	_____

13. Please complete the following personnel matrix:

	SOURCE OF NEW EMPLOYEES	TURNOVER 1983 (Percent)	EXPECTED GROWTH	TOTAL NUMBER
Junior FE				
Senior FE				
Software Support				
Line Manager				
Staff				

14. a. Field service revenues are always a touchy subject, but would you say that FS revenue growth has matched your expectations this year?

_____

_____

b. Was FS department profitable? _____ Please Describe: _____

_____

c. What level of growth? _____

_____

d. What are some of the factors affecting FS growth? _____

_____

e. What were FS revenues? _____

_____

f. What were FS expenses? _____

_____

15. Do you think that the field engineer should be involved in any of these sales or sales-support functions:

	Yes/No	DESCRIBE
- Making Goodwill Calls	____	_____
- Software	____	_____
- Maintenance Contracts	____	_____
- Attending Sales Meetings	____	_____

APPENDIX B: USER DP EQUIPMENT SERVICE EXPENDITURES

APPENDIX B: USER DP EQUIPMENT SERVICE EXPENDITURES

- Since user expenditures for maintenance do not exist in a vacuum, INPUT has included Exhibit B-1, a breakdown of the average expenditures of the Users' Information Services Department.

- It should be noted in Exhibit B-1 that software and hardware maintenance expenditures are among the fastest growing IS budget items at almost 12% and 9% annual growth rates, respectively.

EXHIBIT B-1

1984 AVERAGE EXPENDITURES BY THE USERS' INFORMATION SERVICES DEPARTMENT

BUDGET CATEGORY	1984 PERCENT OF I.S. BUDGET	1984-1985 EXPECTED BUDGET GROWTH
Personnel Salaries and Fringes	41.4%	7.4%
Mainframe Processors	11.3	3.4
Minicomputers	2.5	16.5
Microcomputers	1.9	18.3
Mass Storage Devices	5.5	13.0
Terminals	3.8	(2.1)
Peripherals	3.5	4.0
Total Hardware	28.5%	8.6%
Communications	9.3%	9.4%
External Software	4.5	8.3
Custom Programming	3.1	(12.2)
Integrated Systems	0.8	0.7
Total Software	8.4%	0.0%
Software Maintenance	1.1	11.6
Hardware Maintenance	5.7	8.7
Total Maintenance	6.8%	9.2%
Outside Processing Services	1.4	6.6
Other	4.2	4.9
Total	100.0%	10.8%