SERVICE MARKET ANALYSIS AND FORECASTS

THIRD-PARTY MAINTENANCE SERVICE

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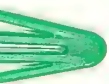Box 22232
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SERVICE MARKET ANALYSIS
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SERVICE MARKET ANALYSIS AND FORECASTS
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ABSTRACT

Third-party maintenance of computer and telecommunications equipment is currently a $1.3 billion market and is expected to increase to $3 billion by 1990. This report analyzes the trends in the TPM market and identifies major opportunity areas for current and potential participants.

The report is divided into five major sections in addition to the introduction and executive summary. They are:

-   Market analysis and forecast which includes revenue projections for the 1985 to 1990 forecast period arranged by the TPM market. Both traditional TPM services and non-traditional services (e.g., fourth-party maintenance) are included in this chapter.
-   Market segmentation which is analyzed for the mainframe, mini, peripheral and terminal, PC, and telecommunication markets.
-   Supporting product manufacturers which describes the increase in TPM/manufacturer alliances in order to better meet customer service needs.
-   Vendor competitive analysis which focuses on growth patterns of the major TPM vendors between 1985-1990.
-   Summary and recommendations which includes both tactical and strategic recommendations to assist the client in adapting to industry trends.

This report contains 120 pages, including 42 exhibits.

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SERVICE MARKET ANALYSIS AND FORECASTS
THIRD-PARTY MAINTENANCE SERVICE

CONTENTS

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SERVICE MARKET ANALYSIS AND FORECASTS
THIRD-PARTY MAINTENANCE SERVICE

EXHIBITS

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I INTRODUCTION

I INTRODUCTION

A. FOREWARD

- This report, <u>Service Market Analysis and Forecasts--Third-Party Maintenance</u>, is the last report in INPUT's TPM module of the 1985 Customer Service Program (CSP). Interest in the TPM market continues to grow, spreading to the information services vendor community following the entry of the hardware and system manufacturers.

- As the number of vendors entering the market has grown, so has the nature of the user's requirements, the quality and cost of the sources provided, and the size of the market. Even IBM felt compelled to break with a long-standing policy of not supporting other vendors' equipment and entered the fray in 1985.

- The question uppermost in the minds of vendors associated with this market is, as always, "Where to from here?" To provide an accurate blueprint for individual vendor's plans, we must:

  - Size the overall market and identify the principal driving forces and growth areas.

  - Examine market structure and provide a forecast of user expenditures and market evolution.

- 1 -

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- Segment the market into clear sectors and measure the market shares of the principal vendors in each field.

- Identify the changing needs of users and recommend a strategy for competing successfully in the TPM market.

- This is substantially the outline of the report with the exception of one fundamental chapter on marketing TPM which INPUT believes is the area where the successful vendors of tomorrow will prove their strength.

- INPUT has employed its best efforts to be as accurate as feasible in the description of vendors, services offered, growth, revenue size, and market shares. Readers should be aware, however, that INPUT is largely dependent on the truthful response of vendors to the telephone and face-to-face interviews that are the basis for this report.

B. STUDY METHODOLOGY

- Three sets of research data form the basis of this report:

    - In-depth analysis of the top 100 TPM vendors in the U.S. (which, as a group, control 85% of all TPM revenues in that market).

    - Telephone interviews with 219 end users of TPM services for each of the major equipment categories covered in the report (mainframes, small systems/minis, micros, telecommunications, and peripherals).

    - INPUT's comprehensive library of customer service studies, which this year covered more than 60 vendors and 1,200 users, and all of the prior years' studies relevant to this research topic.

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- Client inquiries may be made about the data by calling INPUT's "hotline" at (415) 960-3990. An alphabetical list of the top 100 TPM vendors is provided in Appendix A.

C.   USERS OF THIS INFORMATION

- This research provides factual data to a wide range of executives for a variety of decisions, including:

  - Customer Services Organizations.

    - Vice President of Operations—for setting strategic directions, allocating resources, and determining viability of new markets.

    - Field Service Managers—for identifying practical methodologies for dealing with engineer productivity, response time, and personnel issues.

    - Marketing Managers—for establishing the most profitable market focus, pricing, and service packaging approaches.

  - Computer Equipment Companies.

    - Vice President of Marketing—for evaluating and selecting private label vendors and establishing a basis for contracting out services.

    - Managers of large information systems departments—for evaluating the viability of using TPM and selecting qualified vendors for consideration.

- 3 -

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- Third-Party Maintenance Companies.

  . Presidents and their staff—for a total picture of the competitive environment, market opportunities, and user requirements for TPM services enabling them to develop and implement strategic and operational plans.

D. DEFINITION OF THIRD-PARTY MAINTENANCE

- TPM is defined as the provision of maintenance and support services for other manufacturers' products. These services do not have to be provided to the end user, but may support distributors, manufacturers, or other TPMs.

- The development of the TPM market has been dramatic in the last two years in the type of service provided, the type of vendor supplying service, and the products serviced. Exhibit I-I summarizes the trends and forecasts the expected changes to 1990.

  - So far, the principal actors in the TPM market have been the independent vendors, but in the last two years, all of the system manufacturers have moved (slowly but surely) into the market.

  - Information services vendors are also moving into the market (turnkey systems vendors having to support mixed vendor hardware, and software products vendors having to consider supporting mixed vendor software systems).

  - Telecommunications vendors in general and the Regional Bell Operating Companies (RBOCs) in particular are readily making inroads into the market.

- 4 -

EXHIBIT I-1

EVOLUTION OF TPM SERVICE MARKET

CURRENT				
	TPM SERVICE COVERAGE			
VENDOR TYPE	Hardware Maintenance	Hardware Support	Software Maintenance Support	Product Level and Mfg. Support
Independents	Late 60s/ Early 70s	Early 70s	Late 80s	Late 80s
System Manufacturers	Mid 80s	Late 80s	Late 80s	1990s
Information Services Vendors	Late 80s	Late 80s	Late 80s	1990s
RBOCs and Telecoms Cos.	Late 80s	Late 80s	1990s	Late 90s
FORECAST				

- 5 -

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- Beyond straight hardware maintenance and the ancillary hardware related support services (installation/deinstallation, system refurbishment, training, education, systems design, consulting) lie two major growth areas that will fund the growth of the TPM market to 1990.

  - Software maintenance and support (predominantly, but not exclusively, systems software related).

  - Product launch and marketing support (which will include assisting a hardware manufacturer in beta-testing a new product, performance feedback, marketing/product launch, and design change modification).

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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.

    - Provide an executive presentation and script that facilitates group communications.

- The key points of the entire report are summarized in Exhibit II-I through II-6. On the left-hand page facing each exhibit is a script explaining the exhibit's contents.

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A. THE THIRD-PARTY MAINTENANCE MARKET, 1985

- In 1985, the total U.S. customer service market was worth $13.95 billion, 85% of which was captured by system manufacturers supporting their own installed base of products. Third-party maintenance vendors provided $1.33 billion or 9.5% of that market (shown in Exhibit II-1).

- User self-maintenance and special purpose systems are the other two components of that market.

  - Self-maintenance of their own systems by large and small corporations provides a cost-effective way of controlling service expenditures, but is not generally applicable to every system in every corporation.

  - Special purpose systems are military, scientific, or other sensitive, classified, or proprietary systems that cannot be serviced under normal service contracts. INPUT estimates the contracts were worth $550 million in 1985.

- Third-party maintenance revenues were unevenly divided in 1985 between the independent TPM vendors (who captured 83% of the total market), system manufacturers (who have begun to supply customer services to other manufacturers' products), and independent depot repair vendors who are generally contracted by hardware manufacturers to perform specialized repair functions on a narrow spectrum of products or modules. The greatest potential for profit is in independent depot repair due to specialized nature of the repair and the total absence of any end-user contact.

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EXHIBIT II-1

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THE THIRD-PARTY MAINTENANCE MARKET, 1985

U.S. CUSTOMER SERVICES MARKET
1985- - $13.95 Billion
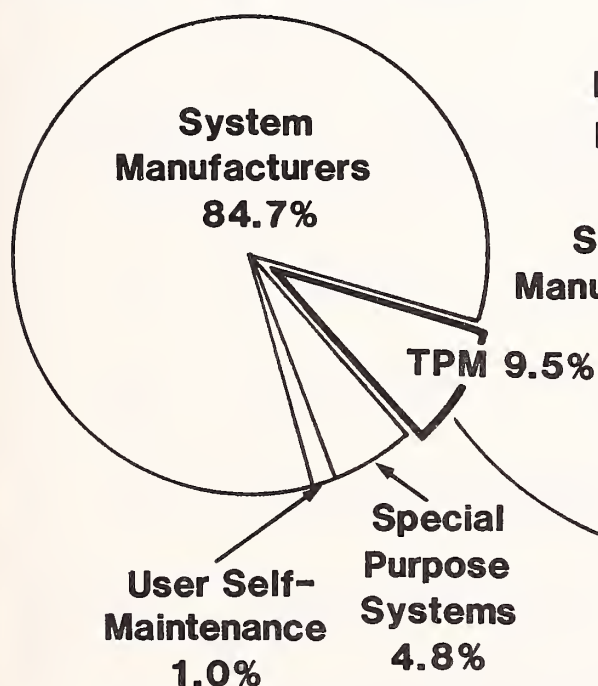
U.S. TPM MARKET
1985- - $1,330 Million

System Manufacturers 84.7%

TPM 9.5%

User Self-Maintenance 1.0%

Special Purpose Systems 4.8%

Independent Depot Repair

System Manufacturers

5%

12%

Independents 83%

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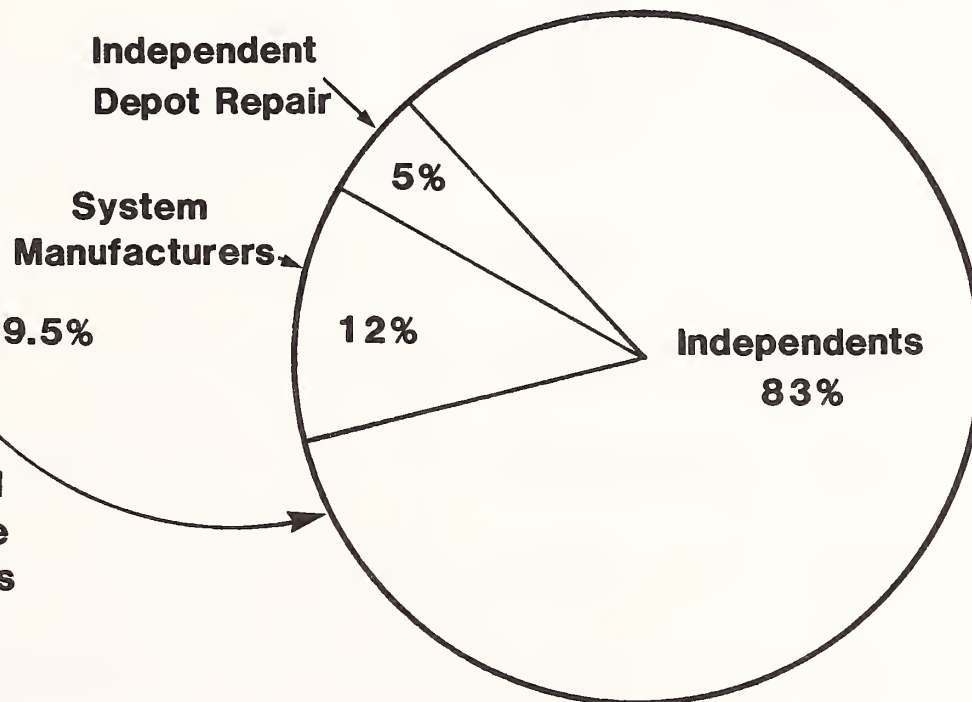
B.   TOP FIVE TPM VENDORS IN 1985

● In 1985, the top five TPM vendors in the U.S. captured over 52% of the market, up from the previous year's 49%. At present growth rates, by 1995 one of the five vendors listed in Exhibit II-2 will top $1 billion for the first time in the industry's history.

● All five of the vendors shown are subsidiaries of large corporations and have access to substantial financial resources to:

- Expand into new markets.

- Increase marketing and sales activities.

- Acquire other TPMs.

- Survive market downturns as they occur.

● Some of the five vendors listed have, nevertheless, serious difficulties.

- Although CDC's TPM business is relatively sound and growing reasonably well, the parent company is not. It is possible that CDC (corporate) would consider selling the TPM division.

- RCA Services' foray into the micro TPM arena was, like that of many other vendors, unprofitable; some of the product lines it services are not growing (with the exception of satellite telecoms) and there does not appear to be a coordinated marketing thrust.

- General Electric (GEISCO) recently restructured and relocated its TPM services. It also is lacking a clear marketing thrust and services a very varied group of products.

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EXHIBIT II-2

TOP FIVE TPM VENDORS IN 1985

RANK	TPM VENDOR	1985 TPM Revenues ($Millions)	Market Share (Percent)
1	TRW	$232	17.4%
2	Sorbus	202	15.2
3	Control Data	110	8.3
4	RCA	86	6.5
5	General Electric	68	5.1

C.   TPM SELECTION

- Over the last 12 months, there has been a rapid evolution in user requirements when selecting a TPM vendor, as evidenced in Exhibit II-3.

    - In the early stages of the TPM market, the ability to support mixed vendor hardware was foremost in the user's mind. Now that this is available from more and more TPMs, it has diminished in importance (i.e., it is expected and taken for granted).

    - Price was not of overriding importance in the eyes of users early on; however, TPM vendors made it their most important selling point. Now, in a twist of fate, the vendors can only blame themselves for the end user has accepted the prompting and price is the second most important criterion for users.

- The most important factor today (and one that is as much the result of the growing maturity as of earlier user experiences with unstable vendors) is vendor reputation. The user is looking for staying power, quality of service, and peformance backed by references from existing users.   This is the dominant factor that will shift the market away from the independent TPM (relatively few of which have a strong image) and toward the system manufacturers who can leverage their service reputation from their own installed base.

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EXHIBIT II-3

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TPM SELECTION CRITERIA

RANK			IMPORTANCE IN SELECTING TPM						
1985	1984	CRITERIA	1	6	7	8	9	10	
1	3	Vendor Reputation				7.8			
2	5	Price			7.2				
3	4	Response Time			7.2				
4	1	Mixed Vendor		6.8					

Scale: 1 = Low, 10 = High

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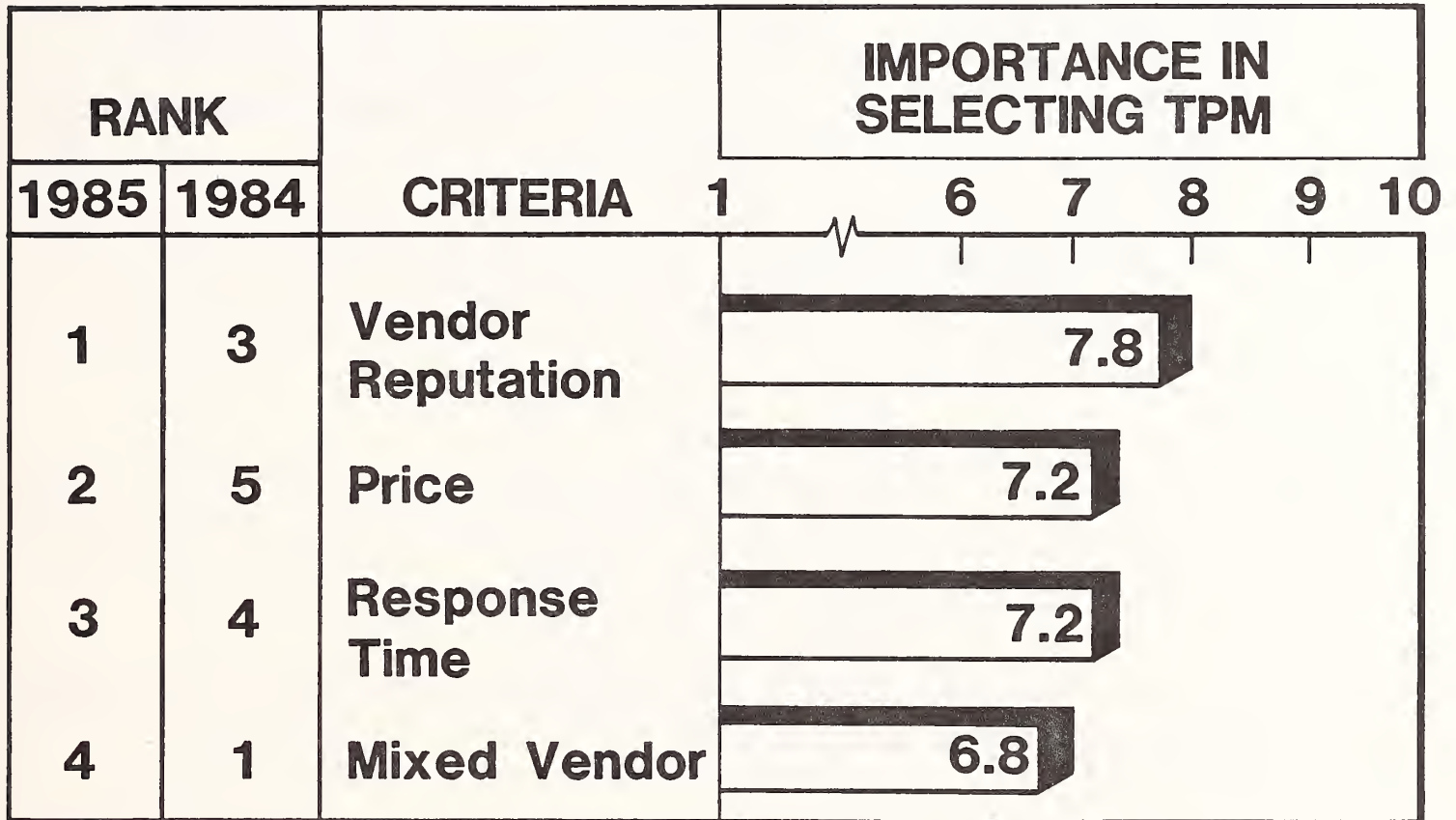
D.   MANUFACTURERS' ENTRY INTO TPM

- In 1984, a number of system manufacturers made their entry into the TPM market with varying success. DEC made a half-hearted attempt, NCR made a determined thrust, and Sperry, Data General, and even IBM began putting a toe in the water quietly.

- The most surprising of these was IBM, which INPUT did not expect would depart from its established policy of not supporting other vendors' products. Now that it has taken this unusual step, the vital question is how far will it go? Theoretically, IBM could capture just as much of the total TPM market as it does of other markets (traditionally above 50%), but this is highly unlikely for one very good reason: in IBM's terms, 50% of a billion dollars is not much of a target. Furthermore, IBM would not like to be in the position of supporting products that it doesn't produce and sell.

- As a group, however, the manufacturers are expected to make the largest inroads into the TPM market of any single group, largely at the expense of two other vendor groups.

    - Independent TPMs (who will lose market share steadily as the manufacturers take accounts back).

    - Depot repair TPMs (who will experience the same phenomenon).

- Most system manufacturers will concentrate their TPM efforts on defending their own installed base (by servicing other vendors' peripheral equipment attached to their own systems). However, INPUT expects a few system manufacturers to adopt the more aggressive approach of treating the TPM market like any other market--open to competition.

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EXHIBIT II-4

MANUFACTURERS' ENTRY INTO TPM

MARKET SHARE 1985 (Percent)	SUPPLIER	MARKET SHARE 1990 (Percent)
82%	Independent TPM	65%
12%	Equipment Mfr.	29%
5%	Depot Repair	5%
1%	Other	1%
$1,330 Million	Market Size	$2,988 Million

E.   KEYS TO SUCCESS: SERVICE QUALITY, FLEXIBILITY, AND MARKETING

- In addition to the recommendations made in INPUT's 1984 TPM market study that vendors be selective in the markets and products they chose to service, it is apparent that as the market moves into the second phase of its development, marketing strength will play a fundamental role in the growth of all TPM vendors.

- Quality service will, of course, continue to be the backbone of vendor reputation development and image building, but the TPM market has begun to move away from word-of-mouth referrals as it becomes more complex.

- One very successful approach that can be developed into a full-blown market strategy toward equipment manufacturers is to offer a New Product Launch service consisting of:

    - Quality, serviceability, reliability analysis.

    - Early evaluation of customer satisfaction and suggestions on diagnostic tools and maintenance reduction steps.

    - Flexible service agreements tailored to opportunity, product mix, and business volume.

    - Account assignment to a dedicated service team (that acts as the anchor for vendor-to-TPM exchanges).

- In any event, service marketing and service packaging capabilities as they apply to TPM will determine the long-term growth of TPM vendors in the late 1980s.

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EXHIBIT II-5

KEYS TO SUCCESS: SERVICE QUALITY, FLEXIBILITY, AND MARKETING

TPM

END USER

- Quality Service
- Reasonable Price
- Flexible Agreements

PRODUCT MANUFACTURER

- RAS (Reliablity, Availability, Serviceability) Analysis
- Product Performance Feedback
- Account Management
- Marketing Support

F.   TPM MARKET FORECAST: 1985-1990

● The forecast for the TPM market through 1990 is provided in Exhibit II-6 and highlights the following trends.

- The independent TPM vendor's share of the market will shrink from 82% to 65%, mainly through the failure of many small to medium vendors and a small number of large vendors; the remaining vendors can anticipate growth rates averaging 29%.

- System manufacturers (e.g., NCR, Sperry, Honeywell, etc.) will make the most dramatic gains, averaging 40% growth. The main reason why their growth will not be even higher is that they will constrain themselves by their internal policies concerning the type of products they will and will not support.

● Depot repair vendors will continue to flourish although the total market will remain fairly small. The expectation is that the hardware manufacturers who have provided them with the majority of their business until now will gradually absorb part of the workload back into internal operations.

● Information services vendors, particularly turnkey systems companies and processing services vendors, will continue to increase their involvement in the TPM market. Their potential is huge, but it is expected that few will grasp the opportunity fully, with the majority being convinced that system maintenance lies outside the scope of their capabilities and their obligation to their end users.

- 18 -

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EXHIBIT II-6

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TPM MARKET FORECAST: 1985-1990

VENDOR CATEGORY	($ Millions)		AAGR (Percent)
	1985	1990	
Independents	$1,090	$1,942	12%
Equipment Mfr.	160	865	40
Depot Repair	70	150	17
Information Services	10	31	25
Totals	$1,330	$2,988	18%

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III TPM MARKET ANALYSIS AND FORECAST

III TPM MARKET ANALYSIS AND FORECAST

A. THE TPM MARKET IN 1985

- Many pressures have assailed the TPM vendor in 1985, modifying business conditions, the competitive environment, profitability, and future prospects. To react appropriately, the TPM vendor must clearly identify these trends and carefully consider their impact on his particular operations.

- First, the entry of most of the equipment manufacturers into the TPM market, sometimes in a minor way (e.g., IBM) and sometimes in a major way (e.g., NCR, MDS), has definitely affected the independent TPM market. This move begins a long period of leaner business conditions (tighter margins, heavier competition) for all TPMs.

- Second, very few TPMs have achieved nationwide coverage or a clear market image. They must do so in very short order or face a steady erosion of the existing customer base. This is best achieved by specialization.

    - By product category (e.g., telecommunications service).

    - By product type (e.g., IBM product service).

    - By service category (e.g., fourth-party maintenance).

    - By regional coverage (e.g., greater L.A. region).

- 21 -

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- Lastly, a gradual shift is underway as to what constitutes an acceptable TPM service offering. Two years ago, hardware service to part of the customer's configuration/system was acceptable. This past year, single-source maintenance of mixed vendor hardware had become widespread. Within two years, product manufacturers will demand a broader list of skills from their TPMs, and users will demand the addition of software maintenance to current hardware services.

- As if this was not enough, some of the "bread and butter" TPM markets have come under heavy pressure:

  - Large system users, the highest margin TPM market of them all, indicated to INPUT in the 1985 users survey that they intend to increase their service reliance on the equipment manufacturer and decrease their use of TPMs.

  - Microcomputer users have seen the price of hardware plummet along with the cost of service (due to heavy price competition). They have also seen the departure of many TPM service vendors by either voluntary retraction from the market or bankruptcy. This activity has muddied the water for those service suppliers who remain and made the micro user a very difficult user to do business with.

  - IBM equipment users who formerly were tempted to use TPM services have become the target of IBM's service selling, with pressure applied to reconvert to the IBM fold.

- This has removed a small but growing slice of actual and potential business from the independent TPMs and, as already noted in Exhibit II-6, the independents are expected to grow (excluding acquisitions) at the slowest growth rate of any of the four major categories of TPM service suppliers in the U.S. market during the 1985-1990 period.

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- While a number of new market entrants will continue to arrive, prompted by special opportunities or circumstances, it is clear that already the stakes for being a "viable" TPM (i.e., one with long-term projects) have risen sharply. They will continue to do so through 1990 and beyond, and any TPM (or new market entrant) who is unable to meet the criteria will have serious difficulty in maintaining a viable TPM presence in the U.S. market.

- Exhibit III-I summarizes the "viability" parameters and is intended as a guide/target for TPM planning for the period 1986-1990. Obviously, it is only a partial list of the criteria needed for success, but it includes most of the main ingredients necessary to compete in today's and tomorrow's markets.

- Size in itself is not important, but there is a critical mass below which the overheads for minimum operation cannot be sustained. In 1985, this more than doubled from $2 million to $5 million, based upon the need for:

  - Computerized parts inventory and shipping.

  - Computerized dispatch and fault monitoring/product history.

  - Steadily increasing salaries for qualified engineers.

  - Steadily decreasing net income (typically 6-8%).

- Like many maturing markets, the trend is toward higher volume, lower margins, and the need for continued improvements in individual productivity. By 1990, each engineer must generate $90,000 of revenue.

- The main issue, however, will be in the ability to offer a greater scope of services to the end user and the product manufacturer.

  - To the end user, not only will system-level maintenance services be necessary, but system software support as well.

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EXHIBIT III-1

PARAMETERS FOR LONG-TERM TPM VIABILITY
1985–1990

	1985	1990
Revenues, ($ Millions) Minimum/Year	$ 5	$ 20
Revenues/Engineer ($ Thousands/Year)	55	90
Number of Accounts	160	400
Profitability (Percent of Revenue)	15%	10%
Services Offered:		
– Hardware Maintenance	Product Level	System Level
– Systems Software Support	Optional	Mandatory
– New Product Launch	N/A	Yes
– Product Performance Reporting	Optional	Mandatory
– Service Royalties	N/A	Optional

- 24 -

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- To the product manufacturer, a whole gamut of product support services will be necessary, including the possibility of offering royalty payments on service revenues.

- The driving force behind both of these developments is the same: the ability to distinguish one's self from other suppliers and offer a better service.

- In 1985, these trends were largely ignored by the majority of suppliers, most of whom had short-term concerns to contend with rather than long-term ones. For the majority of the TPMs, survival was uppermost in their concerns, along with margin retention and profitability.

- For the top 20 TPMs, the concerns were many and included:

  - The turnover of many maturing contracts (with a high percentage of them changing hands).

  - The slowdown in new business (with end users deferring decisions as much as possible).

  - The inability to find qualifed personnel (other than by poaching from the competition).

  - The shortage of good quality TPM acquisition targets.

- As a result, it seems likely that most TPMs will miss their 1985 plans by a wide margin. Others have had to refocus their efforts (particularly those who staked their growth on the business microcomputer and who have found this market to be difficult to acquire and nearly impossible to make money in).

- 25 -

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B.   FOURTH-PARTY MAINTENANCE/DEPOT REPAIR

- One of the more profitable but highly specialized maintenance areas that has developed rapidly over the last three years is so-called fourth-party maintenance or depot repair. This concerns the provision of specialized services to maintenance organizations such as printed circuit board testing and clean-facility testing of Winchester drives.

- The key to growth in this area is to corner the market for the targeted specialized service because nearly all of the vertical market opportunities are relatively small. After gaining a foothold in the market, the only path to continued success is to make an exhaustive list of the potential clients and contracts available and press for the business.

- In many of the vertical market opportunities, competition is limited to a handful of players, but is nevertheless fierce. Once established in the field, however, the goal must be to drive the competition out of the business altogether.

- Profitability is usually assumed by the very nature of the business. For example, it is not uncommon for 60% of the printed circuit boards tested to pass screening tests which take very little time. Pricing is often on a per-board basis which allows some healthy margins.

- Most of the independents in this business (who accounted for over one-half of the revenue in 1985) are small, undercapitalized concerns with under 50 contracts. A small number of much larger TPMs account for the remaining revenue, but have not made the fourth-party maintenance market a major target. As a result of these two factors, the market goes largely untapped and growth has been unspectacular.

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- Exhibit III-2 shows the characteristics of the fourth-party maintenance vendor in 1985 projected to 1990.

- One of the options open to the larger TPMs is to ally themselves with companies supplying maintenance services in non-computer areas, offering them the use of in-place logistics and parts/handling capabilities. The object is to make these activities revenue generators without affecting the competition within their own markets.

- There are a multiplicity of non-computer maintenance services which could benefit from the computerized logistics and parts handling services of the larger TPMs. These include electromechanical products of all types (e.g., medical equipment, automotive parts, etc.) electronic products, and plain mechanical products (e.g., airport ground-handling equipment, construction equipment, etc.).

- In some instances, it may be possible to offer such services to other TPMs who are not competitors in the company's own markets. Examples would be a minicomputer maintenance TPM offering services to an office products dealer/distributor chain. Such links must be carefully watched by both parties, however, since both vendors have the opportunity to learn a great deal about each other's client base and mode of generation, not to mention the reliability and general performance of the product base. All of this data would be invaluable to a company contemplating entering a new market.

- The bottom line for offering such services is to lay part of the overhead burden off onto other companies by increasing the volume of calls/parts handled by the logistics/parts handling system and to reduce costs and increase revenues—both worthwhile goals.

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EXHIBIT III-2

FOURTH-PARTY MAINTENANCE MARKET CHARACTERISTICS

	1985	1990	GROWTH
Revenue ($ Millions)	$70	$ 220	26%
Percent Growth in Year	24%	25%	N/A
Average Vendor Revenue ($ Millions)	$1.75	$9	Fivefold
Number of Vendors	40	25	<38%>

- 28 -

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C.   THIRD-PARTY SOFTWARE MAINTENANCE

- Third-party software maintenance is a tantalizing subject for many TPMs in that they recognize the market potential, yet are unaware of how to exploit it. The potential is enormous. A typical system is now comprised of 60% software and 40% hardware at time of purchase. As the system ages, these percentages move to an 80/20 ratio in terms of end-user expenditure.

- On the maintenance revenue side, the disparity is maintained. Typically, hardware maintenance charges average less than 12% of the purchase price of the installed equipment per year. Software maintenance, however, already averages 15% and is steadily moving higher.

- The compounding of these two factors means that the potential for software maintenance revenues is five times greater than hardware maintenance revenues. However, at present, the average maintenance organization obtains five times as much hardware maintenance revenue as it does software maintenance revenue--the exact reverse.

- Recognizing the potential of the market and exploiting that potential are two very different things, however. To begin with, large amounts of installed software are composed of customized applications which end users generally maintain. This is not a TPM target except for very large, very time-sensitive applications for which the systems design knowledge resides in a small number of individuals (in which case the potential for a takeover exists). An example would be airline reservation systems.

- Secondly, most of the PC software sold today is impossible to maintain. The cost of supporting it far outweighs the revenue obtained from selling it. Software such as this is generally supported by self-help documentation or small, 800-number, tele-support groups.

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- Considerations such as these do severely limit the potential market. Does this mean that third-party software maintenance is not a target? The answer is a qualifed no, as the following sections will show.

D.   USER NEED FOR THIRD-PARTY SYSTEM SUPPORT

- In the early stages of the TPM market, most vendors offered limited services that covered only part of a user's on-site hardware (most frequently the terminals and peripherals). As the market developed, service offerings expanded to cover more and more of the user's system hardware, and today it is common for major TPM vendors to be able to cover all of a user's on-site hardware.

- In the early 1980s, the larger TPMs began offering limited systems software support, if only to be able to distinguish between a hardware failure and a software problem. Nevertheless, it is generally the case that software support is not available from the TPM servicing the hardware.

- Users, meanwhile, have a need for a single source of maintenance and support, so the problem is, how can this be achieved if the knowledge and skills necessary for software support are not available to the average TPM?

- One possible solution is for TPMs to establish a "service and support coordinator" for each end user whose task it is to monitor all hardware and software maintenance and support needs and to be responsible for getting them resolved, whether directly via the TPM's own resources or indirectly through the manufacturer or software product vendor.

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- The objectives are many:

    - Resolve a real user need (having to deal with multiple maintenance and support supplies which leads to conflict and poor response time).

    - Control the user account (a prime strategic goal for account revenue growth and renewal).

    - Reduce competition from the manufacturer and other TPMs.

    - Open up new growth market areas compatible with the TPM hardware service base.

- The last point is a key consideration for many TPMs as we enter the last half of the decade (particularly for the majors such as TRW and Sorbus). Growth to date for those vendors has been swift and steady, but in 1985, the market became a tougher place to earn substantial profits as users became more cautious in their DP expansion plans. The PC market paused in its growth, and competition (in the shape of the manufacturer) became stronger.

- To be able to continue their growth through 1990, these companies and other TPMs like them must exploit new markets that have substantial potenital while maintaining a steady growth in the more mature market of hardware maintenance and support.

- Exhibit III-3 lists the open "soft" services market compared to the "hard" services currently offered by most TPMs. By 1990, INPUT expects a quarter of all TPM service revenue to come from the soft services area.

- 31 -

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EXHIBIT III-3

THIRD-PARTY SERVICE MARKETS, 1985-1990

HARDWARE MAINTENANCE SERVICE MARKETS	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
Mainframes	$ 170	$ 177	$ 184	$ 191	$ 199	$ 208	4%
Minicomputers	200	232	267	307	353	402	15
Peripherals	250	275	303	333	366	399	10
Terminals	140	172	212	258	313	378	22
PCs	390	472	571	685	815	970	20
Telecomms	130	172	227	297	389	509	31
Other	50	60	72	86	103	121	19
Subtotal	$1,330	$1,560	$1,836	$2,157	$2,538	$2,987	18%
Product Refurbishment							
Subtotal	$ 25	$ 30	$ 36	$ 43	$ 52	$ 62	20%
Fourth-Party Maintenance							
Subtotal	$ 70	$ 88	$ 111	$ 140	$ 176	$ 220	26%
Hardware Services							
Total	$1,425	$1,678	$1,983	$2,340	$2,766	$3,269	18%

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E.   "HARD" SERVICES MARKETS

- For discussion purposes, we have divided the current and potential markets into two categories:

    - "Hard" services or maintenance services that are established markets concerned with products. Fourth-party maintenance has been included in hard services because the dominant activity is hardware repairs. As discussed earlier, it is important to emphasize the sale of logistics and parts handling capabilities as well in the coming years.

    - "Soft" services or support services that support hardware and software maintenance in the field.

- While hard services represent nearly 78% of the revenues obtained by TPMs in 1985 and will continue to be the dominant source of revenue for the next five years, it is important to note that the future lies with soft services. For the moment, most TPMs are rooted in hard services, both in terms of management orientation and in service capability.

- Hardware diagnosis and maintenance is, and will remain, the largest single market over the five-year forecast period. In 1985, the market was worth $1.33 billion out of a total TPM hard services market of $1.425 billion (see Exhibit III-3). The PC third-party maintenance market grew 28% in 1985 and became, as a result, the single largest TPM market. This will continue to be the case for the forecast period, with PC TPM revenues rising to over $1 billion by 1990.

- The fastest growing hard services market is that of telecommunications, which will triple in size in just five years to $450 million. In the process, it will become the second largest hard services market after PCs, bypassing minicomputer TPM. It is also a high profit margin market and one that has high strategic potential.

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- Another rapidly expanding market is that of fourth-party maintenance, which will grow at an average annual growth rate of 26% over the next five years. This market is equivalent to the provision of wholesale services to manufacturers, OEMs, dealers, and distributors and has excellent profit potential, if limited strategic value.

- The slowest growth area is that of mainframe TPM, which is by definition a narrow, niche market for a small number of vendors. Marketing needs to be done on a direct-sales-only basis and individual contract sales costs are high. However, the potential for profit is very high even if growth is difficult to achieve (because of the lack of adequately trained personnel willing to work in the customer locations). Attracting skilled staff to young (frequently undercapitalized) TPM companies is also a problem.

- The peripherals and terminals TPM market will continue to provide substantial revenue to established vendors, but the profit margin from these activities is likely to erode steadily. It is therefore very important to maximize cost savings on parts servicing and reduce inventories as much as possible (e.g., by the use of "just-in-time" parts ordering).

- The bulk of 1990 hard services revenues (38%) will come from PC TPM, but this is an area of marginal profitability and widely disparate product lines. This means that only large TPMs, particularly those that can spend their overhead on the TPM activities, have a chance at success in this market. This is another area for ongoing cost containment and productivity programs.

F.   "SOFT" SERVICES MARKETS

- These markets are support services that surround the hard services TPM markets, without which many would have no meaning. Nevertheless, in 1985,

- 34 -

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22% of the total TPM market was provided by these services, most of it from leasing revenues (see Exhibit III-4).

- The highest potential market is software support, erroneously called software maintenance (which can only be performed by the original product manufacturer). Software support and file conversion assistance produced negligible revenue in 1985, but are expected to generate over $120 million by 1990, growing at the fastest rate of any TPM market.

- Just as significant as the growth rate is the fact that most large-account TPM users will be looking to receive their software support from the same source as their hardware support by 1990, and while the revenue produced by software support may not be considerable, the absence of this capability may result in the loss of major hardware support TPM revenue.

- Leasing has always been a high potential revenue market when associated with TPM revenues and will remain the highest volume revenue market in the soft services arena. The profitability of leasing has become problematic recently due to changes in tax write-off legislation, but the potential, though diminished, is still there.

- Consulting, planning, education, and documentation are all small but lucrative markets that develop excellent customer sensitivity skills while producing revenue and profit. They should not be considered as markets by themselves (being so small), but as complementary opportunities to major markets such as software support or hard services markets.

G.   TPM MARKET EVOLUTION

- The TPM market has undergone some rapid changes in the last three years:

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EXHIBIT III-4

THIRD-PARTY SERVICE MARKETS, 1985-1990

"SOFT" SUPPORT SERVICE MARKETS	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Leasing	$350	$389	$431	$479	$531	$590	11%
Software Support/ File Conversion	5	15	35	65	91	127	91
Consulting/Planning	15	19	24	31	36	41	22
Education/Documentation	20	24	30	38	44	50	20
System Installation/ Deinstallation	22	25	29	33	38	44	15
"Soft" Services Total	$412	$472	$549	$646	$740	$852	16%

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- Until 1982, third-party maintenance was considered a "fringe" market, one that was served by a small number of large companies and a large number of small companies that came and went quickly.

- With the PC explosion, many retail outlets were thrust into the maintenance business with little or no training, guidance from the manufacturers, or interest on their own part. The same PC explosion drew a large number of new and established companies into the TPM service market with illusions of rapid fortunes.

- By 1984, it was apparent that servicing PCs could be a costly business and many TPMs , new and seasoned, exited from the market. At the same time, the telecommunications TPM market was rapidly emerging and new opportunities in software and consulting were beginning to show promise. Simultaneously, many manufacturers decided that TPMs could impact profitable service markets by servicing mixed vendor hardware--something they themselves had been reluctant to do until then--and began to formulate TPM market plans.

- By 1985, most manufacturers had partial or complete TPM offerings on the market and were actively seeking OEM contracts as well as end-user contracts. Even IBM began offering limited third-party mainte-nance--an ominous sign for the many TPMs who have invested in IBM PC service.

- As we stand on the brink of the last half of the 1980 decade, several trends appear inevitable.

  - The number of TPM vendors in the market must shrink.

  - The average size of the TPM vendor must grow substantially.

  - The manufacturers' share of the TPM market will increase steadily.

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- Under the pressure of these forces, the successful TPM vendor must:

    - Specialize, choosing markets that relate closely to the core capabilities of the company but that do not represent limited profit or growth potential.

    - Watch the manufacturers carefully. In a head-to-head confrontation, most TPMs will lose and all will be severely impacted. It is better to reach a modus vivendi rather than attempt conflict.

    - Develop, implement, and constantly refine cost containment measures that target profit maximization and margin retention. The TPM market is about to become very competitive, and this will be felt in market share, growth, and margin, with the inexorable result that many vendors will be squeezed out of the market.

    - Choose and promote an image that is consistent with the long-term market role that the company wishes to play. An opportunistic, "all things to all people" approach will no longer suffice.

- The coming five-year period will be a difficult, challenging time for all market participants and the battle lines are being drawn. Already some TPMs (e.g., Sorbus and TRW) have secured enviable financial backing comparable to the support that the average manufacturer will give his TPM division. Smaller TPMs can only survive by carefully selecting narrow market niches that will not be a target for the majors during the next five years. For all, it will be a period of consolidation, competition, and challenge.

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IV MARKET SEGMENTATION

IV   MARKET SEGMENTATION

A.   OVERVIEW

- The TPM market, like most service markets, requires that vendors focus carefully on selected market targets in the light of their own capabilities and long-term goals. This is a continuous process.

    - Each year, at a minimum, every TPM must review the markets that are being serviced, the competition encountered, the growth opportunities within these existing markets, and those found outside current targets.

    - For each market, current or prospective, a critical appraisal of margins, return on investment, and growth capital requirements must also be made and performance reviewed against susceptible financial ratios. In particular, any trends that point to a lessening of margins must be quickly highlighted and appropriate measures taken.

- There is an enormous divergence in user needs, marketing approaches, distribution channels used, and competition encountered in each of the market segments. This is most easily done by product category, so the rest of this chapter will analyze each category separately. Market forecasts for each major sub-category are included, particularly for IBM products or IBM compatibles where relevant.

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- A competitive analysis by major vendor within each of the eight segments analyzed is also included to assist readers with a view of the market in 1985. This is based on INPUT's service vendor profiles (top 100 TPM vendors by revenue size in 1985). In 1985, these top 100 TPMs accounted for 85% of all TPM revenues, and the top 20 accounted for 71%.

B.   MAINFRAME TPM MARKET

- This market includes supercomputers, mainframes, and superminis (e.g., DEC VAX II/780, DG MV8000, etc.) and revenues shown in Exhibit IV-I are system revenues, i.e., they include the TPM revenue accrued from the peripherals, terminals, etc. attached to the processor.

- The largest share of this market is IBM mainframes (73%), and this will continue, mainly due to the vast market that IBM represents rather than the successful penetration of IBM-based TPMs. Indeed, INPUT expects IBM to continue to pressure the TPMs with lower and lower on-site service rates.

- This market size remains the most lucrative on a per-contract bases. Each site can be treated on a project management basis and a careful analysis of the profitability of each contract can be done, something that is almost never done elsewhere.

I.   MARKET ANALYSIS

- The IBM service resellers (e.g., DataServ, CMLC, etc.) continue to flourish, with DataServ topping all TPMs in percentage growth (see Chapter VI, Competitive Analysis). Others like Decision Data have aimed at the medium-sized IBM mainframe with great success.

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EXHIBIT IV-1

MAINFRAME THIRD-PARTY SERVICE MARKETS, 1985-1990

	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
IBM Mainframes	$129	133	137	141	145	150	3%
IBM Compatibles	7	7	8	8	9	9	5
Subtotal	$136	$140	$145	$149	$154	$159	3%
DEC Superminis	$ 14	$ 15	$ 16	$ 17	$ 18	$ 19	6%
DG Superminis	4	5	5	6	7	9	17
Other	16	17	19	19	20	22	7
Total	$170	$177	$185	$191	$199	$209	3%
Product Refurbishment							
Total	$ 3	$ 3	$ 3	$ 4	$ 4	$ 4	4%
Fourth-Party Maintenance							
Total	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	0%
Grand Total	$173	$180	$188	$195	$203	$213	4%

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- The IBM base has, of course, been the prime target for Sorbus (since its inception) and CDC (since CDC's acquisition of COMMA). Both of these companies had strong growth in 1985 and now are the second and third largest TPMs in the U.S.

- Initially, INPUT believed that this market would show either stagnation or decline, but it is now apparent that the sheer magnitude of the market allows even minor penetration to appear as growth. Nevertheless, the mainframe market is a relatively small one compared to other TPM opportunities.

2.   PRINCIPAL COMPONENTS

- Exhibit IV-1 provides INPUT's forecast of the expected growth for each of the main components of the TPM mainframe market to 1990.

  - IBM mainframes will remain the largest market while slowly becoming a smaller share of the overall mainframe TPM market.

  - IBM compatibles (e.g., NAS, Amdahl, and the Japanese mainframes) will grow slowly without achieving any notable size.

  - DEC superminis will continue to provide a meaningful market despite the increased service attention that DEC is finally paying to its own product base.

  - DG superminis are a small but significant market showing good growth.

  - Product refurbishment offers a small but interesting market, without much growth opportunity, however.

- Fourth-party maintenance, as it applies to mainframe TPM, is almost non-existent, nor is it expected to develop.

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3.   SERVICE DELIVERY MODES

● The dominant mode of service is on-site, both resident on-site and on-call. The IBM service resellers revenue is classified as per call, however, since that is how the IBM engineer services the customer.

● The percentage of on-site versus on-call service is expected to remain at 100%.

● Exhibit IV-2 details the coverage distribution of the large system TPM business base.

4.   MAINFRAME TPM MARKET EVOLUTION

● The large system market is a cut-throat business now with constant price cuts and performance increases. To the average end user, the constant evolution of the market is bewildering.

● Adding to the pressure in 1985, the Japanese manufacturers solidified their hold over the upper range of IBM's competitors with NAS, Amdahl, and Honeywell all offering Japanese products at their high end. Competition between the Japanese for their own market is intense and will drive price/performance ratio improvements, but the Japanese obsession with the U.S. computer market (and singular lack of succes so far) will determine that the Japanese will be IBM's competitor in this market for the foreseeable future.

● Nearly all of the large mainframe vendors have begun to offer limited forms of TPM--extending their service offerings to the mix of peripherals, terminals, and data communications products attached to their processors. This further pressures the TPMs whose service offerings are limited to peripherals or terminals or data communications products only.

- 43 -

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EXHIBIT IV-2

TPM BUSINESS BASE - LARGE SYSTEMS

Contract

100%
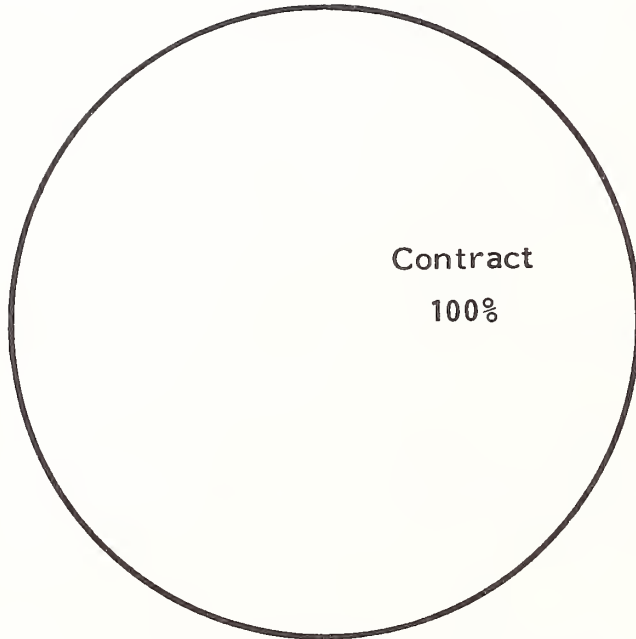
Contract versus T&M

DAYS COVERED	USE (Percent)
Monday–Friday	75%
Monday–Saturday	0
Monday–Sunday	25
HOURS COVERED	USE (Percent)
0 – 9	37%
10 – 16	37
17 – 24	26

On-Site

100%

On-Site versus Depot

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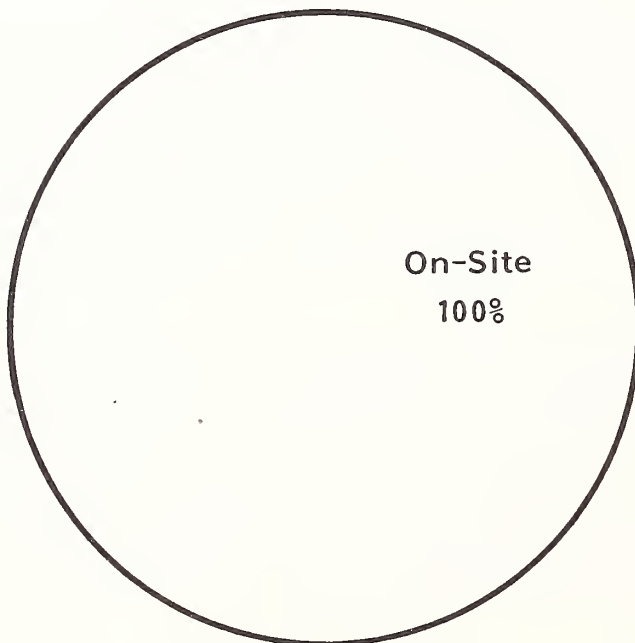
- The mainframe TPM market has for all intents and purposes begun to be a composite of narrow niche markets with limited scope for growth. However, it will provide profitable opportunities to a small number of vendors for years to come.

C.   MINICOMPUTER/SMALL BUSINESS TPM MARKET

- This section refers to classic minicomputers (DEC PDP/11 series, DG Eclipse/NOVA, Prime, Perkin-Elmer, etc.) as well as small business systems (HP 3000 series, NCR 8200 series, Burroughs 90 series, etc.). Also included are the supermicros that compete in this market; e.g., the Altos multi-user systems. Peripherals, terminals, and data communications TPM revenue, when part of a total system of this size, is included also.

1.   MARKET ANALYSIS

- The value-added resellers, distributers, OEMs, and system integrators dominate this market in terms of product distribution and end-user control, yet most have avoided servicing the hardware they sell (although most do service the applications software that is sold as part of the solution).

- This has provided a widely distributed TPM market opportunity that TRW has been the first to pursue.

    - Offering to service, nationwide, the installed base of an OEM/distributor makes good sense to the OEM/distributor.

    - It also makes a lot of sense to the TPM vendor, who often collects an installed base of several thousand end users with one contract and one sales effort.

- 45 -

2.   PRINCIPAL COMPONENTS

● Exhibit IV-3 provides INPUT's forecast of the expected growth for each of the main components of the TPM minicomputer/small business systems market to 1990.

  - DEC minicomputers will easily remain the largest TPM market in this category of systems due to the volume of the shipments that will be made and to DEC's apparent indifference to the service needs of the very varied mix of end-user equipment attached to DEC processors.

  - IBM minicomputers which have been a good TPM market will gradually fade in importance as IBM tightens its hold on the market.

  - A whole variety of minicomputer products from smaller manufacturers will be the growth TPM markets to 1990 in the same way as DEC OEMs have been for many years.

● Product refurbishment is a small but interesting market if combined with other markets--by itself it does not warrant attention.

● Fourth-party maintenance is a strong growth market in this category of systems; a wide variety of systems, components and, in particular, circuit boards offer a good opportunity.

3.   SERVICE DELIVERY MODES

● The dominant mode of service is again on-site service (see Exhibit IV-4). Most of the end users of this level system expect it, and, with the exception of the terminals and small peripherals attached to the system, depot repair is just not feasible.

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EXHIBIT IV-3

MINICOMPUTER THIRD-PARTY SERVICE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
DEC Minis	$103	$121	$139	$159	$183	$211	15%
IBM Minis	35	38	41	44	48	51	8
DG Minis	17	20	24	29	34	40	19
Other	45	54	64	75	88	100	17
Total	$200	$233	$268	$307	$353	$402	15%
Product Refurbishment							
Total	$ 4	$ 5	$ 5	$ 6	$ 8	$ 9	20%
Fourth-Party Maintenance							
Total	$ 11	$ 14	$ 17	$ 22	$ 28	$ 35	26%
Grand Total	$215	$252	$290	$335	$389	$446	16%

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EXHIBIT IV-4

TPM BUSINESS BASE - SMALL SYSTEMS
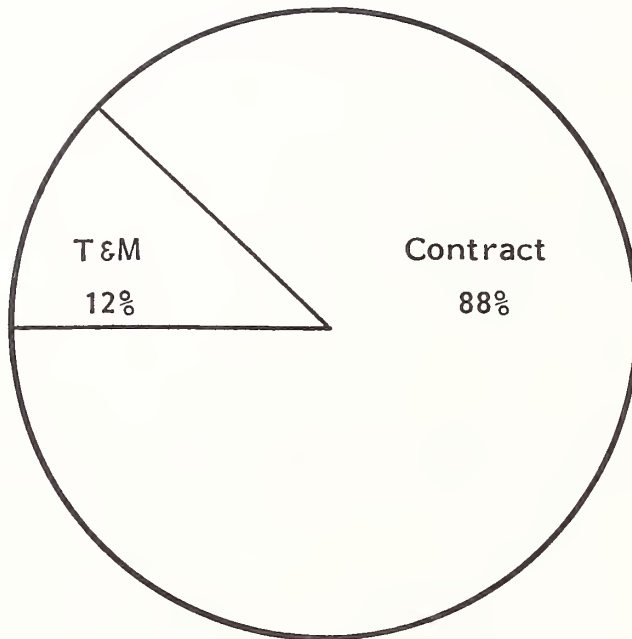
Contract versus T&M

DAYS COVERED	USE (Percent)
Monday–Friday	74%
Monday–Saturday	7
Monday–Sunday	19
HOURS COVERED	USE (Percent)
0 – 9	51%
10 – 16	26
17 – 24	23
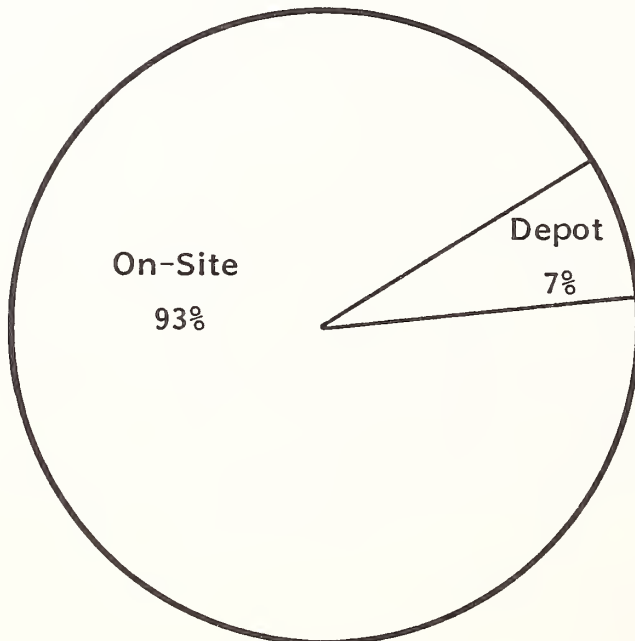
On-Site versus Depot

DEPOT TYPE	USE (Percent)
Carry-In	33%
Mail-In	0
Courier	67

- 48 -

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- Note also that the majority of the contracts are for Monday through Friday with a high percentage of contracts covering over 10 hours a day. More and more, small businesses are operating on extended hours, with a high 23% in the 7- to 24-hour per day category.

- The corollary is that most service business is contract-based, not T&M.

4. MINICOMPUTER/SMALL BUSINESS SYSTEM TPM MARKET EVOLUTION

- This market now looks as if it will be a solid TPM market for the foreseeable future. While many small system manufacturers have made some attempt to extend their service to other manufacturers' products, they have been largely unsuccessful.

- The competition for this business will be intense; however, there are a large number of TPMs for whom this market is the main target.

D. PERIPHERALS AND TERMINALS TPM MARKET

- Previously, there have been no markets that have matched the TPM potential of the peripherals and terminals markets; however, this is no longer the case. The personal computer market has taken over the number one role.

- Terminals have been the single largest market and will continue to be a very strong growth area. The reason for combining peripherals and terminals in one chapter is that the vendors who target one usually service the other also.

1. MARKET ANALYSIS

- The diversity of products and manufacturers in these markets makes them a difficult target, but this is one of the rare markets where manufacturers are often eager to find a quality service supplier.

- The market is also significantly IBM-oriented (and IBM-compatible). Therefore a separate market forecast is provided for these products as well as an overall forecast.

- Overall, the market will experience a 14% average annual growth over the next five years while the IBM-based or IBM-compatible market will grow faster--16% average.

2. PRINCIPAL COMPONENTS

- Exhibit IV-5 shows the expected growth of each of the five main components.

    - Tape drives have come to a standstill in terms of TPM potential and will practically be a static market from 1985 through 1990.

    - Disk drives are a growth market in terms of units, but the manufacturers are keen to retain the associated service dollars. As a result, although the market will grow somewhat, it is also expected to be fairly limited in TPM terms.

    - Floppy disks, on the other hand, are a good opportunity in terms of unit growth. Prices are still falling, however, so that in dollar terms the growth is not as dramatic as it might otherwise be. Generally speaking, vendors are open to contracting the service to third parties.

    - Printers are like floppy disks--good TPM unit growth is expected while unit prices (and service prices) are expected to drop. Again, many manufacturers are open to third-party service contracts.

    - Terminals are the ideal TPM market--good unit growth, fairly stable unit services, and good user and vendor acceptance of TPM service.

- 50 -

EXHIBIT IV-5

PERIPHERALS AND TERMINALS THIRD-PARTY SERVICE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
Tape Drivers	$ 45	$ 47	$ 49	$ 50	$ 51	$ 52	3%
Disk Drives	84	90	97	104	112	120	7
Floppy Disks	51	60	70	81	93	106	16
Printers	70	78	87	98	110	121	12
Terminals	140	172	212	258	313	378	22
Total	$390	$447	$515	$591	$679	$777	15%
Product Refurbishment							
Total	$ 7	$ 9	$ 10	$ 12	$ 15	$ 18	20%
Fourth-Party Maintenance							
Total	$ 21	$ 26	$ 33	$ 42	$ 53	$ 66	25%
Grand Total	$418	$482	$558	$645	$747	$861	16%

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- Each of these forecasts is analyzed again for the IBM-compatible only submarkets in Exhibit IV-6.

- Product refurbishment is once again a small but rapidly growing market, not insignificant to the smaller vendor.

- Fourth-party maintenance is an excellent opportunity at this end of the market with one of the strongest growth rates and meaningful revenue volume.

3. SERVICE DELIVERY MODES

- Contract services predominate peripherals (see Exhibit IV-7), but a significant number of end users make use of T&M contracts. On-site services are the lion's share of the market with most of the service provided during the daylight shift.

- For terminals, the picture is different. Loaner units are a common offering. Depot service is very common since many users can do without a single failed unit for short periods of time.

4. PERIPHERALS/TERMINALS TPM MARKET EVOLUTION

- These two separate markets will become the backbone of many TPMs' business over the next five years as they seek to establish new markets (perhaps in telecommunications or personal computers).

- Again, the competition will steadily increase over the next five years. On the one hand, the manufacturers will attempt to increase their control of the service dollar expenditures of users with their products, and, on the other hand, TPMs will be more aggressive in providing contracts.

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EXHIBIT IV-6

IBM PERIPHERALS THIRD-PARTY SERVICE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
Tape Drives	$ 18	$ 19	$ 19	$ 20	$ 20	$ 21	3%
Disk Drives	46	50	54	58	63	68	8
Floppy Disks	23	27	30	35	40	45	14
Printers	28	31	34	37	39	41	8
Terminals	110	135	166	203	246	295	22
Total	$225	$262	$303	$353	$408	$470	16%
Product Refurbishment							
Total	$ 4	$ 5	$ 6	$ 7	$ 8	$ 10	20%
Fourth-Party Maintenance							
Total	$ 12	$ 15	$ 19	$ 24	$ 30	$ 38	26%
Grand Total	$241	$282	$328	$384	$446	$518	17%

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EXHIBIT IV-7

TPM BUSINESS BASE - PERIPHERALS
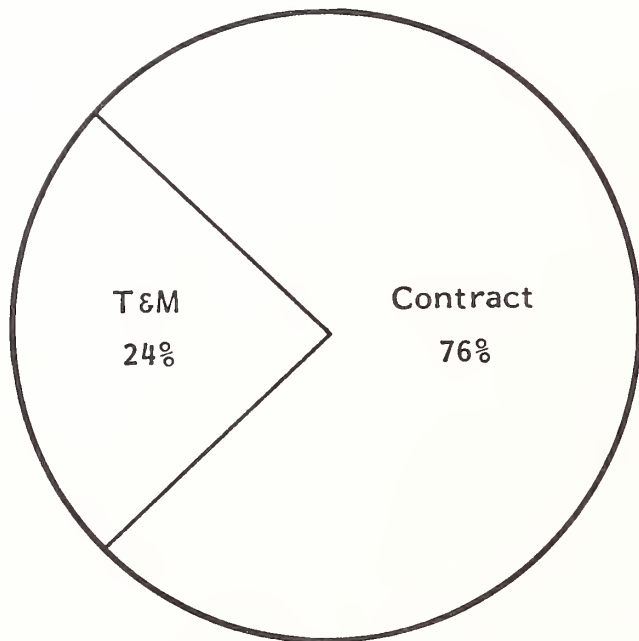
DAYS COVERED	USE (Percent)
Monday-Friday	90%
Monday-Saturday	0
Monday-Sunday	10
HOURS COVERED	USE (Percent)
0 - 9	80%
10 - 16	13
17 - 24	7

Contract versus T&M
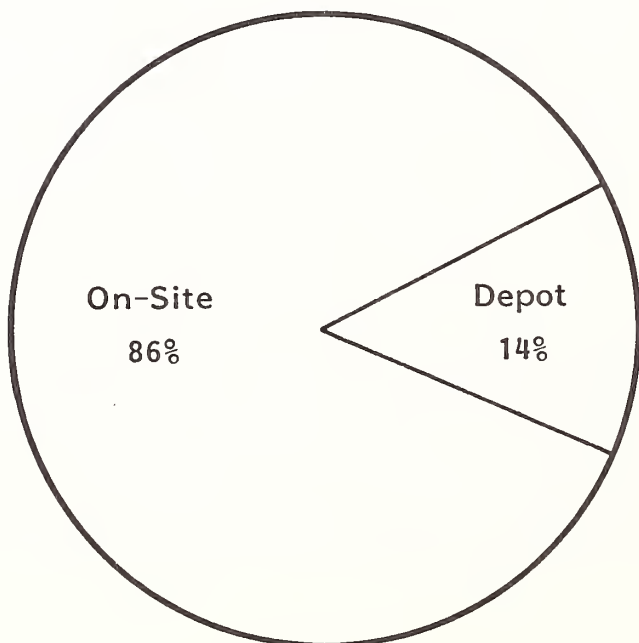
DEPOT TYPE	USE (Percent)
Carry-In	53%
Mail-In	7
Courier	40

On-Site versus Depot

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- Service prices for both categories of products will erode only slightly (5-10% per year is expected) so that no great savings in revenue from established clients need be feared.

E.   PERSONAL COMPUTER TPM MARKET

- The personal computer service market is a minefield for the unwary TPM.

  - The high volume nature of the market is an attractive lure to many TPMs.

  - The thin margins are not sufficient deterrent to warn TPMs of the dangers of the market.

  - There is so much business available that everybody gets more business and feels encouraged by their success.

  - Most TPMs believe that if they could only increase their volume, the losses would go away.

1.   MARKET ANALYSIS

- In 1985, large numbers of TPMs came to the conclusion that the PC market was not for them and retired from the market. What is particularly annoying about the PC market is the fact that many users remain unconvinced of the need for ongoing service, and then reduce their usage of the service when failures occur.

- Fortunately, the business PC market is in full swing. Unit growth has been somewhat reduced, but the market remains strong. With the overwhelming success of the IBM PC, the market for third-party maintenance of that device and the compatibles has become the number one target for TPM vendors.

- 55 -

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- PC service pricing trends have been disturbing--from a 1982 average of 17% of purchase price, the norm has turned steadily downward to today's 15% (of a much reduced purchase price). Both purchase prices and service prices as a percent of those purchase prices are expected to continue sliding so that by 1990, INPUT expects service prices to be at only 10% of purchase price.

2. PRINCIPAL COMPONENTS

- Exhibit IV-8 provides the INPUT forecast of the principal components of the PC TPM market through 1990.

    - IBM PCs (of all configurations and modes) will be the largest single TPM market, growing at a 22% average each year.

    - IBM-compatible PCs of all types will be the fastest growth market, but a much smaller one and one that is divided into over 20 different product lines.

- Jointly, the two represent two-thirds of the 1985 market and will increase to over 75% by 1990. Product refurbishment is a small, slowly growing market, and fourth-party maintenanance is a better-sized, more rapidly growing market.

3. SERVICE DELIVERY MODES

- Exhibit IV-9 details the 1985 breakdown of average user contract type and service delivery mode.

- Time and material services are the overriding part of service delivery mode for personal computers. Being a predominantly business-oriented market, most service calls are for Monday through Friday and during the day shift.

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EXHIBIT IV-8

PC THIRD-PARTY SERVICE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
IBM PCs	$251	$299	$362	$432	$511	$602	19%
IBM Compatibles	40	52	66	83	102	127	26
Subtotal	$291	$351	$428	$515	$613	$729	20%
Other	99	121	144	170	202	241	19%
Total	$390	$472	$572	$685	$815	$970	20%
Product Refurbishment							
Total	$ 7	$ 8	$ 10	$ 11	$ 13	$ 15	15%
Fourth-Party Maintenance							
Total	$ 21	$ 25	$ 30	$ 35	$ 42	$ 49	18%
Grand Total	$418	$505	$612	$731	$870	$1,034	20%

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EXHIBIT IV-9

TPM BUSINESS BASE - PERSONAL COMPUTERS
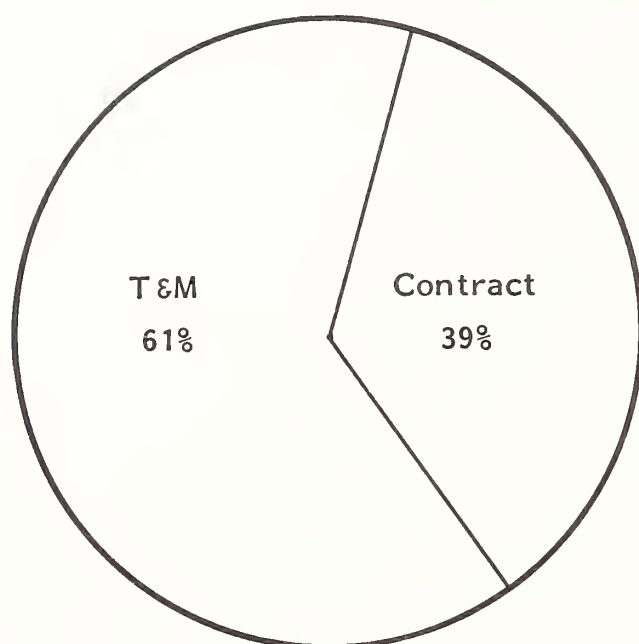
Contract versus T&M

DAYS COVERED	USE (Percent)
Monday-Friday	100%
Monday-Saturday	0
Monday-Sunday	0
HOURS COVERED	USE (Percent)
0 - 9	85%
10 - 16	15
17 - 24	0
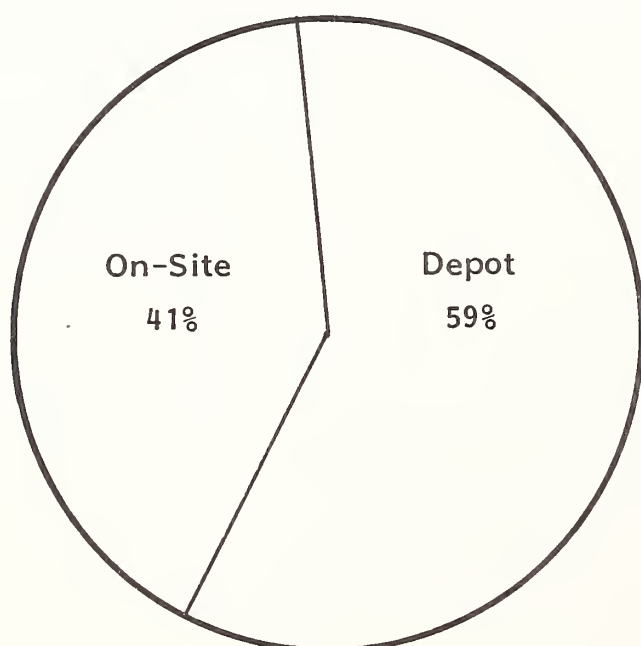
On-Site versus Depot

DEPOT TYPE	USE (Percent)
Carry-In	65%
Mail-In	0
Courier	35

- 58 -

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- Depot repair, mostly carry-in, is the predominant service type and is increasingly used for business PCs.

4. PERSONAL COMPUTER TPM MARKET EVOLUTION

- After a shaky start in the early years of the PC market when dealers and distributors were thrust into a service role and responsibility they did not want and TPMs rushed in to service them, the PC market now enters phase two, when the shake-out of TPM suppliers now underway will determine market participants for the next five years.

- The market will be one of very high volume, very low margins, and limited profitability. Only after the market begins to move into phase three (maturity) will meaningful profits become possible. Until then, PC TPM will be a difficult market to participate in.

F. TELECOMMUNICATIONS TPM MARKET

- This report covers six categories of telecommunications products, including digitial switches, front-end processors, modems and couplers, facsimile devices, teleprinters, and earth stations. The "other" category includes local area networks, protocol converters, and the small opportunity TPM markets.

- All of these markets except that of teleprinters have two things in common--huge growth potential and excellent strategic value. There is growth potential because U.S. businesses no longer consider communications an option, but rather an obligation if competitiveness is to be maintained. There is strategic value because of the opportunity--once the base network products have been contracted for, the TPM may seek to service the products that are connected to the network.

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I.   MARKET ANALYSIS

• The telecommunications market is partly characterized (like the personal computer market) by dealer/distributor networks that channel products to the end users. Much of the product is highly reliable and end users are encouraged to support themselves where possible.

• There are exceptions—digital data switches, FEPs, and earth stations are often directly supported by the manufacturer, and the large vendors (AT&T, Rolm, IBM, Northern Telecom, etc.) support all of their own products directly. The Regional Bell Operating Companies (RBOCs) represent the megadealer network that was formerly the unique province of AT&T. Now they have become major channels of distribution and support for many other manufacturers.

2.   PRINCIPAL COMPONENTS

• Exhibit IV-10 lists the forecasted growth for each of the components of this market.

  - Digital switches are frequently serviced by dealers and distributors and the market is sizeable one.

  - Front-end processor are for the most part supported and serviced by the original manufacturer, but there are many exceptions. Some Japanese manufacturers are open to TPM service as are the smaller U.S. manufacturers.

  - Modems and couplers are a rapidly growing TPM market, but as an integral part of network support rather than as an isolated market.

  - Facsimile devices are frequently serviced by depot repair and on-call services by dealers, distributors, and manufacturers alike. As these products become more widespread, the TPM market will grow.

- 60 -

EXHIBIT IV-10

TELECOMMUNICATIONS THIRD-PARTY SERVICE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Maintenance							
Digital Switch	$ 60	$ 77	$ 92	$111	$133	$153	21%
FEPs	22	29	38	48	63	82	30
Modems and Couplers	17	22	30	42	57	75	35
Facsimile Devices	6	9	11	17	27	41	47
Teleprinters	6	8	10	12	14	16	22
Earth Stations	16	22	34	48	67	98	44
Other	3	6	12	19	29	44	71
Total	$130	$173	$227	$297	$390	$509	31%
Product Refurbishment							
Total	$ 4	$ 5	$ 6	$ 7	$ 8	$ 10	20%
Fourth-Party Maintenance							
Total	$ 12	$ 15	$ 19	$ 24	$ 30	$ 38	26%
Grand Total	$146	$193	$252	$328	$428	$557	31%

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- Teleprinters have been a small but steady TPM market and will continue as such. The product is being slowly superceded by electronic alternatives, however, so the market will stay small.

- Earth stations are a TPM market within larger management contracts. It is seldom that the equipment manufacturer is the service supplier.

3. TELECOMMUNICATIONS TPM MARKET EVOLUTION

- The telecommunications market is destined to become the next giant battleground after the computer market, with huge opportunities for those who are able to find a niche.

- Surprisingly, to date, few TPMs have targeted the market, including many for whom it would be a natural strategic consequence of the business directions they have already chosen (e.g., McDonnell Douglas, First Data Resources, RCA Services, etc.).

G. PRODUCT REFURBISHMENT TPM MARKET

- Product refurbishment within any one of the product categories we have discussed separately in this chapter is always a small and relatively insignificant TPM opportunity. However, taken as a whole, the total dollars available are not insignificant.

- The players in this market tend to be very small vendors who do not specialize in product refurbishment but who pursue other markets at the same time.

- 62 -

- Exhibit IV-11 provides a summary of all of the product refurbishment markets by product category.

H.   FOURTH-PARTY MAINTENANCE (FPM)

- The potential for FPM is considerable. Although concentrated in the PC, terminal, and minicomputer maintenance markets so far, the growth rates of any of these markets are quite considerable.

- By 1990, the total market will top $200 million annually, a non-negligible target that could support several large TPM vendors.

- Exhibit IV-12 provides detailed forecasts.

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EXHIBIT IV-11

PRODUCT REFURBISHMENT SERVICE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Mainframes	$ 3	$ 3	$ 3	$ 4	$ 4	$ 4	4%
Minicomputers	4	5	5	6	8	9	20
Peripherals	5	6	7	9	10	12	20
Terminals	2	3	3	3	5	6	20
PCs	7	8	10	11	13	15	15
Telecomms	4	5	6	7	8	10	20
Other	0	0	1	2	4	6	N/A
Total	$25	$30	$35	$42	$52	$62	20%

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EXHIBIT IV-12

FOURTH-PARTY MAINTENANCE MARKETS, 1985-1990

	$ MILLIONS						
	1985	1986	1987	1988	1989	1990	%AAGR
Mainframes	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	0%
Minicomputers	11	14	17	22	28	35	26
Peripherals	6	8	9	12	13	15	25
Terminals	15	18	24	30	40	51	25
PCs	21	25	30	35	42	49	18
Telecomms	12	15	19	24	30	38	26
Other	4	6	10	15	21	28	48
Total	$ 69	$ 86	$109	$138	$174	$216	26%

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V MARKETING PRODUCT SUPPORT TO VENDORS

V   MARKETING PRODUCT SUPPORT TO VENDORS

A.   OVERVIEW

- One of the most successful ways of establishing a large TPM revenue base rapidly is to obtain multi-year contracts with manufacturers, distributors, dealers, and OEMs for the exclusive or preferred source service of their products nationwide. This has been the core of TRW's growth from the beginning, and many vendors have tried to emulate them. This market remains an extremely lucrative, although well-penetrated, source of business.

- Many of these multi-year contracts are now coming due for renewal and competition for them is intense. It is no longer sufficient to offer the same type of maintenance services as those provided under the expiring contract, nor is it sensible to compete merely on price (which devalues the contract even if it is retained). More is needed to attract the contract renewal, and that "more" is the subject of this chapter.

- In many ways, the best description of the trend in manufacturer service requirements is away from third-party maintenance (TPM) and toward third-party service and support (TPSS). The difference lies in the expanded services/support needed, some of which have been touched upon in Chapter III under "soft" services. One that must now be examined separately, because of its fundamental importance to successful TPM service in the forecast period and beyond, is marketing support.

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B.   TPM MARKETING/SUPPORT SERVICES

- Marketing support is the ability to assist a product manufacturer in test marketing, product introduction, product promotion, and product field evaluation, all from the maintenance and support side. It is providing the manufacturer with the support and feedback he would normally receive from an in-house service operation as well as product maintenance.

- Two types of activities should be offered--those that assist the product vendor to sell more products and position the maintenance services accurately in the marketplace, and those that assist in the product launch and in-field testing of new products and ongoing analysis and reporting of all products (see Exhibit V-1).

- It is important to understand why these services are necessary. Successful TPM growth relies not only on the capture of new business, but also on the retention of existing contracts. In today's extremely competitive marketplace, this means offering services beyond plain vanilla maintenance (to distinguish the company from most TPM offerings) and fostering good relations with the vendors who are already clients.

- Too many TPMs (including many large ones) have restricted the scope of their service offerings to plain product maintenance and adopt a "take-it-or-leave-it" attitude when contract renewal time comes around. Many do not try to compete on price (indeed, often the prices are raised in view of the knowledge gained from in-field maintenance experience), and all the customer sees is the prospect of the same service at higher cost. Since there are always TPMs who are willing to accept lower margins, contract renewal percentages begin to shrink.

- It should be the goal of every TPM to obtain 100% renewal (excluding those contracts where a strategic decision has been made not to pursue them) and to

- 68 -

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EXHIBIT V-1

TPM MARKETING/SUPPORT SERVICES

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                    ┌──────────────────────────┐
                    │  VENDOR/TPM CONTRACT      │
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SERVICE MARKETING

- Service Packaging

- Service Pricing

- Service Positioning

- Sales Assistance

SUPPORT SERVICES

- Alpha-Testing
  (New Products)

- In-Field Testing (All
  Products)

- Reliabity/Perforamnce
  Reporting and Analysis
  (All Products)

JOINT PLANNING

- Market Intelligence

- One- and Five-Year Planning

- New Markets Targeting

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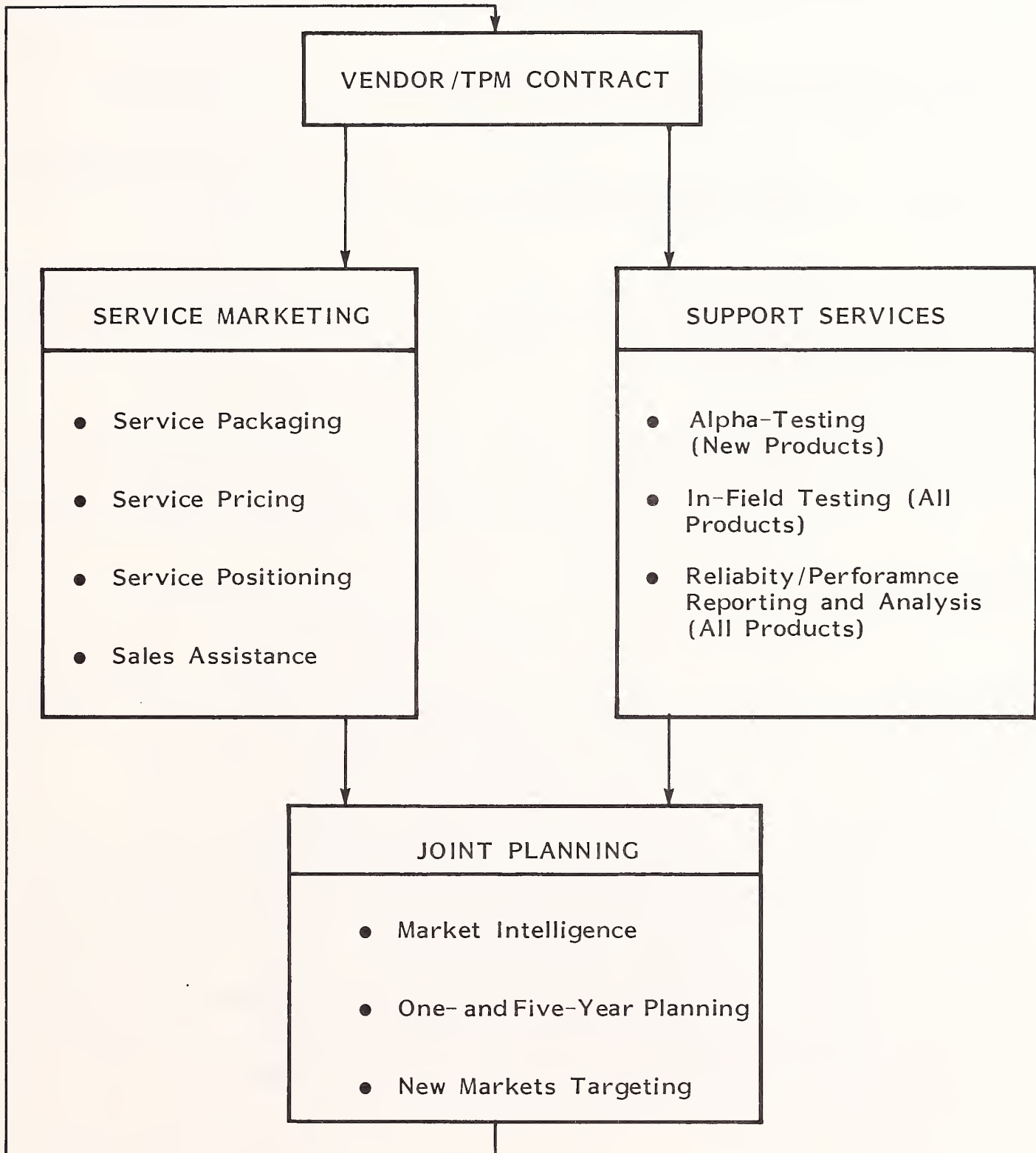
increase the revenue volume from each contract. This can only be achieved by fostering good relations with the vendor/customer which go beyond in-field service performance and by offering service and support options which justify price increases.

C.   SERVICE MARKETING

- Part of the process is to offer service marketing which encompasses:

    - Packaging the services which the vendor/customer and the TPM have contractually agreed are to be offered to end users.

    - Pricing those same services at levels that are consistent with good competitive rates and that ensure a fair and reasonable return to the TPM.

    - Positioning the services in the marketplace (which means analyzing the vendor/customer's competition and ensuring that the cost of ownership to the end user of the product/service package does not negatively impact product sales).

    - Offering sales assistance to the vendor/customer in those instances where a particularly large or important contract is being sought, demonstrating that the TPM and the vendor act as one with the same basic goal in mind—expansion of the number of installations.

- Very few vendors/customers are insensitive to the need to service their end users successfully once a sale has been made, and many are reluctant to turn this vital role over to a third party since their own company image is intimately associated with the customer's post-sale satisfaction levels. Therefore, to be able to offer service marketing enhances the TPM's likelihood of obtaining new contracts, distinguishes him from the average TPM in today's market, and opens up new revenue opportunities.

- 70 -

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- How should these services be priced? Obviously, providing service marketing costs money which the vendor/customer must pay. The options are threefold (see Exhibit V-2).

    - Option pricing--where each of the two main service marketing activities (service packaging and sales assistance) are billed on a as-needed bases; e.g., at a daily rate for each person involved.

    - Fixed price packages--where each activity is treated as a separate contract to be negotiated, signed, and executed as the need arises.

    - Bundled pricing--where all service marketing activities are treated as part of the overall contract.

- On the face of it, the safest way to go is option pricing since any manpower expended will be billed separately. The drawbacks to this approach are several. First, the administration overhead in tracking, billing, and collecting each man-hour used for each client can prove to be too costly, and secondly, the vendor/customer may reduce the TPM's involvement in ongoing business for fear of the open-ended costs involved.

- Fixed-price packaging is tiresome; there is no future in continuously negotiating new contracts with customers.

- Bundled pricing seems risky; if no limit is put on the TPM's involvement, how can costs be contained? However, for the customers this is the most appealing approach and one which has allowed some TPMs to win contracts while being as much as 35% more expensive than the nearest competitor. It also places the main emphasis of both the TPM and the vendor/customer where it should be--on getting more business and catering to end-user needs.

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EXHIBIT V-2

SERVICE MARKETING

OPTION PRICING

- Open-Ended Contract
- Man/Day Rate
- Billed as Needed

FIXED-PRICE PACKAGES

- Negotiated Separately
- Fixed Price per Activity

BUNDLED PRICING

- Negotiated in Main Contract
- Increases Basic Rates
- Not Billed Separately

PRICING

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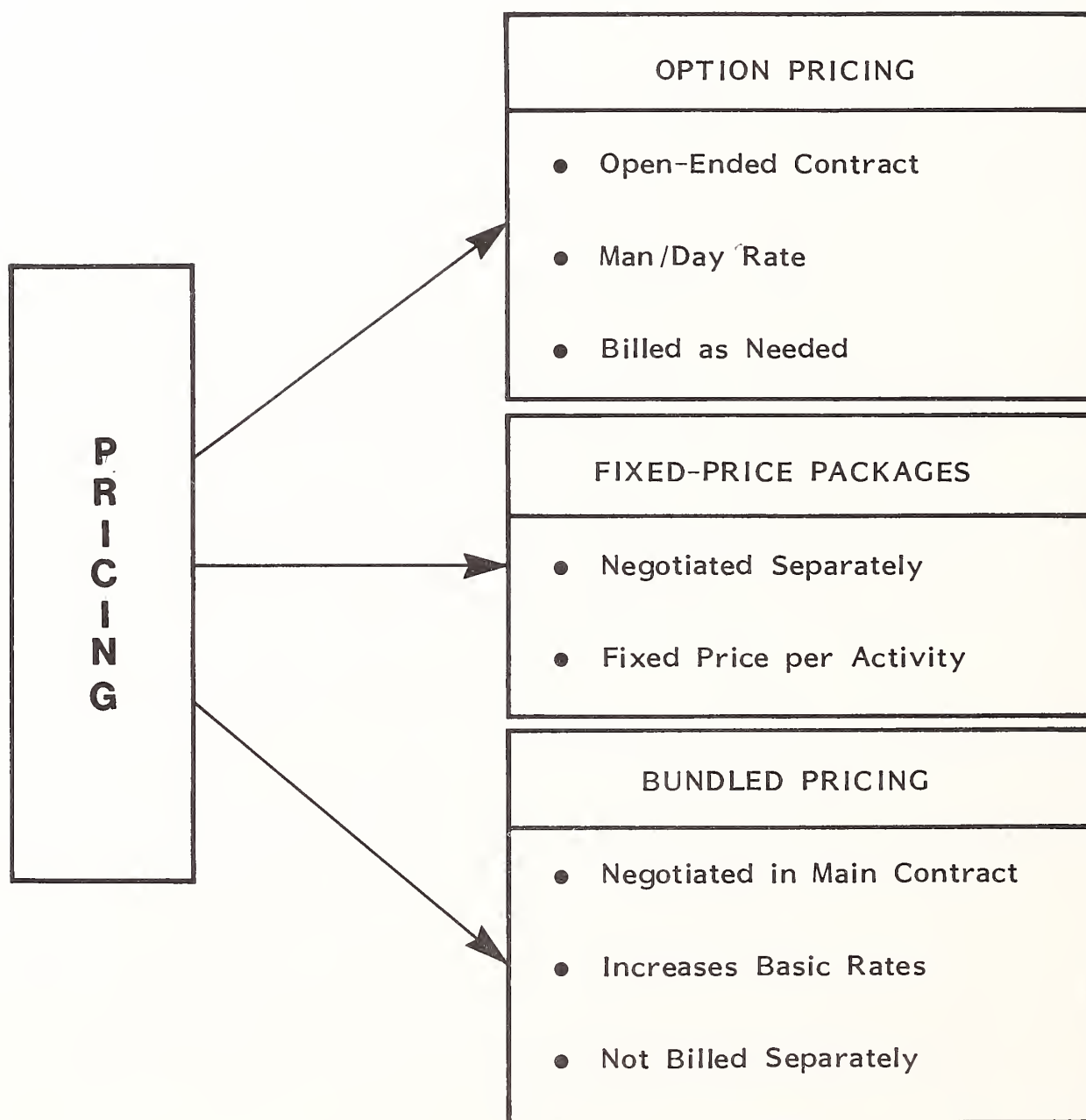
D.   SUPPORT SERVICES

● Support services recognize the fact that the vendor/customer's portfolio of products is constantly changing and that a need exists to facilitate the smooth, successful introduction of new products into the field and into the TPM/vendor contract.

● Whenever a new product is introduced for the TPM to support, it is of vital importance that the TPM validate the product from the reliability, availability, and serviceability aspects and that the TPM be given to opportunity to evaluate the service costs that the product will incur. It is advantageous for this determination to be based on the TPM's own in-field data and not data provided by the vendor/customer.

    - The TPM's own personnel will be the ones called upon to service the product (with whatever product knowledge has been given them), not the vendor's own (specialized) people.

    - It is the TPM's procedures and policies that will apply to end users, not the vendor/customer's. Besides, the data may simply be faulty or applied to too small a sample to be valid.

● It is doubly advantageous for this evaluation to be paid for by the vendor/customer as part of the TPM's normal duties. The components of support services are listed in Exhibit V-3.

● Alpha testing (or in-house testing) examines the endurance and limits of the product performance against specification and applies both to individual parts and to the entire product. It is often difficult to duplicate the entire range of environments and conditions that the product will be called upon to perform in, so there are significant limitations to the value of an alpha test. In addition, the documentation available to support the test does not provide an

- 73 -

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EXHIBIT V-3

SUPPORT SERVICES


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┌─────────────────────────────────────┐
│               L-TEST                 │
├─────────────────────────────────────┤
│                                      │
│  • In-House, Endurance and           │
│    Limits Testing                    │
│                                      │
│  • Parts and Product Testing         │
│                                      │
│  • Documentation Development         │
│                                      │
│  • Initial Remote Training           │
│                                      │
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┌───────────┐
│ C         │
│ O         │
│ M         │
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┌─────────────────────────────────────┐
│          IN-FIELD TESTING            │
├─────────────────────────────────────┤
│                                      │
│  • All Products Covered by Contract  │
│                                      │
│  • All Releases and Updates          │
│                                      │
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┌─────────────────────────────────────┐
│      RELIABILITY/PERFORMANCE         │
│            FEEDBACK                   │
├─────────────────────────────────────┤
│                                      │
│  • Regular Reporting to Vendor/      │
│    Cutomer                           │
│                                      │
│  • Trends Analysis                   │
│                                      │
│  • Product/Documentation Modifica-   │
│    tion Recommendations              │
│                                      │
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- 74 -

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accurate image of what will be made available for field use, nor are the technicians executing the test a good example of the average in-field technician. At this stage, an evaluation can be begun of the service profile of the product.

- In-field testing is more crucial in that the TPM must now establish the performance, cost, and price criteria which will support adequate profit margins on volume installations. The success or failure of an entire product hinges on accurate, reliable data from this stage. It is therefore essential that accurate tests be executed whenever a product modification is released as well as for a new product.

- Reliability/performance feedback is the score card which the TPM and the vendor/customer review regularly on the progress and trend of the product installations. It is also the basis for product and documentation adjustments, and updates being prepared and should serve as one of the key ingredients to the third-party marketing/support services activity (see next section, "Joint Planning").

- All of the above support services are necessary activities in a successful TPM's management of an installed product base, and it is infinitely better for them to be part and parcel of the TPM's contract (paid for by the vendor/customer) than left to the vendor/customer.

E.   JOINT PLANNING
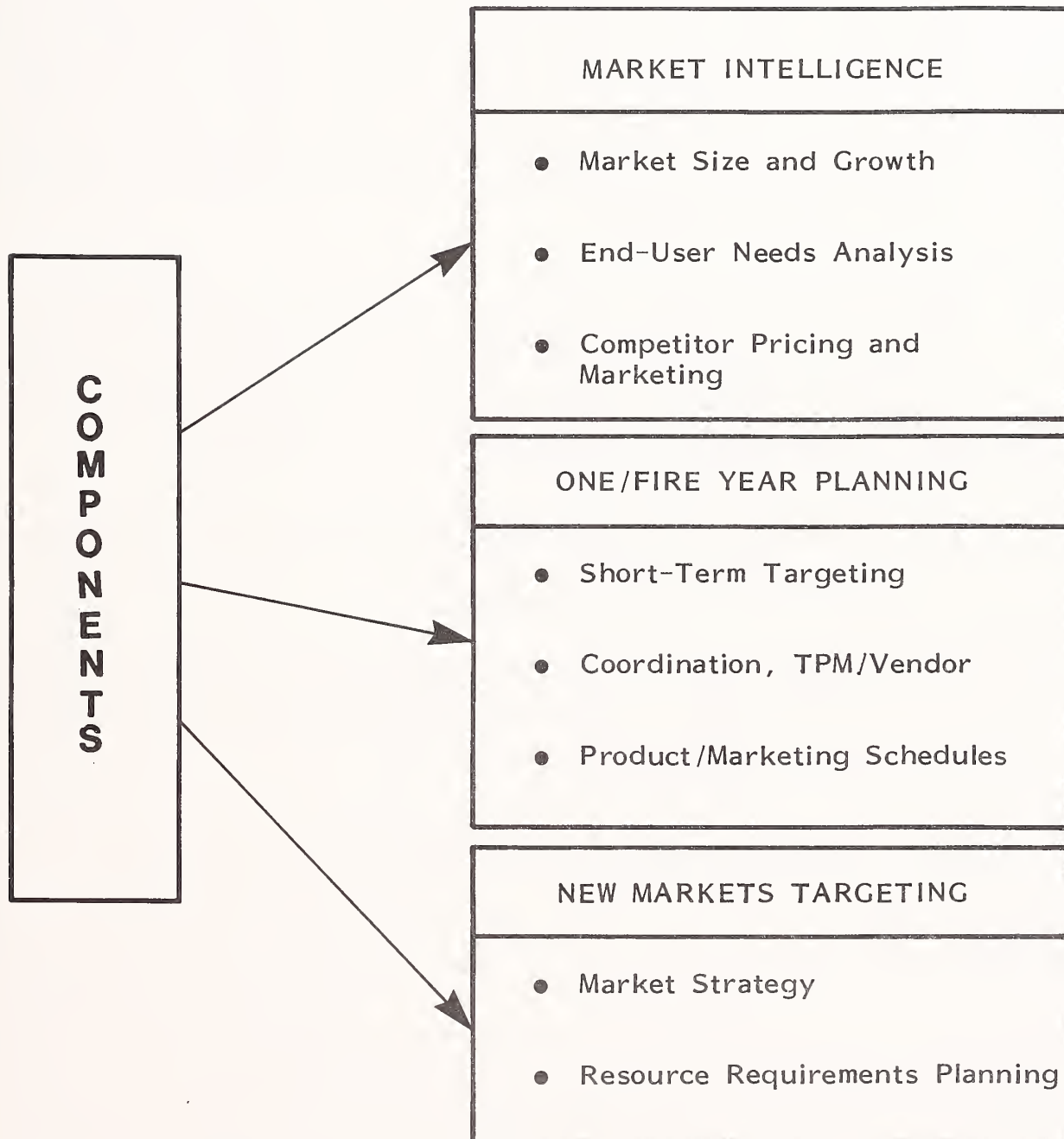
- As the most significant of marketing/support services, joint planning ranks lowest on the scale of revenue gainers and highest on the scale of strategic activities aimed at long-term growth of a TPM's relations with a vendor/customer. In effect, this can be either purely a public relations activity, maintaining good communications between the TPM and vendor/customer, or

- 75 -

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it can be developed into a strong marketing activity, analyzing new market opportunities, evaluating competition, and producing on a regular basis a joint short-term and long-tem plan (see Exhibit V-4).

- The basis for any plan is gathering intelligence on the markets that are presently targeted, and this includes:

  - The size and growth rates of the markets that the TPM and vendor/customer currently participate in.

  - An analysis of the end-user needs in those markets with particular attention to new trends.

  - A complete review of the competition (both on the vendor/customer side and on the TPM side) in terms of marketing, options/services offered, pricing, and relatively success.

- This market analysis is then fed into the development of short- and long-term plans for existing markets and into a new market evaluation where relevant.

- Short- and long-term planning aims at coordinating the efforts, resources, and direction of the TPM and the vendor/customer. The short-term is merely the current year's plan and includes the schedule for current and new products (in terms of developments, new releases, etc.) and the sales and marketing campaign that will be engaged in over the next 12 months.

- New markets targeting is far more complex in that it asks the TPM and the vendor/customer to share information on their goals for the long term. It also hits upon one of the fundamental weaknesses of U.S. vendors today--long-term planning. In many cases, no such thing exists, is vaguely outlined, or is extremely sensitive data.

- 76 -

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EXHIBIT V-4

- 77 -

JOINT PLANNING

COMPONENTS

MARKET INTELLIGENCE

- Market Size and Growth

- End-User Needs Analysis

- Competitor Pricing and Marketing

ONE/FIRE YEAR PLANNING

- Short-Term Targeting

- Coordination, TPM/Vendor

- Product/Marketing Schedules

NEW MARKETS TARGETING

- Market Strategy

- Resource Requirements Planning

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- One such fundamental determination is the market strategy to be pursued-- disclosing this to what may appear to be a casual partner is not easy for many vendors/customers to do. Without it, however, new market planning cannot be achieved. Some vendors may wish to keep the TPM in a subservient role and not involve him in corporate strategy.

- Whether the vendor/customer allows new market targeting to take place or not, the TPM must engage in this activity and have a definite plan outlined for the future. This is no easy task since it may involve trying to reconcile numerous markets with very widely differing needs. Nevertheless it is important that an attempt be made and, preferably, each aspect of it be coordinated with the developments and plans of the vendors/customers who are central to its completion.

- Joint planning is ideally an activity which engages the efforts of the upper management of the TPM organization and forces them to abstract themselves from daily operational management to view and plan for the coming five-year period. Contact with the main customers is an added bonus.

  - It demonstrates concern and top-level commitment to the achievement of the vendor's/customer's success.

  - It eliminates the layers of intermediaries which normally intervene between TPM management and the clients, providing a more direct and first-hand view of matters.

  - It is an excellent discipline to execute on a regular basis.

INF

VI VENDOR COMPETITIVE ANALYSIS

VI VENDOR COMPETITIVE ANALYSIS

A. THE COMPETITION IN 1985

- In 1985, the top 10 third-party maintenance vendors in the U.S. captured nearly 63% of the market, yet only two of them are dedicated to TPM. For the remainder, TPM is a secondary (even tertiary) activity that is not a central thrust of the company.

- TPM competition increased in 1985.

  - The computer business itself had a poor year.

  - Many manufacturers began partial TPM offerings which, even if they were on the whole unsuccessful, introduced some fomidable new players to the market.

  - Service prices continued to erode across the board, driven by falling manufacturer service prices and hardware prices.

- Exhibit VI-I shows the market shares of the top 20 TPMs in 1985. There were some major changes in market share and in the players themselves.

  - TRW increased market share from 17.3% in 1984 to 17.4% in 1985 and remained firmly in the lead.

- 79 -

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EXHIBIT VI-1

1985 MARKET SHARE ANALYSIS

RANK	VENDOR	ESTIMATED 1985 TPM REVENUES ($ Millions)	OVERALL MARKET SHARE (Percent)
1	TRW*	$232	17.4%
2	SORBUS*	202	15.2
3	CONTROL DATA*	110	8.3
4	RCA	86	6.5
5	GENERAL ELECTRIC (GE)	68	5.1
6	BELL & HOWELL	38	2.9
7	GRUMMAN*	30	2.3
8=	McDONNELL DOUGLAS (TYMSHARE)*	22	1.7
8=	FIRST DATA RESOURCES*	22	1.7
10	TOTAL TECHNICAL SERVICES	21	1.6
11	XEROX	20	1.5
12	DATASERV	19	1.4
13=	CMLC	16	1.2
13=	DECISION DATA	16	1.2
15	DOW JONES	13	1.0
16	ADP/MTTR*	7	0.5
17	KALBRO	6	0.5
18	SYSTEC	5	0.4
19	BRAEGEN	4	0.3
20	SPERRY	2	0.2
	TOTAL		70.9%

* These companies either were acquired or made acquisitions in 1984 which, in many cases, affected revenues.

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- Sorbus increased its share from 11.8% to 15.2%, mainly as a result of reclassifying the MAI products service revenue from captive to noncaptive.

- CDC also gained from 8.0% to 8.3% while RCA lost ground (from 7.7% to 6.5%).

- GE gained from 4.4% to 5.1% and Bell & Howell increased from 2.6% to 2.9%.

- Some new names were added to the top 20 list.

  - McDonnell Douglas took over Tymshare and as a result entered the list for the first time.

  - First Data Resources, despite the closing of its PLANUS division, jumped to ninth place on the strength of two acquisitions.

- Others did not fare so well.

  - Western Union disappeared from the chart after its disastrous strike with the unions.

  - Xerox fell from ninth to eleventh place and from a 1984 share of 1.6% to 1.5% in 1985.

- The company which bears watching in the future is ADP/MTTR. If the company were to dedicate as much attention to product service as to their core business of information services, they could become a formidable competitor overnight.

- 81 -

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B.   TOP 10 REVENUE AND GROWTH GAINERS

- It is often not easy to establish who made the biggest stride in any one year. Percentages are sometimes misleading, particularly for smaller companies and the largest (the one appears to grow dramatically, the other very little, because of the disparity in the base revenues on which the percentages are calculated).

- In an attempt to minimize this problem and list the best gainers, Exhibit VI-2 is provided. It compares the actual revenue gains, dollar for dollar, without reference to size and answers the question "Who grabbed the biggest slice of the 1985 revenue gain?"

- TRW leads the group with a TPM revenue gain of nearly $34 million or nearly 18% of all of the new service dollars added to the TPM market in 1985. Sorbus is a close second, but it must be emphasized that this is largely due to the adjusted status of the MAI revenue. Both companies will service selected peripherals and whole systems, but their target markets are somewhat different.

- TRW has, from the beginning, gone after system management contracts with manufacturers and as a result has found itself in the following markets: medical electronics (computer-driven), point-of-sale devices, mainframes, minicomputers, micros, banking industry products (particularly teller terminals and ATMs), and office products. TRW's association with Datapoint overseas also gave it a strong interest in the intelligent terminal market. Current targets include Fortune 500 companies, the federal government (symbiotic with TRW's heavy professional services business with the federal government), and the banking industry.

- Sorbus began servicing primarily IBM mainframes and grew into mini-computers and almost every brand of micro and personal computer. Non-IBM

- 82 -

EXHIBIT VI-2

TOP 10 REVENUE GAINERS

RANK	COMPANY	1984-1985 REVENUE GAIN ($ Millions)
1	TRW	$33.7
2	Sorbus	32.2
3	RCA Services	18.3
4	General Electric	10.9
5=	CDC	10.0
5=	Grumman	10.0
7	Total Technical Services	8.4
8	First Data Resources	6.3
9	Bell & Howell	5.2
10	McDonnell Douglas	4.0

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markets have had the fastest growth for Sorbus in recent years, particularly such products as Magnuson, Zilog, General Automation, and MAI for which they have exclusive contracts. Sorbus has mainly targeted large system populations which still means that IBM is the largest part of its business.

- In the past, CDC serviced IBM equipment through its COMMA division. This made sense because of CDC's penetration of many of these accounts with its OEM disk drives. IBM PCs were targeted starting in 1984, and CDC continues to target DEC equipment. Two acquisitions bolstered this thrust in 1984.

    - Computer Marketing Associates (a PDP/11 series maintenance company in Sunnyvale, CA).

    - Total Tec, which has a base of 600 DEC users.

- RCA Services is divided into three divisions:

    - Government services.

    - Consumer and commercial services.

    - Data services.

- The company does not target any particular market or group of end users and services a little of everything. As should be expected, telecommunications and data communications are a natural part of RCA's business. Recently, the company began offering maintenance for earth stations and Ungemann-Bass's local area network product line nationwide.

- General Electric's principal target is the manufacturing industry and Fortune 1000 industrial companies. The company segments its service business into the following areas:

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- Computer and data communications equipment.

- Electronic test equipment.

- PBX systems and shared-tenant systems.

- Rental and leasing services.

- Brands serviced include DG, DEC, IBM, and a variety of modems, multi-plexers, concentrators, and PBXs from over 45 other vendors.

- Now that GE has acquired RCA, the rationalization of the two services divisions will occur, resulting in:

  - A services company with $154 million of revenue and a good chance of reaching $195 million in 1986.

  - Strength in servicing of all aspects of the telecommunications and data communications markets.

  - Strength in manufacturing services and government services.

- All of these markets are high growth activities and GE is now the highest potential growth candidate in the TPM market.

- For reference purposes, Exhibit VI-3 provides the top 10 percentage gainers in 1985.

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EXHIBIT VI-3

TOP 10 PERCENTAGE GAINERS

RANK	COMPANY	1984–1985 GAIN (Percent)
1	DataServ	70%
2	Total Technical Services	67
3	Grumman	50
4	First Data Resources	40
5	ADP/MTTR	35
6	Decision Data	30
7	RCA Services	27
8	Dow Jones	25
9	McDonnell Douglas	22
10	Sorbus	19

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C. DELIVERY MODES AND CONTRACT DISTRIBUTION OF THE TOP 10

- It is instructive to review the service delivery modes used by the top 10 TPM vendors in 1985 and the distribution of their contract base by type.

- Exhibit VI-4 ranks the top 10 TPM vendors by revenue in 1985 and then shows the percentage of their revenue that is produced by on-site service versus depot repair/other. Most companies show a trend toward increasing the on-site percentage, which currently averages around 85% up to 90%.

- The one exeception is Bell & Howell whose business base to date has been servicing minicomputers, micros, peripherals, point-of-sale terminals, printers, and modems. More recently, Bell & Howell entered the telecommunications services market, maintaining satellite dish antennae.

- Exhibit VI-5 shows the contract type distribution for these same vendors. For the most part, contract services predominate with end-user oriented business closer to 95% contract service and manufacturer-oriented services (and microcomputer services) closer to 75% contract service. Bell & Howell is once again the exception.

D. THE COMPETITION IN 1990

- It is always interesting to speculate as to how the competition will move over the next five years since a "what if" analysis provides the basis for corrective plans and moves. Much of what follows, while based on reasonable assumptions and known facts in 1985, is of this speculative nature.

- First of all, we can expect the total number of TPM vendors to drop from today's absurdly high 450 to a more reasonable 300 or so. Even at that level,

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EXHIBIT VI-4

DELIVERY MODES OF THE TOP 10

RANK BY REVENUE 1985	COMPANY	PERCENT OF REVENUE IN 1985	
		ON-SITE	DEPOT AND OTHER
1	TRW	85%	15%
2	Sorbus	80	20
3	CDC	98	2
4	RCA Services	75	25
5	General Electric	90	10
6	Bell & Howell	60	40
7	Grumman	90	10
8	McDonnell Douglas	75	25
9	First Data Resources	85	15
10	Total Technical Services	95	5

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EXHIBIT VI-5

CONTRACT DISTRIBUTION OF THE TOP 10

RANK BY REVENUE 1985	COMPANY	PERCENT OF DISTRIBUTION IN 1985	
		CONTRACT	T&M
1	TRW	70%	30%
2	Sorbus	95	5
3	CDC	95	5
4	RCA Services	95	5
5	General Electric	75	25
6	Bell & Howell	20	80
7	Grumman	90	10
8	McDonnell Douglas	99	1
9	First Data Resources	85	15
10	Total Technical Services	80	20

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there will be a lot of undercapitalized TPMs with questionable futures in the market.

- Second, we can expect that by that time dealers, OEMs, and distributors will have dropped out of the service market for the most part, placing their service needs in the hands of the larger TPMs.

- Third, the profile of the remaining TPMs will be more strongly established by then. Their main market thrusts will be clear--they will have succeeded where they are going to succeed and failed where they are going to fail.

- Fourth, margins will stabilize by 1990, as will service prices. Much of the abnormal deterioration in hardware and service prices can be expected to be past, with more normal erosion rates in place (say 10% per annum). This will make the market still very difficult, but that is the lot of the average TPM anyway.

- But what of today's vendors? Where will they be and who will be top dog? Exhibit VI-6 shows the results of extrapolating from today's revenue levels to 1990 with normal growth rates.

- First, TRW will, on this basis, retain the top post, but will lose market share to just over 16% from today's 17.4%. Second, GE's combined service activities (including RCA Services) will grow strongly to narrowly edge Sorbus for second place in the table. GE's market share will triple from 5.1% in 1985 to 15.3% by 1990.

- Sorbus, growing strongly, will be the third largest TPM, and will retain its current 15.2% market share, while CDC will grow two percentage points to 5.9% by 1990.

- Two independents, DataServ and Total Technical Services (TTS), are expected to make substantial gains, more than doubling their market share to over 3% apiece.

- 90 -

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EXHIBIT VI-6

PROJECTED COMPETITION IN 1990

RANK		VENDOR	$ MILLIONS						
1990	1985		1985	1986	1987	1988	1989	1990	%AAGR
1	1	TRW	$232	$271	$315	$365	$420	$483	16%
2	4	GE/RCA	154	195	244	302	371	457	24
3	2	Sorbus	202	238	281	332	388	454	18
4	3	Control Data	110	121	133	146	161	177	10
5	12	DataServ	19	30	44	60	80	104	41
6	9	TTS	21	32	43	55	72	93	35
7	7	Grumman	30	41	53	66	79	93	25
8	8	First Data Resources	22	30	39	50	65	84	31
9	6	Bell & Howell	38	44	51	59	69	80	16
10	7	McDonnell Douglas	22	27	32	39	46	56	20

Average Annual Growth Rate: 1985-1990: 18%

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- Grumman will gain market share slightly, but lose one rung on the top 10 TPM ladder, while First Data Resources will maintain its position and also gain market share.

- Bell & Howell will be the biggest loser in rank, but will lose only 0.5% of its market share, while McDonnell Douglas will gain marginally in market but lose three ranks.

- Not counted in the above, of course, are any of the outsiders or groups that may still be created overnight by mergers and acquisitions. Naturally, any of the top 10 TPMs listed could merge with or acquire one other, creating an industry leader overnight.

- The top 10 as a whole, despite some dramatic growth rates individually, are not expected to outpace the market, with the average combined growth rate being 18%—the same as the TPM market between 1985 and 1990.

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VII SUMMARY RECOMMENDATIONS

VII SUMMARY RECOMMENDATIONS

A. OVERVIEW

- Summarizing the trends and recommendations for success in the TPM market is extremely difficult due to the diversity and specificity of the TPM markets, vendors, and users. However, some overall guidelines are possible to construct that are valid whichever market(s) an individual TPM may target.

- Most TPM vendors' plans take into account a variety of factors, almost all of which have to do with the history of the company so far and result in an empiric view of the world.

    - "Our business is servicing X products because that is how we started."

    - "A marketing campaign is out of the question--we have a lot of problems to solve before we start that."

    - "We cannot consider acquisitions--we don't have the money."

    - "Our plan is simple--reach December 1986 in one piece."

- Being successful demands a more open and aggressive posture and the ability to divert management's attention from day-to-day operations to examine the road ahead. This is often very difficult in view of everyday pressures, but it is a necessary ingredient for survival in the 1990s.

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B.   PREPARING FOR THE 1990s

- It is INPUT's experience that many TPMs of all sizes do not have a strategy. There is no substitute for this, and an operational budget does not offer a guideline to key decisions that must be made on an ongoing basis (see Exhibit VII-1). The key ingredients to a strategy include:

    - A statement of the role the company fulfills (or intends to fulfill) in the marketplace.

    - A guideline for growth, either related to a market share, the competition, or a simple annual revenue growth percentage.

    - A list of the product categories and services that will be (are) offered, and to which end-user or manufacturer community the services are directed.

    - An outline of the manner in which the company intends to achieve the above, or what distinguishes the company from the competition.

- The second aspect of the plan for the 1990s must include an examination of how the service offerings provided by the TPM can be integrated into a meaningful and homogenous service. This applies to pricing and contracts, documentation and training, and sales and marketing, as well as to the services themselves. The goal is to present to the user/customer a unified image of related services and to allow painless expansion of the current customer base into other services.

- In the process of trying to integrate service offerings, it will become apparent to the TPM where areas of incompatibility exist and if adjustments need to be made. Integration is not an easy process and may require some painful compromises within the TPM organization.

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EXHIBIT VII-1

- 95 -

PREPARING FOR THE 1990s

- Have a Strategy!

- Integrate Service Offerings

- Control Costs Constantly

- Review Market Intelligence Regularly and Act on It

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- The third area of activity is cost control. It must be the TPM management's constant preoccupation, with ongoing programs in place that are regularly reviewed. One aspect of cost control is the "do or buy" decision--if a particular activity can be executed better and/or more cheaply by subcontracting the activity, then either a cost containment/reduction program must be implemented to reduce costs to within 10% of the outside supplier's price or the outside supplier should be used. This approach will reveal how far some cost containment programs have to go.

- Lastly, market intelligence or data on products, services, sales approaches, growth rates, etc. of the competition and the marketplace in general needs to be gathered on an ongoing basis and regularly reviewed. There should be a formal process to this evaluation; i.e., it should not be based on rumor or unsubstantiated fact.

- Having gathered the data, evaluated its implication for the business, and reviewed the options open, action must be taken. Too frequently, much time is dedicated to talking about the market, the competition, and internal progress without any adjustments being made to the way in which the TPM conducts business. Clearly, if this is the case, the success of the TPM in the 1990s is in doubt--no vendor can operate in a vacuum.

- The key word in the foregoing discussions has been "ongoing." Planning and strategic analysis, service integration, cost control, and market intelligence are not one-shot activities. They are frequently regarded as of secondary importance, however, in the rush to compete, grow, and adapt to the TPM market's ever-changing needs.

- "Preparing for the 1990s" could therefore be more accurately "preparing for the next five years"--a permanent part of management's responsibilities.

C.   BUILDING A TPM BASE

- There are four components to the main preoccupation of the average TPM--building a TPM customer base. Those four components are as follows:

    - Hanging on to the customers already captured (against attrition, competition, and the manufacturers).

    - Leveraging the skills and capabilities already acquired.

    - Seeking out and selecting the highest potential growth areas that correspond to those skills.

    - Acquiring existing operations that match a need in manpower, type of customer, service capability, or geographic coverage (see Exhibit VII-2).

- To begin with, hanging onto the existing customer base is becoming more and more difficult. Not only are the manufacturers becoming more aggressive in attempting to recapture their own equipment base and not only is the competition more fierce, but end-user expectations are constantly rising. Dissatisfaction levels are therefore difficult to keep at a manageable level.

- There is no substitute, of course, for good quality service, but it is advisable to have the customer base on long-term contracts where possible. This is not only a benefit to the TPM, but also to the customers. Customers do not like having to renew contracts and legally verify conditions on services for which they are satisfied.

- A compromise is the automatically renewable contract with price increases scheduled at regular intervals. Providing the customer remains satisfied, this "open-ended" contract need not be modified for many years.

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EXHIBIT VII-2

BUILDING A TPM BASE

- **Acquisitions Are a Fundamental Necessity for Growing:**

    - Geographic/Service Coverage

    - Skilled Manpower Pool

    - Customer Base

    - Revenue Volume

- **Emphasize Long-Term Contracts/Automatic Renewals**

- **Invest in On-Going Marketing Program**

- **Focus on Growth Targets**

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- Much of the growth that the top 20 TPM vendors are expected to achieve over the next five years will be due to acquisitions of other TPMs. In the last 12 months, 6 of the top 10 vendors made significant acquisitions, most well focused and directly in line with the overall strategic direction of the vendor.

- For example, one of the markets that Control Data targets is the DEC market, and the company made two DEC-related acquisitions--Total Tec and Computer Marketing Association. Others were more opportunistic.

  - Grumman Data acquired Computer Systems Support.

  - McDonnel Douglas acquired Tymshare and merged its TPM activities with those of Microdata, another McDonnell Douglas subsidiary.

  - ADP acquired MTTR, itself a spinoff from GTE's financial services network maintenance group.

  - First Data Resources, fresh from its acquisition by Indeserve, acquired the POS/office system service activities of ATV Systems.

- There is no doubt that well-managed and carefully selected acquisitions are the quickest route to growth. In the information services marketplace, ADP has demonstrated by over 60 acquisitions that it is possible to grow from $1 million to $1 billion in just 30 years. Already a measure of concentration has been achieved in the TPM market by the same cause--the top five vendors accounted for over 50% of the market in 1985. Clearly, acquisitions must be a part of the plan for every TPM who is serious about being a success in the 1990s.

- Lastly, it is important to make the necessary investment in ongoing marketing programs--as much as 7% of revenue ought to be spent on marketing and certainly no less than 3%. Sadly, the average TPM falls far short of this

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guideline. The success of the marketing program is, however, dependent on the TPM's ability to select growth targets compatible with his particular company's skills. This will be examined later in this chapter.

D. COMPETING WITH THE MANUFACTURERS

• It is now an established fact of life for every TPM that much of the competition now and in the future will come from product manufacturers. This is a significant, new, and widespread development that can only be expected to increase in the long run. Given the enormous resources that the average manufacturer has (compared with the average TPM), how can TPMs hope to compete?

• The answer is "on the whole, quite well." How? By doing those things that the manufacturers have always found difficult to achieve.

    - Being flexible toward customers.

    - Focusing on niche markets, particularly application-specific niches.

    - Selling solutions, not services.

    - Keeping overheads down, margins reasonable, and prices down.

• In order to become "solution-specific," each TPM must rapidly focus its efforts on those market niches that form the core of its business and develop unique capabilities adapted to those needs. This means, starting from the top, focusing on market intelligence gathering, executing niche analysis, and determining where the best "fit" of niche application needs, growth opportunity, and company capabilities exists. Satisfying such specific needs may require going outside the realm of current services.

- 100 -

- One useful method of tracking the company's progress against the manufacturers is to establish "score cards" which itemize the competitive elements of the TPM markets targeted and then show the manufacturer(s) and the TPM(s) that are the dominant forces in that market. The regular evaluation of the score cards should ideally be done by an independent third party.

- Exhibit VII-3 summarizes the main points of this section.

E.   FOCUS ON GROWTH TARGETS

- Obviously, it is easier to "grow" a company when the market it is targeting is growing as well, so it is relevant at this point to ask which are the fastest growing markets.

- Exhibit VII-4 lists by size of TPM revenue addition (i.e., new service dollars added to the marketplace between 1985 and 1990) the growth markets. For example, between 1985 and 1990, $714 million of new revenue will be generated by the personal computer market, which will be growing at a 22% average yearly rate during that period.

- Clearly, personal computers represent a significant opportunity for TPMs, but as INPUT explained in the 1984 TPM market study, Volume I, this market also represents some significant dangers to all vendors:

    - The annual service price of the average business PC has continued to drop over the last two years by an average of 22% per year.

    - The wide variety of PC configurations that must be supported, even within a single brand name, is a deterrent to good parts inventory control and low cost overheads.

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EXHIBIT VII-3

COMPETING WITH THE MANUFACTURERS

- Focus Market Intelligence

- Execute Niche Analysis

- Establish and Update "Score Cards"

- Emphasize Quality, not Price (But Price Aggressively)

- Offer Flexibility and Solution Selling

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EXHIBIT VII-4

FOCUS ON TPM GROWTH TARGETS

PRODUCT CATEGORY	1985-1990, TPM REVENUE ADDITION ($ Millions)	AAGR for 1985-1990 (Percent)
PCs	$ 714	22%
Telecommunications	320	28
Leasing	240	11
Terminals	227	22
Minis	206	16
Fourth-Party Maintenance	150	26
Peripherals	125	9
Software Support	122	91

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- Being the largest single TPM market, it will become the target for the manufacturers in the years to come, and thus the most competitive of all markets.

- TPM profit margins are already wafer thin in this market, and the outlook is for more of the same.

- Telecommunications TPM, on the other hand, is a rapidly developing, reasonable margin, strategic market that does not suffer from heavy manufacturer competition. (The market has strategic value since once the network service is in the hands of the TPM, he may pursue the service of connected equipment as well.) At a 28% per annum growth rate, the market can accommodate several large TPMs confortably (the $320 million of new revenue that will be generated between 1985 and 1990 represents approximately one and one-half of TRW's). Few vendors have focused on this market as yet--the one exception being Bell & Howell--including Tymshare, FDR, and ADP, who are logical candidates for this market.

- Leasing is not a maintenance market, but is definitely a service opportunity. Like any of the other markets listed in Exhibit VII-4, it is a very specialized undertaking, but one that marries itself well with maintenance.

- The terminals market, although very well established, continues to flourish. The 22% average annual growth rate is among the faster growth rates of major markets. It is a natural market for those who pursue the personal computer TPM market and vice versa.

- The minicomputer TPM market is becoming more difficult--competition is increasing, the manufacturers are waking up to its potential, and the users are increasingly demanding sole-source service. This explains the slow (16%) growth rate expected and the relatively small revenue addition betwen 1985 and 1990.

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- Fourth-party maintenance will no doubt surprise many in the coming five-year period. It is a high margin, low competition activity which has yet to be fully exploited. Competition will increase as the visibility of the market increases, but for the moment it is an interesting secondary market.

- Software support, on a negligible 1985 base, will grow the fastest of all TPM activities between 1985 and 1990. INPUT expects it to be the third largest TPM market by 1995. Few vendors have attempted to define and serve it as yet, but the end user may force them to shortly.

F.   LEVERAGING A QUALITY IMAGE

- As the saying goes, an ounce of image is worth a pound of performance. Well, not quite, but it is certain that an image is just as difficult to acquire as it is to destroy. Once established, an image can be leveraged into higher profit and growth (see Exhibit VII-5).

- Some images have been created without the help of marketing. An example is Hewlett-Packard's image of reliability and quality, much of which has been deserved but which was never touted until recent years, well after the products had spoken for themselves.

- Nevertheless, it is essential for a TPM to establish an image related to a particular kind of service, product brand(s) supported, capability mix, etc., so that the market can identify and pigeonhole the vendor. Being the largest of a nondescript group of general vendors is not an easy image to promote. Being the quality supplier in any market, no matter how small, is.

- The benefit of a clean market image is that it enables the TPM to upgrade two important things:

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LEVERAGING A QUALITY IMAGE

- Establish Image for Responsiveness and Quality Service

- Market the Image Heavily

- Target Up-Market Customers

- Price Up-Market

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- The type and quality of the customers targeted. "We are the best at what we do and large/important companies like you deserve the best."

- The prices charged for the services rendered. "Yes, we are slightly more expensive, but then, quality always is."

- The net result of both of these steps is higher proft and higher growth while improving the ratio of sales and lowering the competition--all very desirable results. Certainly, no leading TPM in the 1990s can survive without a quality image, while the leverage potential of a TPM who has one is enormous.

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APPENDIX A: TOP 100 TPM VENDOR LIST

APPENDIX A: TOP 100 TPM VENDOR LIST

A. TOP 20 TPM VENDORS

- TRW
- Sorbus
- Control Data Corporation
- RCA Services Company
- General Electric Company
- Bell & Howell Service Company
- Grumman Systems Support Corporation
- McDonnell Douglas Field Service Company
- First Data Resources Service Company
- Total Technical Services
- Xerox Corporation
- DataServ Computer Maintenance
- Computer Maintenance and Leasing Corporation
- Decision Data Service Inc.
- Dow Jones & Company
- ADP Financial Services Group
- Kalbro Corporation
- Systec, Inc.
- The Braegen Corporation
- Sperry Corporation

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B.   TPM VENDORS 21-100 (ALPHABETICALLY LISTED)

- AFI/Datatrol
- ASJ Support Services
- Arrow Electronics Inc.
- Business Equipment & Supply Company
- C&L Terminals, Inc.
- Cap-Info Systems Inc.
- Carterfone Communications Corporation
- Central Computer Services Corporation
- Circle Computer Services, Inc.
- Circuit Test Inc.
- Computer Board Repair Depot
- The Computer Factory, Inc.
- Computer Hardware Maintenance Company, Inc.
- Computer Hardware Service Company
- Computer Maintenance Corporation
- Computer Repair Center, The
- Computer Sales & Service Corporation
- Computer Task Group, Inc.
- Custom Computer Specialist Inc.
- Data Access Systems, Inc.
- Data Card Corporation
- Data Collection Systems, Inc.
- Data Entry, Inc.
- Data Systems Services
- The David Jamison Carlyle Corporation
- Delta Data Systems Corporation
- E.F. Industries
- E.O. Data
- Eaton Corporation
- Electronic Engineering Company

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- Fisher Scientific Company
- Formation, Inc.
- General Diagnostics, Inc.
- General Instrument Corporation
- Gentry Associates, Inc.
- Granada Data Systems
- Greyhound Capital Corporation
- Haltronics Corporation
- Hanson Data Systems, Inc.
- Healthdyne Products Service Group
- Honeywell
- Inacomp Computer Centers, Inc.
- Integrated Automation, Inc.
- Integration Systems Group, Inc.
- Logical Solutions Company, Inc.
- Loonam Computer Products
- M/A-Com Alanthus Data, Inc.
- MSC Computer Stores
- MSI Data Corporation
- Magnetic Recovery Technologies, Inc.
- McIntyre's Minicomputer
- Moore Business Systems
- Mosler/American Standard
- NCR Corporation
- National Advanced Systems
- National Computer Communications
- National Computer Systems
- Precision Methods, Inc.
- Pritronix, Inc.
- R&M Associates
- Radian Corporation
- Reynolds and Reynolds
- Ricoh Corporation

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- S&S Electronics
- Scopus Corporation
- Serviceland, Inc.
- Servitech, Inc.
- Shields Business Machines, Inc.
- Sirius Computer
- Systems Industries
- 3M/Equipment Service Support Division
- Tel-Tex
- Terminals Unlimited Inc.
- Three Delta Corporation
- URS Corporation
- Ultimate Computer Services
- United Computer Systems, Inc.
- Unitrace, Inc.
- W.A. Brown Instruments, Inc.
- William Marion Company

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APPENDIX B: DEFINITIONS

APPENDIX B: 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 resouces to solve a support-related problem.

- DOCUMENTATION - All manuals, newsletters, and text designed to serve as reference material for the ongoing operation 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 followup to ECNs which include 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.

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- 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 computer whose basic element is a single integrated circuit with a limited basic instruction set.

- MINICOMPUTER - See Small System.

- OPERATING SYSTEM SOFTWARE (SYSTEMS SOFTWARE) - Software that enables the computer system to perform basic functions. Systems software,

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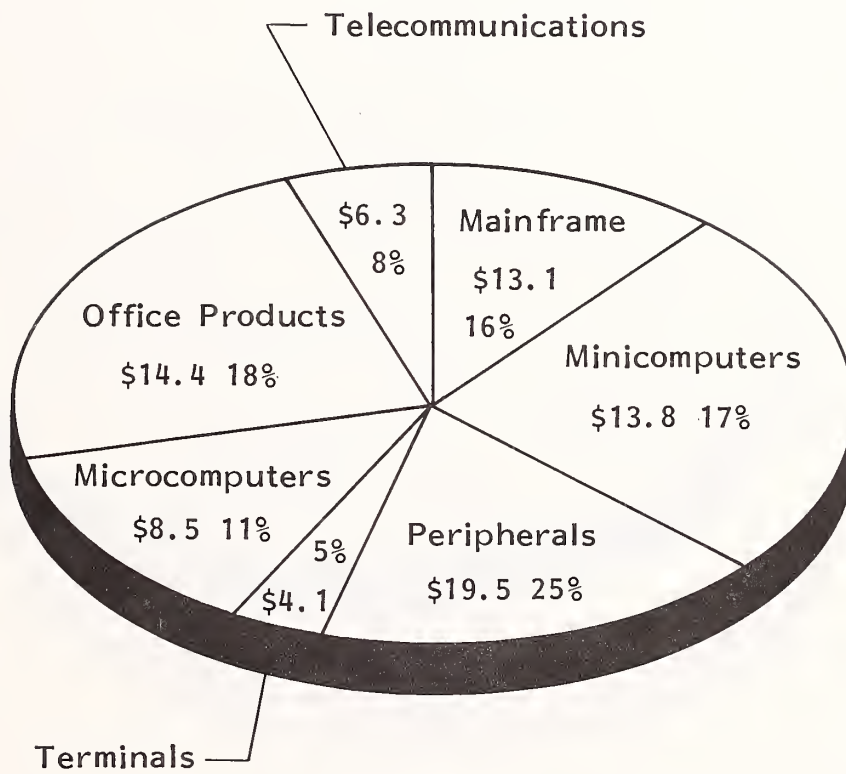for the purposes of this report, does not include utilities or program development tools.

- <u>PERIPHERALS</u> - 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.

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

- <u>PLUG-COMPATIBLE MAINFRAME (PCM)</u> - 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.

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

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

- <u>SOFTWARE ENGINEER (SE)</u> - 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.

- <u>SOFTWARE PRODUCTS</u> - 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.

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- <u>SUPERMINICOMPUTER</u> - See Small System.

- <u>SYSTEM INTERRUPTION</u> - Any system downtime requiring an Initial Program Load (IPL).

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

- <u>THIRD-PARTY MAINTENANCE (TPM)</u> - The provision of maintenance and support services for other manufacturers' products.

- <u>TRAINING</u> - 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.

- <u>TURNKEY SYSTEM</u> - Composed of hardware and software integrated into a total system designed to fulfill the processing requirements of a single application completely.
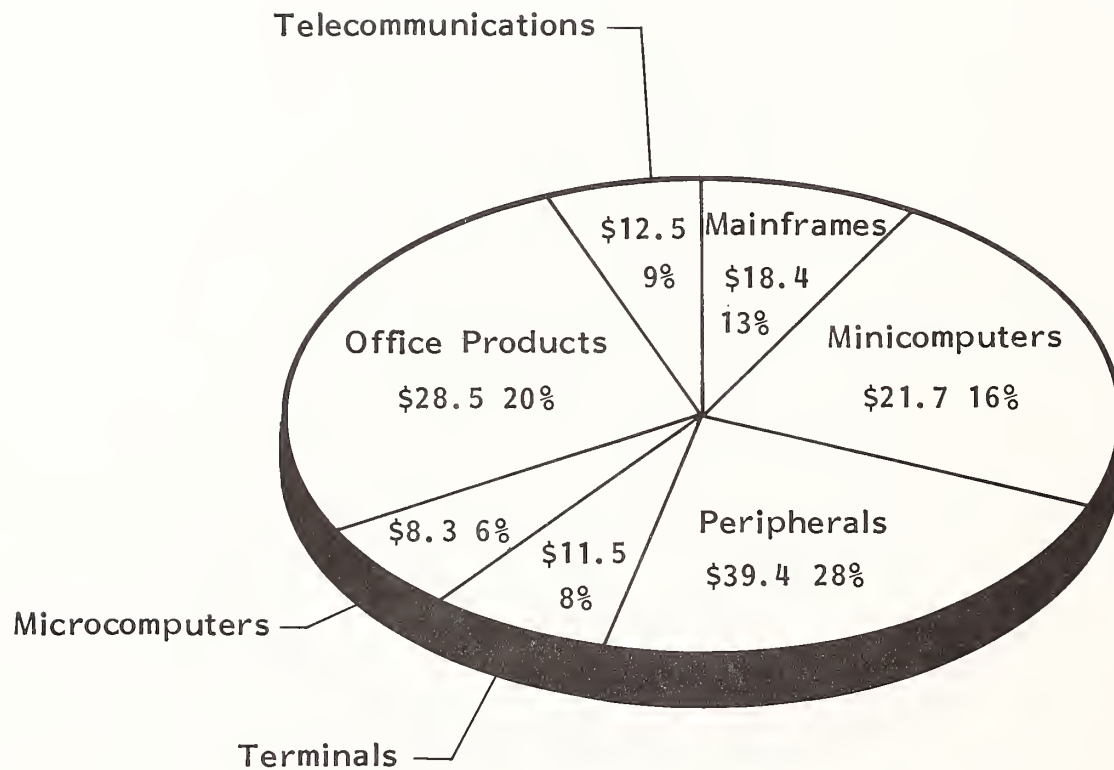
APPENDIX C: DATA BASE

EXHIBIT C-1

1985 EQUIPMENT SHIPMENTS

Total Shipments in 1985 = $79.7 Billion

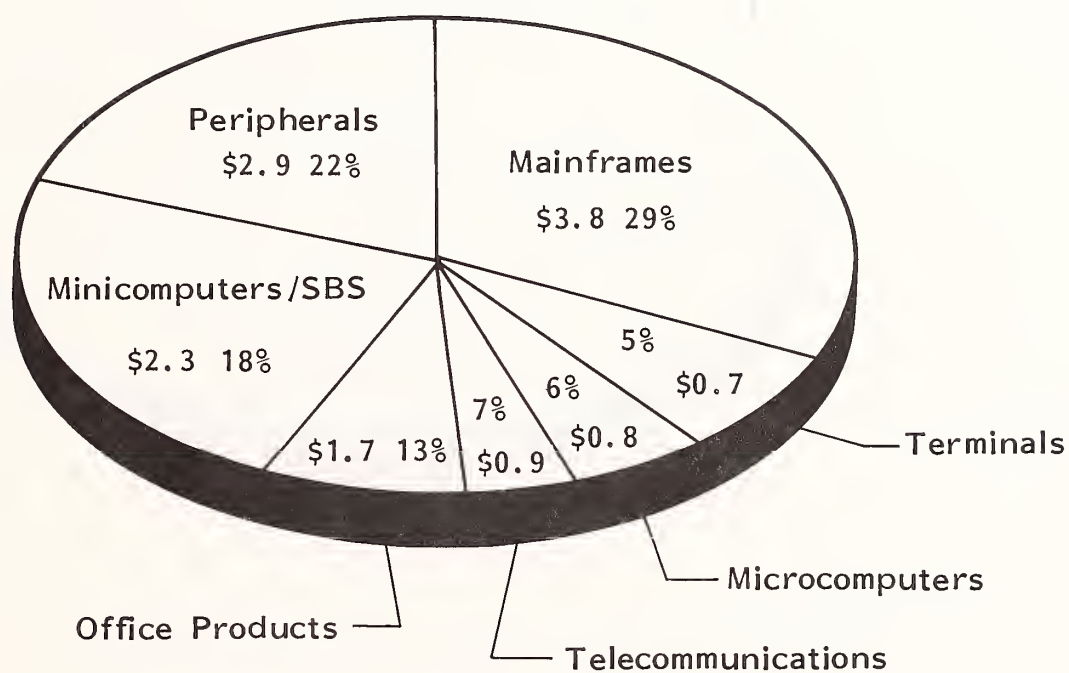EXHIBIT C-2

1990 EQUIPMENT SHIPMENTS

Telecommunications

$12.5 9%

Mainframes $18.4 13%

Office Products $28.5 20%

Minicomputers $21.7 16%

$8.3 6%

$11.5 8%

Peripherals $39.4 28%

Microcomputers

Terminals

Total Shipments in 1990 = $140.3 Billion

1985-1990 AAGR = 12.0%

INPL
FMA4
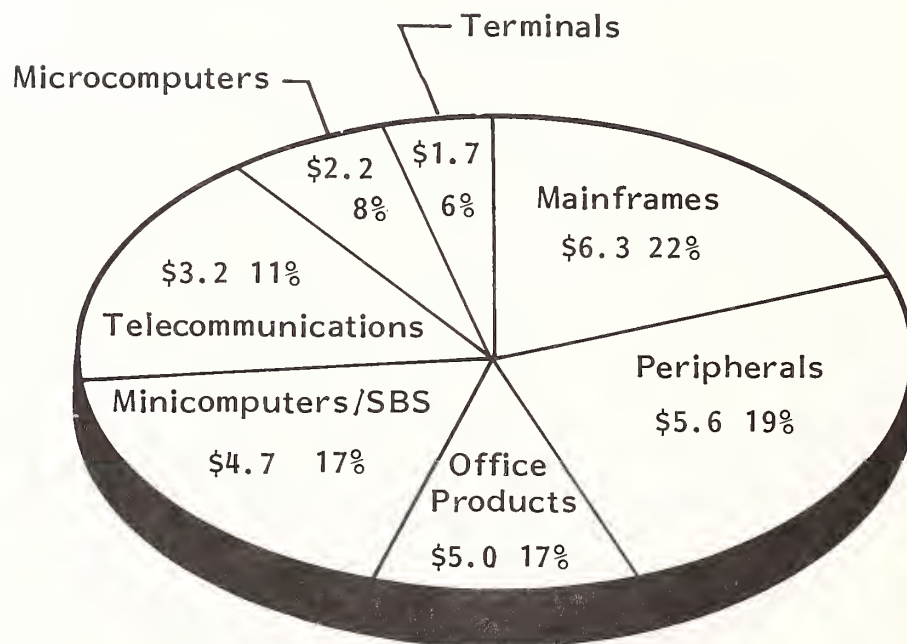
EXHIBIT C-3

INPUT

1985 U.S. CUSTOMER SERVICE USER EXPENDITURES
(Billions)

Total U.S. Service User Expenditures in 1985 = $13.1 Billion

INPUT
FMA4

EXHIBIT C-4

1990 U.S. CUSTOMER SERVICE USER EXPENDITURES
(Billions)

Total U.S. Service User Expenditures in 1990 = $28.7 Billion
1985-1990 AAGR = 17%