Office Systems Service Market Analysis and Forecast 1985-1990

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OFFICE SYSTEMS SERVICE
MARKET ANALYSIS AND FORECAST
1985 - 1990

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CONTENTS

OFFICE SYSTEMS SERVICE MARKET ANALYSIS AND FORECAST
1985-1990

EXHIBITS

I INTRODUCTION

- This report, Office Systems Service Market Analysis and Forecasts, 1985-1990 is the last of a series of deliverables in the microcomputer module of the 1985 Customer Service Program. The purpose of this report is to identify and highlight the major trends in the rapidly evolving microcomputer service market and to illustrate how these trends will affect future service operation.

- The report is broken down into four main sections;

  - An executive summary designed to summarize the key findings of this study in presentation format.

  - An analysis of the 1985 customer service market for both the entire market and, in much greater detail, the microcomputer portion of that market.

  - A discussion of the current operations of microcomputer customer service, reflecting changes in service delivery and pricing that result from the increased requirement for microcomputer service. This section also provides an analysis of the current and future revenue contributions of hardware maintenance, software support, educational services, and professional services to the microcomputer service vendor.

- A presentation of short-term objectives and long-term goals that will aid microcomputer service vendors in meeting the challenge of satisfying the increasing need for microcomputer service while continuing to improve profitability.

- The information found in this report is derived primarily from extensive primary research performed throughout the year, including both user and vendor surveys conducted by telephone. A glossary of terms used in this report can be found in Appendix A.

II EXECUTIVE SUMMARY

- This Executive Summary is designed to provide key research findings and observations in a quick and orderly format. The summary is organized in presentation format, with exhibits placed on the right-hand pages and the corresponding text on the facing pages.

- The microcomputer market is undergoing a transition from a product-intensive market to a maturing, service-intensive focus. Microcomputer service and support is becoming a much more important factor in the selection and use of microcomputers in the corporate environment, fueling a growth in the microcomputer service market that will outstrip both the new shipments and installed base growth.

- This report will analyze both the current and future microcomputer service market, highlighting high growth and profit segments, and provide both short-term and long-range strategic recommendations for continuing this growth.

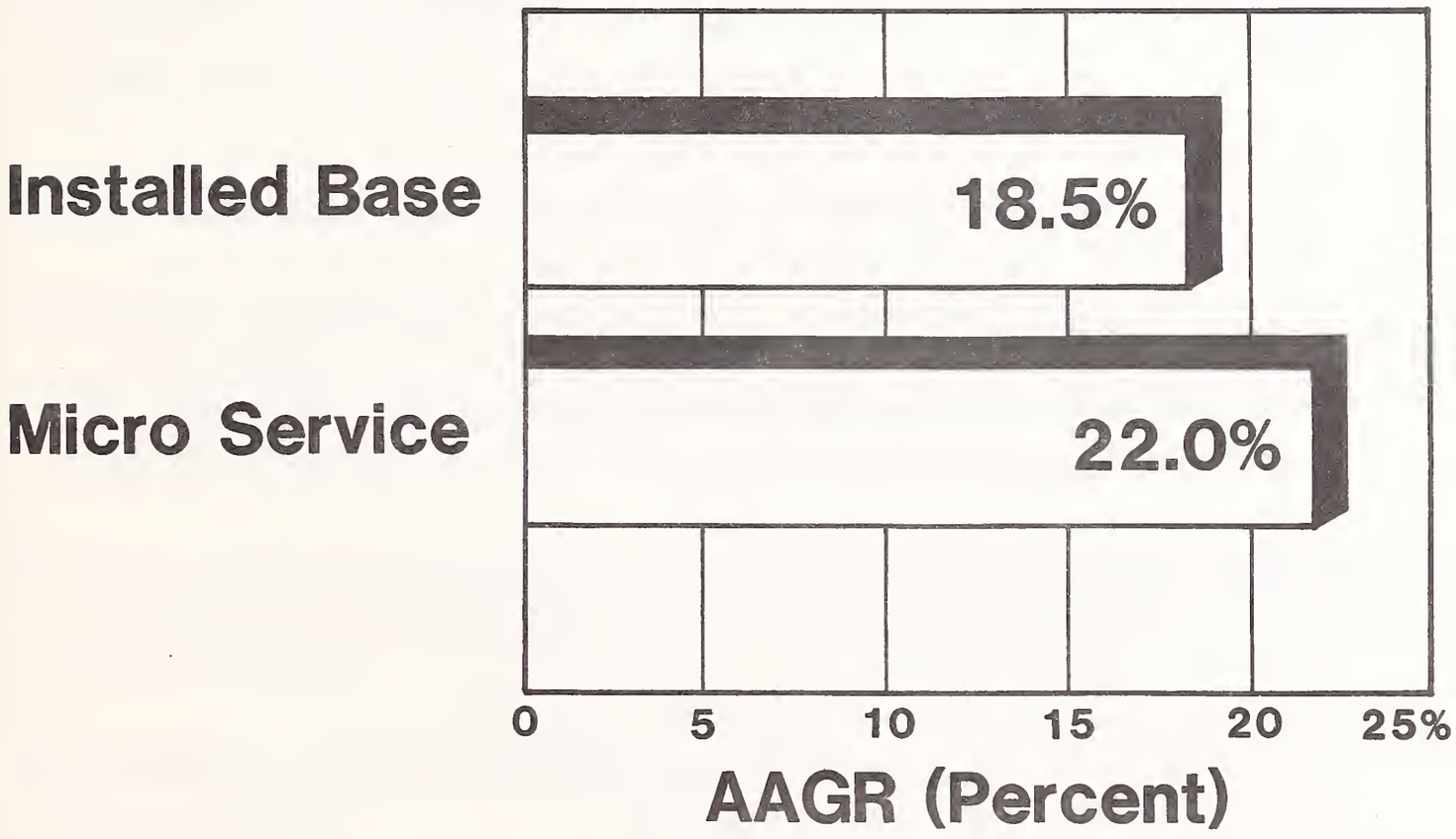
A. MICROCOMPUTER SERVICE GROWTH WILL EXCEED PRODUCT SALES

- In 1985, business-use microcomputer user expenditures were $8.5 billion. By 1990, the microcomputer market will actually decrease by approximately 1%, to $8.3 billion. A number of factors will contribute to the decline in new product shipments, including saturation of the white collar worker market, increased product life cycles resulting from improved reliability, and the acceptance of distributed data processing systems built around low cost, high performance minicomputer systems.

- Of greater importance to the growth and prosperity of microcomputer service is the continued growth of the microcomputer installed base, as shown in Exhibit II-1. This installed base, as opposed to the new shipment rate, is not impacted by the improved life cycles of the new microcomputers, since improved life cyles will reduce the equipment retirement rate. Thus, while new shipments will demonstrate a lower growth through the forecast period, the installed base will grow at 18.5% AAGR.

- Growth in the installed base will contribute to the rapid growth of the microcomputer service market. A greater impact on this growth will be the increased centralization of product and service purchasing authority in corporations, increased sophistication of applications (which will encourage users to purchase service), and improved economy of scale, which will encourage vendors to become inreasingly competitive in service pricing.

MICRO INSTALLED BASE AND SERVICE GROWTH, 1985-1990



B. EVOLVING MICROCOMPUTER SERVICE MARKET

- Responding to growing user pressure for increased and improved microcomputer service and support, manufacturers gradually eased into the microcomputer service market. Attracted by the almost explosive growth potential of micro service, manufacturers, particularly IBM, have increased their involvement in maintenance and support so that they currently control over one-half of all business-use microcomputer service revenues. Manufacturer service revenue will grow at an average of 24% annually over the next five years.

- Increased service competition by manufacturers has caused third-party maintenance firms to become more price competitive. Third-party maintenance vendors, especially the larger, nationally based firms, are also attempting to increase their name recognition by advertising their long association with microcomputer service and support. However, TPM vendors will need to provide innovative service offerings in order to compete with established hardware manufacturers.

- Although some dealer/distributor networks, such as Businessland and Pactel, have set up service organizations that have successfully appealed to corporate users, most corporate microcomputer service growth will be controlled by manufacturers and third-party maintenance vendors. Dealers and distributors will be forced to focus on small business and individual users where geographic proximity will be a major competition advantage.

- Special mention should be made concerning the unsuccessful attempt by service franchisers to acquire a significant portion of the market. With increased competition from manufacturers, TPM vendors, and dealers/distributors, combined with the higher than advertised costs associated with starting up a service location, the future for these "store front" service franchises appears relatively limited.

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MICROCOMPUTER SERVICE MARKET

- Increased Activity by Manufacturers, Particurarly IBM, in Servicing Own Base
- Pricing Competition from TPM Vendors
- Increased Competition by TPM Vendors, Resulting in Greater User Awareness of TPM and More Competively Priced Service Offerings
- Few Dealers with Organized Competitive Service Mechanism
- Stunted, if Not Negative, Growth of Service Franchisers

C. VENDORS UNABLE TO KEEP UP WITH RISING UPTIME NEEDS

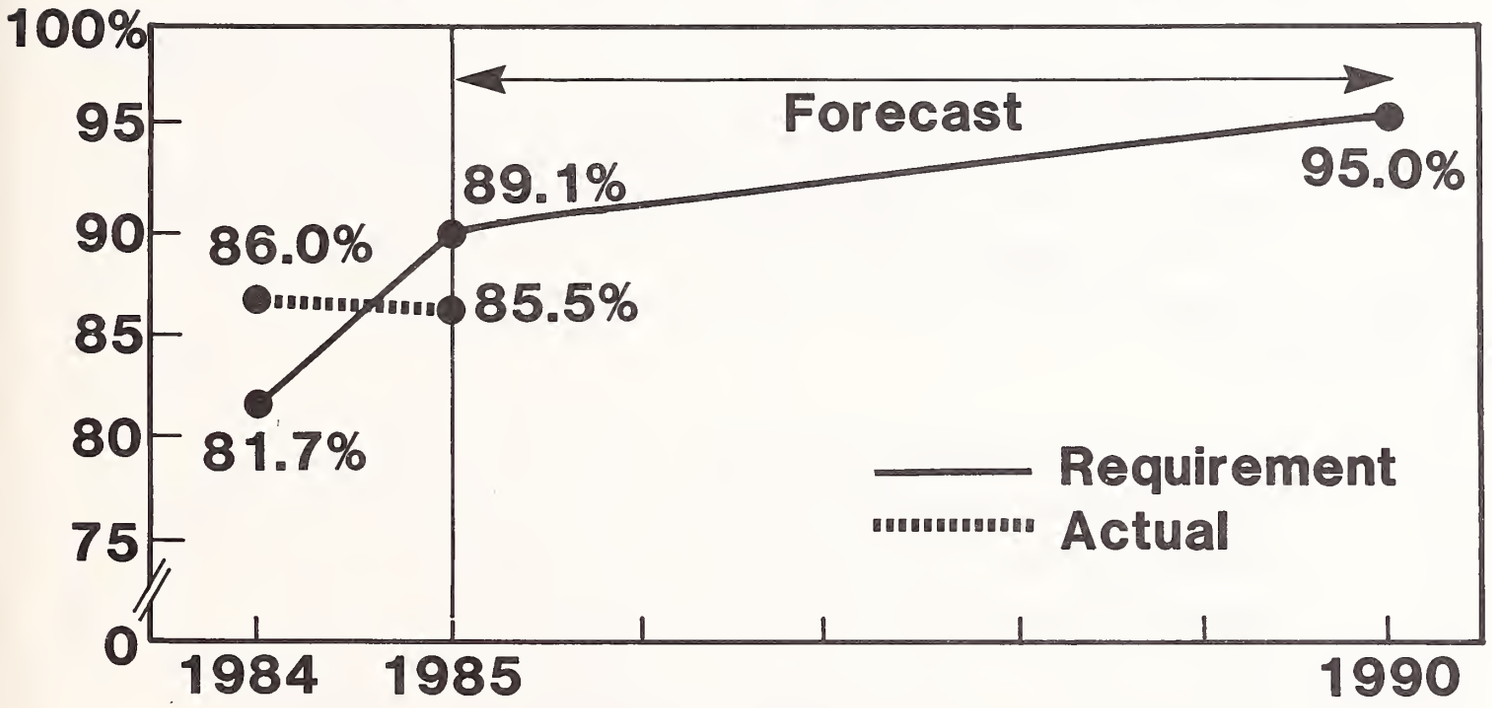
- A by-product of the rapid advancements the microcomputer industry has made in increasing the sophistication and size of applications that can be performed on microcomputers is the increased requirement that users place upon their machines, both in terms of usage and system availability. Since microcomputers are already being used to satisfy processing functions that in the past were handled by larger systems, it is not inconceivable that the users would place the same uptime requirements on their micros that they placed upon the equipment that the micros replaced.

- Exhibit II-3 demonstrates that microcomputer user system availability requirements are already approaching 90%, having grown from just under 82% in 1984 to over 89% in 1985. The mean system availability requirement for small system (minicomputer) users in 1983 was just over 93%. Vendors must be concerned with the dramatic rise in microcomputer user expectations for system availability.

- INPUT expects that the user demand for higher levels of microcomputer system availability will continue to increase through the end of the decade. By 1990, INPUT projects that microcomputer users will require 95% system availability, a range similar to what mainframe users expect today.

- As corporate usage of advanced microcomputer applications (micro-host links, LAN networks, etc.) increase, system availability requirements will also rise accordingly. Increased product reliability will be able to take up only a small part of the slack. Microcomputer service venders will need to improve on service delivery, both in terms of actual performance (response time, repair time, and parts distribution) and in terms of supplementary services provided, such as consulting, training, and documentation.

RAPIDLY GROWING NEED FOR INCREASED SYSTEM AVAILABILITY



D. GRADUAL PRICE EROSION IN MICRO SERVICE

- Microcomputer service price erosion has been hidden by the remarkable decline in hardware purchase prices; however, as Exhibit II-4 demonstrates, the decline in service prices will be dramatic between 1985 and 1990.

- Service pricing has traditionally been determined by any one of the following strategies:

  - Service price set as a percentage of purchase price. This method makes it easier to communicate the importance of service since it connects the value of service to the cost of replacing the equipment. This method is usually employed when the costs of providing service are variable; the percentage can be changed if it proves to be too high or low.

  - Prices set on a cost-plus-margin basis. This procedure assures profitability but requires a detailed knowledge of related costs plus a feel for acceptable margins. This methodology also is susceptible to competitive pricing, especially from vendors who can survive lower margins.

  - Prices set as a reflection (or reaction) to competition. This strategy can increase sales but can also lead to price instability.

- Microcomputer service pricing was initially set at an artificially high level in hopes of covering the expenses incurred by supporting a dispersed product and to compensate for the cost of establishing a service network. As the microcomputer market increased dramatically, the product base became more controlled, leading to greater efficiency and improved scale of economy. Service prices began to fall.

- Increased competition for service dollars, particularly from corporate users, will result in a continued downward movement of service prices.

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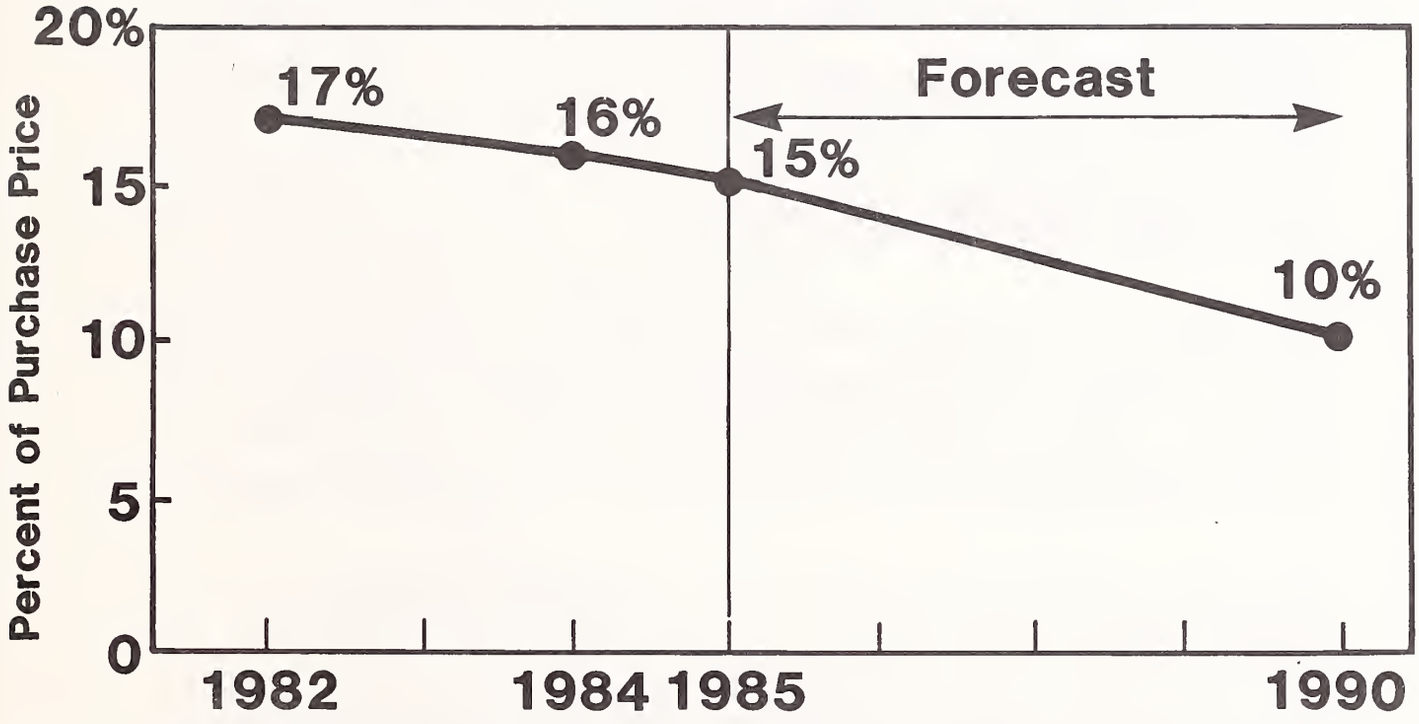
MICRO SERVICE* SEES GRADUAL PRICE EROSION



*On-Site Service, Next Day Response

E. MICROCOMPUTER SERVICE OF THE FUTURE

- Microcomputers are being used for increasingly sophisticated applications and user expectations for service have increased accordingly. Microcomputer service vendors will need to find new ways to increase and improve their service offerings while keeping service price levels stable and improving system availability. Although it is acceptable to assume that increased product reliability, along with improved serviceability of design, will improve system availability, service vendors should expect that increased usage, especially in such complex applications as micro-LAN and micro-host environments, will require increased vendor activity in microcomputer service and support, particularly in the areas of software support, consulting, and training, as demonstrated in Exhibit II-5.

- Since many of the advancements in microcomputer usage have revolved around increasingly sophisticated software packages, microcomputer service vendors will need to increase and improve the delivery of software support at all levels, including improved documentation and extended telephone support.

- One way to attract new customers to microcomputer service is to "re-package" existing service offerings in order to provide popular services at a price that is lower than the individual service offerings. A number of service vendors have already been successful in this area. Texas Instruments, for example, has introduced a telephone support offering that, as a further inducement, brings with it a 25% discount on a depot contract.

- Concerns over hardware maintenance turnaround time can be alleviated with increased use of independent depot repair companies, popularly referred to as "fourth-party" maintenance firms. These independent board and component repair firms offer the advantage of quicker turnaround on certain repairs which normally would have lower priority through a manufacturer's scheduling process.

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MICRO SERVICE OF THE FUTURE

- Increases Software Support
  - e.g., Improved Documentation
- Innovative "Repackaging" of Existing Services
  - Unbundled Services
  - Pricing
  - Marketing
- Increased Partnerships with "Fourth-Party" Firms

III MICROCOMPUTER SERVICE MARKET ANALYSIS

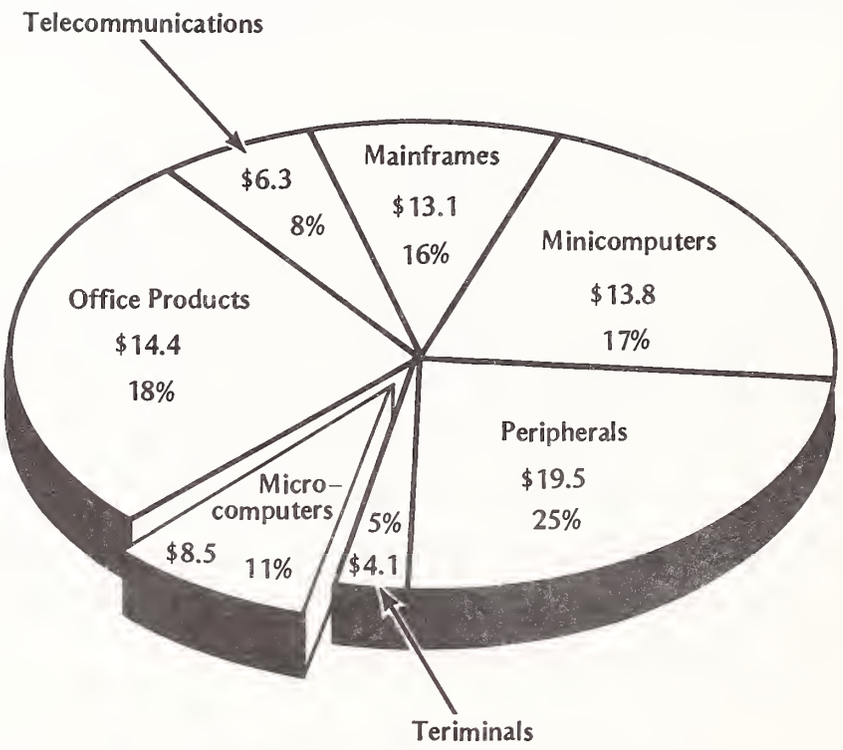
A. CURRENT OVERALL CUSTOMER SERVICE MARKET AND FORECAST 1985-1990

- As shown in Exhibit III-1, data processing equipment shipments grew to $79.7 billion in 1985, which reflects a 19% increase over 1984. This growth occurred despite slowdowns in the overall mainframe and minicomputer industries, reflected by layoffs by such market leaders as Wang, Data General, AT&T, and other major manufacturers. Concerns about the economy, plus new shipment order delays as a result of anticipated new products, have contributed to this slowdown. However, certain equipment markets, such as for telecommunications, peripherals, and microcomputers, along with specific submarkets within the systems markets (the superminicomputer market, as an example), exhibited significant growth in 1985.

- Over the next five years, this growth will slow as continual user pressure for increased functionality and lower purchase prices drive the market to smaller and less expensive systems. Significantly, new product shipments in the microcomputer market, the major growth contributor to this point, will peak in 1986 (shown later in Exhibit III-11) and will actually reflect negative growth during the five-year forecast period. This negative growth, shown in Exhibit III-2, will offset significant shipment growth in the terminals, peripherals, office products, and telecommuncations markets.

EXHIBIT III-1

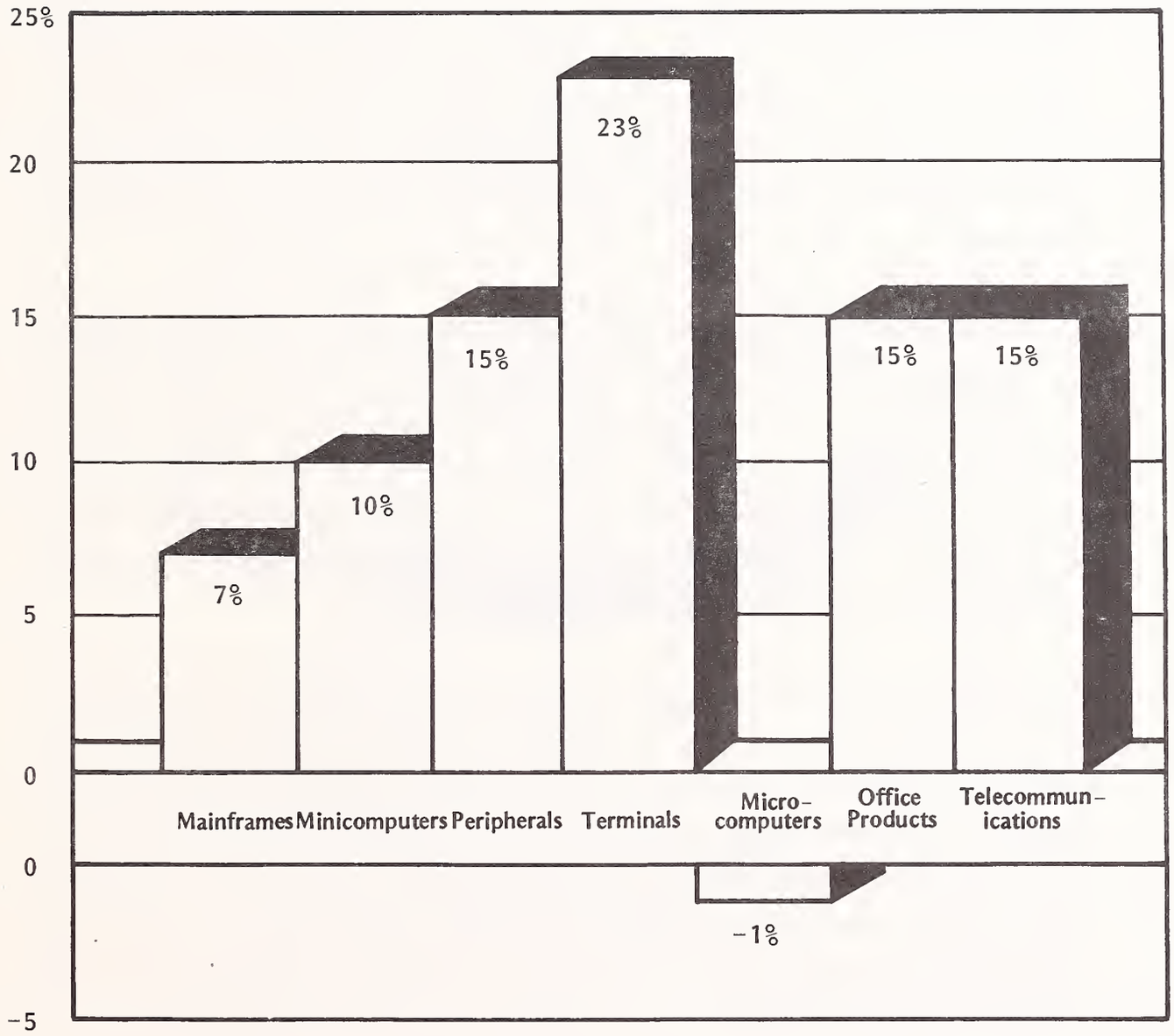
1985 EQUIPMENT SHIPMENTS



Total Shipments in 1985 = $79.7 Billion

EXHIBIT III-2

EQUIPMENT SHIPMENT GROWTH
1985-1990



- Exhibit III-3 provides a breakdown of the 1990 market, reflecting the decline of the microcomputer market. Also, the slowdown in systems sales are reflected in the smaller portions held by the mainframe market, which went from 16% to 13% of the total market, and the minicomputer market, which fell from 17% to 16% of the total market. As a result of these slowed growth markets, the total DP equipment shipment average annual growth rate is expected to be only 12% during the forecast period.

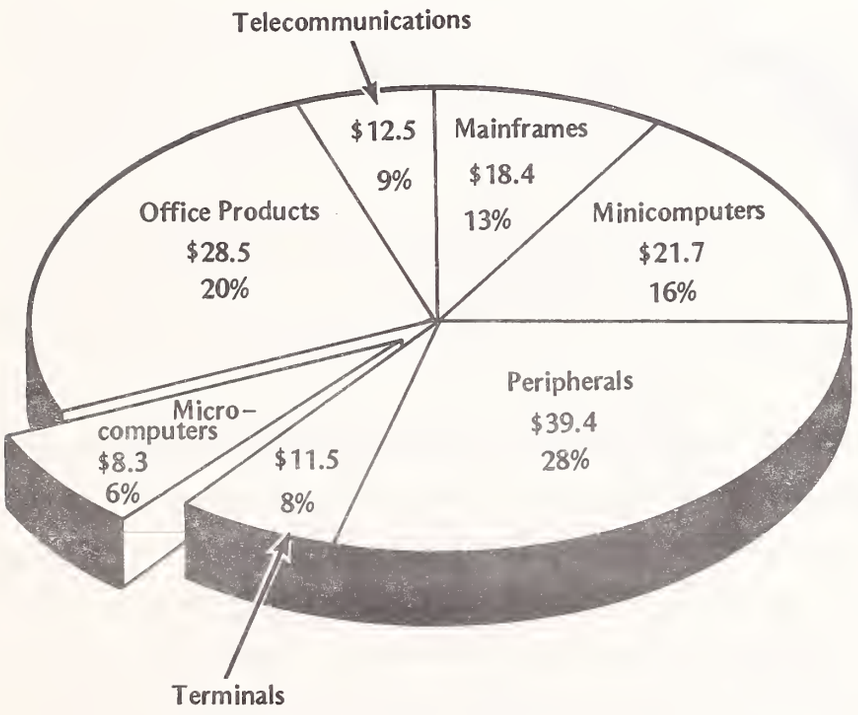
- The 1985 customer services market will grow to $13.2 billion in 1985, as shown by Exhibit III-4. The exhibit also demonstrates the lessening relationship between new equipment shipments and service growth as a number of service markets, most notably the mainframe systems market, contribute a larger proportion to the overall service market than they do to equipment shipments.

- The mainframe market captures such a large share of the total service market for a number of reasons: first, users are less price sensitive to service due to a greater overall service requirement; second, the service market for mainframes is much more mature, with more extensive service offered from service vendors with greater organizational strengths; and last, mainframe users require services in areas (e.g., consulting, training, and software support) that have higher profit-generating potential.

- The minicomptuer service market contributes $2.3 billion in user expenditures, or approximately 18% of the total customer service market. The minicomputer segment is marked by greater product differentiation, with high growth in the superminicomputer subsegment while the traditional and low-end minicomputer subsegments are on the decline. Service for minicomputers, while currently not as extensive as for mainframes, will grow at a faster rate as users continually increase their system availability needs and overall service requirements.

EXHIBIT III-3

1990 EQUIPMENT SHIPMENTS

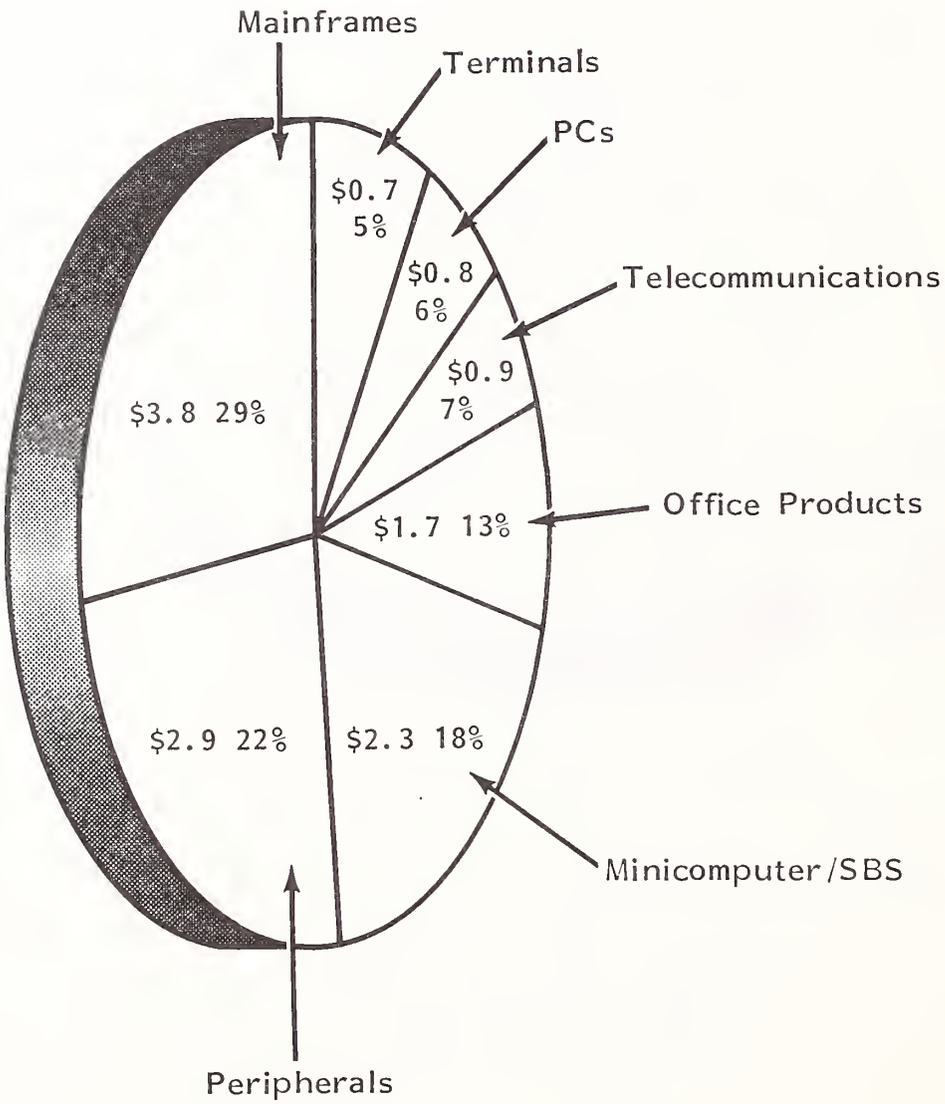


Total Shipments in 1990 = $140.3 Billion

1985-1990 AAGR = 12.0%

EXHIBIT III-4

1985 U.S. CUSTOMER SERVICE REVENUES
($ Billions)



Total U.S. Service Revenue in 1985: $13.2 Billion

- Most significantly, microcomputer service will make an impact on total customer service user expenditures, contributing $800 million in 1985; as shown in Exhibit III-5, service will grow at an average 22% per year during the forecast period. This increased contribution will be caused by a number of factors:

  - A stabilization of the market, as "fringe" manufacturers continue to drop out while larger manufacturers with more extensive service and support offerings dominate.

  - Increased sophistication of microcomputer applications, including networked and multi-user systems, which will dramatically increase user requirements and decrease service price sensitivity.

  - Greater product density, which will reduce service costs due to improved economy of scale, encouraging greater vendor participation in microcomputer service.

- A segment within the customer service market demonstrating vast growth potential is the telecommunications market, not as a result of service factors but directly as a result of the expected growth in telecommunications itself. The service side of the market is currently in a state of confusion, as many service vendors attempt to establish service offerings that will effectively and profitably deal with a quickly changing market featuring products with relatively long product life cycles, extremely high reliability rates, and a lack of standardization that makes fault determination and problem resolution extremely difficult.

- Exhibit III-6 demonstrates the increased contributions by the peripherals, microcomputer, and telecommunciations markets to the overall customer service market, expected to reach $28.4 billion in 1990, representing a 17% average annual growth rate.

EXHIBIT III-5

U.S. SERVICE GROWTH
1985-1990

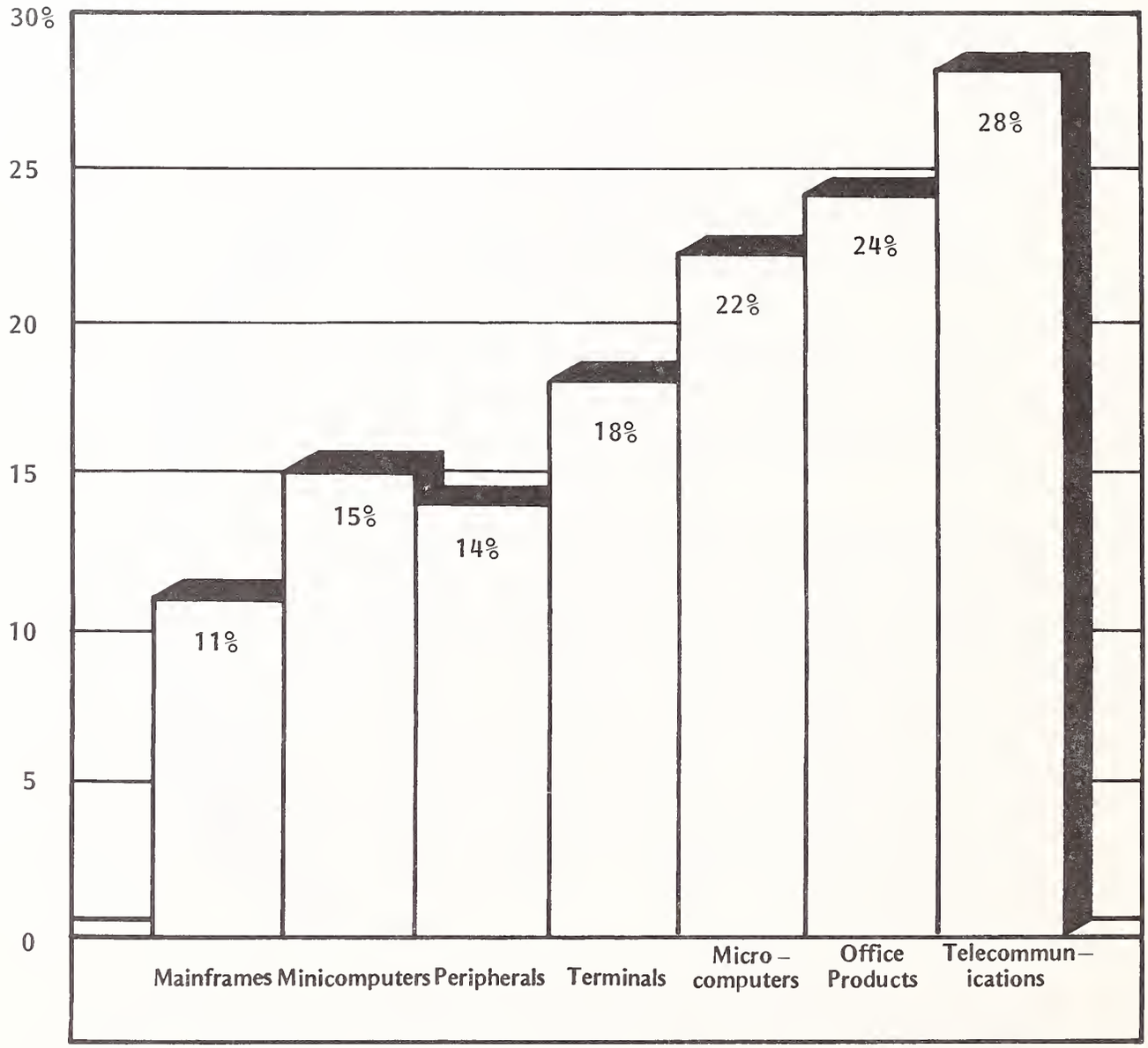
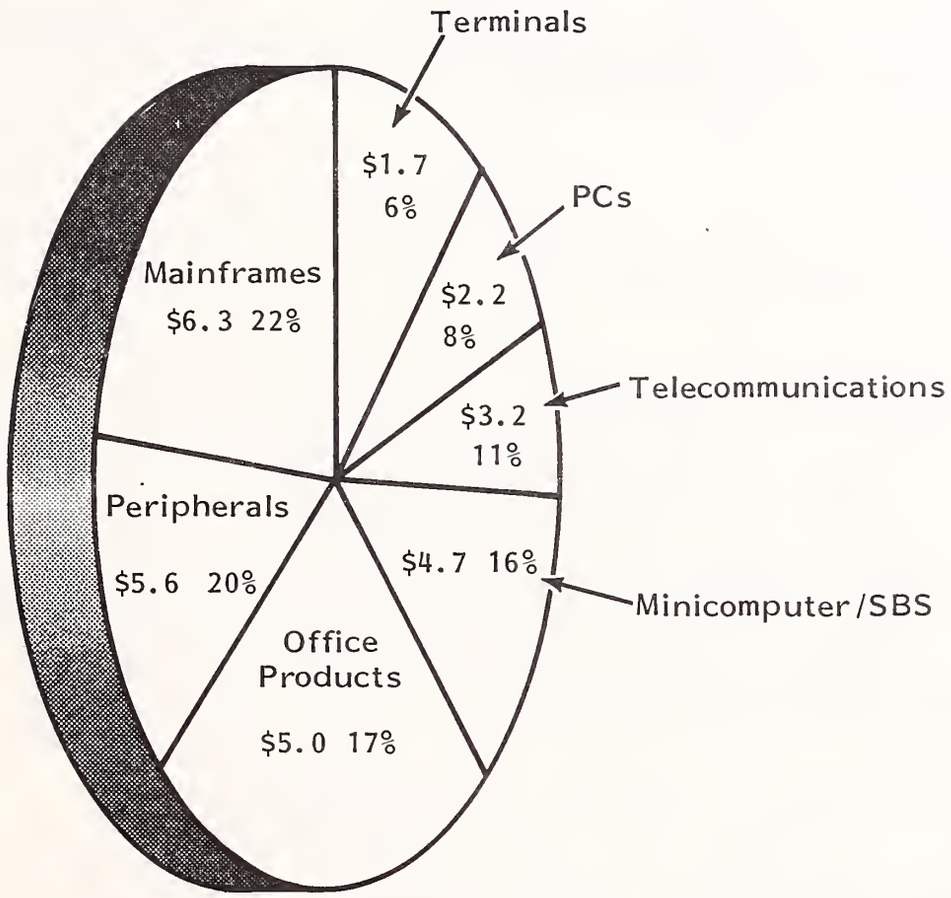


EXHIBIT III-6

1990 U.S. Customer Service Revenues
($ Billions)



Total U.S. Service Revenue in 1990: $28.7 Billion

B. CURRENT TPM MARKET AND FORECAST, 1985-1990

- The TPM market historically concentrated on three main service markets:

  - Equipment that the manufacturer used to service, but due to age considered to old to service profitably and therefore influenced (usually by raising prices) the user to look elsewhere.

  - Equipment that the manufacturer could not service profitably or effectively due to geographic location.

  - Equipment that the manufacturer could not service due to a lack of an extensive service organization. This was especially true in the early microcomputer market.

- The TPM market has evolved into a viable service alternative for many computer users, as indicated by size ($1.33 billion in 1985) and by growth, which is expected to be faster than growth in equipment shipments and the service market during the next five years. Exhibit III-7 shows that the TPM market's average growth from 1985 to 1990 will be 18%, slightly higher than the 17% average annual growth rate of the total service market. Principal contributors to this growth include:

  - The telecommunications market, with a 31% AAGR.

  - The terminals market, with 22% AAGR.

  - The microcomputer market, with 20% AAGR.

- The growth in the microcomputer market reflects the ever-increasing installed base in corporations. However, the relatively high growth rate does not properly indicate the increased involvement by certain manufacturers,

EXHIBIT III-7

THIRD-PARTY MAINTENANCE REVENUE, 1985-1990

PRODUCT SECTOR	1985 ($ Billions)	1990 ($ Billions)	AAGR*
Mainframes	$ 170	$ 210	4%
Minicomputers/ Small Business Systems	200	400	15
Peripherals	250	400	10
Terminals	140	380	22
Personal Computers	390	970	20
Office Products	50	120	19
Telecommunications	130	510	31
Total	$1,330	$2,990	18%

*AAGR = Average Annual Growth Rate

such as IBM, in maintaining their own business user base. This increased activity has already hurt the dealer/distributor segment of microcomputer service and should impact the more traditional form of TPM service soon.

- Exhibit III-8 demonstrates the growth in manufacturer-supplied service versus TPM-supplied service for each market. Note the relatively slow growth expected for TPM service in the mainframe and peripherals markets, both in comparison with manufacturer-supplied service and with the total service growth rate.

- The mainframe market has been traditionally resistant to TPM penetration, as indicated by Exhibit III-9. As previously stated, mainframe users are less price sensitive, making it difficult for TPM vendors to compete on a service price only basis. Mainframe users rely heavily on the post-sales support, such as training, consulting, and software support, that they receive from their equipment vendors. Perhaps most significantly, parts availability is an extremely high priority. These are but a few areas that contribute to a greater sense of vendor loyalty in the mainframe market.

- The microcomputer service market, on the other hand, allowed almost unlimited penetration by TPM vendors, due to the absence of any real participation by manufacturers in providing direct support for their users. Gradually, the economics of providing direct support, in addition to growing user requirements for increased service levels, encouraged manufacturers to increase their own involvement in providing maintenance and support offerings. By 1985, manufacturers had assumed control of over 50% of the business-use microcomputer service business, and by 1990, their share should grow to 56%.

- Exhibit III-10 provides a glimpse at the 1990 TPM penetration into the total service market. Note that the mainframe, peripherals, microcomputer, and office products TPM markets will all lose market share, while the terminals and telecommunications TPM markets will gain market share.

EXHIBIT III-8

U.S. SERVICE REVENUE GROWTH, 1985-1990

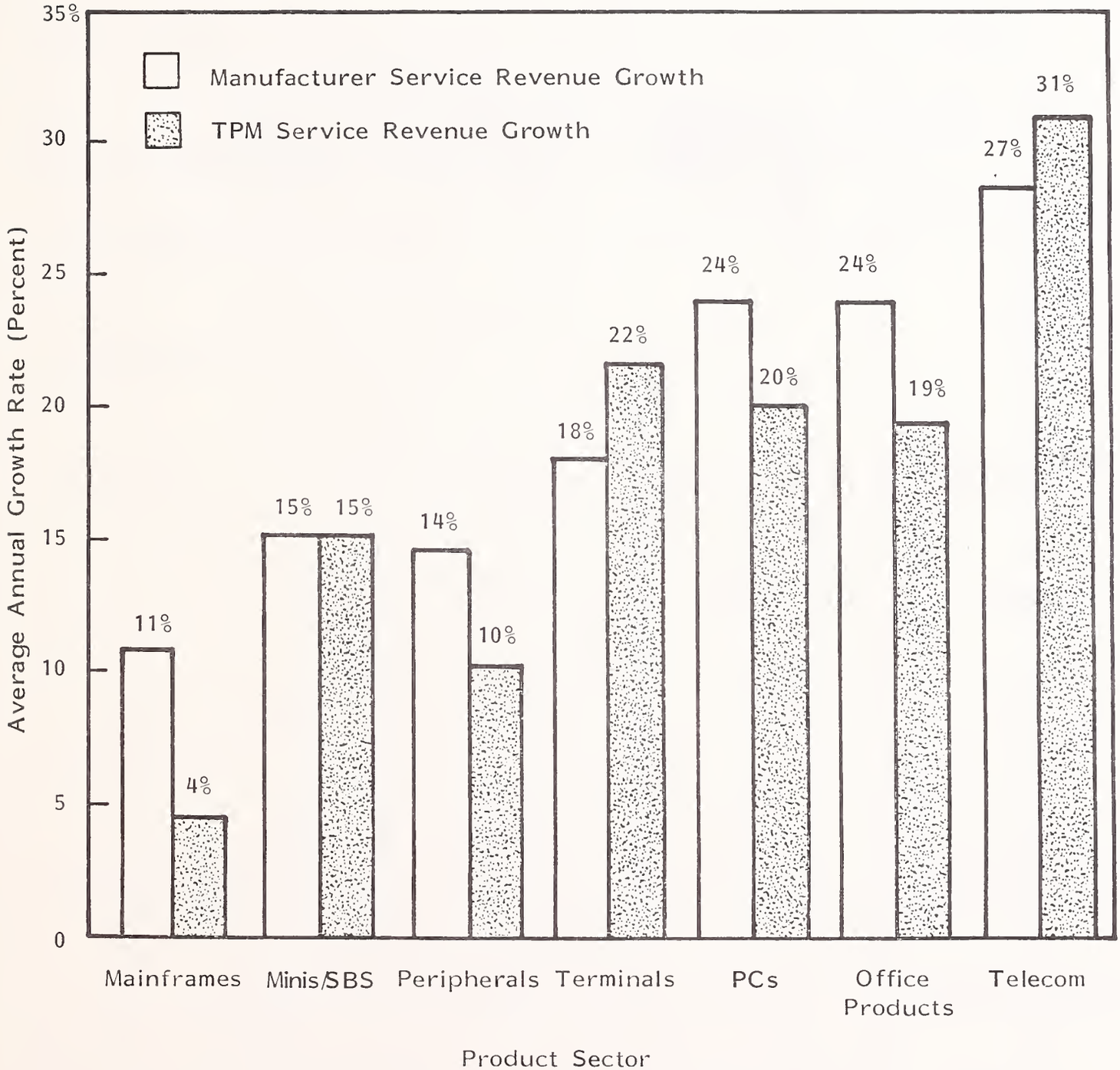


EXHIBIT III-9

TPM PENETRATION
1985

PRODUCT SECTOR	1985 TOTAL SERVICE USER EXPENDITURES ($ Billions)	1985 TOTAL USER EXPENDITURES ($ Billions)	TPM MARKET PENETRATION (Percent)
Mainframes	$3.77	$0.17	5%
Minicomputers	2.31	o.20	9
Peripherals	2.89	0.25	9
Terminals	0.75	0.14	19
Microcomputers	0.81	0.39	48
Office Products	1.70	0.05	3
Telecommunications	0.92	0.13	14

EXHIBIT III-10

TPM PENETRATION
1990

PRODUCT SECTOR	1990 Total Service User Expenditures ($ Billions)	1990 TPM User Expenditures ($ Billions)	TPM Market Penetration (Percent)
Mainframes	$6.3	$0.21	3%
Minicomputers	4.7	0.40	9
Peripherals	5.6	0.40	7
Terminals	1.7	0.38	22
Microcomputers	2.2	0.97	44
Office Products	5.0	0.12	2
Telecommunications	3.2	0.51	16

C. CURRENT MICROCOMPUTER SERVICE MARKET AND FORECAST, 1985-1990

- As previously stated, the microcomputer market, after exhibiting explosive sales and shipment grow since 1981, will actually peak in 1986 and new shipment growth will decline to pre-1985 levels by 1990, as shown in Exhibit III-11. A number of factors will contribute to this:

  - White collar worker penetration in business environments will soon reach saturation levels.

  - Improved reliability will increase product life cycles, dramatically reducing new product growth as a result of product retirement.

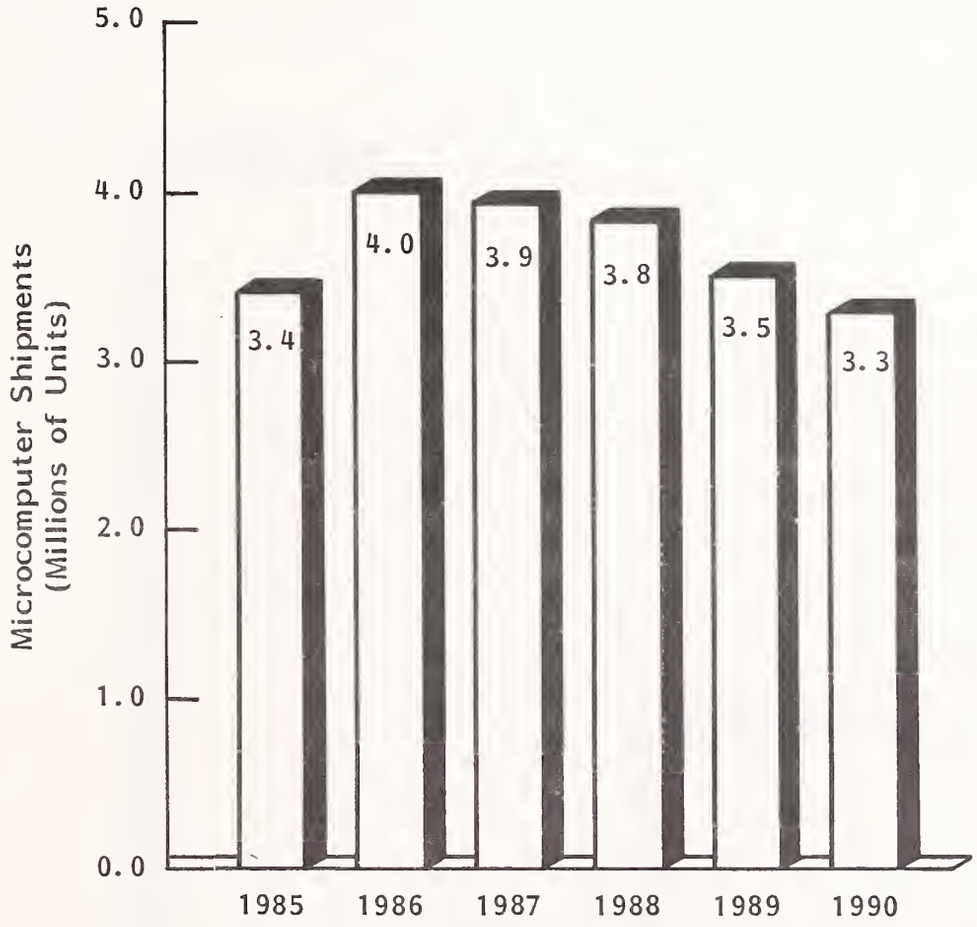
  - A less tangible factor will be the reduction in sales to users attracted to the "status" of having a microcomputer in the office.

- Another factor in the growth, or lack of growth, of new microcomputer shipments in the next few years will be corporate information systems (IS) acceptance of distributed data processing built around traditional low-cost minicomputers with dedicated terminals, such as IBM's System 36.

- The installed growth, on the other hand, will continue to grow, as shown in Exhibit III-12. The 1985 installed based of 8.5 million units should grow to just under 20 million units by 1990, representing an average annual growth rate of 19%. Since only 36% of microcomputers installed are currently under service contract, and since a combination of improved reliability and reduced product turnover will contribute to increased product life cycles, the steady growth in the microcomputer installed base should provide excellent growth possibilities in microcomputer service, even with declining new product shipments.

EXHIBIT III-11

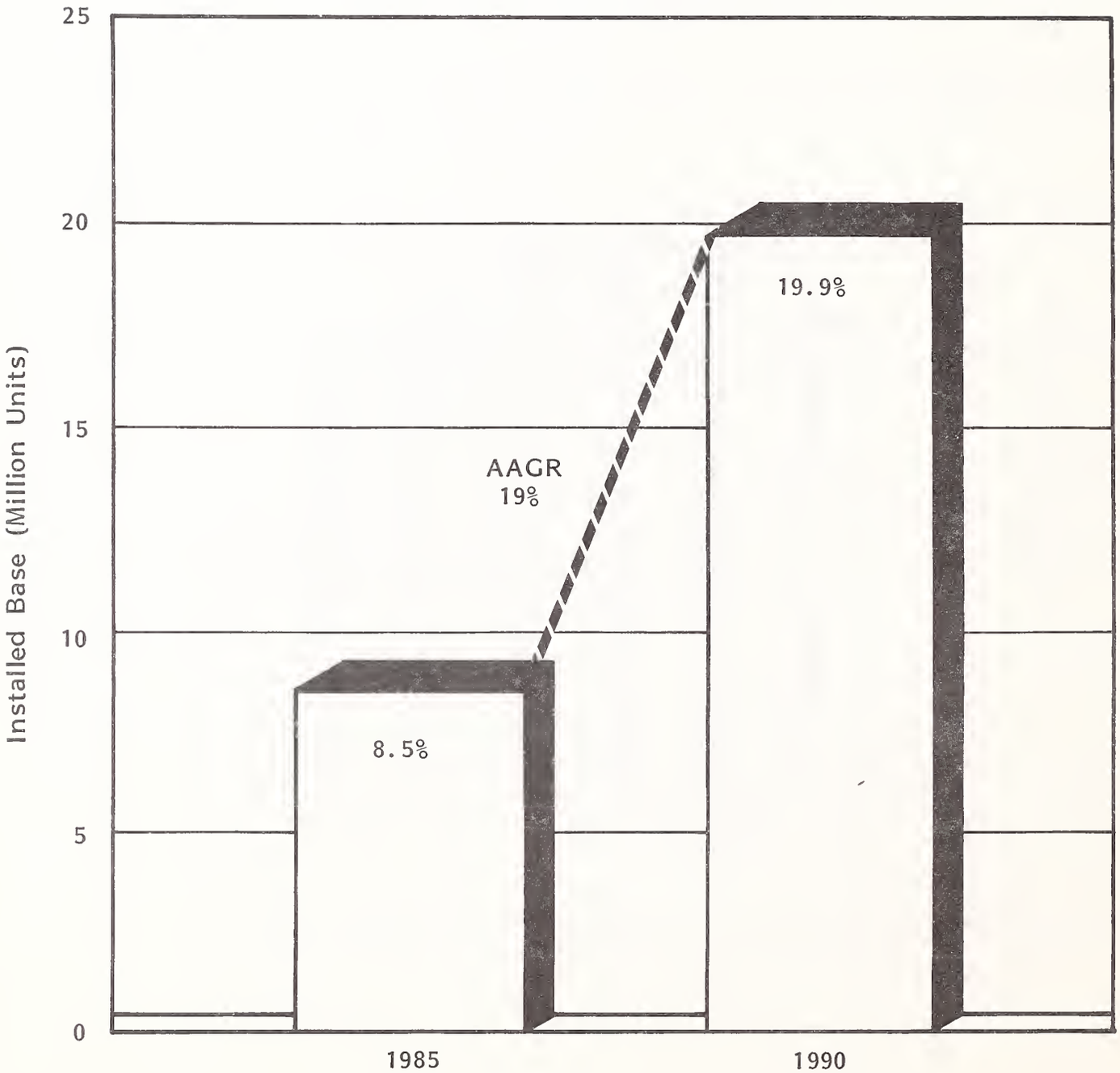
ANNUAL SHIPMENTS OF MICROCOMPUTERS*,
1985-1990



* U.S. sales of microcomputers selling for less than $15,000 that are used for business.

EXHIBIT III-12

BUSINESS-USE MICRO INSTALLED BASE



- Exhibit III-13 reflects this growth in microcomputer service from $800 million in 1985 to $2.2 billion in 1990, representing a 22% average annual growth rate. Key to this growth is the increased activity by manufacturers, most notably IBM, in providing maintenance and support on their own equipment. Since the increased manufacturer participation was in part a result of the attraction of increased revenues inherent in providing service, the fact that their resulting participation will increase service growth in effect completes the cycle.

- 1985 marked the first year where manufacturers held the majority of the microcomputer service market, as demonstrated in Exhibit III-14. The manufacturer share, at 52% of the micro service market, is up considerably over the previous year, when manufacturers held approximately one-third of the 1984 service market. Dollar growth of this segment is shown in Exhibit III-15.

- The growth in manufacturer activity in direct service should continue as the market becomes increasingly dominated by IBM, whose aggressive discounting policy indicates a growing desire to increase their own involvement in the microcomputer market. In addition, whatever success that AT&T has in capturing and increasing their own share of the microcomputer market will surely contribute to the increase in direct manufacturer support.

- Key factors to this growth will be a more open-minded policy by the major manufacturers in providing "single-source" service on all the components and devices attached to a microcomputer system. By not providing such support, the manufacturer often drives the user to third-party maintenance vendors. Early indications suggest that most major manufacturers, including AT&T and IBM, are cautiously providing such "single-source" maintenance on selected peripheral devices and boards.

- Another factor in the continued growth of manufacturer-provided service will be increased user acceptance of sophisticated microcomputer products that

EXHIBIT III-13

TOTAL MICRO SERVICE USER EXPENDITURES
1985-1990

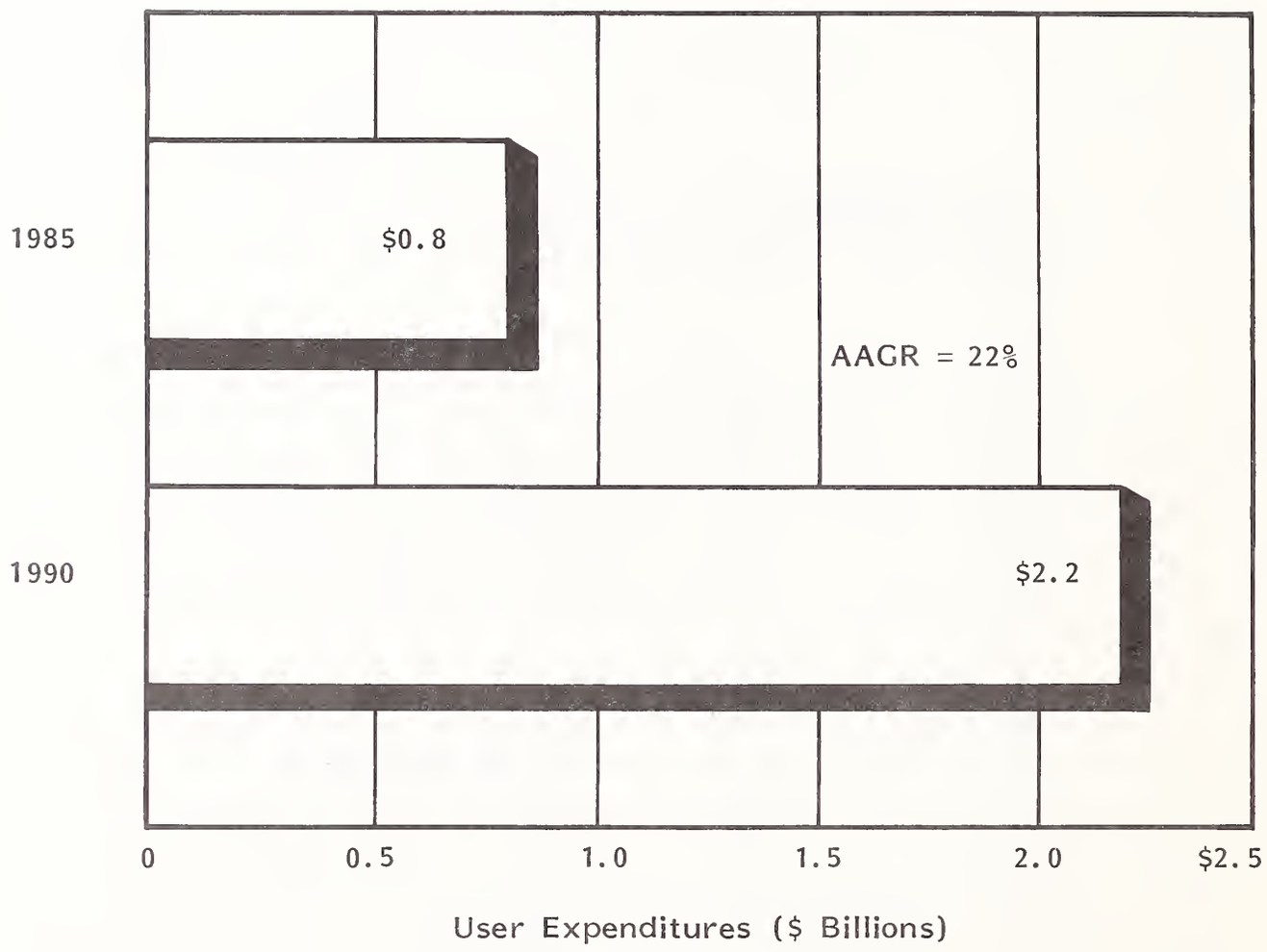
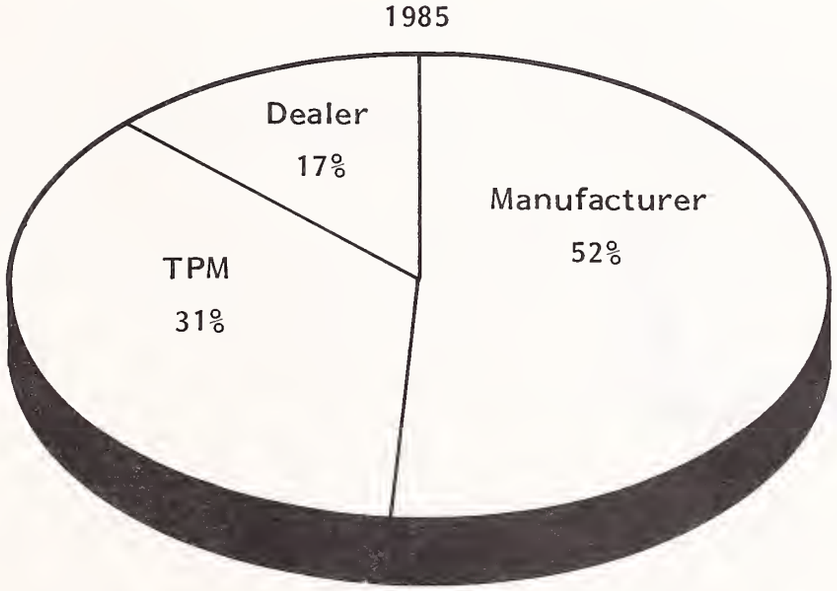
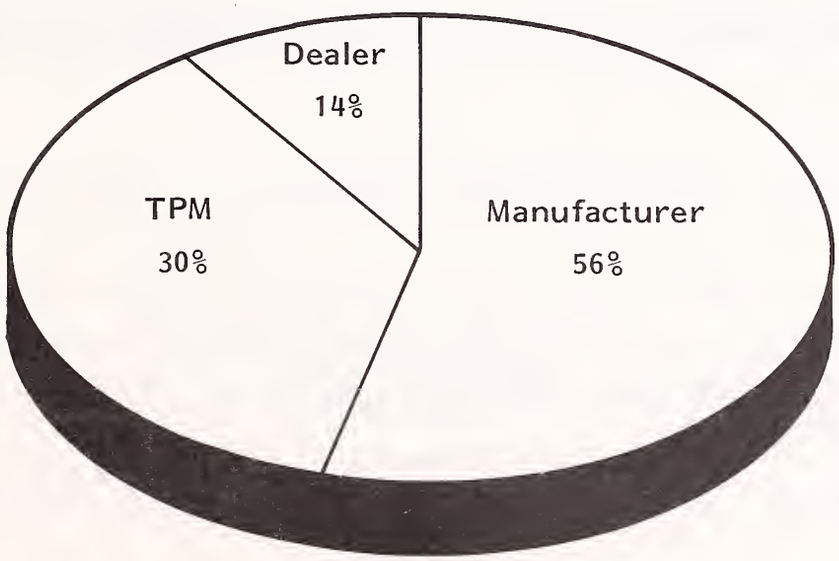


EXHIBIT III-14

MICRO SERVICE MARKET COMPOSITION
1985-1990



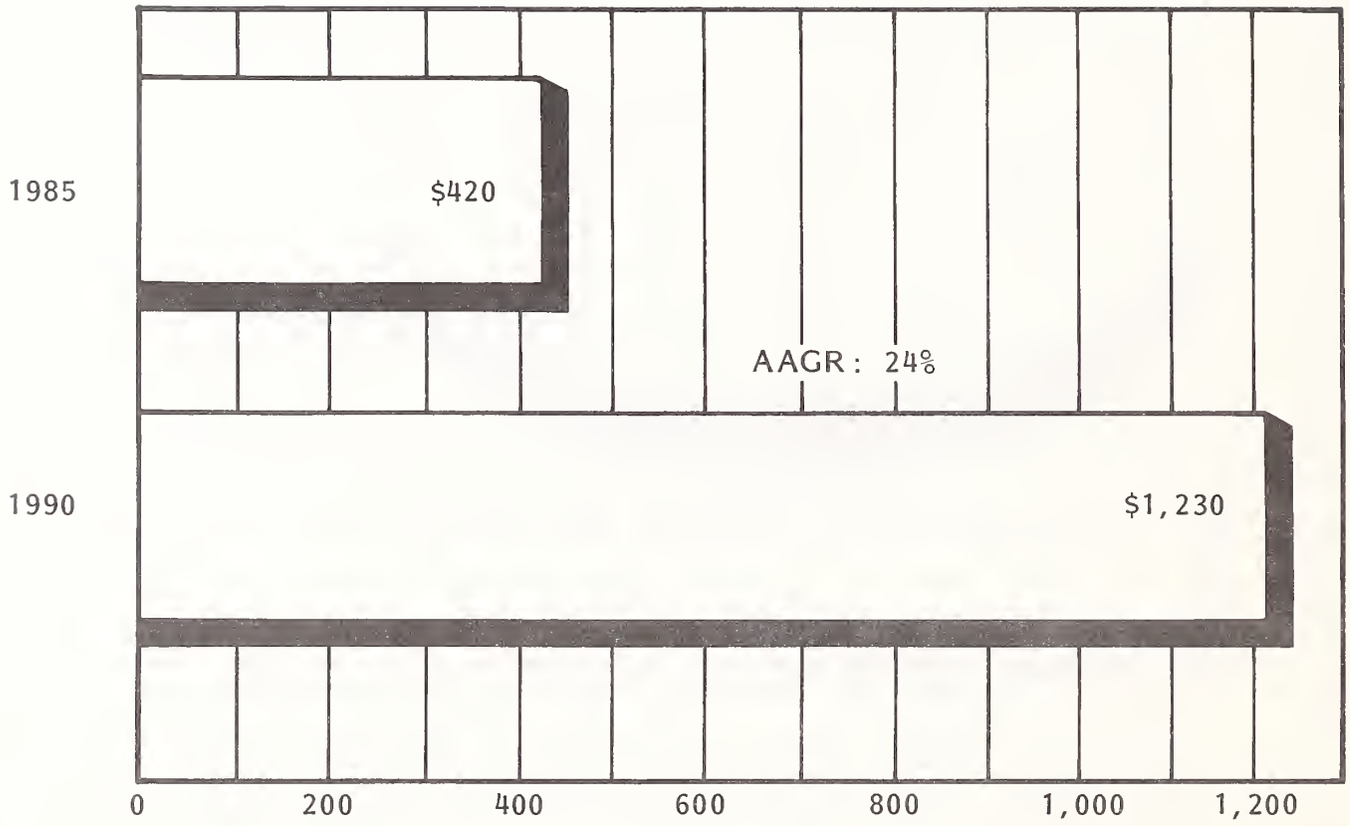
Total Micro Service Market: $0.8 Billion



Total Micro Service Market: $2.2 Billion
1990

EXHIBIT III-15

MANUFACTURER SERVICE USER EXPENDITURES
1985-1990



Rapid growth spured by increased concentration of purchase authority, increasingly satisfactory applications, and improved economy of scale.

are blurring traditional minicomputer and microcomputer product lines. IBM has already announced a long list of AT-, XT-, and PC-based products that approach minicomputer performance. In addition, IBM has recently introduced a down-sized minicomputer, the System/36 PC, whose primary feature is its capability to work eithier as a standalone ("desktop") computer or as a file server for a number of PCs.

- Other vendors have also been active in developing high-end microcomputers. Hewlett-Packard has announced an AT-compatible microcomputer, the Vectra Personal Computer, that, when used in conjunction with their OfficeShare LAN, allows the new machine to link departmental data processing capabilities with the HP 3000 minicomputer familiy. AT&T announced their PC 6300-Plus, an XT-compatible machine, that will compete directly with the AT. And Digital Equipment Corporation expects to sell 60,000 of their Micro VAX IIs, which have most of the power of a VAX 11/780 in a package that is 42 times smaller, by the end of 1985.

- The significance of this development in product design is the resulting increase in both system availability and overall service requirements demonstrated by users, especially in situations where these supermicrocomputers are replacing traditional minicomputers. Users of these systems will expect response, repair, and overall service performance at similar, if not superior, levels as the levels they received on the machines that were replaced.

- This demonstrates the importance of product segmentation and its effect on service growth. While some users will be able to purchase some of these new supermicrocomputers through dealer/distributor channels, the bulk will be sold through the manufacturer's direct sales efforts, especially for large corporate purchases. Users will be encouraged to buy service and support at the time of purchase. Thus, manufacturers will definitely benefit from the service growth resulting from these more sophisticated microcomputer offerings.

- Segmentation of the microcomputer market will be even more critical for the non-manufacture service sources--third-party maintenance vendors and dealers/distributors. While some microcomputer dealers have been formulating and effecting large corporate sales and service offerings (Businessland has been effective in this), increasingly aggressive service pricing strategies by manufacturers and by the larger TPM vendors will hinder dealers in their efforts to sustain appreciable service growth in large corporate sales.

- Instead, dealer/distributor service growth will more than likely result from targeting small (less than $10 million) companies, who will contribute to microcomputer sales growth in two areas:

  - Vertical market applications, utilizing "bundled" systems such as NCR's PC4-based Retail Personal Computer that combines hardware, software, and peripherals (including a cash drawer).

  - Individual productivity applications, single-user microcomputer price drops, and improved multifunction software encourage small businesses to use micros to perform generic accounting, planning, word processing, and other business functions.

- These users will have reduced service and support requirements and will be most apt to choose depot-style hardware maintenance delivery. They will also be most attracted to the localized support capabilities inherent in dealer support, particularly in the areas of pre-sale consulting and initial training and education services often provided free of charge to dealer customers.

- Therefore, dealers/distributors will need to focus on these service areas to protect themselves from the inevitable move toward manufacturer service. In some situations, the availability of localized support services such as training or consulting may attract large corporate users to dealer support, if only for those services. In addition, these services not only provide a steady stream of revenue, but also assist in securing future sales.

- Third-party vendors, on the other hand, will continue to compete with manufacturers for corporate accounts, particularly the largest vendors with national coverage. These vendors will need to focus on three factors:

  - Multi-system and multi-vendor service capabilities, although the gap between TPM and manufacturer service capabilities regarding "mixed systems" will narrow.

  - Aggressive pricing strategies, as typified by CDC's Back-Up microcomputer maintenance plan.

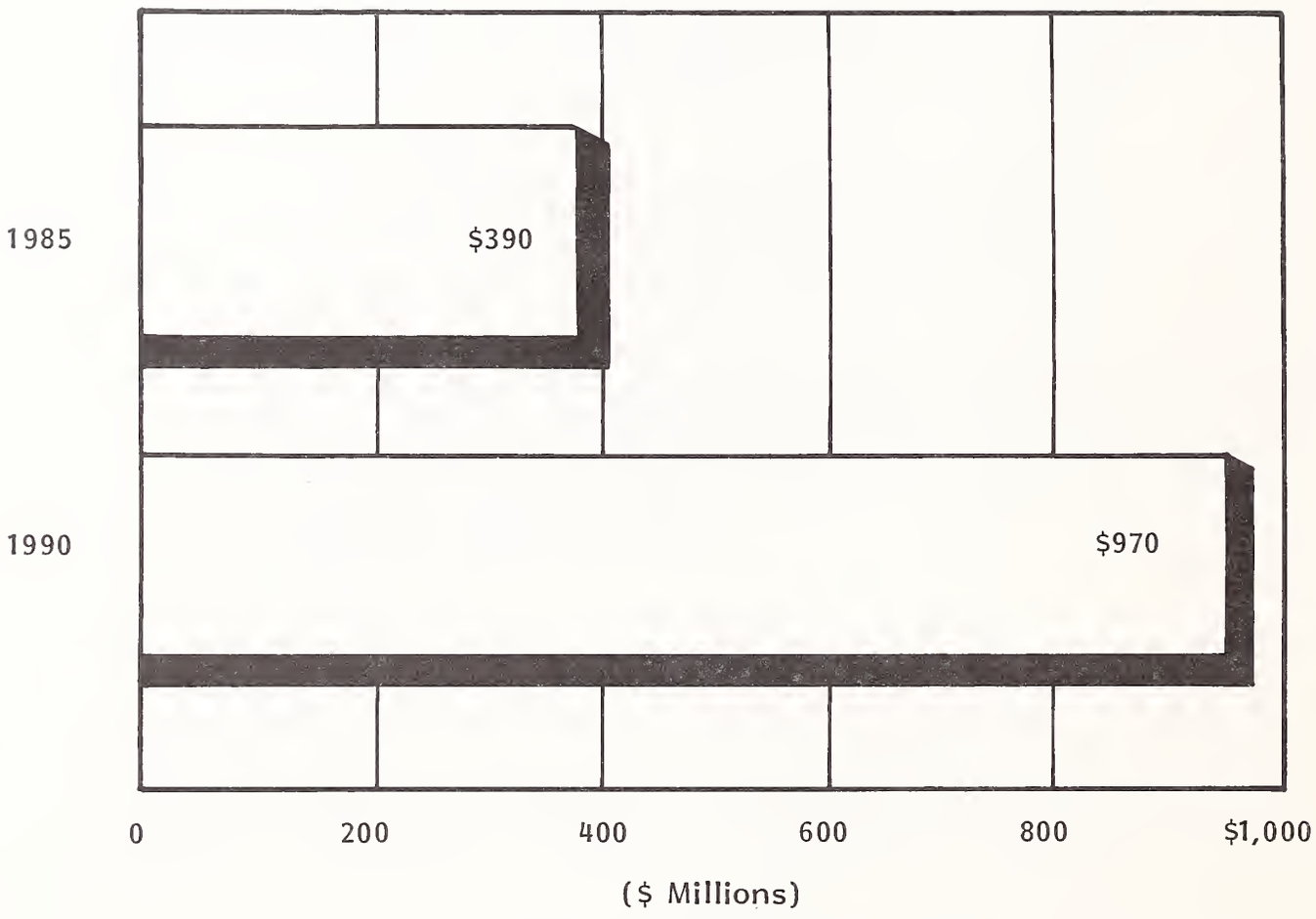
  - To a lesser degree, TPM's strong background in microcomputer maintenance, which will continue to attract new users.

- Exhibit III-16 demonstrates that third-party maintenance and dealer/distributor service will still exhibit substantial growth through 1990.

EXHIBIT III-16

DEALER SERVICE USER EXPENDITURES

1985-1990



Dealers/distributors target small businesses through vertical applications and localized support. TPM vendors compete for corporate accounts through pricing discounts.

IV MICROCOMPUTER SERVICE DEVELOPMENTS

A. MICROCOMPUTER SERVICE REVENUE SOURCES

- Not surprisingly, the bulk of microcomputer service, in terms of revenue contribution, is connected to hardware maintenance. In fact, revenues derived from hardware maintenance activities, as shown in Exhibit IV-1, make up 98% of all service-related revenues. This can be contrasted to minicomputer and mainframe hardware maintenance, which contribute 82% and 83% to their respective service totals. Of course, users of these larger systems have high overall service requirements, especially in the areas of professional services (planning, consulting) and educational services. As microcomputer use becomes more sophisticated, user requirements in these areas will become more pronounced.

- Certain realities limit the current activity by microcomputer service vendors in these service areas. Installation and environmental and site planning are almost never necessary (although this will change for networked and supermicrocomputer applications). Whatever training or consulting that users receive is performed just prior to or at the time of purchase, most often by the purchase source. Software support is performed through the microcomputer purchase source or, in the case of applications software support, through the software vendor.

EXHIBIT IV-1

MICROCOMPUTER SERVICE GROWTH BY SERVICE MARKET
1985-1990

SERVICE MARKET	1985 REVENUE ($ Millions)	AAGR 1985-1990 (Percent) 0 25 50 75%
Hardware Maintenance	$794	20%
Software Support	8	68%
Educational Services	8	68%
Professional Services	0	0%
Total	$810	

- A number of problems arise from this situation. First, the decentralization of sources of these support services tends to frustrate the end user, since the resolution of any one problem may require the end user to contact two or more vendors. Second, as ease of use (including the accessibility of support) of software available becomes an increasingly important factor in the purchase of a microcomputer, microcomputer manufacturers find themselves increasingly dependent on the support capabilities of others in satisfying their users' current and future support requirements and assuring future sales. Third, a large number of hardware-related problems result from (at least in part) improper installation, environmental conditions, or user misuse of either hardware or software.

- Perhaps most important, a considerable amount of service revenue was left on the table. Larger systems service vendors are already moving toward software support, educational services, and professional services as sources of service revenue growth for a number of reasons:

  - User system availability requirements are increasing to a level where improvements in hardware maintenance activities (response time, repair time, etc.) are becoming physically impossible without radical changes in product design (such as the introduction of redundant systems or increased use of remote support embedded into the system).

  - Increased system availability requirements encourage users to "rethink" their attitudes toward professional, educational, and software support services. This trend should continue as the complexity of current and future applications increases.

  - Service vendor capabilities in providing these services are improving, especially in the delivery of software support.

  - Improved performance in these areas has a greater impact on overall user satisfaction, which in turn leads to improved sales.

- In the microcomputer arena, users are already demonstrating a desire to utilize increasingly complex systems and applications. A number of vendors have already responded by elevating the importance of non-hardware maintenance activities and integrating them into their existing support structures.

  - A large number of microcomputer vendors are selling software support through toll-free telephone lines. One such vendor, Texas Instruments, is bundling telephone support with depot maintenance by offering a significant discount to users who sign up for both programs.

  - Another vendor, Tandy, is offering both training and consulting services through localized Area Training and Support Centers.

  - Other vendors, such as Hewlett-Packard and Digital Equipment Corporation, offer service programs that parallel the service levels available to their minicomputer users, including an exhaustive catalog of training courses available to the end user.

- By 1990, microcomputer service vendor activity in software support, educational services, and professional services should increase significantly. Exhibit IV-2 shows that while hardware maintenance still accounts for 89% of all service revenues, educational services and professional services (particularly in the area of consulting) will produce new revenue growth possibilities. Contributing factors to this increased growth include:

  - Increased activity by microcomputer manufacturers in the maintenance and support of their own microcomputers, particularly those manufacturers who have successfully implemented such service and support structures for their mainframe and minicomputer users.

  - The increased competition from manufacturers' involvement in maintenance will encourage TPM vendors to increase and diversify their

EXHIBIT IV-2

INCREMENTAL REVENUE CONTRIBUTION BY SERVICE MARKET

SERVICE MARKET	1990 REVENUES ($ Millions)	INCREMENTAL REVENUE 1985-1990 ($ Millions)
Hardware Maintenance	$1,958	$1,164
Software Support	110	$102
Educatonal Services	110	$110
Professional Services	22	$22
Total	$2,200	

service offerings in order to shed their "hardware maintenance-only" image.

- Increased user service requirements, particularly for networked applications, whether they be micro-host or micro-LAN systems. As a result, network planning and consulting will become a necessary and highly profitable service offering.

- Increased use of vertical application microcomputer systems will require expansion of both training and consulting, with attention paid to both industry-specific and application-specific functions.

B. MICROCOMPUTER SERVICE PRICING TRENDS

- In the microcomputer industry, both purchase prices and overall service prices have gradually decreased for the last three years. For example, the purchase price for an IBM PC dropped 36% from 1982 to 1984, and the service price dropped 34% during the same period of time. This trend led some to believe that the microcomputer service business would never survive, since increased product reliability would reduce the need for service while rapid product purchase prices would encourage users to treat their microcomputers as "disposable" items.

- Instead, continual product advances upheld purchase prices, and the design enhancements enabled users to utilize their microcomputers for increasingly complex and sophisticated applications. The result was that microcomputers became more important to the user, thus much more lucrative (and eventually profitable) to the microcomputer service vendor.

- Historically, computer equipment maintenance pricing has been tied to the product's purchase price. This connected the value of service to the value of

the machine, justifying the cost of service versus the cost of completely replacing the defective unit with a new machine. Also, this made it easier to sell both the product and service, since the price of service could be communicated simply as a percentage of the purchase price.

- Basing microcomputer service pricing on a percentage of purchase price became necessary because vendors could not base service prices on a cost-plus-margin basis (another, more effective service pricing strategy). It was often impossible to place actual field repair costs accurately, especially at new product introduction time. Instead, vendors had to hope that service revenues derived would at least come close to covering service costs, and if not (or if services prices proved to be too excessive), service prices could be adjusted later when actual costs could be accurately determined.

- From the outset, microcomputer service pricing has had a confused history. Historically, service prices ranged from a low of 7% of the purchase price to a high of 24%, regardless of the quantity of services provided. In fact, two vendors who provided the highest level of services, Digital Equipment Corporation and Hewlett-Packard, usually charged the lowest service prices.

- IBM's entrance into the microcomputer market was expected to legitimize the market and provide stability (and standardization) to both the product market and the connected service and support policy. Instead, IBM initially set up its support structure through retail dealers and third-party maintenance organizations, and the confusion over service pricing continued.

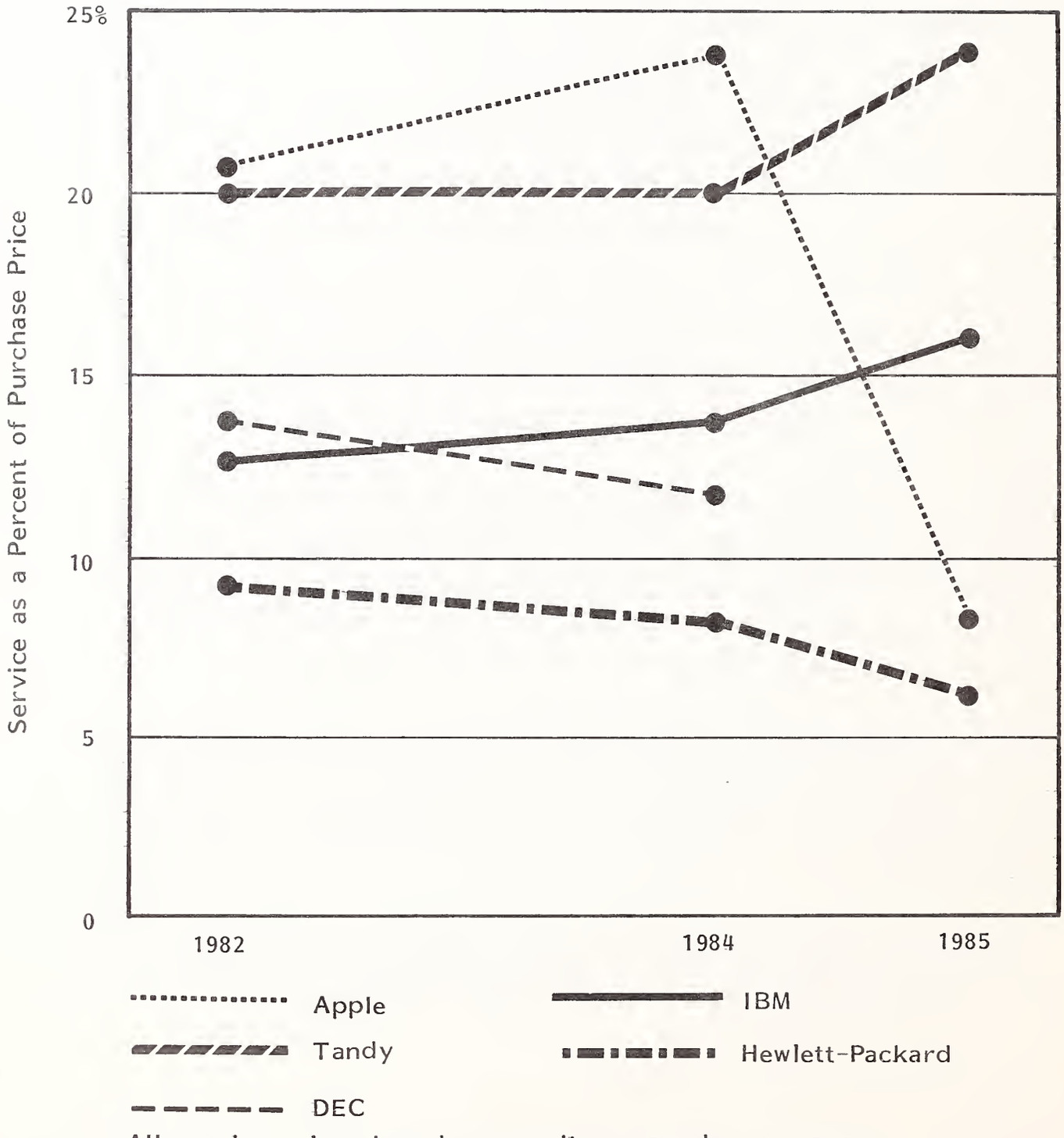
- Now that IBM has had two years to develop and increase their own activity in the service and support of their microcomputers, it is interesting to see that the confusion over microcomputer service pricing continues, as shown in Exhibit IV-3.

  - Certain vendors, such as HP and DEC, continue to provide a high level of service at prices well below those of other vendors.

EXHIBIT IV-3

MICRO PRICING TRENDS

1982-1985



All service prices based on on-site, same-day response.

- IBM prices have stayed fairly constant, considering their extensive discounting policy available to large systems users.

- Tandy, perhaps as a reflection of the increased costs that resulted from their expanded training and consulting services, raised their already high service prices.

- New entrants, such as NCR and Sperry, based their service pricing very competitively (although not shown on the exhibit) at 11% of purchase price.

- The biggest change in service pricing, regarding Apple's MacIntosh, resulted from the switch from RCA to Honeywell after the first quarter of 1985.

- Microcomputer service pricing should continue to fluctuate as the major players in micro service--large national dealers, TPMs, and manufacturers--react to the large quantity discount lead of IBM. Some service vendors will attempt to compete strictly on a volume discount level, while others will attempt to try to compete with innovative "re-bundling" of service offerings (as Control Data Corporation did with their Back Up program). The resulting service price competition will definitely benefit the corporate microcomputer user, who will probably be able to take advantage of multiple service plan offerings, effectively dropping the actual service price well into the 10-15% of equipment list price levels.

C. INCREASED CONTRACT USAGE

- One by-product of the growing need and reliance on service is the increased acceptance of service contracts by users versus the use of the time-and-

materials (T&M) method for paying for service performed. Exhibit IV-4 shows that over one-third (36%) of the current business microcomputer user base purchase service contracts rather than pay for their maintenance on a T&M basis. By 1990, this number will increase to well over half of the user base.

- In the past, users were more likely to opt for T&M service on their microcomputers due to the perceived high expense of purchasing service contracts. Service contract prices, as a percentage of purchase prices, have dropped in the last few years. However, high service contract prices were not as much the problem as a low perception of the value of service and support for microcomputers by their users.

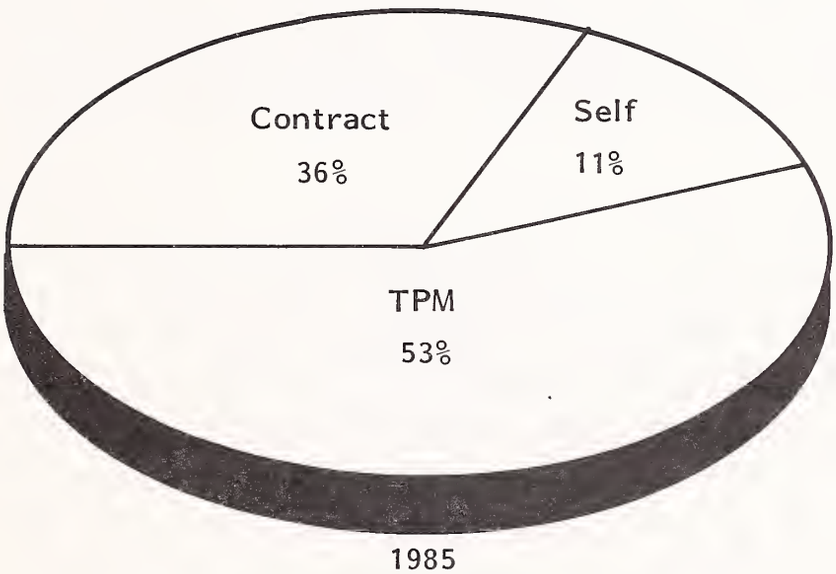
- Microcomputer manufacturers and their distributors are the primary contributors to users' low perception of the value of service. The manufacturers, in most situations, were unable to provide efficient levels of service and support to an almost uncontrollable user base. Instead, they relied on their distribution channels, usually in the form of office product and computer-speciality stores, to handle both sales and service. The highest priority for these stores was sales, and even the thought of service implied unreliability, which in turn would hurt sales.

- This misconception slowed the growth of microcomputer service to such a point that some vendors, both retailers and even some manufacturers, felt that significant purchase price drops, combined with the inevitable increases in product reliability, would result in the microcomputer becoming a "disposable" item, making service (and service contracts) an unnecessary expense.

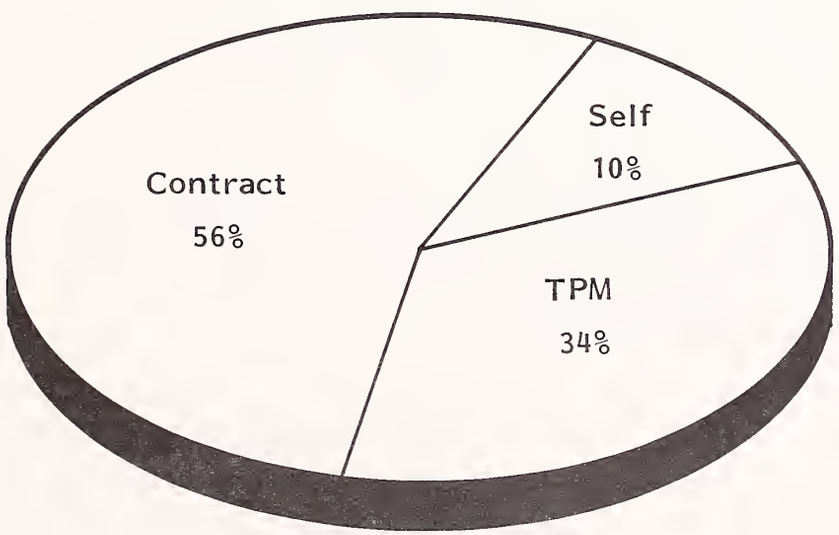
- Fortunately, this never occurred. Purchase prices were stabilized by increasingly sophisticated product designs (standard business configurations have evolved from 8-bit, 64K RAM, two floppy systems to 16-bit, 256K RAM, two DS/DD floppy systems and will soon improve), and the increasingly sophisticated applications that these new machines performed persuaded users to

EXHIBIT IV-4

MICRO SERVICE CONTRACT USAGE
1985-1990



1985



1990

reevaluate their perceptions about microcomputer service and support. And vendors, calmed by a stablized product base, became attracted to the potential revenue growth that results from service.

- Currently, microcomputer service vendors are actively pursuing new ways of making service contracts more attractive to business users. These methods include more traditional attempts, such as large quantity discounts (industry leader IBM has perhaps the most extensive discount schedule for large quantity PC users), to more innovative attempts at "repackaging" existing service offerings (Texas Instruments' "bundling" of their telephone support service with a 25% discount on a depot contract is a perfect example).

- Perhaps the most innovative attempt at expanding service contract usage has been Control Data Corporation's "Back Up" program, which combines both contract aspects with per-incident pricing. In the program, users purchase contract "treatment" (priority responsiveness) at 25% of the normal contract cost, yet pay a per-incident repair charge (that covers both labor and parts) should any work be necessary. The customer is protected by an annual "cap" that prevents the user from paying a significantly higher rate (25% over the annual contract price) than if the user purchased a regular contract.

- This program provides the user the "insurance" aspect of a contract at a fraction of the cost. The user gambles that the machine does not break down and require repairs that will equal or exceed a standard contract cost. More importantly, the program provides a continual stream of revenues and expands the potential contract customer base to users who would not have considered purchasing contracts in the past. In addition, whatever costs incurred by performing the actual repair and service are covered, in part or in their entirety, by the per-incident charge.

- Lastly, a major factor in the past and continued growth in contract usage is the proactive marketing efforts from a growing number of service vendors. In recognition of the attractiveness of service as a profit-generating "product,"

service vendors have been increasingly effective in marketing service through a number of medias including print, radio, and even television. Even select retailers, such as Businessland, emphasize service and support in their advertisements. Indeed, microcomputer service and support has come a long way from the "service as a necessary evil" days.

- One should note that 11% of the microcomputer user sample users responded that they have no experience with either contract or T&M service (not to be confused with the 15% of the sample who considered themselves their own primary service source, although they may have utilized T&M service). A significant number of microcomputer users will continue to pass on service, such as:

  - Large corporate users who are developing their own in-house service and support structures, in part a recognition of the importance of microcomputer use in their companies, but also in part a demonstration of their frustration with the quantity and quality of microcomputer service and support currently available.

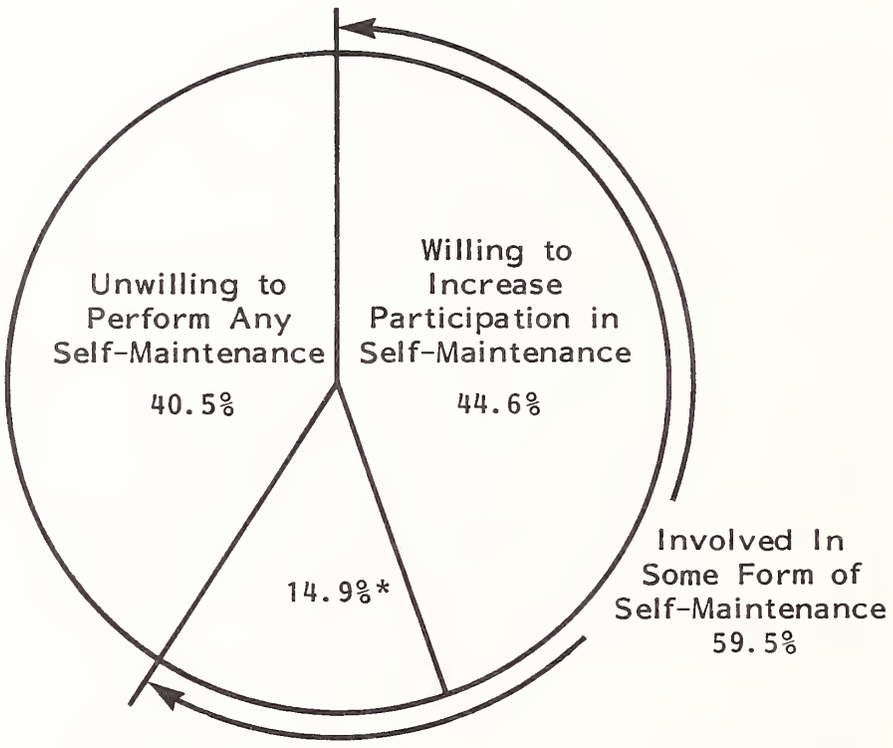
  - Small businesses and individuals who are not aware of the importance of service or cannot afford the current service offerings.

  - Individuals, in the past referred to as "hobbyists" or "hackers," who prefer to do their own service.

- Exhibit IV-5 reflects the level of self-maintenance that current users are willing to participate in. A large percentage of the users (45%) are currently willing to increase their own activity in maintaining their own equipment, most commonly to the board level. This is not surprising, considering that many microcomputer users are already experienced in the installation of memory boards and peripheral cards.

EXHIBIT IV-5

USER INVOLVEMENT IN SELF-MAINTENANCE



*Consider Themselves the Primary Source of Maintenance

Level Willing to Maintain
(In Increasing Order of Difficulty)

Component Level	9.7%
Board Level	62.4
Chip Level	11.8
All Levels	16.1%

D. INCREASED DEMAND FOR ON-SITE MAINTENANCE

- With the increased sophistication and complexity of microcomputer usage in corporate environments, the increased system availability requirements that resulted are encouraging users to opt for on-site maintenance over depot (mail-in or carry-in) maintenance delivery methods. Exhibit IV-6 shows that 41% of microcomputer users receive their hardware maintenance on-site, compared to 38% in 1984. Furthermore, INPUT believes that 60% of all microcomputer service will be performed on-site by 1990.

- There are a number of factors that will contribute to the growth of on-site maintenance:

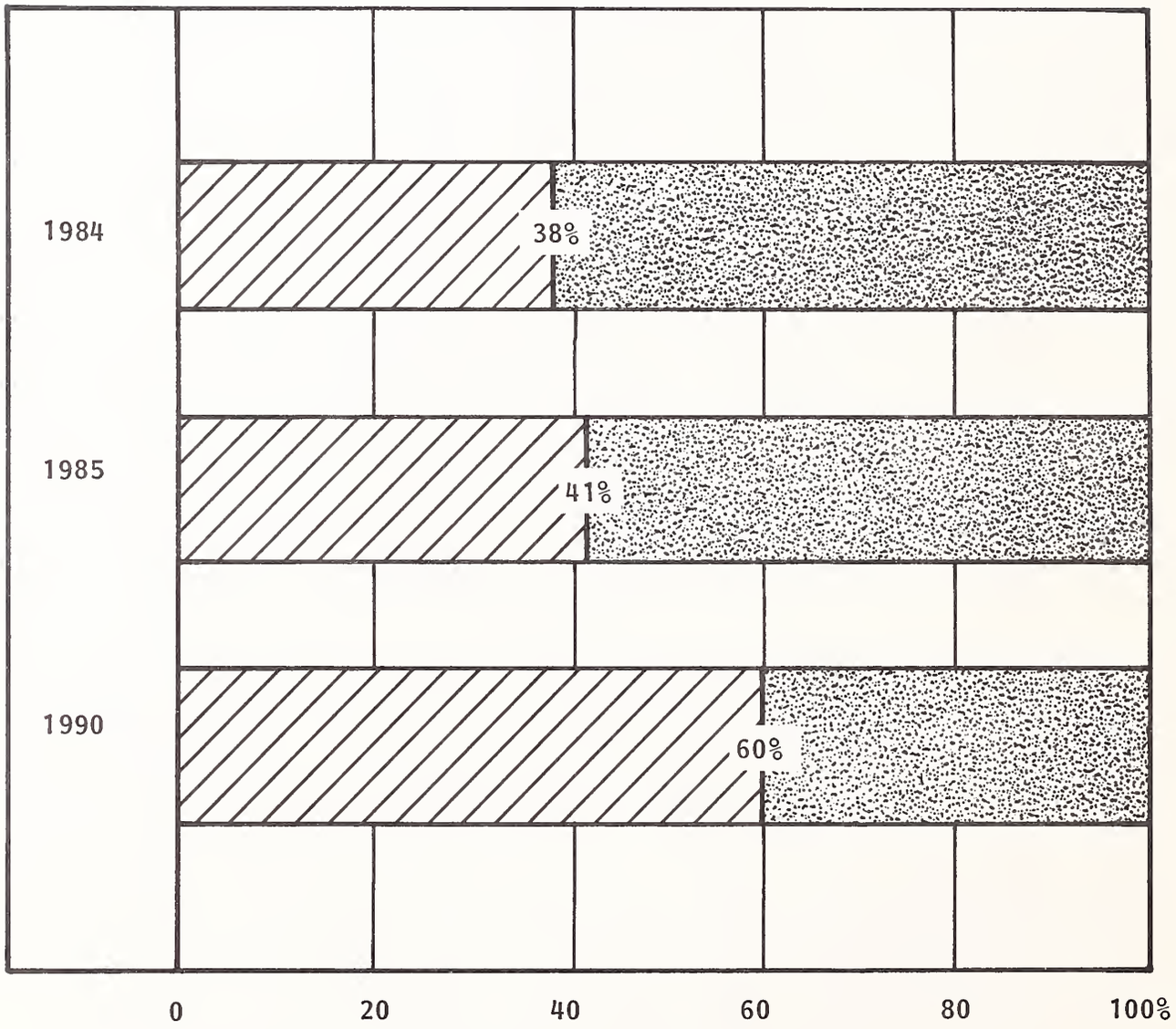
  - Increasingly sophisticated systems, including LAN-connected and micro-host applications, which would make depot maintenance impractical.

  - A larger and more controlled product base, which will allow vendors to offer large quantity discounts due to improved economy of scale.

- A large proportion of microcomputer users will still opt for depot maintenance (in most cases carry-in). These users will have reduced service requirements, and the cost advantage will outweigh the inconvenience and turnaround time disadvantage inherent in the carry-in delivery mode. More than likely, these users use their microcomputer for individual (personal) productivity applications, rather than networked applications, and would not be severely impacted by the longer turnaround times associated with depot maintenance. In addition, users of portable and transportable microcomputers will also be attracted to depot maintenance, since in most cases, their microcomputer's portability facilitates carry-in maintenance.

EXHIBIT IV-6

ON-SITE VERSUS DEPOT MICROCOMPUTER SERVICE



Note: 1984 and 1985 data from sample.

- This illustrates the importance of properly analyzing and segmenting the user base in order to determine the most efficient and profitable service programs to offer.

E. INCREASED NEED FOR PROFESSIONAL AND EDUCATIONAL SERVICES

- Areas of service revenue growth that have until recently been overlooked are in the closely related segments of professional and educational services. Professional services are comprised of such pre- and post-sales activities as planning, consulting, and sales support. Educational services include both pre- and post-sale training.

- These services have usually been supplied to users in limited amounts at the time of purchase from the purchase source. Usually, these services are provided to the user free of charge, either during the actual sales process or "thrown in," most often in the form of one- to two-hour classroom instruction. These limited attempts were beneficial to the user; however, as both the hardware market, and, to an even greater degree, the software market grew, the ability of the sales source to train a user effectively on all possible hardware/software combinations diminished, thus limiting the benefit to the user.

- As microcomputer applications continue to become more sophisticated, particularly in corporate environments, the need for effective professional and educational services will rise dramatically. A number of microcomputer service vendors have already recognized this trend.

  - Tandy, recognizing the difficulties in having a sufficient number of effective training and consulting personnel in their dispersed service network, has regionalized these personnel into Area Training and Support Centers where users can receive either classroom or customer

site training and consulting services in addition to hardware maintenance and software support.

- Both Digital Equipment Corporation and Hewlett-Packard publish an extensive catalog of training courses available to their microcomputer users, covering subjects ranging from application software usage to simple microcomputer repair.

- A number of vendors provide centralized telephone support numbers, usually priced on a per-call basis. Although some of these toll-free telephone support services may have limited coverage, most act as a training or consulting service. As previously discussed, TI has bundled their telephone support line with their depot service contract, encouraging contract usage while still providing inexpensive (in terms of vendor costs) support.

- Still, a significant amount of end-user training and consulting revenue is still being bypassed. An indication of the increased user requirement for these services that are currently going to non-microcomputer service vendors is the growth in the number of professional training companies, such as TekLink (Mountain View, CA), The Training Company (San Francisco, CA), and DELTAK (Naperville, IL). In addition, a large number of large corporations are organizing their own in-house user support groups, usually a part of the IS group, in part as a response to the lack of structured training and consulting services.

- Implementation of these services are not without their costs. For example, the high costs involved in producing up-to-date documentation, manuals, and other written training materials has encouraged a number of vendors to attempt to "automate" the process using computers. The result, computer-based training (CBT), presents information and instructional material in a series of screens, sometimes using texts and sometimes using graphics. One attribute of CBT is the ability to employ user interaction and system feed-

back. Also, the system is self-paced, does not require instructors, and can accommodate a large number of users.

- CBT is not without its disadvantages, the most important being the high cost of development and implementation. However, there are already development tools available from such vendors as Bell and Howell and Interactive Training Systems (Cambridge, MA).

- Exhibit IV-7 compares the benefits of various training methodologies.

F. DEALER VERSUS MANUFACTURER SUPPORT

- Dealers have played a major role in the distribution and support of microcomputers since the earliest stages of the microcomputer market development. At first, dealers, both in the form of office product stores and the later form of specialty-computer stores, were the dominant source of microcomputer sales and, in limited amounts, support.

- Gradually, manufacturers and third-party maintenance companies have increased their activity in microcomputer service, resulting in a lesser role for dealers and distributors in servicing the business user base.

- Dealers have been traditionally effective in providing localized training and consulting at the individual level. However, their traditional weakness has been in providing consistently rapid turnaround times for hardware repairs. This is due in part to the fact that most dealers find it difficult to compete with larger companies for well-trained engineers. As a result, most dealers need to send high level repairs (chip level repairs, fixed disk drive maintenance) to the manufacturer for a swap-out or repair. The relatively lengthy turnaround times sparked the development of "fourth-party" maintenance vendors who could guarantee faster turnaround times than the manufacturers themselves.

EXHIBIT IV-7

USER ATTITUDES REGARDING COMPUTER TRAINING AND EDUCATION METHODS

1. In-House Training Coordinator	• Considered effective in channeling outside resources • Often used in large and small organizations
2. End-User Support Group	• Not favored by most users • Instructional and organizational techniques poor
3. Professional Training Company	• Considered cost effective in most cases • High marks for experienced instructors, multi-media training approach
4. Formal In-House Training	• High development costs • Low user completion rate
5. Computer-Based Training (CBT)	• Very cost effective for the user • Wide variety of training materials/techniques • High completion rate

- Faced with the ever-increasing competition for the business user market, dealers should focus in on their own inherent strengths, such as:

  - Accessibility, both for individuals and, more importantly, for the local small business user.

  - Experience in support, which is very important to first-time users. Pre-sale consulting, often overlooked by the large corporate user, is instrumental in assuring user satisfaction once the purchase has been made.

  - Software support, particularly on popular third-party application packages. Dealers should strive to increase the level of training on applications software, possibly by encouraging in-store personnel to specialize in specific application areas, such as word processing or data base management, rather than acquiring superficial knowledge of many software packages.

- While dealers should continue to provide a certain amount of pre-sale training and consulting at no cost, they should also explore ways to provide premium levels of these services as a service product. Exhibit IV-8 shows that 96% of all dealers surveyed provided some level of end-user training, but Exhibit IV-9 shows that 44% of these dealers receive no revenue as a result of this training. Again, it should be stressed that dealers who have been successful in gathering a significant share of the business market (e.g., Businessland, Sears Business Centers, PacTel, and Inacomp) have successfully introduced training service offerings.

EXHIBIT IV-8

DEALER SUPPORT PROFILE

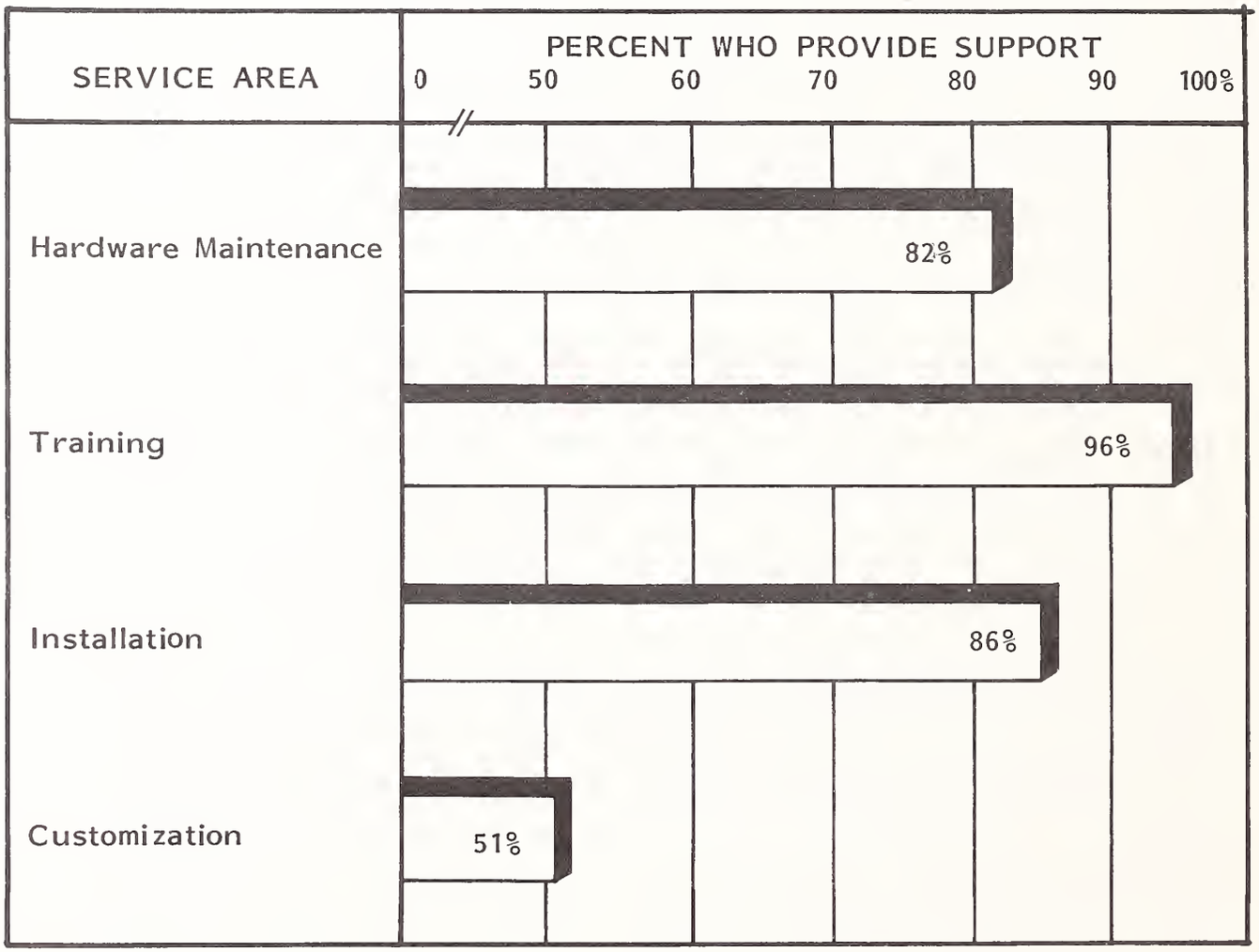
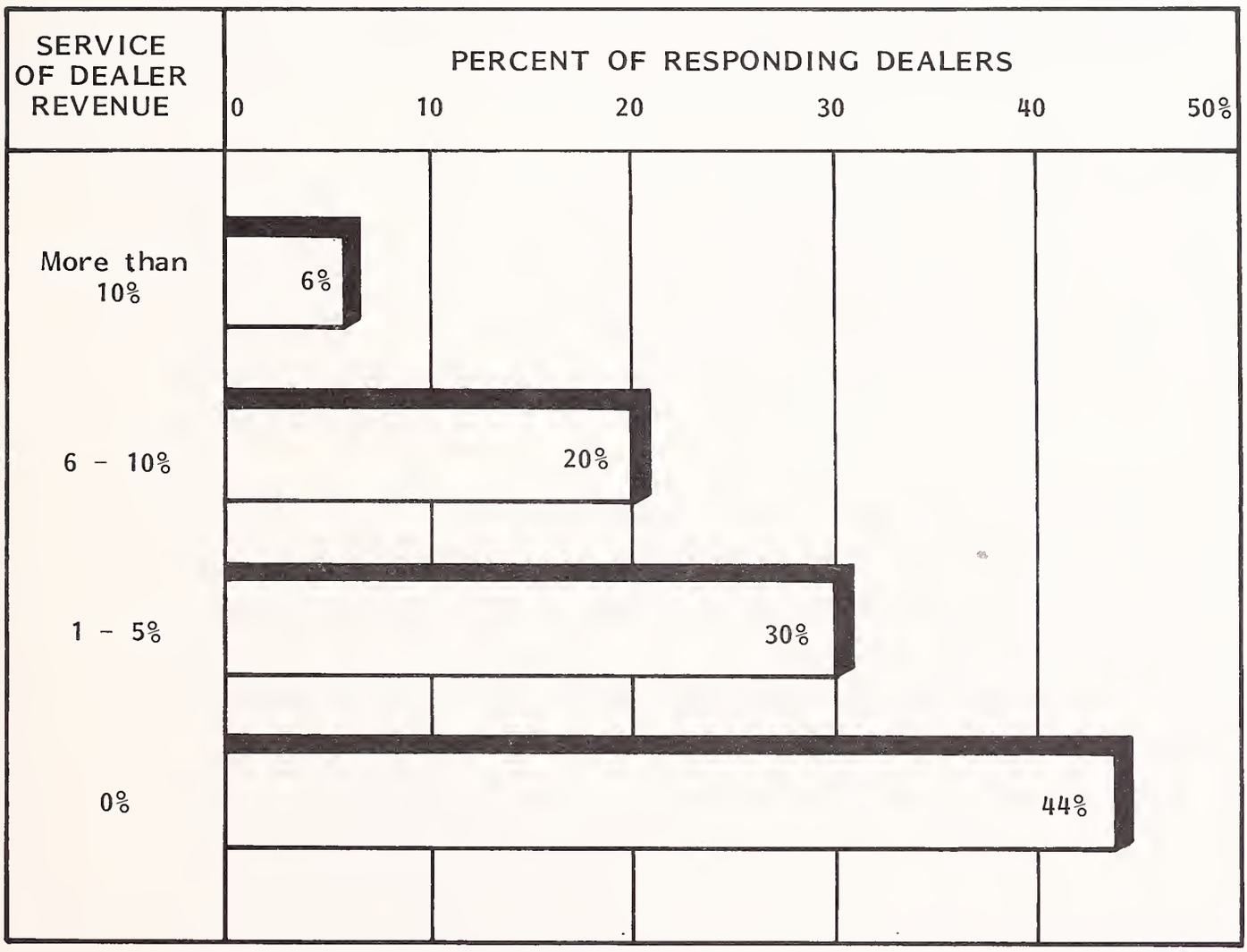


EXHIBIT IV-9

DEALER TRAINING AND EDUCATION
AS A PERCENT OF STORE SALES



V RECOMMENDATIONS AND CONCLUSIONS

A. INCREASED SERVICE COVERAGE THROUGH PROPER SEGMENTATION

- From the time that microcomputers first gained acceptance until 1984, microcomputer service existed in a very limited sense. Users often brought their micro into a company as a "personal productivity" tool and rarely concerned themselves with service, which existed (usually) as a carry-in offering. Service contracts, if available, were usually too expensive for the individual to purchase.

- As the size of the microcomputer market increased, aided greatly by corporate acceptance of the microcomputer, microcomputer service became an established force in the industry. As the market grew, increased product density made service less costly to provide, attracting increased activity by both manufacturers and third-party maintenance organizations. The reduced service costs, along with the increased competition between manufacturers, TPMs, and dealers/distributors, brought service prices down to a level that encouraged large corporate users to purchase service contracts.

- Microcomputer service and support is currently beginning the next phase of its evolution. Increasingly sophisticated applications, such as micro-LAN and micro-host networked systems, are allowing today's micro user to replace much larger systems--systems built around more extensive service and support offerings. Indeed, current micro user system availability requirements are

nearing the levels reported by small system (minicomputer) users as recently as 1983.

- To effectively meet these growing service and support requirements, microcomputer service vendors must investigate new ways to increase and improve service coverage while still providing the same high levels of service profitability that helps drive the market. To do this, micro service vendors will need to correctly identify and segment the potential service market and design service offerings that will optimize service coverage for each major market segment, as suggested in Exhibit V-1.

- For example, a manufacturer that markets or plans to market a multi-user system can expect that systems users will want premium turnaround time for service performed on-site. On the other hand, a manufacturer who plans to market a system designed and packaged to satisfy a specific, vertical market application (e.g., a retail POS system built around a microcomputer) can expect that accessibility to support, training, and low service prices would be most important to a user of that system.

- What this points out is the need to analyze carefully which market the product will access--system usage, response and repair time requirements, system location, or acceptable service pricing for users of that system. Exhibit V-2 provides an example of such an analysis for a cross-industry, general business microcomputer application. Note the increasing service requirements expected of microcomputers used in more complex applications.

- Although the current microcomputer market is dominated by standalone, individual productivity applications, with 76% of all business-use systems falling in this category (see Exhibit V-3), growth in micro-host, micro-LAN, and micro-LAN-host applications is inevitable. By 1990, INPUT predicts that 65% of all business microcomputers will be "linked" in some fashion. An additional three million microcomputers will be of the multi-user type, as shown in Exhibit V-4, up an AAGR of 50% from the estimated 400,000 units installed in 1985.

EXHIBIT V-1

STRATEGIC RECOMMENDATIONS FOR SERVICE GROWTH

- Better Segmentation of User Market
- Recognition of Growth Applications
- Flexible Service Contract
- Innovative Service Offerings
- "Fourth-Party" Maintenance Partnerships

EXHIBIT V-2

MICROCOMPUTER SERVICE USER SEGMENTATION

	MAIN SERVICE MODE	ACCEPTABLE SERVICE TURNAROUND	MAIN SERVICE CONCERN
Individual/Small Business	Carry-In	1-3 Days	Local Support, Training, Cost
Corporate - Non Linked	On-Site	4-8 Hours	Contract Coverage, Discounts
Corporate - Networked	On-Site	Less than 4 Hours	Total Support Needs, Similar to Host

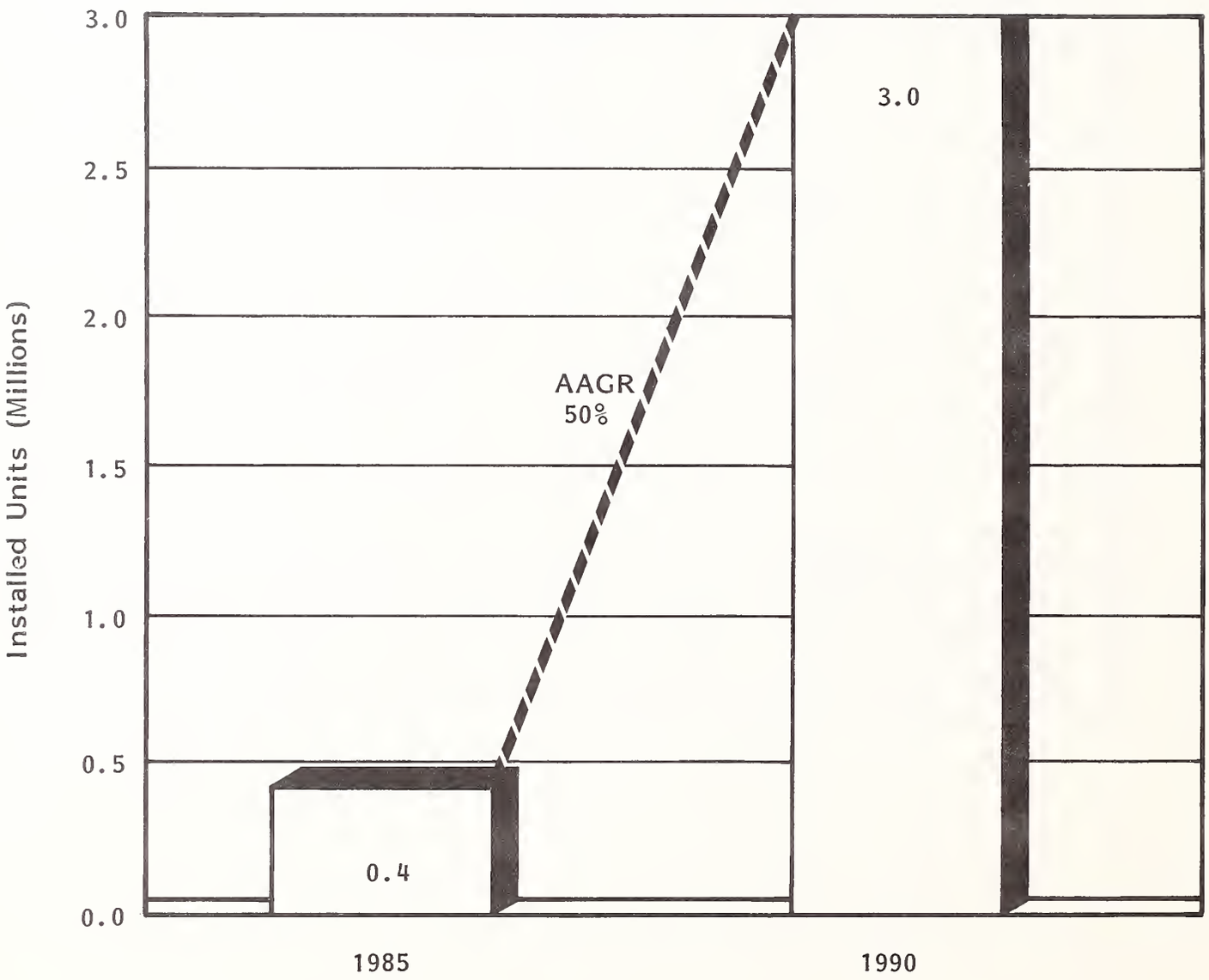
EXHIBIT V-3

GROWTH IN NETWORKED SYSTEMS

MICRO-COMPUTER APPLICATION	PERCENT OF TOTAL INSTALLED BASE	
	1985	1990
Standalone	76%	45%
Micro-LAN	2	9
Micro-LAN-Host	5	15
Micro-Host	17	31
Total	100%	100%

EXHIBIT V-4

MULTI-USER MICRO GROWTH*
1985-1990



*Business-use Microcomputers Only

- This growth will undoubtedly attract intense competition from manufacturers and third-party maintenance firms, with manufacturers having the advantage of selling the equipment to corporate users. Users will require on-site support, with response and repair times of under four hours. Most importantly, users will require total system support, with emphasis on pre-sale services, such as system design (site, environmental, and installation planning), post-sales consulting, and both pre- and post-sale end-user training.

B. INCREASED USE OF FLEXIBLE CONTRACTS

- Even though attitudes and perceptions toward the value of microcomputer service are changing, microcomputer service vendors will still face the inevitable problem of how to expand service coverage in an increasingly competitive market. As with any other product service area, vendors are faced with the dilemma of increased pressure from users for lower prices combined with rising service and support expectations.

- One way to satisfy both of these problems is to "unbundle" the service offering or to separate the service offering into clearly defined (and priced) service products. Rather than presenting service as an all-encompassing, expensive offering, the service vendor presents a list of individual maintenance and support services, allowing the user to pick and choose the services desired.

- Although there are increased costs built into a service plan such as this, especially in sales and invoicing, this practice encourages users to create a service offering that fits their particular needs. Moreover, since each service performed carries with it a specified charge, each service develops a tangible service value. In addition, the lower individual service prices will introduce a large number of new users to service, expanding the revenue potential avail-

able. Many vendors have already successfully created this "unbundled" service environment in larger systems, most notably IBM.

- Another innovative strategy for marketing service is the "repackaging" of low-cost service products that, when combined, provide comprehensive service coverage. An excellent example of such a service strategy is Texas Instruments' ProPak service coverage, which offers inexpensive telephone support with a discounted carry-in maintenance coverage. The combination of these two service offerings provides the user with a comprehensive software (telephone support) and hardware (depot maintenance) support plan and provides the vendor with a larger potential for contract service customers.

- A second example of a "repackaged" service policy is Control Data Corporation's Back Up program, which combines contract coverage (at 25% of the normal price) with per-incident repair charges. Again, the user gets the "warm, fuzzy feeling" of a service contract, with contract customer status, at a much reduced rate (of course, the user also gambles that whatever repairs are necessary will not add up to over the normal maintenance charge). The vendor also benefits since the potential base of the service contract customer is greatly expanded. And if any repairs are needed, the majority of service costs are then covered by the per-incident charges.

- Exhibit V-5 summarizes the benefits of flexible contract usage.

C. INCREASED RELIANCE ON "FOURTH-PARTY" MAINTENANCE

- One niche within the third-party maintenance market that is growing quickly is that of the independent repair depot segment, commonly referred to as the "fourth-party" maintenance market. These small service vendors usually provide complex board and component level repairs in clean room environments (due to the danger of dust contamination in certain board and disk drive

EXHIBIT V-5

FLEXIBLE CONTRACTS

- A Result of Proper Marketing - Segmentation
- Quantity Discounts
  - Centralized Contract
  - Increase User Participation
- Combining Service Options
  - Contract + Fixed Price
  - Depot + Phone Support

repairs). By and large, the majority of these firms support manufacturers, dealers, and other service vendors, rather than end users, hence the name "fourth party."

- Manufacturers frequently are faced with a dilemma concerning subassembly repair. In the past, most repairs were made on-site by the field engineer. Presently, most repairs on-site are performed as component or board exchanges, with the failed part(s) sent back to the manufacturer for refurbishment. Since the manufacturing cycle is more profitable during new product manufacturing, new product manufacture always received higher priority. As a result, refurbished parts may have turnaround times approaching six months.

- Instead, some manufacturers developed their own captive subassembly repair facilities, assuring much shorter turnaround times for refurbished parts and lower overall costs, considering that any interruption in the new product manufacturing drew away from company revenues. However, the extremely high costs of setting up an extensive subassembly repair facility (essentially doubling the manufacturing operations) proved to be prohibitive to smaller manufacturers and almost all other service vendors, creating a void in timely subassembly repair.

- "Fourth-party" maintenance companies have quickly responded to fill this void. A number of these firms (e.g., Unitrace, CPX, etc.) are experiencing growth rates in excess of 20%. Not coincidentally, a number of these firms are prime acquisition candidates (Unitrace was recently purchased by Dynaelectron). Even manufacturers, such as Texas Instruments, are opening their own manufacturing facilities to others in order to exploit this market.

- These firms offer many benefits to all types of service vendors. Small to medium sized manufacturers can receive faster turnaround and lower cost test, repair, and refurbishment services from these independents without causing a costly interruption in their manufacturing cycle. Third-party

maintenance vendors can benefit from these firms as a source of remanufactured and certified parts for products that are no longer being manufactured. And retailers can benefit from the quicker turnaround that these firms offer, especially on disk drive maintenance.

- Furthermore, increased reliance on "fourth-party" maintenance firms aids all types of service vendors in one crucial area of service--parts management. Service vendors not only can rely on these refurbishment specialists to provide certified parts that are difficult, if not impossible, to get, but these depot centers also free the service vendor from the necessity of storing a large number of hard to get or otherwise costly parts, since the service vendor can rely on quick turnaround on refurbished parts. An additional benefit is a reduced dead-on-arrival (DOA) rate, since the refurbished part, once tested, repaired, and certified, has already gone through the critical burn-in period where most part failures occur.

- Therefore, all microcomputer service providers can benefit from increased use of "fourth-party" maintenance services, as summarized in Exhibit V-6.

EXHIBIT V-6

"FOURTH-PARTY" MAINTENANCE

- Usually Board and Component Level Repair
- Provides Faster Turnaround, Frees Manufacturing
- Improves Level of Repair for Dealers
- Reduces Overall Costs of Repairs, Inventory
- Examples - CPX, Unitrace, Texas Instruments

APPENDIX A: DEFINITIONS

- APPLICATIONS SOFTWARE - Software that performs processing to service user functions.

- CONSULTING - Includes analysis of user requirements and the development of a specific action plan to meet user service and support needs.

- DISPATCHING - The process of allocating service resources to solve a support-related problem.

- DOCUMENTATION - All manuals, newsletters, and text designed to serve as reference material for the ongoing operation or repair of hardware or software.

- END USER - May buy a system from the hardware supplier(s) and do own programming, interfacing, and installation. Alternatively, may buy a turnkey system from a systems house or hardware integrator.

- ENGINEERING CHANGE NOTICE (ECN) - Product changes to improve the product after it has been released to production.

- ENGINEERING CHANGE ORDER (ECO) - The follow-up to an ECN which includes parts and a bill of material to effect the change in hardware.

- ESCALATION - The process of increasing the level of support when and if the field engineer cannot correct a hardware or software problem within a prescribed amount of time, usually two to four hours for hardware.

- FIELD ENGINEER (FE) - For the purpose of this study, field engineer, customer engineer, serviceperson, and maintenance person were used interchangeably and refer to the individual who responds to a user's service call to repair a device or system.

- HARDWARE INTEGRATOR - Develops system interface electronics and controllers for the CPU, sensors, peripherals and all other ancillary hardware components. He may also develop control system software in addition to installing the entire system at the end user site.

- LARGE SYSTEM - Refers to traditional mainframes including at the low end IBM 4300-like machines and at the high end IBM 308X-like machines. Large systems have a maximum word length of 32 bits and a standard configuration price of $350,000 and higher.

- MEAN TIME BETWEEN FAILURES (MTBF) - The elapsed time between hardware failures on a device or a system.

- MEAN TIME TO REPAIR - The elapsed time from the arrival of the field engineer on the user's site until the device is repaired and returned to the user for his utilization.

- MEAN TIME TO RESPOND - The elapsed time between the user placement of a service call and the arrival at the user's location of a field engineer.

- MICROCOMPUTER - A microprocessor-based single- or multi-user computer system typically priced less than $15,000. A typical configuration includes an 8- or 16-bit CPU, monitor, keyboard, two floppy disk drives, and all required cards and cables.

- MINICOMPUTER - See Small System.

- OPERATING SYSTEM SOFTWARE (SYSTEMS SOFTWARE) - Software that enables the computer system to perform basic functions. Systems software, for the purposes of this report, does not include utilities or program development tools.

- PERIPHERALS - Includes all input, output, and storage devices, other than main memory, which are locally connected to the main processor and are not generally included in other categories, such as terminals.

- PLANNING - Includes the development of procedures, distribution, organization, and configuration of support services. For example, capacity planning, "installation" planning.

- PLUG-COMPATIBLE MAINFRAME (PCM) - Mainframe computers that are compatible with and can execute programs on an equivalent IBM mainframe. The two major PCM vendors at this time are Amdahl and National Advanced Systems.

- SMALL BUSINESS COMPUTER - For the purpose of this study, a system which is built around a Central Processing Unit (CPU) that has the ability to utilize at least 20M bytes of disk capacity, provides multiple CRT workstations, and offers business-oriented systems software support.

- SMALL SYSTEM - Refers to traditional minicomputer and superminicomputer systems ranging from a small multi-user, 16-bit system at the low end to sophisticated 32-bit machine at the high end.

- SOFTWARE ENGINEER (SE) - The individual that responds (either on-site or via remote support) to a user's service call to repair or patch operating system and/or applications software.

- SOFTWARE PRODUCTS - Systems and applications packages, which are sold to computer users by equipment manufacturers, independent vendors, and others. Also included are fees for work performed by the vendor to implement a package at the user's site.

- SUPERMINICOMPUTER - See Small System.

- SYSTEM INTERRUPTION - Any system downtime requiring an Initial Program Load (IPL).

- SYSTEMS HOUSE - Integrates hardware and software into a total turnkey system to satisfy the data processing requirements of the end user. May also develop system software products for license to end users.

- THIRD-PARTY MAINTENANCE - Any service provider other than the original equipment vendor.

- TRAINING - All audio, visual, and computer based documentation, materials, and live instruction designed to educate users and support personnel in the ongoing operation or repair of hardware and software.

- TURNKEY SYSTEM - Composed of hardware and software integrated into a total system designed to fulfill the processing requirements of a single application completely.

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