USER SERVICE REQUIREMENTS - SMALL SYSTEMS



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USER SERVICE REQUIREMENTS-SMALL SYSTEMS

MAY 1984



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# I INTRODUCTION

### I INTRODUCTION

- This report on the customer service requirements of small-system users is produced by INPUT as a part of the 1984 Customer Service Program in the U.S. for clients of that program.
- The objective of this report is two-fold. First, it will identify and measure small-system user needs and desires for post-sales support supplied by the vendor; secondly, it will explore new sources of revenue growth exposed by user responses.
- In addition, the report analyzes the effects of third-party maintenance and single-source service on the competitiveness of customer support.
- INPUT has scheduled the user requirement series of reports as the first deliverables of the program.

### A. DEMOGRAPHICS

• A total of 386 small-system users were surveyed by telephone during the months of February and March 1984. Exhibit I-I compares the user sample (broken down by vendor) with the 1983 user sample, indicating a 13% increase in sample size.

#### EXHIBIT I-1

	SMALL-SYSTEM USERS SURVEYED: 1984	SMALL-SYSTEM USERS SURVEYED: 1983
Burroughs	34	30
Computervision	15	19
Data General	43	30
Datapoint	23	20
Digital Equipment Corp.	44	31
Four-Phase	20	20 -
Hewlett-Packard	40	20
Honeywell	27	30
IBM	53	40
Intergraph	11	20
MDS/Qantel	19	- *
NCR	15	21
Perkin-Elmer	10	20†
Prime	21	20
Texas Instruments	11	20
Total	386	341 ‡

#### SMALL-SYSTEM USER SAMPLE BY VENDOR

Notes:

\* Not included in 1983 Small-Systems Report.

† Included in 1983 Large-Systems Report.

\* Other users surveyed in 1983 included Autotrol (21 users).

- Exhibit I-2 provides an industry breakdown of the user sample.
- The titles of users surveyed were as follows:

-	President/Vice President/Owner	33
-	Director	12
-	Data processing manager	213
-	Operations manager	67
-	Systems analyst/Programmer	51
-	Other	10
		386

### B. METHODOLOGY

- The basis for this report was the interview form presented in Appendix B. Results of the survey were entered and stored in a dBASE II data base and analyzed using the statistical package ABSTAT.
- Approximately one-third of the respondents were also surveyed in 1983 in an attempt to discover the effect of time on user requirements and satisfaction levels.
- In order to assure complete and accurate responses, all surveyed users were assured of complete company confidentiality. All demographic information has been removed from the survey results in order to assure that no individual company or respondent can be associated with a survey response.
- Appendix A contains a more in-depth description of the structure of the data base and methodology used in analysis.

### EXHIBIT I-2

### SMALL-SYSTEM USER SAMPLE BY INDUSTRY SECTOR

INDUSTRY SECTOR	USERS SURVEYED
Process Manufacturing	62
Discrete Manufacturing	110
Transportation	2
Utilities	5
Banking and Finance	46
Insurance	12
Medical	10
Education	10
Retail	13
Wholesale	20
Federal Government	3
State and Local Government	27
Services	58
Other	8
Total	386

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# II EXECUTIVE SUMMARY

### II EXECUTIVE SUMMARY

### A. INTRODUCTION

- In the past, field service performance has been measured by the field service organization's ability to meet established response and repair time objectives. Field service was viewed as a necessary expense for most vendors and was often performed as such. This approach has been drastically modified over the last three years with the role of field service (predominantly maintenance oriented) widened to encompass <u>customer service</u> (predominantly support oriented).
- The increased competitiveness of the market has transformed customer service from an expense center to a profit center, which has spurred vendors to explore new service offerings and support techniques in order to maximize revenue opportunities. This has not been lost on the users, who have begun to expect more and better service from their vendors.
- In 1983 INPUT presented the total service concept, which outlined 14 postsale service components in which users' needs were analyzed versus the level of service that they received from their vendors. In that year, small-system users reported general satisfaction with a number of service areas; however, improvements were necessary in such areas as documentation, training, and hardware maintenance. These service areas were presented as targets for improved service and increased revenue potential.

• This year's user requirements report narrows the list of user requirements to 10 and concentrates on defining where and how each vendor's service/support efforts should be concentrated.

### B. SYSTEM AVAILABILITY

- Vendors' service performance is judged by the degree to which vendors satisfy user response and repair time requirements, the key components that make up the small-system users' system availability requirements. These are of vital concern to the user, as indicated in Exhibit II-1. The overriding importance of system availability is leading many small-system vendors to offer contracted uptime guarantees to their users. Maintenance pricing (which becomes a highly visible part of a small-system user's EDP budget after completion of the equipment purchase) is the least important factor prior to purchase.
- There is a wide range of response and repair times required and received by small-system users, as shown in Exhibit II-2. The total hardware service "turnaround" time required by users is satisfied by only half the small-systems vendors. A major contributor to the failure of many vendors to meet their users' "turnaround" requirements is a much slower than required response time, for both hardware maintenance and software support. INPUT found that small-systems vendors' hardware response time was 38% slower than their user's requirements and that small-systems vendors' software response time was 64% slower.
- Not coincidentally, there is a strong correlation between vendor responsiveness and the users' overall service image of the vendor. Exhibit II-3 demonstrates that vendors with the slowest combined response and repair times also received the lowest overall service image ratings from their users.

### EXHIBIT II-1

### IMPORTANCE OF MAINTENANCE FACTORS IN SMALL-SYSTEM PURCHASE DECISIONS



Rating: 1 = Low, 10 = High







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#### EXHIBIT II-2 (Cont.)

### TOTAL HARDWARE MAINTENANCE TURNAROUND TIME



Classification is by total actual turnaround time

Continued



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#### EXHIBIT II-2 (Cont.)



#### TOTAL HARDWARE MAINTENANCE TURNAROUND TIME

Note: Classification is by total actual turnaround time

#### EXHIBIT II-3

#### OVERALL SERVICE IMAGE OF VENDOR



All Small-Systems Average

Rating: 1 = Low, 10 = High

- INPUT recommends that vendors establish response time targets for both hardware and software that include all components of downtime, as perceived by users, including repair time and recovery time.
- Specific actions necessary include the development of an automated dispatching and fault-tracking system that is operated on a regional scale. Included within this system should be parts distribution and site historical data in order to fully coordinate all facets of service implementation.

### C. DEVELOPMENT OF POST-SALES SUPPORT

- It is not enough to consider customer service effectiveness solely on the basis of achievement of contractual performance guidelines. Vendors need to incorporate all components of post-sales support into a coordinated and efficient service profile.
- The first step for service organizations is the definition of user requirements in each of these service areas. As shown in Exhibit II-4, many users interviewed by INPUT reported receiving extremely high service levels in some service areas, such as planning, sales of supplies, and add-on sales, while receiving very low service levels in the more important service areas.
- By better defining each user's service requirements, vendors can redirect service resources toward satisfying high-priority service needs, especially in the key areas of hardware maintenance, software support, and documentation, while still providing satisfactory service levels in other service areas.

#### EXHIBIT II-4

#### SMALL-SYSTEM USER SERVICE SATISFACTION



\* Users rated requirements over 7.0

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### D. REVENUE OPPORTUNITIES IN CUSTOMER SERVICE

- Customer service operations must satisfy two basic needs: they must provide maintenance and support that satisfies user requirements at an acceptable price, and they must provide revenue growth for the vendor. Service managers are aware that, although users consider service performance before service prices, users still are price sensitive when product prices drop at the same time that product performance reliability continues to rise. This forces the customer service manager to find new, alternative ways to increase service revenue while avoiding drastic price increases for basic maintenance.
- One such way is the development of a more complete service offering one that includes many options and delivery modes that allow the user to pick and choose how much support is needed. Users are willing to pay for increased services, such as guaranteed response time and preventive maintenance, if they feel that these services will increase the system availability that they receive.
- Also, users see the advantages of increased user involvement that is accompanied by an appropriate discount. One such service offering that is favored by users is telephone support centers. Increased user involvement not only will increase user satisfaction with service (in part by bringing the user into the service process), but also will cut costs for the vendor by eliminating onsite service visits for minor difficulties and no-fault-found calls.
- Lastly, there is great revenue potential in the development of a single-source maintenance program. The benefits of such a move are numerous. A singlesource maintenance program:
  - Satisfies the users' need for a single source of service, eliminates problems in fault determination, and reduces the problems in dispatching and billing.

- Opens up a larger user base to service.
- Locks in current users by providing service of all equipment at their site.

III VENDOR PERFORMANCE ANALYSIS

### III VENDOR PERFORMANCE ANALYSIS

#### A. INTRODUCTION

- The following analyses are based on the definition of small-system user service level requirements for each post-sale support component versus the service level received. Since these requirement levels may vary from vendor to vendor, they do not directly allow comparison from vendor to vendor. However, the percentage of each vendor's users whose service requirements are met by the vendor can be used for comparison.
- Each vendor's performance analysis begins with a definition of the user's average service level requirements versus the service actually received from the vendor. These levels give not only a sense of the quality of service received versus what is required, but also an indication of how important each group of users feels that particular service is.
- In some cases, a service level that is much greater than the level required can be considered a problem, especially when much more needed service is being left unsatisfied. In these cases a redirection of resources should be made in order to bring a more complete overall satisfaction with service.
- Each vendor's performance is also analyzed by the percentage of users who are satisfied by the service level that they receive. In this respect, user requirements versus service received are analyzed on a case-by-case basis, showing a true picture of the overall satisfaction that exists.

• In addition to the individual vendor's performance analyses, an analysis of the entire small-system user sample is presented in order to provide an industry standard.

### B. OVERALL SMALL-SYSTEM USER ANALYSIS

- The survey results for all small-system users are presented in Exhibits III-1 through III-3.
- Exhibit III-1 compares the average level of service required in the 10 service component areas to the level of service received by all small-system users.
- Users report that in certain service areas, such as planning, consulting, sales of supplies, site audits, and relocation/deinstallation, the level received is much higher than the level required.
- Of greater concern should be the lower-than-required service level of hardware maintenance, software support, and documentation, continuing a trend first reported in the 1983 Small-System User Requirements reports.
- Exhibit III-2 graphically represents the combined vendor performance versus the service level requirements of the users. Optimum performance levels are represented by placement within the gradient line above and below the satisfaction line. Obviously, as the service level requirement increases, the importance of meeting or bettering the service requirement level increases.
- Exhibit III-3 presents the percentage of users satisfied and dissatisfied with the level of service received. Again, the areas of greatest concern include hardware maintenance, documentation (both with 52% dissatisfied), and software support (with 54% dissatisfied).

### EXHIBIT III-1

# USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED ALL SMALL-SYSTEM VENDORS

	MEAN SERVICE LEVEL	
SERVICE PROVIDED	REQUIRED	RECEIVED
Planning	5.0	7.1
Consulting	5.1	6.8
Documentation	6.9	6.7
Training	5.8	6.8
Sales of Supplies	4.4	6.8
Add-On Sales	5.1	6.6
Site Audits	3.6	5.8
Relocation/ Deinstallation	4.3	6.8
Hardware Maintenance	8.9	8.1
Software Support	7.2	6.8

Rating: 1 = Low, 10 = High



### USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED ALL SMALL-SYSTEM VENDORS



Rating: 1 = Low, 10 = High
## USER SATISFACTION LEVELS ALL SMALL-SYSTEMS VENDORS

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	79.48	20.6%	267
Consulting	71.1	28.9	275
Documentation	48.4	51.6	326
Training	58.1	41.9	299
Sales of Supplies	82.2	17.8	248
Add-On Sales	71.9	28.1	266
Site Audits	73.1	26.9	188
Relocation / Deinstallation	80.2	19.8	201
Hardware Maintenance	47.8	52.2	372
Software Support	45.7	54.3	276

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#### C. BURROUGHS PERFORMANCE ANALYSIS

- Burroughs products pertaining to this survey included the B80, B90, B93, B800, and B900 systems.
- Burroughs service performance, as reported by its users, was lower than the overall small-system levels. Areas of concern included software support, documentation, and training. Almost 70% of the users were dissatisfied with the software support they received, indicating an immediate need for improvement.
- Hardware maintenance was found satisfactory by over 57% of the Burroughs users, which is surprising compared to the low average level of service received, indicated by Exhibit III-4.
- Exhibits III-4 through III-6 provide complete Burroughs results.

#### D. COMPUTERVISION PERFORMANCE ANALYSIS

- The Computervision sample was comprised entirely of the Designer series.
- According to Exhibits III-7 through III-9, Computervision does a commendable job in satisfying its users' requirements in all areas except software support and documentation. Even in hardware maintenance, where Computervision users report a high requirement level, Computervision managed to satisfy onehalf of its users.
- Computervision excells in the areas of consulting and site audits, which are important areas to CAD/CAM users.

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: BURROUGHS

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	5.1	6.7	
Consulting	5.1	5.9	
Documentation	6.4	5.6	
Training	6.5	6.4	
Sales of Supplies	4.9	6.9	
Add-On Sales	4.8	5.9	
Site Audits	4.1	4.2	
Relocation/ Deinstallation	4.0	6.4	
Hardware Maintenance	8.5	7.9	
Software Support	7.6	6.1	

Rating: 1 = Low, 10 = High



## USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: BURROUGHS



Rating: 1 = Low, 10 = High

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#### USER SATISFACTION LEVELS

#### VENDOR: BURROUGHS

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	65.6%	34.4%	32
Consulting	48.4	51.6	31
Documentation	36.4	63.6	33
Training	56.3	43.7	32
Sales of Supplies	75.8	24.2	33
Add-On Sales	54.5	45.5	33
Site Audits	40.9	59.1	22
Relocation / Deinstallation	50.0	50.0	16
Hardware Maintenance	57.6	42.4	33
Software Support	30.4	69.6	23

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## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: COMPUTERVISION

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	5.6	6.5	
Consulting	5.3	6.5	
Documentation	6.9	6.1	
Training	7.0	7.8	
Sales of Supplies	4.6	6.6	
Add-On Sales	5.7	6.6	
Site Audits	5.3	6.7	
Relocation/ Deinstallation	5.5	6.7	
Hardware Maintenance	8.9	8.0	
Software Support	8.1	6.1	

Rating: 1 = Low, 10 = High

## USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: COMPUTERVISION



Rating: 1 = Low, 10 = High

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RECEIVED

## USER SATISFACTION LEVELS VENDOR: COMPUTERVISION

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	54.5%	45.5%	11
Consulting	66.7	33.3	9
Documentation	41.7	58.3	12
Training	71.4	28.6	14
Sales of Supplies	77.8	22.2	9
Add-On Sales	58.3	41.7	12
Site Audits	90.0	10.0	10
Relocation / Deinstallation	75.0	25.0	8
Hardwâre Maintenance	50.0	50.0	14
Software Support	46.7	53.3	15

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• Documentation and software support should be of primary concern, however, considering the sophistication of the product.

#### E. DATA GENERAL PERFORMANCE ANALYSIS

- Data General equipment pertaining to this survey included the Eclipse and NOVA series systems.
- Exhibits III-10 through III-12 indicate a high degree of satisfaction reported by Data General small-system users. Data General came close or satisfied a large percentage of users' requirements in all areas including hardware maintenance and documentation.
- A surprisingly large number (almost 58%) of Data General users were dissatisfied with the service level that they received in the area of site audits. This conflicts, though, with the Data General requirements versus received service levels.
- Data General was one of the few vendors that satisfied users' requirements for documentation services. Not coincidentally, the users also report general satisfaction with their software support.

#### F. DATAPOINT PERFORMANCE ANALYSIS

- All Datapoint equipment pertaining to this survey was 6600 systems.
- Datapoint users reported relatively low service requirements in all areas except hardware maintenance. This led to a very high service satisfaction rating in all areas. Most notably, Datapoint users received satisfactory service in even the most crucial areas such as:

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: DATA GENERAL

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	4.5	7.2	
Consulting	4.8	6.9	
Documentation	6.5	6.8	
Training	4.9	6.5	
Sales of Supplies	3.3	6.2	
Add-On Sales	4.6	6.9	
Site Audits	3.6	5.5	
Relocation/ Deinstallation	3.1	6.8	
Hardware Maintenance	8.8	8.0	
Software Support	6.5	6.6	

Rating: 1 = Low, 10 = High

#### USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: DATA GENERAL



Rating: 1 = Low, 10 = High

RECEIVED

#### USER SATISFACTION LEVELS

#### VENDOR: DATA GENERAL

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	73.9%	26.1%	23
Consulting	82.1	17.9	28
Documentation	51.4	48.6	35
Training	69.2	30.8	39
Sales of Supplies	85.7	14.3	21
Add-On Sales	60.0	40.0	25
. Site Audits	42.1	57.9	19
Relocation / Deinstallation	80.0	20.0	15
Hardware Maintenance	48.8	51.2	41
Software Support	46.7	53.3	30

- Hardware maintenance, with nearly 70% satisfied with service received.
- Software support, with over 73% of the users receiving a level of service equal to or greater than requirements.
- Documentation, with just under 70% of the users satisfied.
- The overall service picture, as a result, is quite good at Datapoint. Even as user expectations for service start to rise, the level of service provided is high enough to continue satisfying users.
- Exhibits III-13 through III-15 provide complete Datapoint user responses.

#### G. DIGITAL EQUIPMENT CORPORATION PERFORMANCE ANALYSIS

- DEC systems pertaining to this survey included the PDP 11/34, 11/60, and 11/70.
- DEC performs well above its user requirements in most service areas notably for hardware maintenance, satisfying over 52% of their users, and for software support, satisfying almost 60% of their users.
- An area that requires attention is documentation, which falls significantly below the level required by DEC's users. This need was emphasized by a large number of users who felt that this was the one area where DEC needed improvement.
- Exhibits III-16 through III-18 provide complete DEC responses.

#### USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: DATAPOINT

·	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	2.7	6.0	
Consulting	3.6	6.2	
Documentation	5.2	5.4	
Training	4.7	5.6	
Sales of Supplies	3.5	6.1	
Add-On Sales	4.7	6.7	
Site Audits	2.6	4.6	
Relocation/ Deinstallation	3.6	6.7	
Hardware Maintenance	8.5	8.3	
Software Support	6.4	6.5	

Rating: 1 = Low, 10 = High

## USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: DATAPOINT



Rating: 1 = Low, 10 = High

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#### USER SATISFACTION LEVELS VENDOR: DATAPOINT

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	90.08	10.08	10
Consulting	84.6	15.4	13
Documentation	68.8	31.2	16
Training	61.5	38.5	13
Sales of Supplies	78.6	21.4	14
Add-On Sales	81.3	18.7	16
Site Audits	90.9	9.1	11
Relocation / Deinstallation	100.0	0.0	12
Hardware Maintenance	69.6	30.4	22
Software Support	73.3	26.7	13

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: DIGITAL EQUIPMENT CORPORATION

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	5.2	7.7	
Consulting	4.9	· 7.3	
Documentation	8.1	6.8	
Training	5.9	7.1	
Sales of Supplies	5.0	6.7	
Add-On Sales	4.9	5.7	
Site Audits	3.9	6.7	
Relocation/ Deinstallation	4.3	6.9	
Hardware Maintenance	8.9	8.2	
Software Support	5.9	7.5	

Rating: 1 = Low, 10 = High

## USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: DIGITAL EQUIPMENT CORPORATION



Rating: 1 = Low, 10 = High

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#### USER SATISFACTION LEVELS

#### VENDOR: DIGITAL EQUIPMENT CORPORATION

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	80.6%	19.48	31
Consulting	62.9	37.1	27
Documentation	40.5	59.5	37
Training	51.7	48.3	29
Sales of Supplies	76.5	23.5	34
Add-On Sales	70.9	29.1	31
Site Audits	82.6	17.4	23
Relocation / Deinstallation	79.2	20.8	24
Hardware Maintenance	52.5	47.5	40
Software Support	59.1	40.9	22

#### H. FOUR-PHASE PERFORMANCE ANALYSIS

- Four-Phase systems pertaining to this survey included IV/40, IV/50, IV/70, IV/80, and IV/90.
- Overall, Four-Phase service was relatively satisfactory to users; Exhibit III-21 shows that each service component satisfied a majority of Four-Phase users.
- Although a large number of Four-Phase users were satisfied with the services of documentation and training, some users reported fairly low levels of satisfaction with these services, indicating uneven service.
- Four-Phase scores particularly high in the areas of sales, of both supplies and add-on equipment.
- Exhibits III-19 through III-21 provide complete details.

#### I. HEWLETT-PACKARD PERFORMANCE ANALYSIS

- The Hewlett-Packard sample consisted entirely of HP3000 users.
- Overall, service from HP is very good, with relatively high service levels reported in all service areas.
- Software support is quite low, satisfying one-half the users surveyed.
- As with last year's survey, two problem areas exist. These areas are:
  - Hardware maintenance, with 55% of the users dissatisfied with their service.

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: FOUR-PHASE

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	6.4	6.9	
Consulting	6.4	6.5	
Documentation	7.1	6.7	
Training	6.7	6.3	
Sales of Supplies	3.2	7.4	
Add-On Sales	5.2	7.4	
Site Audits	3.8	6.3	
Relocation/ Deinstallation	6.3	7.1	
Hardware Maintenance	8.8	7.9	
Software Support	7.4	6 <b>.</b> 9	

Rating: 1 = Low, 10 = High

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## USER SATISFACTION LEVELS

#### VENDOR: FOUR-PHASE

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service <their Requirements</their 	NUMBER OF RESPONSES
Planning	76.5%	23.5%	17
Consulting	58.8	41.2	17
Documentation	72.2	27.8	18
Training	64.7	35.3	17
Sales of Supplies	85.7	14.3	7
Add-On Sales-	77.7	22.3	9
Site Audits	81.8	18.2	11 .
Relocation / Deinstallation	77.7	22.3	9
Hardware Maintenance	52.6	47.4	19
Software Support	61.5	38.5	13

- Documentation, with only 42% of the users receiving a satisfactory service level.
- HP satisfies a vast majority of their users in most of the remaining service areas, particularly in site audits (just under 92% satisfied), planning (nearly 88% satisfied), and consulting (over 83% satisfied).
- Exhibits III-22 through III-24 provide complete HP survey results.

#### J. HONEYWELL PERFORMANCE ANALYSIS

- Honeywell equipment pertaining to the survey included DPS6 and Series 60 systems.
- Honeywell users had relatively low service level requirements, except in the areas of documentation, hardware maintenance, and software support. Thus, it comes as no surprise that Honeywell comfortably satisfies its users' requirements, with the exception of the three services mentioned.
- Hardware and software support continue to be problems for Honeywell users, both in the average service level required and in the percentage of satisfied users. For example:
  - Only 37% of Honeywell users receive adequate hardware maintenance.
  - Almost 70% of Honeywell users are dissatisfied with the software support that they receive.
- Again, both sales of supplies and add-on sales are bright spots for Honeywell users, satisfying 95% and 85% of the users, respectively.

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: HEWLETT-PACKARD

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	5.8	7.5	
Consulting	5.3	7.5	
Documentation	7.8	7.3	
Training	5.7	7.2	
Sales of Supplies	5.1	7.4	
Add-On Sales	6.2	7.6	
Site Audits	3.9	6.5	
Relocation/ Deinstallation	5.2	7.4	
Hardware Maintenance	9.3	8.4	
Software Support	7.6	7.9	

Rating: 1 = Low, 10 = High





USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: HEWLETT-PACKARD

Rating: 1 = Low, 10 = High

#### USER SATISFACTION LEVELS

#### VENDOR: HEWLETT-PACKARD

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	87.9%	12.18	33
Consulting	83.3	16.7	30
Documentation	42.1	57.9	38
Training	67.7	32.3	31
Sales of Supplies	75.0	25.0	28
Add-On Sales	70.9	29.1	31
Site Audits	91.7	8.3	24
Relocation / Deinstallation	85.7	14.3	28
Hardware Maintenance	45.0	55.0	40
Software Support	50.0	50.0	34

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- Documentation, as a service area, has improved in the past year. Only 50% of the Honeywell users in 1983 reportedly were satisfied with documentation service, but in 1984 over 62% of users reportedly are satisfied.
- Exhibits III-25 through III-27 provide complete Honeywell survey results.

#### K. IBM PERFORMANCE ANALYSIS

- IBM systems pertaining to the survey included the Series I, Systems/32, /34, and 8100.
- The 1983 small-system user requirements study concluded that IBM outperformed the other small-system vendors in satisfying users' service needs. In 1984 IBM maintained its standing.
- IBM users report no major problem; in fact, all service requirements are either met or exceeded. At least 64% of the IBM users are satisfied with all service areas and, in most areas, nearly three-fourths of the users receive a level of service that meets or exceeds their requirements.
- Exhibits III-28 through III-30 provide full details of IBM user responses.

#### L. INTERGRAPH PERFORMANCE ANALYSIS

- The entire Intergraph user sample consisted of IGS users.
- The survey results demonstrate the overriding importance Intergraph users place on hardware maintenance, software support, and documentation, as shown by the extremely high service levels required in these areas.

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: HONEYWELL

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	4.9	7.0	
Consulting	5.2	7.2	
Documentation	7.3	7.1	
Training	6.0	6.9	
Sales of Supplies	4.7	7.4	
Add-On Sales	4.9	6.5	
Site Audits	3.1	5.3	
Relocation/ Deinstallation	3.3	5.9	
Hardware Maintenance	9.4	8.1	
Software Support	7.6	7.1	

Rating: 1 = Low, 10 = High



# USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: HONEYWELL



Rating: 1 = Low, 10 = High

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## USER SATISFACTION LEVELS VENDOR: HONEYWELL

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service <their Requirements</their 	NUMBER OF RESPONSES
Planning	75.0%	25.0%	20
Consulting	76.2	23.8	21
Documentation	62.5	37.5	24
Training	60.9	39.1	23
Sales of Supplies	95.0	5.0	20
Add-On Sales	85.0	15.0	20
Site Audits	50.0	50.0	12 ~
Relocation / Deinstallation	85.7	14.3	14
Hardware Maintenance	37.1	62.9	27
Software Support	30.4	69.6	23

#### USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: IBM

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	5.4	7.4	
Consulting	5.4	7.2	
Documentation	5.9	7.5	
Training	6.3	7.4	
Sales of Supplies	5.5	6.9	
Add-On Sales	4.9	7.2	
Site Audits	4.1	6.0	
Relocation/ Deinstallation	4.7	6.7	
Hardware Maintenance	8.7	8.4	
Software Support	7.2	7.3	

Rating: 1 = Low, 10 = High

#### USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: IBM



Rating: 1 = Low, 10 = High

#### USER SATISFACTION LEVELS

#### VENDOR: IBM

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service <their Requirements</their 	NUMBER OF RESPONSES
Planning	74.48	25.6%	39
Consulting	74.4	25.6	39
Documentation	83.3	16.7	36
Training	70.0	30.0	40
Sales of Supplies	86.1	13.9	36
Add-On Sales	80.6	19.4	31
Site Audits	70.8	29.2	24
Relocation / Deinstallation	87.5	12.5	36
Hardware Maintenance	71.1	28.9	51
Software Support	64.3	35.7	36

- With this emphasis, Intergraph's service record must be considered rather poor, since Intergraph fails to satisfy a large proportion of its users in these areas.
  - Over 72% of Intergraph users are dissatisfied with their hardware maintenance.
  - Eighty percent of the users are dissatisfied with their software support.
  - An astounding 90% are dissatisfied with their documentation.
- Intergraph will need to show improvement in all these areas in order to maintain any share of its market base.
- Complete Intergraph results are presented in Exhibits III-31 through III-33.

#### M. MDS/QANTEL PERFORMANCE ANALYSIS

- MDS/Qantel equipment surveys included responses from 200 and 300 series users.
- MDS/Qantel support, when judged on average service levels received versus required, is mediocre considering that the levels received for documentation, hardware maintenance, and software support are below the requirements reported by its users.
- But analyzed on a case-by-case basis, MDS/Qantel performance is very good, even in the areas listed above.

## USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: INTERGRAPH

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	4.3	7.1	
Consulting	4.8	7.6	
Documentation	7.9	6.4	
Training	4.9	6.8	
Sales of Supplies	3.3	5.8	
Add-On Sales	4.3	6.0	
Site Audits	2.5	5.7	
Relocation/ Deinstallation	3.0	7.5	
Hardware Maintenance	9.8	8.1	
Software Support	8.8	5.2	

Rating: 1 = Low, 10 = High
#### EXHIBIT 111-32

## USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: INTERGRAPH



## USER SATISFACTION LEVELS

### VENDOR: INTERGRAPH

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	75.0%	25.0%	8
Consulting	71.4	28.6	7
Documentation	10.0	90.0	10
Training	50.0	50.0	6
Sales of Supplies	50.0	50.0	4
Add-On Sales	80.0	20.0	5
Site Audits	IN	SUFFICIENT RESPON	SE
Relocation / Deinstallation		SUFFICIENT RESPON	SE
Hardware Maintenance	27.2	72.8	- 11
Software Support	20.0	80.0	10

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- Almost 58% of the users were satisfied with documentation and hardware maintenance.
- Just under 65% of the users received satisfactory service in the area of software support.
- Over 75% of the users received satisfactory service in the remaining service areas, indicating that MDS/Qantel is strong in all service areas.
- Exhibits III-34 through III-36 provide complete MDS/Qantel user survey results.

### N. NCR PERFORMANCE ANALYSIS

- NCR systems pertaining to the survey were of the 8200 series.
- According to the 1984 survey results, NCR users continue to receive the uneven service first described in last year's report. Particular service problems include:
  - Documentation, which satisfied just over 55% of the users surveyed.
  - Hardware maintenance, satisfying only one-half of the users.
  - Software support, which was found unsatisfactory by 75% of the respondents.
- NCR scored quite well in the remaining service areas. Yet, their users place less importance on these services, emphasizing the need for a redirection of effort in the more important areas of documentation, hardware maintenance, and software support.

# USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: MDS/QANTEL

	MEAN SERVICE LEVEL			
SERVICE PROVIDED	REQUIRED	RECEIVED		
Planning	4.1	6.9		
Consulting	5.5	6.7		
Documentation	7.6	6.6		
Training	6.9	7.1		
Sales of Supplies	4.4	6.5		
Add-On Sales	5.5	6.6		
Site Audits	3.6	5.7		
Relocation/ Deinstallation	4.9	7.0		
Hardware Maintenance	9.0	8.5		
Software Support	7.9	7.5		

Rating: 1 = Low, 10 = High

# USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: MDS/QANTEL



Rating: 1 = Low, 10 = High

### USER SATISFACTION LEVELS

### VENDOR: MDS/QANTEL

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	100.08	0.0%	15
Consulting	76.5	23.5	17
Documentation	57.9	42.1	19
Training	78.9	21.1	19
Sales of Supplies	80.0	20.0	15
Add-On Sales	83.3	16.7	18
Site Audits	75.0	25.0	12
Relocation / Deinstallation	85.7	14.3	14
Hardware Maintenance	57.9	42.1	19
Software Support	64.7	35.3	17

• Exhibits III-37 through III-39 provide complete NCR user survey results.

### O. PERKIN-ELMER PERFORMANCE ANALYSIS

- Perkin-Elmer systems pertaining to the survey were of the 3200 series.
- According to the survey results, Perkin-Elmer users require essentially only three services from their vendor - documentation, hardware maintenance, and software support.
- Perkin-Elmer users report general satisfaction with the documentation they receive, with just under 56% of the users receiving a service level equal to or exceeding the level of service required.
- Immediate attention should be placed upon hardware maintenance, which currently satisfies only 11% of the Perkin-Elmer users surveyed.
- Exhibits III-40 through III-42 provide complete Perkin-Elmer survey results.

## P. PRIME PERFORMANCE ANALYSIS

- Prime small systems pertaining to the survey included the 300, 400, and 500 series equipment.
- Again, as with users of most other small systems, Prime users reported they had problems with three service areas:
  - Documentation, with more than 68% dissatisfied.

# USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: NCR

	MEAN SERVICE LEVEL		
SERVICE PROVIDED	REQUIRED	RECEIVED	
Planning	3.4	8.1	
Consulting	3.9	6.5	
Documentation	5.4	7.4	
Training	4.8	7.3	
Sales of Supplies	4.0	7.2	
Add-On Sales	3.6	6.5	
Site Audits	3.3	7.3	
Relocation/ Deinstallation	4.4	7.3	
Hardware Maintenance	8.7	8.0	
Software Support	8.3	7.6	

Rating: 1 = Low, 10 = High

#### EXHIBIT 111-38





Rating: 1 = Low, 10 = High

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## USER SATISFACTION LEVELS

### VENDOR: NCR

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	100.08	0.0%	8
Consulting	75.0	25.0	8
Documentation	44.5	55.5	9
Training	71.4	28.6	7
Sales of Supplies	100.0	0.0	9
Add-On Sales	60.0	40.0	5
Site Audits	IN	SUFFICIENT RESPON	SE
Relocation / Deinstallation	83.3	16.7	6
Hardware Maintenance	50.0	50.0	14
Software Support	25.0	75.0	4

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# USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: PERKIN-ELMER

	MEAN SERVICE LEVEL			
SERVICE PROVIDED	REQUIRED	RECEIVED		
Planning	3.7	5.0		
Consulting	3.3	5.4		
Documentation	5.9	5.9		
Training	4.3	5.2		
Sales of Supplies	2.5	5.3		
Add-On Sales	4.9	6.4		
Site Audits	1.9	3.2		
Relocation/ Deinstallation	3.0	7.3		
Hardware Maintenance	8.6	6.7		
Software Support	3.9	3.3		

Rating: 1 = Low, 10 = High





# USER SATISFACTION WITH SERVICES RECEIVED/REQUIRED VENDOR: PERKIN-ELMER

Rating: 1 = Low, 10 = High

# USER SATISFACTION LEVELS

### VENDOR: PERKIN-ELMER

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	57.1%	42.9%	7
Consulting	71.4	28.6	7
Documentation	55.6	44.4	9
Training	66.7	33.3	6
Sales of Supplies	100.0	0.0	4
Add-On Sales	100.0	0.0	7
Site Audits	100.0	0.0	6
Relocation / Deinstallation	85.7	14.3	7
Hardware Maintenance	11.1	88.9	9
Software Support	50.0	50.0	6

- Hardware maintenance, with 57% dissatisfied.
- Software support, with over 70% of the users dissatisfied.
- In addition, training and add-on sales services were found unsatisfactory.
- Exhibits III-43 through III-45 provide complete Prime small-system user results.

### Q. TEXAS INSTRUMENTS PERFORMANCE ANALYSIS

- All Texas Instruments users surveyed were TI 990 users.
- TI small-system users had slightly lower service requirements than the smallsystem norm. This contributed to a relatively positive service performance by the vendor.
- In most service areas, TI service proved satisfactory to most users, most notably in the areas of documentation (more than 63% satisfied) and hardware maintenance (more than 54% satisfied).
- Areas of concern are software support (with 70% of the TI users receiving a lower level of service than they require) and training (which satisfied only one-half of the TI users), despite the fact that the users reported having a relatively low service requirement for this support area.
- Exhibits III-46 through III-48 provide complete TI 990 user responses.

# USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: PRIME

	MEAN SERVICE LEVEL			
SERVICE PROVIDED	REQUIRED	RECEIVED		
Planning	5.7	5.9		
Consulting	5.4	5.4		
Documentation	7.5	6.3		
Training	5.9	6.1		
Sales of Supplies	2.5	4.3		
Add-On Sales	5.9	5.9		
Site Audits	3.2	4.3		
Relocation/ Deinstallation	5.7	6.8		
Hardware Maintenance	9.0	7.9		
Software Support	6.4	5.6		

Rating: 1 = Low, 10 = High









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# USER SATISFACTION LEVELS

### VENDOR: PRIME

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥Their Requirements	Receive a Level of Service <their Requirements</their 	NUMBER OF RESPONSES
Planning	69.2%	30.88	13
Consulting	57.1	42.9	14
Documentation	31.6	68.4	19
Training	41.2	58.8	17
Sales of Supplies	100.0	0.0	6
Add-On Sales	50.0	50.0	14
Site Audits	70.0	30.0	10 .
Relocation / Deinstallation	75.0	25.0	12
Hardware Maintenance	42.9	57.1	21
Software Support	29.4	70.6	16

# USER SERVICE REQUIREMENTS VERSUS LEVEL OF SERVICE RECEIVED VENDOR: TEXAS INSTRUMENTS

	MEAN SERVICE LEVEL			
SERVICE PROVIDED	REQUIRED	RECEIVED		
Planning	3.2	6.5		
Consulting	4.6	5.7		
Documentation	6.1	5.5		
Training	4.2	5.0		
Sales of Supplies	4.2	5.9		
Add-On Sales	4.7	6.3		
Site Audits	2.8	6.8		
Relocation/ Deinstallation	2.5	5.7		
Hardware Maintenance	8.4	7.3		
Software Support	6.7	6.1		

Rating: 1 = Low, 10 = High





\*Rating: 1 = Low, 10 = High

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# USER SATISFACTION LEVELS

# VENDOR: TEXAS INSTRUMENTS

	SATISFIED (Percent)	DISSATISFIED (Percent)	
TYPE OF SERVICE PROVIDED	Receive a Level of Service ≥ Their Requirements	Receive a Level of Service < Their Requirements	NUMBER OF RESPONSES
Planning	INS	SE	
Consulting	57.1%	42.98	7
Documentation	63.6	36.4	11
Training	50.0	50.0	6
Sales of Supplies	62.5	37.5	8
Add-On Sales	66.7	33.3	9
Site Audits	75.0	25.0	4
Relocation / Deinstallations	INS	SUFFICIENT RESPON	SE
Hardware Maintenance	54.5	45.5	11
Software Support	30.0	70.0	10

IV CUSTOMER SERVICE REQUIREMENTS

# IV CUSTOMER SERVICE REQUIREMENTS

### A. INTRODUCTION

- As previously shown, system availability (or uptime) is the most crucial concern of small-system users. System availability has traditionally been defined as the total scheduled use divided by actual use plus downtime.
- The above definition ignores the fact that users consider their machines down whenever they can't perform processing functions on them. Instead, INPUT prefers to measure system availability as follows:

Scheduled Use Actual Use + Downtime + Recovery Time

• A key component in system availability is the number of system interruptions incurred by the user. Occasionally, system interruptions are caused by factors out of the control of the hardware manufacturer. These factors may include power interruption, user-caused malfunction, and third-party software. More frequently the interruption is hardware-related and falls within the scope of the service organization.

### B. SYSTEM AVAILABILITY REQUIREMENTS VERSUS ACTUALS

- As shown in Exhibit IV-1, system availability reported by small-system users, as a group, meets the requirements of the users. In fact, all but two vendors (DEC and Four-Phase) meet or exceed their users' requirements. This is an improvement over last year's results in which five vendors (Burroughs, Intergraph, Perkin-Elmer, Prime, and Texas Instruments failed to meet their users' requirements).
- The most startling result was the system availability average reported by DEC users, especially in light of the high availability figures reported in 1983. In this year's survey, over 15% of DEC users reported availability actuals of less than 80%.

### C. HARDWARE RESPONSE TIME REQUIREMENTS VERSUS ACTUALS

- Hardware response time, shown in Exhibit IV-2, appears to be a more significant problem for this year's small-system users as compared with last year's sample. Only four of the 15 small-system vendors meet their users' hardware response time requirements, as compared with seven last year. Of the vendors meeting user requirements (Computervision, Hewlett-Packard, Intergraph, and Prime) Hewlett-Packard is most responsive, beating its user requirements by 46%.
- Particular concern should be felt at NCR and DEC, where hardware response times are 129% and 77% (respectively) slower than their users' reported requirements.
- On the basis of outright response time speed, Four-Phase, Honeywell, Hewlett-Packard, and IBM all average less than three hours for hardware call response.

# SMALL-SYSTEM USER SYSTEM AVAILABILITY REQUIREMENTS VERSUS ACTUALS

	1984 MEAN (Percent)		1983 MEAN (Percent)	
VENDOR	REQUIRED	ACTUAL	REQUIRED	ACTUAL
All Vendors	90.5%	92.3%	93.8%	94.5%
Burroughs	88.7	90.7	92.6	91.9
Computervision	92.8	<b>93.</b> 2	94.0	95.3
Data General	91.1	93.6	93.2	95.8
Datapoint	86.6	89.1	91.5	94.0
DEC	91.2	88.3	95.4	95.9
Four-Phase	94.2	93.4	93.3	93.7
Hewlett-Packard	93.6	94.9	95.8	95.5
Honeywell	90.6	91.5	94.1	94.7
IBM	87.9	92.7	91.9	93.8
Integraph	91.8	92 <b>.8</b>	96.2	94.3
MDS/Qantel	89.5	92.1	N/A	N/A
NCR	83.2	91.8	90.7	94.2
Perkin-Elmer	88.7	90.2	94.7	92.2
Prime	93.7	93.6	93.3	92.9
Texas Instruments	87.5	93.4	95.3	94.4

N/A = Not Available

# SMALL-SYSTEM USER HARDWARE RESPONSE TIME REQUIREMENTS VERSUS ACTUALS

	1984 MEAN (Hours)		1983 MEAN (Hours)	
VENDOR	Required	Actual	Required	Actual
All Vendors	4.4	6.1	4.5	4.8
Burroughs	4.3	5.5	4.8	6.2
Computervision	7.1	5.9	4.4	3.5
Data General	3.2	3.5	3.5	3.2
Datapoint	3.2	5.6	2.3	2.5
DEC	3.9	6.9	3.1	2.5
Four-Phase	1.6	2.9	2.9	1.8
Hewlett-Packard	5.0	2.7	3.6	2.9
Honeywell	1.9	2.8	2.6	2.9
IBM	1.5	2.6	3.9	3.5
Intergraph	11.4	9.7	7.9	8.7
MDS/Qantel	3.6	3.7	N/A	N/A
NCR	2.8	6.4	2.3	2.9
Perkin-Elmer	5.8	7.8	6.7	7.2
Prime	3.7	3.7	3.0	2.3
Texas Instruments	14.3	16.1	9.7	13.7

N/A = Not Available

- The response times of the manufacturing systems (Computervision, Intergraph, and Perkin-Elmer) are significantly slower than those of the other small-system vendors, but their users expect slower response times. Users of Intergraph and Perkin-Elmer systems would like faster response, however. This is indicated by the relatively low ratings given to these vendors for general responsiveness, as shown in Exhibit IV-3, and dispatching, as shown in Exhibit IV-4.
- Exhibit IV-3 supports the response time improvements indicated in Exhibit IV 2. Vendors receiving better ratings in responsiveness also demonstrated improved response time.
  - Burroughs, with a 13% higher rating in responsiveness, improved its response time by 11%.
  - Honeywell, with a 5.5% higher rating improved its response time by 3%.
  - Hewlett-Packard, with a 7.7% higher rating, improved its response time by 7%.
  - IBM, with a 2.5% higher rating, improved its response time by 26%.
- Conversely, vendors whose response times deteriorated also received lower ratings from their users. Data General, Datapoint, Intergraph, Prime, and Texas Instruments all received slower response times and lower user ratings.

### D. HARDWARE REPAIR TIME REQUIREMENTS VERSUS ACTUALS

• Hardware repair time is defined as the time between when the field engineer (FE) begins to work on the problem and when the problem is solved. As shown

VENDOR	1984 MEAN	1983 MEAN	1983-1984 CHANGE (Percent)
All Vendors	7.8	7.5	4.0%
Burroughs	7.8	6.9	13.0
Computervision	7.1	7.1	0.0
Data General	7.7	8.0	(3.8)
Datapoint	7.4	7.8	(5.1)
DEC	8.0	7.8	2.6
Four-Phase	7.7	7.5	2.7
Hewlett-Packard	8.4	7.8	7.7
Honeywell	7.7	7.3	5.5
IBM	8.1	7.9	2.5
Intergraph	7.3	7.5	(2.7)
MDS/Qantel	8.5	N/A	N/A
NCR	7.7	7.5	2.7
Perkin-Elmer	6.7	6.5	3.1
Prime	7.9	8.5	(7.1)
Texas Instruments	6.6	7.3	(9.6)

#### USER RATINGS OF VENDOR RESPONSIVENESS

Rating: 1 = Low, 10 = High N/A = Not Available

USER	RATINGS	OF	VENDORS'	DISPATCHING
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VENDOR	1984 MEAN	1983 MEAN	1983-1984 CHANGE (Percent)
All Vendors	7.6	7.9	(3.8)%
Burroughs	7.8	7.6	2.6
Computervision	7.7	8.3	(7.2)
Data General	7.7	8.6	(10.5)
Datapoint	7.8	8.4	(7.1)
DEC	7.6	8.3	(8.4)
Four-Phase	7.9	7.8	1.3
Hewlett-Packard	8.4	7.7	9.1
Honeywell	7.6	6.9	10.1
IBM	7.8	8.4	(7.1)
Intergraph	6.8	7.8	(12.8)
MDS/Qantel	8.2	N/A	N/A
NCR	7.3	7.5	(2.7)
Perkin-Elmer	6.3	7.3	(13.7)
Prime	6.9	8.3	(16.9)
Texas Instruments	6.7	7.5	(10.7)

Rating: 1 = Low, 10 = High N/A = Not Available

in Exhibit IV-5, hardware repair time requirements of the small-system user were met, overall. In fact, hardware repair time (overall) dropped 5% from 1983 to 1984. Burroughs, Four-Phase, IBM, and Texas Instruments users reported significantly faster average hardware repair times in 1984 than 1983.

- Vendors with repair times significantly below the overall average include MDS/Qantel (with a 2.3 hour repair time average), Burroughs, Four-Phase, Hewlett-Packard, and IBM (whose hardware repair times average less than four hours).
- It is important to note that both hardware response and repair times are affected by the significantly higher averages of the manufacturing-based machines, such as Computervision, Intergraph, and Perkin-Elmer. Equally important is the fact that these vendors' users expect slower response and repair times.

### E. SOFTWARE RESPONSE TIME REQUIREMENTS VERSUS ACTUALS

- Software response, rapidly becoming more crucial to user satisfaction, is defined as the time between fault occurrence and the moment when a software support engineer is dedicated to repairing the problem. Software support is often performed off-site, either in the downline loading of software or in the delivery of software updates or patches to the end user in the future. This makes it difficult for the end user to accurately gauge what time the vendor is responding to the problem.
- Exhibit IV-6 provides all user responses to software response times. Overall, software response time actuals averaged seven hours more than reported user requirements. The extremely high standard deviations indicate that a very wide range of response times have been reported, both for the entire group and for individual vendors.

# SMALL-SYSTEM USER HARDWARE REPAIR TIME REQUIREMENTS VERSUS ACTUALS

	MEAN TIME TO REPAIR (Hours)		
VENDOR	1984 REQUIRED	1984 ACTUAL	1983 ACTUAL
All Vendors	5 <b>.5</b>	5.5	5.8
Burroughs	4.5	3.2	3.7
Computervision	19.9	15.1	7.5
Data General	3.2	5.2	2.8
Datapoint	2.8	3.1	2.9
DEC	5.1	6.3	2.4
Four-Phase	2.3	3.3	5.4
Hewlett-Packard	5.0	3.8	3.3
Honeywell	3.7	4.3	2.0
IBM	3.2	3.4	3.6
Intergraph	15.5	13.0	12.1
MDS/Qantel	3.2	2.3	N/A
NCR	3.6	4.8	3.9
Perkin-Elmer	11.8	10.6	8.7
Prime	5.9	4.7	3.9
Texas Instruments	8.4	7.5	10.7

N/A = Not Available

# SMALL-SYSTEM USER SOFTWARE RESPONSE TIME REQUIREMENTS VERSUS ACTUALS

	MEAN SOFTWARE RESPONSE TIME (Hours)			
VENDOR	Required	Standard Deviation	Actual	Standard Deviation
All Vendors	11.1	19.8	18.2	35.2
Burroughs	8.8	10.2	37.2	38.7
Computervision	22.4	19.0	46.3	47.5
Data General	6.7	8.6	8.4	11.6
Datapoint	10.9	13.3	11.9	16.5
DEC	7.0	11.8	10.1	12.7
Four-Phase	3.1	2.8	5.9	4.9
Hewlett-Packard	8.5	12.4	10.7	13.2
Honeywell	7.0	12.1	14.9	29.2
IBM	4.5	7.1	8.2	13.3
Intergraph	15.1	11.4	31.2	28.8
MDS/Qantel	4.8	7.3	3.7	1.8
NCR	7.4	9.3	7.7	9.5
Perkin-Elmer	*	*	*	*
Prime	32.2	51.7	59.6	86.8
Texas Instruments	12.4	17.7	23.9	47.2

\* Insufficient Response

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- Only two vendors met their users' software response time requirements. These are:
  - MDS/Qantel, whose 3.7 hour response time was by far the fastest.
  - NCR, whose 7.7 hour response time was only slightly higher than its users' 7.4 hour response time requirement.
- When all responses greater than 72 hours are removed from the survey, the range of responses becomes more acceptably spread around the mean. Exhibit IV-7 shows that actual response time comes closer to the user requirements, both for the entire small-system sample and for many of the individual vendors.
- At first glance, the manufacturing systems, such as Computervision and Intergraph, seem to demonstrate the slowest software response times; however, Computervision users expect lengthy delays on software response and, consequently, do not require faster response. Of greater concern are vendors whose users do not require relatively quick response, yet receive software response times much slower than their requirements. Intergraph users, for example, require a software response time of 15 hours, yet receive an average response time of twice that span. It is no surprise that Intergraph users report very high dissatisfaction with their software support service.
- One specific improvement that small-system users felt necessary was improved acknowledgement after a software fault call was made. A common complaint from users was the failure of vendors to call back after a problem was reported. This lack of communication is very evident in the ratings of software engineer communication, as shown in Exhibit IV-8. This lack of communication is critical due to the fact that a great deal of software support comes from remote locations, often without the users' awareness. Thus, improved communications would improve the users' perception of software response time.

## SMALL-SYSTEM USER-ADJUSTED SOFTWARE RESPONSE TIME REQUIREMENTS VERSUS ACTUALS

	MEAN (Adjusted) SOFTWARE RESPONSE TIME (Hours)			
VENDOR	Required	Standard Deviation	Actual	Standard Deviation
All Vendors	9.1	11.9	11.1	14.1
Burroughs	8.8	10.1	11.2	12.7
Computervision	22.4	19.1	21.7	16.0
Data General	6.7	8.6	8.4	11.6
Datapoint	10.9	13.3	11.9	16.5
DEC	7.0	11.8	10.1	12.7
Four-Phase	3.1	2.8	5.9	4. 9
Hewlett-Packard	8.5	12.4	10.7	13.2
Honeywell	7.0	12.1	8.8	13.3
IBM	4.5	7.1	8.2	13.3
Intergraph	15.1	11.4	31.2	28.8
MDS/Qantel	4.8	7.3	3.7	1.8
NCR	7.3	9.2	7.8	9.6
Perkin-Elmer	*	. *	*	- *
Prime	11.8	11.6	18.3	25.8
Texas Instruments	12.4	17.8	*	*

\* Insufficient Response

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## USER RATINGS OF SOFTWARE ENGINEER COMMUNICATION

VENDOR	1984 MEAN	1983 MEAN	1983-1984 CHANGE (Percent)
All Vendors	6.4	6.2	3.2%
Burroughs	6.3	5 <b>.9</b>	6.8
Computervision	5.8	5.4	7.4
Data General	6.4	6.4	0.0
Datapoint	7.0	7.5	(6.7)
DEC	6.1	6.5	(6.2)
Four-Phase	6.9	6.1	13.1
Hewlett-Packard	7.2	6.9	4.4
Honeywell	6.2	6.1	1.6
IBM	7.3	7.1	2.8
Intergraph	5.1	5.6	(8.9)
MDS/Qantel	6.9	N/A	N/A
NCR	7.5	6.1	23.0
Perkin-Elmer	4.0	4.4	(9.1)
Prime	4.9	6.7	(26.9)
Texas Instruments	5.7	6.4	(10.9)

Rating: 1 = Low, 10 = High N/A = Not Available

## F. SOFTWARE REPAIR TIME REQUIREMENTS VERSUS ACTUALS

- Users are far removed from the actual repair process, so a wide range of responses to the question of average repair time has occurred. This is also the case for software response time survey results. Exhibit IV-9 provides all small-system users' responses to average software repair time.
- Only four vendors (Data General, Datapoint, Hewlett-Packard, and Prime) provided software repair times that met their users' requirements.
- When all responses that exceeded 72 hours were removed, a more accurate picture of software repair time is provided. Exhibit IV-10 demonstrates that actual software repair time meets and, for many vendors, exceeds most users' requirements.
- Even Intergraph, whose software response time was much slower than required, exceeded its user requirements for software repair time. This further demonstrates the importance of response time as a factor in overall service satisfaction.
- One factor that affects both software response times and software repair times is the current shortage of trained software engineers. This factor will probably have less effect on software supporters as vendors continue to emphasize the recruitment and training of new engineers and the cross-training of existing hardware engineers.

### G. SYSTEM INTERRUPTIONS

• As seen in Exhibit IV-II, there appears to be little correlation between system interruption frequency and system availability. Vendors whose equipment
# SMALL-SYSTEM USER SOFTWARE REPAIR TIME REQUIREMENTS VERSUS ACTUALS

	MEAN SOFTWARE REPAIR TIME (Hours)					
VENDOR	Required	Standard Deviation	Actual	Standard Deviation		
All Vendors	29.5	47.5	34.4	60.0		
Burroughs	63.3	98.7	93.1	138.0		
Computervision	54.0	45.4	*	*		
Data General	19.5	23.5	19.1	24.3		
Datapoint	11.5	16.9	9.8	15.6		
DEC	17.3	21.1	20.1	21.3		
Four-Phase	16.9	20.9	23.3	34.9		
Hewlett-Packard	33.9	49.1	28.4	44.6		
Honeywell	23.5	31.2	31.9	40.7		
IBM	12.8	23.7	13.8	26.7		
Intergraph	16.2	13.5	90.2	107.8		
MDS/Qantel	17.5	41.5	19.7	38.2		
NCR	29.2	47.7	37.5	55.9		
Perkin-Elmer	*	*	*	* .		
Prime	84.1	83.9	64.2	87.9		
Texas Instruments	14.7	16.5	15.0	22.2		

\* Insufficient Response

## SMALL-SYSTEM USER-ADJUSTED SOFTWARE REPAIR TIME REQUIREMENTS VERSUS ACTUALS

	MEAN (Adjusted) SOFTWARE REPAIR TIME (Hours)			
VENDOR	Required	Standard Deviation	Actual	Standard Deviation
All Vendors	17.4	19.3	17.4	19.1
Burroughs	27.9	19.2	30.8	17.9
Computervision	32.0	13.9	*	*
Data General	19.5	23.5	19.1	24.3
Datapoint	11.5	16.9	30.7	71.0
DEC	17.3	21.1	20.1	21.3
Four-Phase	16.9	20.9	14.7	23.5
Hewlett-Packard	17.8	20.3	13.7	17.9
Honeywell	16.6	16.8	17.2	17.7
HBM	9.2	12.7	8.8	12.6
Intergraph	16.2	13.6	12.3	16.6
MDS/Qantel	2.9	2.5	7.2	7.2
NCR	14.1	28.5	10.0	12.3
Perkin-Elmer	*	*	*	*
Prime	29.0	19.7	29.0	19.7
Texas Instruments	14.7	16.5	15.0	22.2

\* Insufficient Response

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## SMALL-SYSTEM INTERRUPTIONS BY VENDOR

	AVERAGE CAUSE NUMBER OF		OF INTERRUPTION (Percent)		
VENDOR	PER MONTH	Hardware	Software	Other	
All Vendors	3.3	60.7%	20.0%	19.3%	
Burroughs	2.9	81.6	15.4	3.0	
Computervision	3.3	76.0	16.0	8.0	
Data General	2.6	59.6	29.6	10.7	
Datapoint	1.7	59.1	20.1	20.8	
DEC	3.3	54.8	17.7	27.5	
Four-Phase	2.4	66.4	24.1	9.5	
Hewlett-Packard	2.1	56.0	24.5	19.5	
Honeywell	3.7	48.2	20.3	31.5	
IBM	2.6	57.1	19.6	23.3	
Intergraph	3.6	46.5	34.0	19.5	
MDS/Qantel	0.9	47.8	20.5	31.7	
NCR	2.1	78.7	. 8.0	13.3	
Perkin-Elmer	1.6	64.1	15.9	20.0	
Prime	2.5	80.3	5.4	14.3	
Texas Instruments	1.1	42.7	20.5	36.8	

demonstrates the most frequent interruptions, such as Honeywell and Intergraph, receive availability rates greater than their users' requirements. This reinforces the importance of response and repair times as components of availability, since the duration of the system problem affects downtime.

• Exhibit IV-II also indicates that for smaller systems the number of interruptions that are neither hardware- nor software-caused are increasing. This can be attributed in part to the greater likelihood of user-caused error, emphasizing the need for greater documentation and training support for users of these systems.

### H. DISPATCHING AND ESCALATION PROCEDURES

- Small-system users continued a trend (seen also in large systems) of decreasing satisfaction with vendor dispatching and escalation procedures. This is not surprising since both hardware and software response time performance does not meet the small-system users' requirements, as demonstrated earlier.
- Many small-system users reported frustration when trying to receive confirmation that their calls were received, especially when calls concerned software problems. This is highlighted by the extremely slow software response times reported by many users.
- Escalation procedures received even lower marks than dispatching, with users rating their vendors' escalation procedure 8% lower than in 1983. Ratings are shown in Exhibit IV-12. Every small-system vendor, with the exception of Datapoint and Prime, received lower marks in 1984.
- A significant number of small-system users expressed dissatisfaction with the competence of their FEs, especially when confronted with a major problem. When asked what single change their vendor should make, a large number of

### USER RATINGS OF VENDORS' ESCALATION PROCEDURE

VENDOR	1984 MEAN	1983 MEAN	1983-1984 CHANGE (Percent)
All Vendors	6.9	7.5	(8.0)%
Burroughs	6.9	7.0	(1.4)
Computervision	6 <b>.6</b>	7.5	(12.0)
Data General	6.6	7.5	(12.0)
Datapoint	7.9	7.3	8.2
DEC	6.9	7.5	(8.0)
Four-Phase	6.8	7.4	(8.1)
Hewlett-Packard	7.2	7.7	(6.5)
Honeywell	7.2	7.9	(8.9)
IBM	7.7	8.4	(8.3)
Intergraph	5 <b>. 2</b>	7.6	(31.6)
MDS/Qantel	7.8	N/A	N/A
NCR	6.4	7.4	(13.5)
Perkin-Elmer	5.1	6.9	(26.1)
Prime	7.1	6.8	- 4.4
Texas Instruments	6.6	7.4	(10.8)

Rating: 1 = Low, 10 = High

N/A = Not Available

users replied "more qualified FEs." This dissatisfaction is undoubtedly carried over into their perception of the vendors' escalation procedure.

- A key factor in these areas is the perceived quality of communications between user and vendor. Frequently, the field engineer provides the first - and in some cases the only - contact between between the user and the vendor, almost always at a time when the user is least satisfied with his equipment. The FE is responsible not only for fixing the equipment, but also for providing support through communication and customer interaction.
- Exhibit IV-13 illustrates the dissatisfaction users have not only with hardware maintenance but also with the quality of communication with hardware engineers. All but four of the vendors surveyed during the past two years received lower ratings from their users in the area of hardware engineer communications. The most notable low ratings were received by Perkin-Elmer and Texas Instruments.
- The only vendor that received a significantly higher user rating in the area of hardware engineer communications was Hewlett-Packard. Not surprisingly, HP users also reported one of the highest overall satisfaction levels with their hardware maintenance, demonstrating the strong correlation between communications and overall service.
- Small-system users reported that communications with software engineers slowly improved from 1983 to 1984, as shown in Exhibit IV-8. Some vendors have demonstrated vast improvement, as seen by the 13% higher rating received by Four-Phase and the 23% higher rating received by NCR.
- Still, the overall satisfaction level with communications between smallsystem users and their software engineers is much lower than with their hardware counterparts. Vendors should strive to improve this area.

#### USER RATINGS OF HARDWARE ENGINEER COMMUNICATION

VENDOR	1984 MEAN	1983 MEAN	1983-1984 CHANGE (Percent)
All Vendors	7.9	8.0	(1.3%)
Burroughs	7.4	7.7	(3.9)
Computervision	7.7	8.3	(7.2)
Data General	8.0	7.9	1.3
Datapoint	7.9	8.1	(2.5)
DEC	8.0	8.4	(4.8)
Four-Phase	7.5	7.9	(5.1)
Hewlett-Packard	8.4	8.2	2.4
Honeywell	8.3	8.3	0.0
IBM	8.2	8.4	(2.4)
Intergraph	7.2	7.8	(7.7)
MDS/Qantel	7.6	N/A	N/A
NCR	7.7	8.2	(6.1)
Perkin-Elmer	6.3	7.3	(13.7)
Prime	7.9	7.9	0.0
Texas Instruments	6.6	7.9	(16.5)

Rating: 1 = Low, 10 = High N/A = Not Available

- This is especially true for vendors such as Prime, Intergraph, and Perkin-Elmer whose users rely heavily on their software operations. These vendors received some of the lowest ratings in software engineer communications and, not coincidentally, also received the lowest overall user satisfaction marks in software support.
- The importance of improved communications will become even more evident as small-system users become more involved in the service process, both in the areas of diagnostics and self-maintenance. Vendors will need to stress the interpersonal skills necessary to interact with the user in order to assure the success of these and other alternative service delivery methods.

## V THIRD-PARTY MAINTENANCE AND SINGLE-SOURCE SERVICE

## V THIRD-PARTY MAINTENANCE AND SINGLE-SOURCE SERVICE

### A. INTRODUCTION

- There is a rapidly growing interest in third-party maintenance from both the users' and vendors' points of view. TPM is expected to grow from a current \$500 million market to an over \$1 billion market by 1987. This growth is being fueled by a number of factors, including:
  - Continuous growth in the number of products that vendors consider "obsolete" and that traditionally have been picked up by TPM service.
  - A dramatic increase in the number of computer vendors (especially in the microcomputer market) that do not have the resources to maintain equipment.
  - The dramatic growth of the telecommunications market, where vendors are unwilling or unable to repair all the products within their systems.
- A traditional hindrance to the growth of user reliance on TPM service has been the users' preference for a single source of service. This preference was based on a number of benefits associated with single-source service, including:
  - Coordination of service, especially in the areas of dispatching and invoicing.

- Availability of spare parts and documentation.
- Elimination of the possibility of conflicts in fault determination, otherwise known as "finger pointing."
- As TPM vendors began to increase the number of products they maintained, they developed the ability to provide a more complete service offering. Since many equipment vendors were unable or unwilling to maintain all the equipment that existed in mixed-vendor environments, TPM vendors began offering total service for these users, resulting in another area of growth for TPM service.
- Recently, computer vendors have begun to compete for this marketplace by offering service on the equipment of other vendors. Some vendors, such as Digital Equipment Corporation, began by offering service on peripherals and terminals attached to their systems. Other vendors expanded the concept of single-source service by providing support for all hardware and software within the system, regardless of manufacturer.

## B. THIRD-PARTY MAINTENANCE USAGE

- The actual use of third-party maintenance by small-system users has declined from 1983 to 1984, as indicated in Exhibit V-1. This decline is influenced greatly by the tremendous drop in DEC TPM users, from 45.2% in 1983 to 19% in 1984, and in Prime TPM users, from 45% in 1983 to only 9.5% in 1984.
- While actual use declined in 1984, the percentage of users considering utilizing TPM grew slightly. Almost 20% of the small-system users who were not already using TPM in 1984 are considering using it. These users could be separated into two main groups:

## USER CONSIDERATION OF THIRD-PARTY MAINTENANCE

	CURRENTLY USING TPM		NOT CUP USING T CONSIDE	RRENTLY PM BUT RING IT
VENDOR	• 1984	1983	1984	1983
All Vendors	12.48	22.5%	19.9%	17.3%
Burroughs	14.7	20.0	10.3	3.3
Computervision	13.3	31.6	30.8	31.6
Datapoint	31.8	15.0	33.3	5.0
Data General	23.8	30.0	21.9	26.7
DEC	19.0	45.2	32.3	35.5
Four Phase	15.0	0.0	5.9	5.0
Honeywell	3.7	13.3	7.4	20.0
Hewlett-Packard	2.5	25.0	7.7	20.0
IBM	11.3	22.5	28.3	12.5
Intergraph	9.1	15.0	30.0	0.0
MDS/Qantel	5.3	N/A	0.0	N/A
NCR	0.0	19.0	13 <b>.3</b>	9.5
Perkin-Elmer	11.1	35.0	25.0	15.0
Prime	9.5	45.0	36.8	20.0
Texas Instruments	36.4	25.0	57.1	45.0

- Those users, such as IBM and DEC users, traditionally have been targeted by TPM vendors and who are considering TPM service for cost reasons.
- A larger group of users (primarily those of Computervision, Intergraph, Perkin-Elmer, Prime, and Texas Instruments) who were dissatisfied with some or all aspects of service they received.
- A growing segment of TPM users will result from increased LAN use. Since most vendors require that all products within the network be theirs before they will provide service, many LAN users use TPM to service part or all of their systems. This is reflected in the high TPM use demonstrated by Datapoint users.
- Exhibit V-2 provides the small-system user ratings of factors in choosing TPM. The price of service is not the most important factor to any computer user, either in the purchase decision or in considering TPM. Users are most concerned with the quality of hardware support and the accessibility of the maintenance vendor, whether this is the original vendor or the TPM organization.
- Users also reported that vendor reputation was very important. This is not surprising since many users who opt for TPM over the equipment vendor's service often feel as if they are taking a gamble concerning not only the quality of actual repair they will receive, but also the amount of other services such as documentation, spare parts, and consulting.
- Note the low rating that software support received from the small-system users. Traditionally, TPM vendors have avoided providing software support, and the users' low rating reflects this.

## FACTORS IN CHOOSING THIRD-PARTY MAINTENANCE

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FACTOR	MEAN	STANDARD DEVIATION	NUMBER OF RESPONSES
Price of third-party maintenance	7.9	1.9	95
Improved response time	7.9	2.2	96
Third-party vendor reputation	8.2	1.9	95
Hardware support	8.8	1.4	94
Software support provided by the third-party vendor	6.3	2.9	79
Overall system uptime (guarantee)	7.6	2.4	91
Geographic accessibility	8.3	1.8	96
Other features (spares, diagnostics)	7.4	2.2	78

Rating: 1 = Low, 10 = High



- The vast majority of TPM users receive their service through contracts calling for Monday-through-Friday, eight-to-five coverage. Typical response time is four hours, although one-fourth of the users require (and receive) two-hour response. Exhibit V-3 provides complete details of small-system user requirements for third-party maintenance contracts.
- Small-system users, overall, report only moderate satisfaction with the level of support that they receive from the third-party maintenance vendor, as shown in Exhibit V-4. These relatively low satisfaction ratings indicate that there is ample opportunity for other vendors, both the original hardware vendor or other companies who provide third-party support, to attract these users into their own service bases. Given the TPM market size indicated by some of the vendors listed, notably Digital Equipment Corporation and Texas Instruments (both of which have large installed bases), there appears to be a significant potential for revenue growth.

### C. USER ATTITUDES TOWARD SINGLE-SOURCE MAINTENANCE

- Single-source maintenance, where one vendor assumes contractual responsibility for the maintenance of all equipment at the user's site, is growing in importance to small-system users, as shown in Exhibit V-5. As increased use and dependence on mixed-vendor systems continue to grow, users will continue to see the advantages of single-source maintenance.
- The most important advantage to users is coordination of service effort, as shown in Exhibit V-6. Users are frustrated with the amount of "finger pointing" that exists when mixed-shop problems occur. This is especially true of networked systems where a fault occurrence degrades the operations of the entire system.

## USER CONTRACT REQUIREMENTS FOR THIRD-PARTY MAINTENANCE

CONTRACT FEATURE	RESPONDENTS CURRENTLY USING (Percent)
Maintenance Contract	80.48
Per Call (i.e., no contract)	19.6
Response Time of:	
2 hours	25.0
4 hours	45.0
8 hours	12.5
Other	17.5
Type of Coverage:	
Monday-Friday	79.7
Saturday	10.2
Sunday	10.1

## OVERALL USER SATISFACTION WITH THIRD-PARTY MAINTENANCE

VENDOR	CURRENTLY USING TPM (Percent)	OVERALL SATISFACTION WITH TPM VENDOR
All Vendors	12.4%	7.4
Burroughs	14.7	9.2
Computervision	13.3	6.5
Data General	23.8	8.5
Datapoint	31.8	8.3
DEC	19.0	6.8
Four-Phase	15.0	4.7
Hewlett-Packard	2.5	*
Honeywell	3.7	*
IBM	11.3	7.2
Intergraph	9.1	*
MDS/Qantel	5.3	*
NCR	0.0	*
Perkin-Elmer	11.1	*
Prime	9.5	*
Texas Instruments	36.4	5.8

Rating: 1 = Low, 10 = High

\* Insufficient Response

## IMPORTANCE OF SINGLE-SOURCE MAINTENANCE

VENDOR	1984 MEAN	1983 MEAN	1983-1984 CHANGE (Percent)
All Vendors	8.3	8.0	3.8%
Burroughs	8.6	8.5	1.2
Computervision	8.4	8.3	1.2
Data General	8.1	7.7	5.2
Datapoint	7.5	8.8	(14.8)
DEC	8.9	8.5	4.7
Four-Phase	7.3	7.4	(1.4)
Honeywell	8.8	8.2	7.3
Hewlett-Packard	9.0	7.9	13.9
IBM	8.4	8.2	2.4
Intergraph	8.5	8.4	1.2
MDS/Qantel	8.1	N/A	N/A .
NCR	9.0	8.5	5.9
Perkin-Elmer	7.0	6.9	1.5
Prime	7.3	7.7	-(5.2)
Texas Instruments	6.4	6.7	(4.5)

Rating: 1 = Low, 10 = High

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# IMPORTANCE OF SINGLE-SOURCE MAINTENANCE FEATURES

FEATURE	MEAN	STANDARD DEVIATION	NUMBER OF RESPONSES
Improved convenience	7.9	1.9	344
Improved response time	8.1	1.9	344
Knowledge of site	8.1	2.0	342
Reputation of single-source vendor	8.1	1.9	344
Avoiding "finger-pointing"	8.5	2.1	341

Rating: 1 = Low, 10 = High

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In some instances, user satisfaction with equipment vendors had direct influence on the user's attitude toward single-source maintenance. Users who received excellent service from their vendors were more likely to rate singlesource maintenance high. Conversely, users who were dissatisfied with their service would rate single-source maintenance much lower.

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VI CUSTOMER SERVICE PRICING

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### VI CUSTOMER SERVICE PRICING

### A. INTRODUCTION

- As previously stated, price as a factor in the computer purchase decision process is secondary in importance to system availability and service performance factors. This indicates that users are willing to pay for what they see as improved performance.
- However, several factors have increased user awareness and sensitivity to price increases. A primary factor is the much improved price/performance ratios of today's small systems. Users have difficulty accepting higher maintenance prices when product prices have dropped and the performance and reliability of products have improved.
- Also, users are becoming more aware of the increased competitiveness of the service market, with both the dramatic increase in third-party maintenance available and the increased marketing of alternative service offerings.
- These factors influence the small-system user to look for product performance as a factor in computer purchase decision making and also for service offerings available.
- As service organizations continue to improve their profitability, vendors will need to acknowledge price sensitivity while attempting to creatively market new service offerings in order to establish new revenue sources.

## B. USER ATTITUDES TOWARD EXTENDED SERVICES

- One method of increasing service revenues that avoids increasing basic coverage prices is the offering of extended services with appropriate premiums. This strategy appeals to the user's need for improved services while avoiding maintenance price increases for those who choose not to receive the extended service coverage.
- Exhibit VI-I indicates the tremendous potential available through offering extended services. Up to 62% of the small-system users require some sort of extended service, and nearly one-third of the users require any one of the services (with the exception of on-site FE) listed in the exhibit.
- As indicated in Exhibit VI-I, users want improved performance from their vendors, in both response and repair times and in preventive services performed by the vendor. Services most popular with the users include:
  - Preventive maintenance and field changes during off-prime hours, required by over 62% of the users.
  - Guaranteed response time, required by over 57% of the users.
  - Guaranteed repair time on hardware, required by over 45% of the users.
- Of greater importance to small-system vendors should be the percentage of users who would be willing to pay for receiving these services, as shown in Exhibit VI-2.
- When those users who do not require the extended services are removed from the sample, a truer picture of the revenue potential can be derived. For example, to receive standby coverage during critical periods:

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# USER REQUIREMENTS FOR EXTENDED SERVICES AND ATTITUDES TOWARD PREMIUMS

	USERS RESPONDING YES TO REQUIREMENT		REASO PRE AS PER BASIC FOR MAI	ONABLE MIUM CENT OF CHARGE NTENANCE
EXTENDED SERVICE	Number	Percent of Users	Mean	Standard Deviation
Stand-by coverage during critical periods	110	30.18	12.18	11.48
Guaranteed uptime	126	34.6	10.5	10.3
Guaranteed response time	209	57.3	11.8	10.7
On-site spare parts	106	29.0	9.1	9.0
Remote diagnostics	151	41.5	7.8	6.2
Preventive maintenance and field changes during off-prime hours	228	62.5	10.2	9.3
Occasional shift coverage (versus fixed schedule)	127	35.0	10.2	9.1
Full-time, on-site service engineer	37	10.1	12.0	8.4
Guaranteed repair time (hardware)	165	45.3	9.5	7.5
Guaranteed turnaround on software fixes	103	31.2	11.8	9.1

CUMULATIVE DISTRIBUTION OF REASONABLE PREMIUMS FOR EXTENDED SERVICES

EXTENDED SERVICE0%1-5%6-10%11-11Stand-by coverage during77.3%22.7%13.6%7.2Stand-by coverage during77.3%22.212.74.8Guaranteed uptime77.822.212.74.8Guaranteed response time77.818.914.46.3On-site spare parts84.815.20.50.4Remote diagnostics83.416.67.91.3Preventive maintenance and field82.917.18.75.2	10% 11-15% .6% 7.2% .7 4.8 .4 6.3	PREMIUN 6.3% 4.0 5.8 0.3	A GROUI 2.7% 2.4 2.5 2.5	PS 26-30% 1.8% 0.8	31-40%	41-50% 0.9% 0.8	51+
EXTENDED SERVICE0%1-5%6-10%11-11Stand-by coverage during77.3%22.7%13.6%7.2Critical periods77.8%22.212.74.8Guaranteed uptime77.8%18.914.46.3Guaranteed response time77.8%18.914.46.3On-site spare parts84.8%15.20.50.4Remote diagnostics83.416.67.91.3Preventive maintenance and field82.917.18.75.2Changes during off-prime hours82.917.18.75.2	10% 11-15% .6% 7.2% .7 4.8 .4 6.3	16-20% 6.3% 4.0 5.8 0.3	21-25% 2.7% 2.4 2.5	26-30% 1.8% 0.8	31-40%	41-50% 0.9% 0.8	+ 12 +
Stand-by coverage during critical periods77.3% 22.7%22.7% 13.6%13.6% 7.87.2Guaranteed uptime77.822.212.74.8Guaranteed response time77.818.914.46.3On-site spare parts84.815.20.50.4Remote diagnostics83.416.67.91.3Preventive maintenance and field changes during off-prime hours82.917.18.75.2	. 6% 7. 2% . 7 4. 8 . 4 6. 3	6.3% 5.8 0.3	2.7% 2.4 2.5	1.8% 0.8	1.8%	0.9%	
Guaranteed uptime77.822.212.74.8Guaranteed response time77.818.914.46.3Guaranteed response time77.818.914.46.3On-site spare parts84.815.20.50.4Remote diagnostics83.416.67.91.3Preventive maintenance and field82.917.18.75.2Changes during off-prime hours82.917.18.75.2	.7 4.8 .4 6.3	4.0 5.8 0.3	2.5	0.8		0.8	i 1
Guaranteed response time77.818.914.46.3On-site spare parts84.815.20.50.4Remote diagnostics83.416.67.91.3Preventive maintenance and field82.917.18.75.2changes during off-prime hours82.917.18.75.2	.4 6.3 5 0.4	5.8 0.3	2.5		0.8		I
On-site spare parts84.815.20.50.4Remote diagnostics83.416.67.91.3Preventive maintenance and field82.917.18.75.2changes during off-prime hours82.917.18.75.2	5 0 4	0.3		1.5	1.0	1.0	
Remote diagnostics83.416.67.91.3Preventive maintenance and field82.917.18.75.2changes during off-prime hours			0.2	0.1	1	I	I
Preventive maintenance and field 82.9 17.1 8.7 5.2 changes during off-prime hours	.9 1.3	1.3	1.3	i	I	I	I
	.7 5.2	3.0	0.8	0.4	0.4	0 • 4	I
Occasional shift coverage 74.0 26.0 15.0 5.6 (versus fixed schedule)	.0 5.6	3.2	1.6	0.8	0.8	0.8	ł
Full-time, on-site service engineer 86.5 13.5 5.4 5.4	.4 5.4	2.7	2.7	1	ł	1	I
Guaranteed repair time (hardware) 76.4 23.6 10.8 6.6	.8 6.6	4.2	2.4	1	I	ł	1
Guaranteed turnaround on 80.6 19.4 9.7 5.8 software fixes	.7 5.8	4.8	2.9	1.0	I	I	I

- 22.7% of the users would be willing to pay a premium of between 1% and 5% over their basic maintenance charge.
- I3.6% would be willing to pay between 6% and 10%.
- 7.2% would be willing to pay between 11% and 15%.
- 6.3% would be willing to pay between 16% and 20%.
- 2.7% would be willing to pay between 21% and 25%.
- By multiplying the premium the user is willing to pay by the percentage of users willing to pay that premium, we find that a potential revenue gain of 1.4% can be expected at the 6% to 10% premium level.
- Analyzed in this fashion, the greatest potential revenue growth can be expected from offering the following extended services with attached premiums:
  - Guaranteed response time, which should result in a 1.4% revenue increase at a 6% to 10% premium level.
  - Occasional shift coverage, which showed results of a 1.5% revenue increase at a 6% to 10% premium level.
  - Guaranteed uptime, bringing in a 1.3% revenue increase at a 6% to 10% premium level.
  - Guaranteed repair time, which showed results of a 1.2% revenue increase at a 1% to 5% premium level.
- Users were not willing to pay premiums for some services that they reported having requirements for. Users felt that services such as remote diagnostics,

on-site spares, and preventive maintenance and field changes, were the vendor's requirements and, as such, the vendors should pay for them.

### C. USER ATTITUDES TOWARD ALTERNATIVE DELIVERY MODES

- Another way of avoiding outright price increases for basic maintenance is the offering of alternative delivery modes with appropriate premiums or discounts attached. Those alternative delivery methods are attractive to users as a way of reducing service prices while becoming more involved and aware of the service process. Vendors, on the other hand, benefit from the reduction of costs that results from increased user involvement in the service process.
- Exhibit VI-3 provides user ratings of various alternative service modes. As can be expected, users report the strongest preference for on-site maintenance; yet there is a growing acceptance of increased user involvement in the maintenance process.
- Small-system users report a great willingness to work with telephone support centers, concerning both hardware and software. As mentioned previously, users prefer to have open lines of communication with their vendors, both in dispatching of on-site work and in the diagnosis and short-term fixes that might be available through telephone support. A large number of users feel that they have the capabilities of providing limited services, as long as they have contact and instruction from the vendors.
- This attitude can be seen in the growth in willingness to do board swaps and software patches. User acceptance of doing board swaps has, in fact, grown 42% from 1983 to 1984. As more and more actual repair is performed at the component and board level, this acceptance should continue to grow, and vendors should move toward providing facilities to receive swapout boards for repair and refurbishment.

### USER ATTITUDES TOWARD ALTERNATIVE DELIVERY MODES

	HARDWARE		SOFTWARE			
MAINTENANCE DELIVERY MODE	1984 Mean	1983 Mean	1983– 1984 Percent Change	1984 Mean	1983 Mean	1983- 1984 Percent Change
User involvement in telephone diagnosis working with support center	6.7	6.0	11.7%	6.8	6.4	6.3%
User involvement with remote diagnostics and software down-line loading	5.8	6.5	(10.8)	5.4	7.1	(23.9)
User replacing circuit boards or patching software	6.1	4.3	41.9	5.9	5.5	7.3
Ship to/carry in to repair center	4.6	4.2	9.5	3.9	3.0	30.0
Consulting/software customization	N/A	N/A	N/A	5.4	*	*
Traditional, on-site response to trouble calls	8.3	8.6	(3.5)	7.1	7.4	(4.1)

Rating: 1 = Low, 10 = High N/A: Not Applicable

\* Not Available

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- Users' acceptance of remote diagnostics declined appreciably between 1983 and 1984. Users view remote diagnostics as a "tool" for vendors, which should reduce the costs of repairing their equipment. Yet some vendors charge users for having remote diagnostics.
- In order to increase user acceptance of remote diagnostics, vendors should increase their marketing and other user education efforts in order to prove to their users the dramatic cost and time savings made available through remote support.
- Users continue to demonstrate a reluctance to rely on depot service as an alternative to on-site support, even with appropriate discount attached. Users reported that they had neither the time nor the resources to deliver such items as terminals or other peripheral equipment to repair centers and would pefer to have their systems serviced on-site.

## D. USER ATTITUDES TOWARD HAVING THE FIELD ENGINEER IN A SALES ROLE

- Another strategy that some vendors are considering as a source of new field service revenue is the increased role of field service in sales support. This is based on the periodic contact that vendors have with their users through their FEs, who have already established a sense of trust from users who view the FE as a source of advice as well as repair.
- Users, on the other hand, clearly want to see the FE continue as an unbiased source of advice, as indicated by the declining interest in having the FE increase his activity in sales, as shown in Exhibits VI-4 and VI-5.

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

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

## 1983 USER ATTITUDES TOWARD HAVING THE FIELD ENGINEER IN A SALES ROLE

FIELD ENGINEER'S SALES ACTIVITY	FAVOR	NEUTRAL	OPPOSE
Supplies	35.1%	11.78	53.2%
Add-On Equipment	57.0	7.3	35.7
New Models	47.1	7.6	45.3
Upgrades	60.2	7.9	31.9
Service Contracts	N/A	N/A	N/A
Software	30.4	9.6	60.0

- Also, users felt that the FE has sufficient responsibilities in keeping the equipment running, and that the FEs should concentrate their time and effort toward that purpose. This was true especially for users who were dissatisfied with their service already.
- Conversely, users who were satisfied with their service levels were also most acceptable, or at least indifferent, to the FE becoming more involved with sales activities. As long as the FE had the ability to maintain their equipment, they frequently thought it advantageous to be able to use the FE as a sales contact with the company, especially for add-on equipment, upgrades, and service contracts. Obviously, users who were dissatisfied with their service were least likely to want to talk about service contracts with the FEs.

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# APPENDIX A: DATA BASE FORMAT

### APPENDIX A: DATA BASE FORMAT

### A. DATA BASE OVERVIEW

- System components for the 1984 small-system user requirements report were as follows:
  - Apple III, with Profile, using CP/M as the operating system.
  - dBASE II, a relational data base management system developed and sold by Ashton-Tate (10150 West Jefferson Boulevard, Culver City, CA 90203).
  - ABSTAT, a statistical analysis program developed and sold by Anderson-Bell Company (5336 S. Crocker Street, Littleton, CO 80120).
- The small-system user reponses were entered and stored into six data (.DBF) files:
  - SSIA.DBF Questions IA through 4B.
  - SSIB.DBF Questions 5A through 9J2.
  - SSIC.DBF Questions 10A1 through 11F.

### INPUT

- SSID.DBF Questions 12A1 through 19.
- SSIE.DBF Questions 20A through 24.
- SSIF.DBF Demographic data.
- All six files are linked by three common fields, catalog number (CATNO), vendor, and product in order to facilitate analysis of all six files.
- The information stored in the file SSIF.DBF contains demographic data only and, in order to assure complete respondent confidentiality, is not available for analysis.

### B. DESCRIPTION OF FILES

- Exhibits A-I through A-6 list the field names and structure of the six files created under dBASE II. The structure description includes information on the field's data tape (whether it is a character field, numeric field, or logical field), the width of the field, and the number of decimal places that field might contain. For example, in Exhibit A-I, field number 003 (QIA) is type "N" (a numeric field), has three characters in width, and contains no decimal positions.
- As previously stated, all six files contain three linking fields, CATNO, vendor, and product, which allows analysis of individual responses across all six files.

## SSIA.DBF

FIELD	NAME	ТҮРЕ	WIDTH	DECIMAL
001	CATNO	N	006	001
002	VENDOR	С	020	
003	PRODUCT	С	020	
004	Q1A	N	003	÷
005	Q1B	N	003	
006	Q1C	N	003	
007	Q1D	N	003	
008	Q1E	N	003	
009	Q2A	N	003	
010	Q2B	N	003	
011	Q2C	N	003	
012	Q 2D	N	003	
013	Q 2E	N	003	
014	Q 2F	N	003	
015	Q 3A	N	005	001
016	Q 3B	N	005	001
017	Q4A	N	005	001
018	Q 4B	N	005	001

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### SSIB.DBF

FIELD	NAME	ТҮРЕ	WIDTH	DECIMAL
001 002 003 004 005	CATNO VENDOR PRODUCT Q 5A Q 5B	N C C N N	006 020 020 005 005	001 001 001
006 007 008 009 010	Q 6A Q 6B Q 7A Q 7B Q 8A	N N N N	005 005 006 006 003	001 001 001 001
011 012 013 014 015	Q 8B Q 8C Q 9A 1 Q 9A 2 Q 9B 1	N N N N N	004 004 001 004 001	
016 017 018 019 020	Q 96 2 Q 9C 1 Q 9C 2 Q 9D 1 Q 9D 2	N N N N N	004 001 004 001 004	
021 022 023 024 025	Q 9E 1 Q 9E 2 Q 9F 1 Q 9F 2 Q 9G 1	Z Z Z Z Z Z Z	001 004 001 004 001	
026 027 028 029 030	Q 9G 2 Q 9H 1 Q 9H 2 Q 9I 1 Q 9I 2	N N N N N N N N N N N N N N N N N N N	004 001 004 001 004	
031 032	Q 9J 1 Q 9J 2	N N	00 <b>1</b> 004	

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### SSIC.DBF

FIELD	NAME	ТҮРЕ	WIDTH	DECIMAL
001 002 003 004 005	CATNO VENDOR PRODUCT Q10A1 Q10A2	NCCZZ	006 020 020 003 003	001
006 007 008 009 010	Q 10B 1 Q 10B 2 Q 10C 1 Q 10C 2 Q 10D 1	N N N N	003 003 003 003 003	
011 012 013 014 015	Q 1 0D 2 Q 1 0E 1 Q 1 0E 2 Q 1 0F 1 Q 1 0F 2		003 003 003 003 003	
016 017 018 019 020	Q 10G 1 Q 10G 2 Q 10H 1 Q 10H 2 Q 10H 2 Q 10H 1		003 003 003 003 003 003	
021 022 023 024 025	Q 10I 2 Q 10J 1 Q 10J 2 Q 11A Q 11B		003 003 003 001 001	
026 027 028 029	Q 1 1C Q 1 1D Q 1 1E Q 1 1F	N N N N	001 001 001 001	

### SSID.DBF

FIELD	NAME	ТҮРЕ	WIDTH	DECIMAL
001 002 003 004 005	CATNO VENDOR PRODUCT Q12A1 Q12A2	N C C N N	006 020 020 003 003	001
006 007 008 009 010	Q 12B 1 Q 12B 2 Q 12C 1 Q 12C 2 Q 12C 1	N N N N	003 003 003 003 003	
011 012 013 014 015	Q 12D 2 Q 12E 2 Q 12F 1 Q 12F 2 Q 13	N N N N N	003 003 003 003 003 001	
016 017 018 019 020	Q 1 4 Q 15A Q 15B Q 16A Q 16B	N C C N N	001 030 020 001 001	
021 022 023 024 025	Q 17A Q 17B Q 17C Q 17D Q 18A	N	001 001 001 001 001	
026 027 028	Q 18B Q 18C Q 19	N N N	001 001 003	

### SSIE.DBF

FIELD	NAME	TYPE	WIDTH	DECIMAL
001 002 003 004 005	CATNO VENDOR PRODUCT Q20A Q20B	NCCNN	006 020 020 003 003	001
006 007 008 009 010	Q 20C Q 20D Q 20E Q 20F Q 20G	N N N N N	003 003 003 003 003	
011 012 013 014 015	Q 20H Q 21 Q 22A Q 22B Q 22C	N N N N N N	003 003 003 003 003 003	
016 017 018 019 020	Q 22D Q 22E Q 23 Q 23A Q 23A 1	N N N N N N N N N N N N N N N N N N N	003 003 001 030 001	
021 022 023 024 025	Q 2 3A 2 Q 2 3A 3 Q 2 3B Q 2 4	N N N C	001 001 001 030	

### SSIF.DBF

FIELD	NAME	TYPE	WIDTH	DECIMAL
001	CATNO	N	006	001
002	ZIP	С	005	
003	INDUSTRY	С	030	
004	AREA	С	003	
005	VENDOR	С	020	
006	PRODUCT	С	020	

### C. ANALYSIS OF THE DATA BASE FILES

- INPUT clients may want to do their own statistical analysis of the smallsystem user survey results. Raw data is available to clients upon request in two forms:
  - In hard copy format as "Raw Data Base Printouts," which contain actual printout of data from all 363 user surveys (excluding demographic information). Since each questionnaire contains over 130 possible data items, this format would be rather unwieldy if used to analyze the entire data base, but would be convenient to analyze individual responses and small groups of respondents.
  - In diskette format, which contains all statistical responses from the user survey (excluding demographic data).
- System configuration requirements necessary to analyze the raw data diskettes include the following:
  - Hardware: Apple II+, Apple IIe, or Apple III.
  - Operating system: CP/M.
  - Applications programs: dBASE II, ABSTAT (optional).
- Use of dBASE II alone will allow users to read and group data and perform rudimentary analysis. For more detailed statistical analysis, INPUT recommends that any statistical package (i.e., ABSTAT) that has the ability to read .DBF files should be used.

APPENDIX B: QUESTIONNAIRE

#### CATALOG NO. FISISIS

1. On a scale of 1-10, how important are each of the following maintenance factors in computer purchase decision-making: (1 = least important, 10 = most important)

a.	Price (of maintenance)	(Q1A)
b.	Uptime or system availability	(Q1B)
c.	Response time	(Q1C)
d.	Repair time	(Q1D)
e.	Vendor reputation	(015)

 On a scale of 1-10, please rate your maintenance vendor in the following categories:

a. Hardware service engineers' communication	(Q2A)
b. Software service engineers' communication	(Q2B)
c. Overall service image of the vendor	
d. Dispatching	
e. Escalation	(Q2D)
	(Q2E)
f. General responsiveness of the vendor	(Q2F)

- 3. a. What is your requirement for hardware response time? \_\_\_\_\_(hours) (Q3A)
  b. What do you receive? \_\_\_\_\_(hours)
- 4. a. What is your requirement for hardware repair time? \_\_\_\_\_(Q4A) (hours)
   b. What is the average repair time (once the FE is on site)? \_\_\_\_\_(Q4B) (hours)
- a. What is your requirement for software response time? \_\_\_\_\_(Q5A) (hours)
   b. What do you currently receive? \_\_\_\_\_(hours)
- a. What is your requirement for software fixes? \_\_\_\_\_(hours)
   b. What do you currently receive? \_\_\_\_\_(hours)
- a. What overall level of system availability do you require?
   (Q7A)
   b. What level of system availability are you experiencing?
   (Q7B)

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CATALOG NO. FISIS 5

- 8. a. How many system interruptions do you have each month?
   (Q8A)
   b. What percentage of system interruptions are hardware related?
   (Q8B)
   c. And software related?
   (Q8C)
- 9. Do you have a requirement for any of the following services, and if so, what would you consider a reasonable premium to pay over the basic maintenance charge?

Service	1 = Yes, 2 = No Yes/No	Reasonable Premium (percent)
a. Stand-by coverage during critical periods	(Q9A1)	Q9A2)
b. Guaranteed uptime	(Q9B1)	
c. Guaranteed response time	(0901)	(0)(2)
d. On-site spare parts	(2901)	
e. Remote diagnostics	(0951)	(Q952)
<ul> <li>f. Preventive maintenance and field changes during off-prime hours</li> </ul>	(Q9E1) (Q9F1)	(Q9E2) 0 (Q9F2)
g. Occasional shift coverage (versus fixed schedule)	(Q9G1)	ې (Q9G2)
h. Full-time, on-site service engineer	(09H1)	0 0
i. Guaranteed repair time (hardware)	(0.011)	<u>(((3))2</u> )
j. Guaranteed turnaround on software fixes	(Q9J1)	(Q912) (Q912)

- 10. a. Please rate, on a scale of 1-10, your requirements for the following vendor goods and services.
  - b. Please rate your current level of satisfaction with the services you receive from your maintenance vendor.

Vendor Goods & Services	Requirement (a) 1-10	Current Level (b) 1-10
a. Planning (environmental, physical site installation)	(Q10A1)	(Q10A2)
b. Consulting	(Q10B1)	(Q10B2)
c. Documentation	(Q10C1)	(Q10C2)
d. Training	(Q10D1)	(Q10D2)
e. Sales of supplies	(Q10E1)	(010E2)
f. Add-on sales	(01051)	
g. Site audits	(Q10F1)	(Q10F2)
h. Relocation/deinstallation	(Q10G1)	(Q10G2)
	(Q10H1)	(Q10H2)
1. Hardware maintenance	(Q1011)	(Q1012)
j. Software maintenance	(Q10J1)	(Q10J2)

11. Would you favor or oppose having the field service engineer take orders for: (1 = favor, 2 = oppose, 3 = neutral)

а.	Supplies	
b.	Add-on equipment	(Q11A)
-	New medale	(Q11B)
с.	New models	(Q11C)
d.	Upgrades	(Q11D)
e.	Service contracts	(0115)
f.	Software	(GITE)
		(Q11F)

12. Please rate the importance of receiving your hardware and software support services by the following methods: (scale 1-10)

	(1-1	10)
	Hardware	Software
a. Your involvement in telephone diagnosis: working with support center	(Q12A1)	(Q12A2)
b. Your involvement with remote diagnostics and software down-line loading	(Q12B1)	(Q12B2)
c. Your replacing circuit boards, or patching software	(Q12C1)	(Q12C2)
d. Ship in/carry in to repair center	. (Q12D1)	(Q12D2)
e. Consulting/software customization f. Traditional, on-site response to trouble		(Q12E2)
Do you currently use third-party maintenance $(1 = yes, 2 = no)$ IF YES, GO	on any of your eq TO QUESTION 1	uipment? 5.
Have you considered using third-party mainten 2 = no) IF YES, GO TO QUESTION 20. IF N	ance? IO GO TO QUESTI (Q14)	(1 = yes, ON 21.
a. Which third-party vendor are you currently	using?	(Q15A)
b. And for which product?(Q15B)		
Do you receive third-party maintenance in: (1	= yes, 2 = no)	
a. Per call or b. Contract	(Q16B)	
If contract:		
What is your response time requirement?(1 = ye	es, 2 = no)	
a. 2 hrs b. 4 hrs c. 8	hrs(Q17C)	

#### CATALOG NO. FISISISI

18. What type of coverage do you receive? (1 = yes, 2 = no)

a.	Mon Fri.	
		(Q18A)
b.	Saturday	
		(Q18B)
c.	Sunday	
	•	(Q18C)

- 19. On a scale of 1-10, how satisfied are you with the third-party maintenance you are now receiving?
- 20. When considering third-party maintenance, how important are each of the following criteria to you? (1 = not important, 10 = very important)

a. Price of third party maintenance			
	(Q20A)		
b. Improved response time			
	(Q20B)		
c. Third-party vendor reputation			
	(Q20C)		
d. Hardware support			
•••	(Q20D)		
e. Software support provided by			
the third-party vendor	(Q20E)		
f. Overall system uptime (guarantee)			
	(Q20F)		
g. Geographic accessibility			
	(Q20G)		
h Other features (spares, diagnostics)			
	(Q20H)		

21. On a scale of 1-10, how important is a single source of maintenance to you?

22. Please rate the importance of the following single source maintenance contract features: (1 = not important, 10 = very important)

a. Improved convenience	
	(Q22A)
b. Improved response time	
	(Q22B)
c. Knowledge of site	
-	(Q22C)
d. Reputation of single-source vendor	
	(Q22D)
e. Avoids "finger pointing"	
5 1 5	(Q22E)

23. Do you currently use a Local Area Network in a conjunction with your small computer and/or word processor? (1 = yes, 2 = no)

(Q23)
a. If yes, which vendor?
(Q23A)
1. Star
((23A1) 2 Ping
(Q23A2)
3. Bus
(Q23A3)
b. If no, do you plan to in the next two years?
(Q23B)
211 Who maintains the network?
25. What is your most significant LAN maintenance concern?
26 In your opinion what is to the terms of the
significantly improve the level of service?
significantly improve the level of service?
THANK YOU.

APPENDIX C: USER RESPONDENTS

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