F-LSU J-Q
letter.
Original

July 1, 1986

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Dear
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:

Enclosed are recently completed analyses of superminicomputer vendor performance analyses to be added to Section III of the Large Systems Service Program binder. Included is an updated Table of Contents and List of Exhibits. Also, a title page has been included to be filed before the table of contents section.

As research is completed, INPUT will send you additional vendor performance analyses, shrink-wrapped and three-hole punched to be filed in Section III. An updated Table of Contents and List of Exhibits will accompany any future deliveries.

In the third quarter of the year, INPUT will begin delivery of the Large System Service Vendor Profiles to be filed in Section V of the binder.

As always, we welcome your questions and comments about our new research format. Please feel free to call me directly at (415) 960-3990.

Sincerely,

Rick Brusuelas
Program Manager, Customer Service Program

RB:ml

Enclosure

Litton **Mellonics** Systems Development

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DATE 6-24-86

CHARGE NO. F-LSU J-Q

JOB DESCRIPTION ANALYSIS OF LARGE SYSTEM SERVICE

COMPANY _____ CONTACT _____ PHONE ( ) _____ EXT _____

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Title / Copyright	Contents i / X	Exhibits ii → viii	III J 1 → 16	III K 1 → 14
III L 1 → 16	III M 1 → 16 (End 1ST Sec)	III N 1 → 15 (Start 2ND Sec)	III O 1 → 16	III P 1 → 15
III Q 1 → 16	skip 1 Sheet except #15			

ANALYSIS OF LARGE SYSTEMS SERVICE

1986

Published by
INPUT
1943 Landings Drive
Mountain View, CA 94043
U.S.A.

Customer Service Program

Analysis of Large Systems Service - 1986

LARGE SYSTEMS USER SERVICE REQUIREMENTS

CONTENTS

EXHIBITS

III J. CONCURRENT COMPUTER CORPORATION

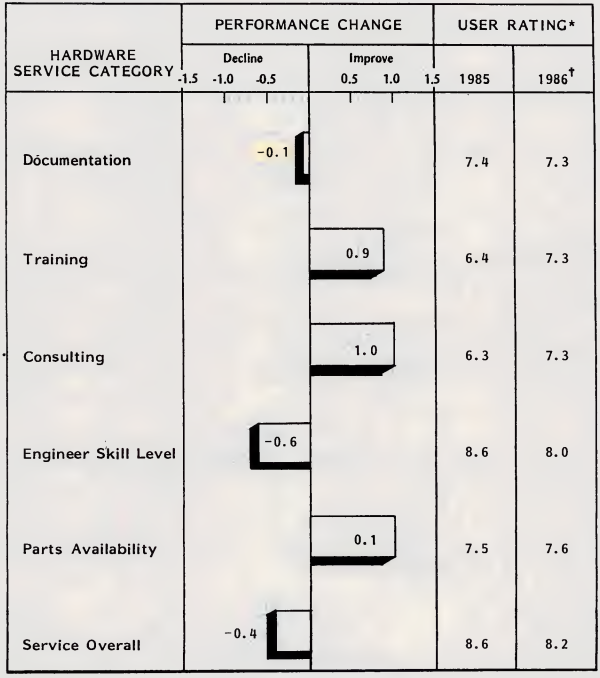
- In April 1986 INPUT interviewed 25 Concurrent 32XX superminicomputer users regarding their current satisfaction with the level of service received versus their required levels of service. All interviews were performed over the telephone, each lasting approximately 20 minutes. As always, INPUT has targeted data processing and operations managers as responsents; however, the very nature of Concurrent's market required that we interview engineering managers as well. Not surprisingly, our sample had a concentration of process manufacturers (with 24% of the sample), discrete manufacturers (20%), and services (also 20%) which presumably target manufacturing companies.

- Exhibit III-J-1 illustrates that Concurrent has made marked improvements in the areas of professional and educational services, both considered key areas of the engineering and scientific marketplace in which Concurrent participates. However, Concurrent users indicate concern over FE skill level, with a perceived drop in performance within the acceptable limits of the standard error of the mean. This concern is highlighted again in Exhibit III-J-2, which demonstrates that FE skill level falls well below user requirements. In addition, users are still concerned with spare parts availability, even though improvement was recognized in this area. Still, the high system availability requirements of these users place unusually high requirements on vendors to assure that the downtime caused or increased as a result of unavailable spare parts is minimized. As a result of these two factors, overall user satisfaction for service suffers.

- Exhibit III-J-3 demonstrates increased Concurrent user satisfaction with such post-sales services as training and consulting. The exhibit shows that user satisfaction with FE skill level has risen dramatically between 1985 and 1986, suggesting that, in light of the drop in actual performance in Exhibit III-J-1, user requirement for FE skill level in 1985 was relatively low. Again, the

EXHIBIT III-J-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
CONCURRENT



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-J-2

1986 USER HARDWARE SERVICE RATINGS
CONCURRENT

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	7.6	7.3	(0.3)
Training	6.6	7.7	1.1
Consulting	6.9	7.3	0.4
Remote Support	4.7	6.8	2.1
Engineer Skill Level	8.9	8.0	(0.9)
Parts Availability	9.1	7.6	(1.5)
Hardware Service Overall	9.2	8.2	(1.0)

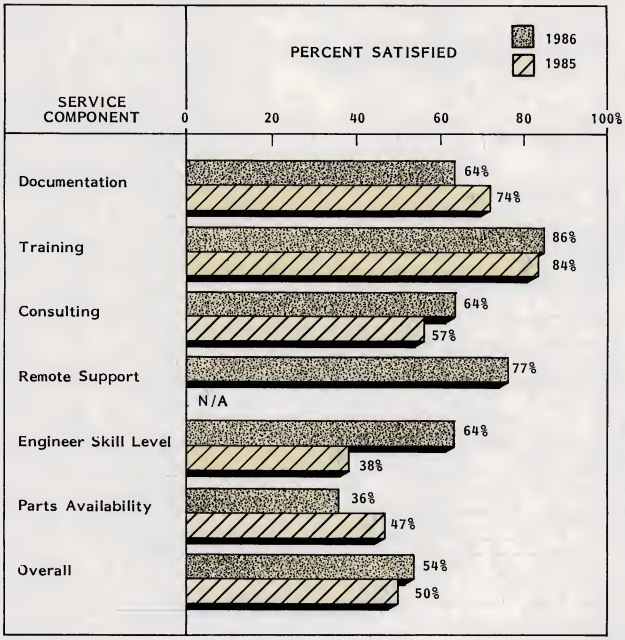
User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-J-3

USER SATISFACTION: HARDWARE SERVICE
CONCURRENT



greatest concern should be placed on spares, since the exhibit demonstrates a significant decline in the percentage of Concurrent users who are satisfied (47% in 1985 and only 36% in 1986). Exhibit III-J-4 graphically plots the relationship between user requirements for a particular service and the level that they receive. Note that parts availability, FE skill level, and overall satisfaction with hardware service are both highest in importance and farthest from the line representing the target area. Concurrent needs to focus their attention on reducing the service gap in these key service areas.

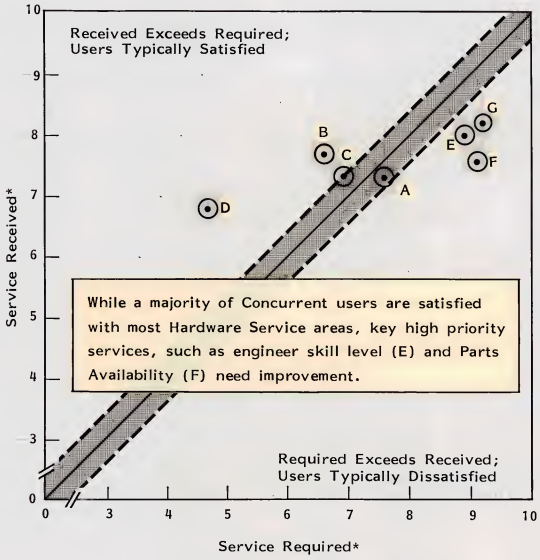
- Concurrent has been much more successful in addressing the rapidly growing service and support requirements of their users in the area of system software support. Although Exhibit III-J-5 shows that users perceived relatively little improvement in the majority of systems software support areas, user satisfaction in virtually all areas comes close to or exceeds user requirements. The exception of note is documentation, which in Exhibit III-J-6 falls below the user requirements. However, Exhibit III-J-7 indicates that even documentation as a service improved in 1986. Concurrent's ability to target and satisfy user requirements in software support should prove critical to the success of the company, due to the growing dependence on increased system availability.

- Exhibit III-J-8 provides a model for properly identifying, measuring, and satisfying the changing requirements of a user base. Note that in each area, Concurrent has provided service to their users at or above the levels required, without exceeding each requirement to such a degree that would suggest a lack of overall focus.

- Exhibit III-J-9 provides the actual numbers associated with measuring service performance. Note that in most areas, actual service performance by Concurrent has improved. System availability has improved both as a result of greater reliability of the 32XX as well as faster total turnaround on hardware and software problem resolution. Exhibit III-J-10 demonstrates that, with the sole exception of software repair time, vendor performance meets or exceeds user requirements.

EXHIBIT III-J-4

HARDWARE SERVICES REQUIRED/RECEIVED
CONCURRENT

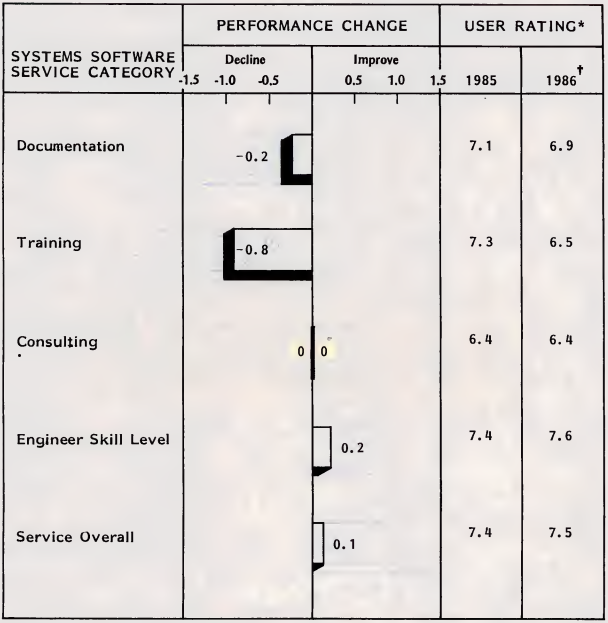


A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-J-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE
CONCURRENT



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-J-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
CONCURRENT

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	7.3	6.9	(0.4)
Training	6.2	6.5	0.3
Consulting	6.4	6.4	0.0
Remote Support	4.3	5.7	1.4
Engineer Skill Level	7.2	7.6	0.4
Service Overall	7.0	7.5	0.5

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-J-7

USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
CONCURRENT

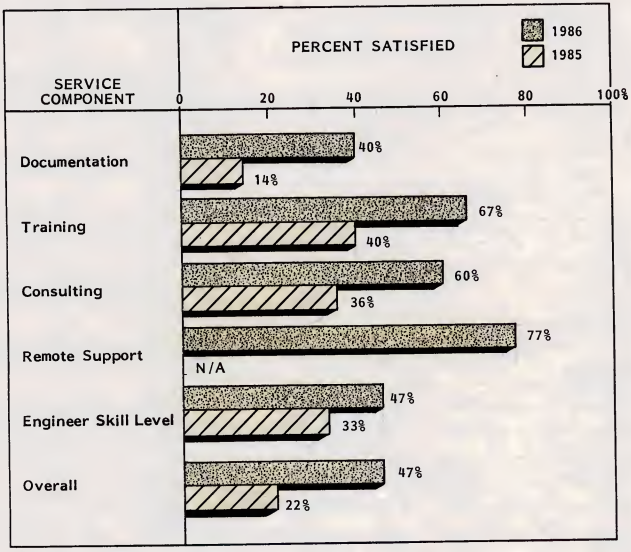
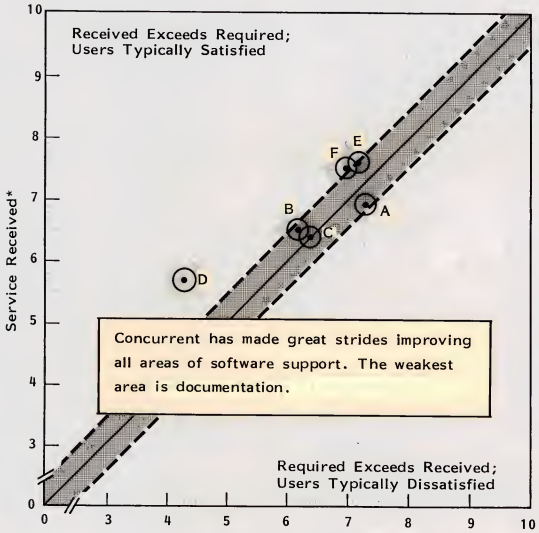


EXHIBIT III-J-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
CONCURRENT



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

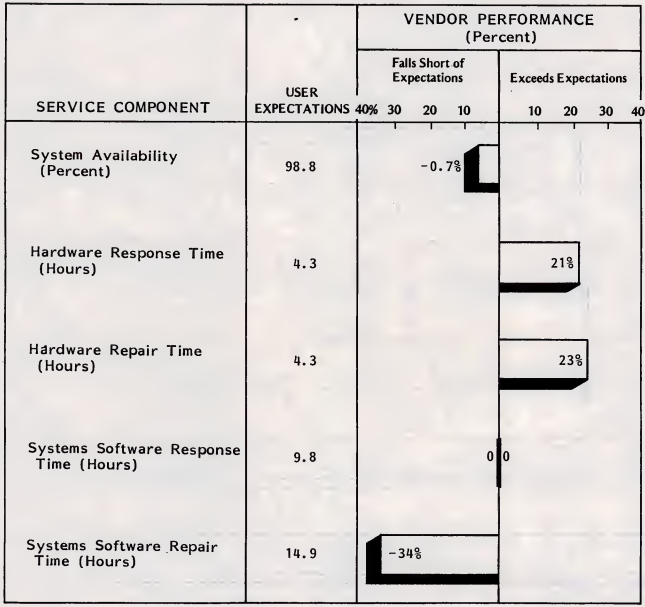
EXHIBIT III-J-9

SERVICE PERFORMANCE
CONCURRENT

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	96.3%	98.1%
Average Number of Interruptions		
Per Month (Number)	4.7	1.0
Percent Hardware Caused	71.0%	54.0%
Percent Software Caused	29.0%	21.0%
Average Hardware Response Time (Hours)	5.6 hr.	3.4 hr.
Average Hardware Repair Time (Hours)	2.6 hr.	3.3 hr.
Average Systems Software Response Time (Hours)	5.6 hr.	9.8 hr.
Average Systems Software Repair Time (Hours)	30.5 hr.	20.0 hr.

EXHIBIT III-J-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE
CONCURRENT

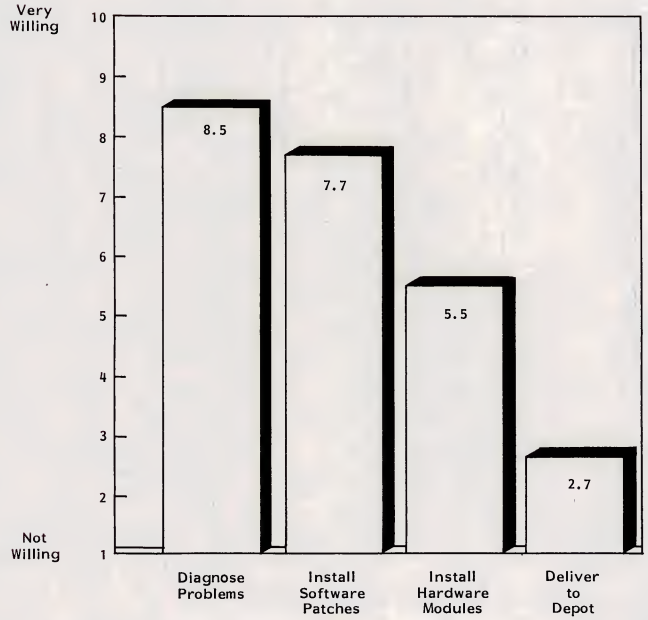


- Not surprisingly, Concurrent user satisfaction with service has helped lock these users into Concurrent support. Exhibit III-J-11 suggests that Concurrent users prefer to leave the majority of service activities to Concurrent, and Exhibit III-J-12 shows that the majority of Concurrent users opt for manufacturer service versus third-party maintenance. One should note that INPUT has predicted that superminicomputer maintenance will become a key growth market for TPM, and this exhibit demonstrates that TPM penetration into Concurrent's use base is growing.

- This satisfaction with service has tended to limit user requirement for premium services, as shown in Exhibit III-J-13. While a large number of users reported a requirement for standby coverage, the majority of those users did not report a very high requirement for that service.

EXHIBIT III-J-11

USER WILLINGNESS TO PERFORM MAINTENANCE
CONCURRENT



* Average Standard Error: 0.2

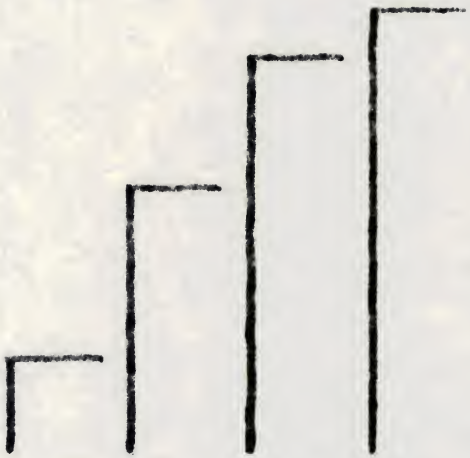
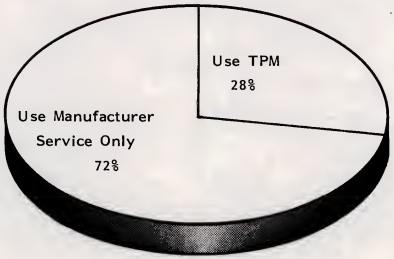


EXHIBIT III-J-12

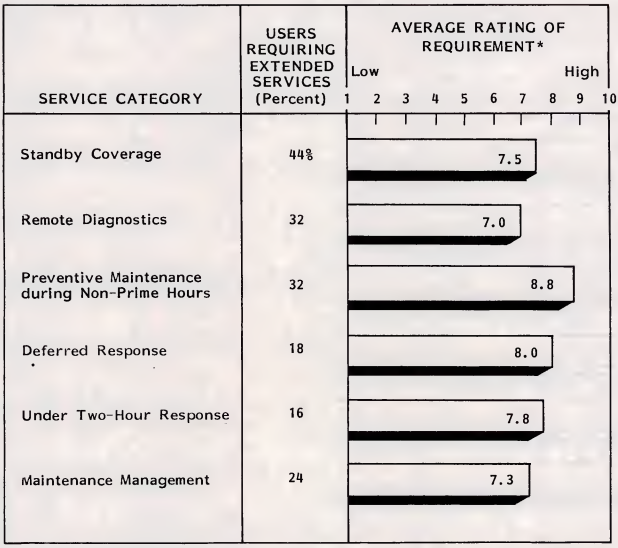
CURRENT TPM USE
CONCURRENT



TPM penetration into Concurrent user sites is limited; however, TPM growth in these sites has increased from 11% in 1985 to 28% in 1986.

EXHIBIT III-J-13

USER REQUIREMENTS FOR EXTENDED SERVICES
CONCURRENT



*Average Standard Error: 0.6

III K. GOULD

- In April 1986 INPUT interviewed 20 Gould 32XX superminicomputer users concerning their current satisfaction with the level of service and support that they received versus their requirements. All interviews were conducted by telephone, each lasting approximately 20 minutes. INPUT specifically targeted data processing and operations managers for this survey, although a number of the respondents were lead engineers involved in CAD/CAM applications. As with the Concurrent sample, the majority of Gould's users were involved in manufacturing, either in process manufacturing (with 30% of the sample, discrete manufacturing (25%), or services (25%). The remaining four were split between education and the federal government.

- This was the first year that Gould superminicomputer users' service requirements were analyzed, making it impossible to present time-series analyses of their service performance. Exhibit III-K-1 demonstrates that Gould service performance is very similar to that reported by their close competitor--Concurrent Computer Corporation. Users report that they receive higher than required levels of service in the areas of remote support, consulting, and training, and lower than required support in the areas of documentation, FE skill level, spare parts availability, and overall satisfaction with hardware service. Again, the most critical area of concern is of spare parts availability, which satisfies only one-fourth of Gould users, as shown in Exhibit III-K-2. While users of market leader DEC also report unmet service requirements in this key service area, DEC at least comes close to satisfying a majority (48%) of their users' needs. Gould and Concurrent will need to address the spares issue in order to gain ground on DEC.

- Exhibit III-K-3 graphically presents the success that Gould has had in satisfying user requirements in certain areas, such as training and consulting, while missing the mark in such key service areas as FE skill level and (most noticeably) spare parts availability.

EXHIBIT III-K-1

1986 USER HARDWARE SERVICE RATINGS
GOULD

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	7.1	6.9	(0.2)
Training	4.6	6.0	1.4
Consulting	5.4	5.9	0.5
Remote Support	4.0	7.3	3.3
Engineer Skill Level	8.5	7.7	(0.8)
Parts Availability	9.0	7.2	(1.8)
Hardware Service Overall	8.5	7.5	(1.0)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-K-2

USER SATISFACTION: HARDWARE SERVICE
GOULD

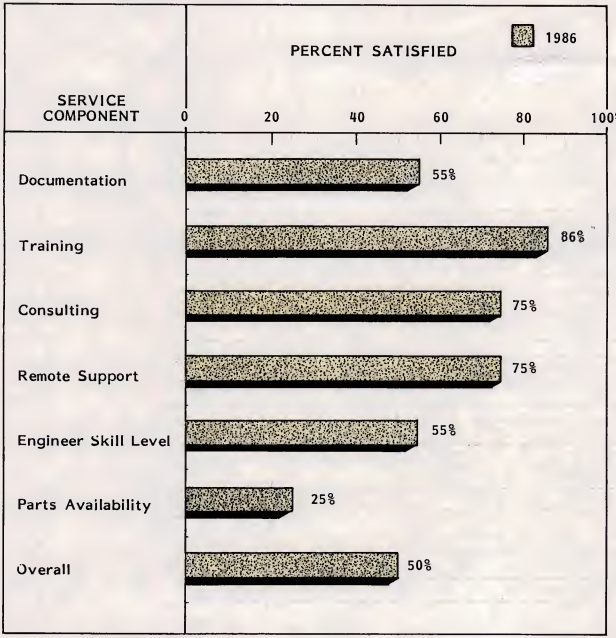
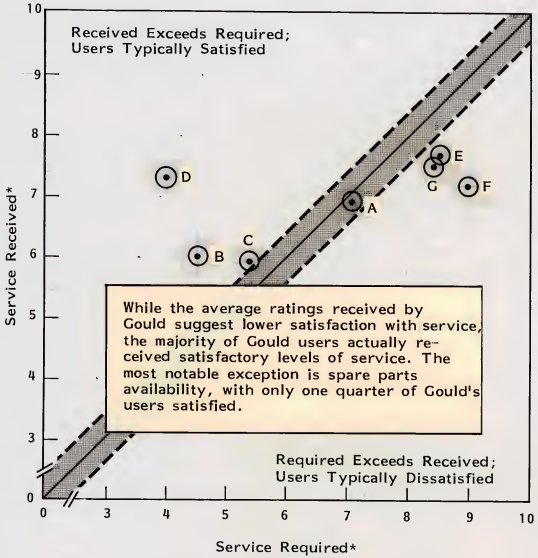


EXHIBIT III-K-3

HARDWARE SERVICES REQUIRED/RECEIVED
GOULD



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

- Exhibit III-K-4 shows that Gould also excells in the areas of consulting and remote support for systems software. An area of immediate concern should be systems software documentation, which falls well below user requirements. In fact, Exhibit III-K-5 indicates that only 20% of Gould users are satisfied with their systems software documentation. Undoubtedly, this dissatisfaction with documentation contributes to the rather low percentage of users who are satisfied with their systems software support overall. The importance of documentation cannot be overemphasized, since INPUT has found that 60% of all software problems are user related. Exhibit III-K-6 graphically demonstrates the distance between user needs and actual vendor performance in systems software documentation.

- Exhibit III-K-7 presents the actual performance marks traditionally used to judge service performance. When viewed in correlation with Exhibit III-K-8, it is obvious that Gould does an admirable job in meeting the high system availability requirements of their users. Gould exceeds the hardware response and repair time requirements of their users, and comes close to the systems software response and repair time requirements. This tends to highlight the growing concern which users are placing on spare parts availability, since it appears that the FE is arriving quickly enough, just not with the correct part.

- Exhibit III-K-9 suggests that Gould users are very willing to increase their involvement in problem determination. In many situations, this indicates a user desire to reduce their service costs. In this case, however, user willingness indicates a desire to become more involved in fault diagnosis, with the possible goal of improving the chances of the FE having the correct spare part at hand before being dispatched. In this case, the increased willingness of the user to become involved can be used by the vendor to improve service satisfaction.

- Exhibit III-K-10 indicates that almost one-third of Gould's users are experienced with third-party maintenance. Since this is the first year that Gould

EXHIBIT III-K-4

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
GOULD

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	8.3	5.8	(2.5)
Training	6.4	6.2	(0.2)
Consulting	5.5	6.1	0.6
Remote Support	3.6	6.7	3.1
Engineer Skill Level	7.9	7.2	(0.7)
Service Overall	7.7	6.4	(1.3)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.6

EXHIBIT III-K-5

USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
GOULD

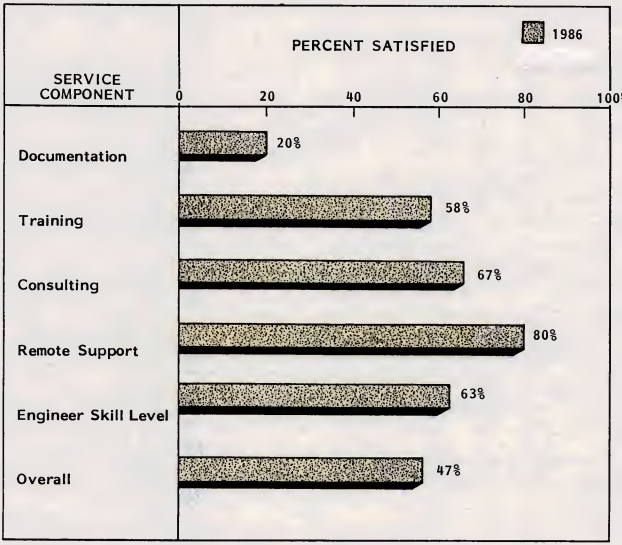
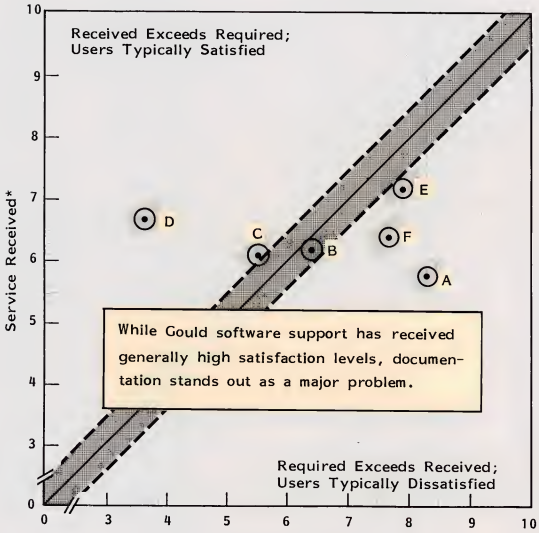


EXHIBIT III-K-6

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
GOULD



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-K-7

SERVICE PERFORMANCE
GOULD

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	N/A	98.0%
Average Number of Interruptions		
Per Month (Number)	N/A	1.3
Percent Hardware Caused	N/A	52.0%
Percent Software Caused	N/A	30.0%
Average Hardware Response Time (Hours)	N/A	5.1 hr.
Average Hardware Repair Time (Hours)	N/A	5.7 hr.
Average Systems Software Response Time (Hours)	N/A	9.9 hr.
Average Systems Software Repair Time (Hours)	N/A	11.1 hr.

EXHIBIT III-K-8

USER EXPECTATIONS FOR SERVICE PERFORMANCE
GOULD

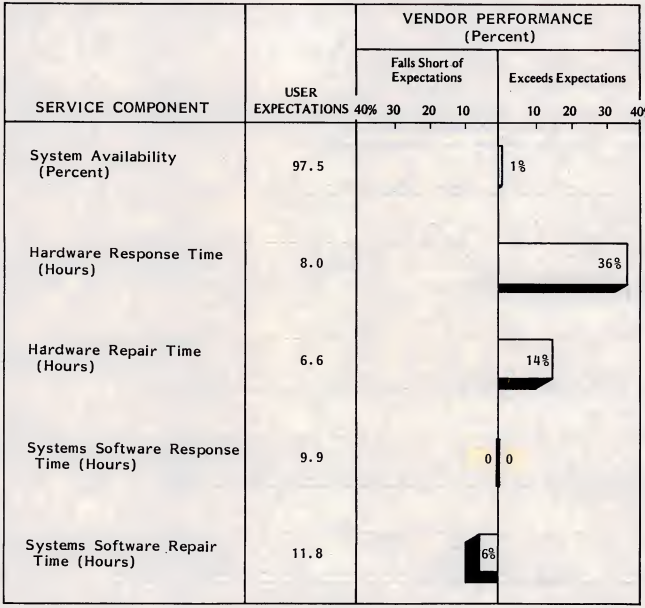
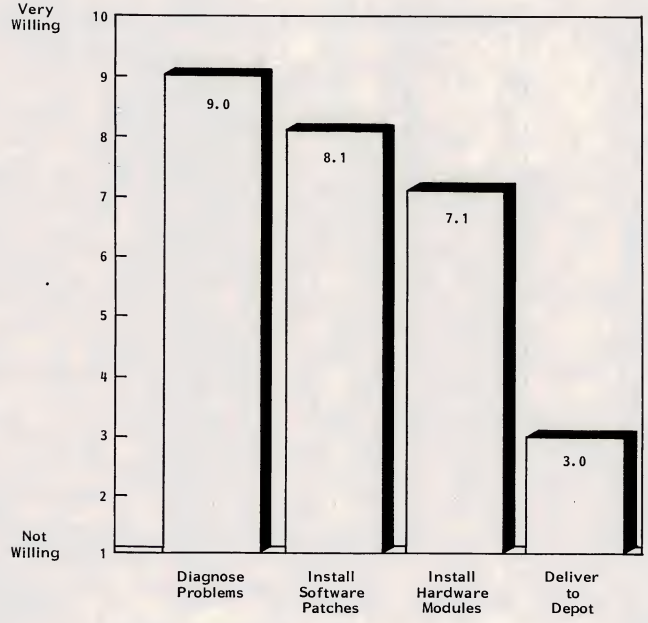


EXHIBIT III-K-9

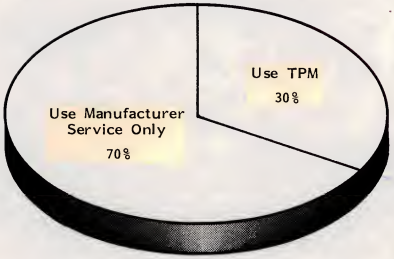
USER WILLINGNESS TO PERFORM MAINTENANCE
GOULD



* Average Standard Error: 0.2

EXHIBIT III-K-10

CURRENT TPM USE
GOULD



Almost one-third of all current Gould Super-mini computer users are experienced with third-party maintenance companies.

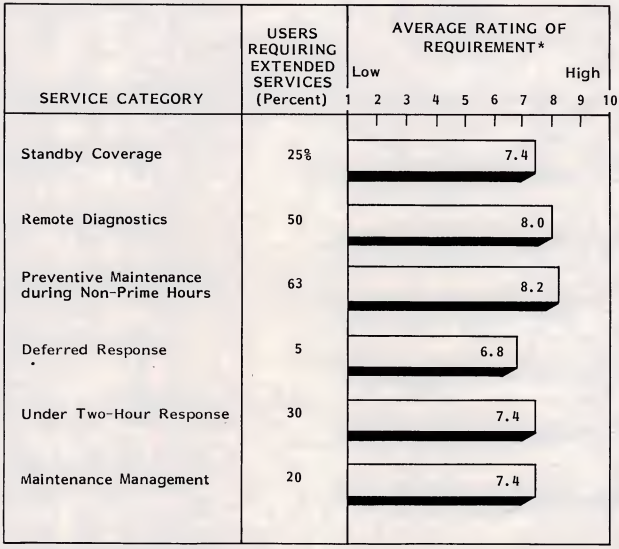
users were surveyed, it is not possible to gauge whether TPM encroachment is increasing. However, it is safe to project that TPM penetration into the superminicomputer market is growing and that Gould, as a vendor in that market, is not immune.

- Exhibit III-K-11 suggests that Gould superminicomputer users are not attracted to premium services, with the exception of non-prime hours preventive maintenance visits. Gould users recognized the importance of PM visits in preventing downtime, and thus were attracted to these additional visits as a way of maintaining high levels of system availability.

EXHIBIT III-K-11

USER REQUIREMENTS FOR EXTENDED SERVICES

GOULD



*Average Standard Error: 0.4

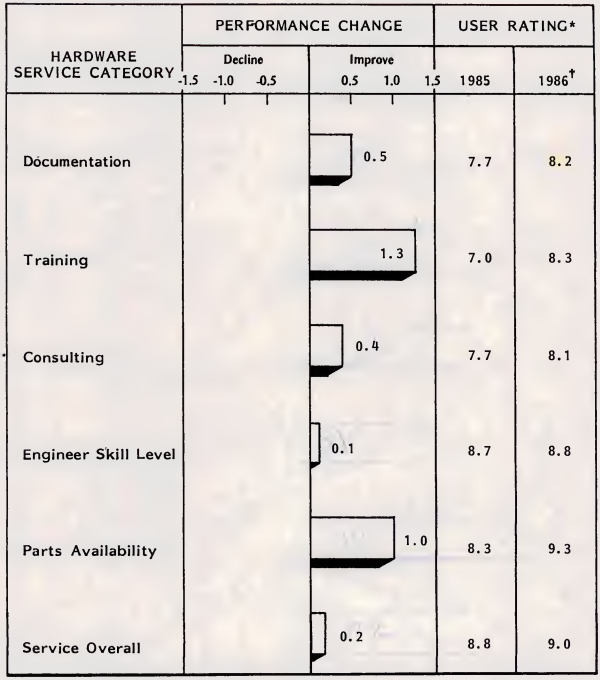
- In April 1986 INPUT interviewed 25 IBM System 38 users regarding their satisfaction with the level of hardware maintenance and system software support that they received from IBM. All interviews were performed by telephone, each lasting approximately 20 minutes. Respondents were typically data processing or computer operations managers. Other than process manufacturers, which constituted 36% of the respondent base, the IBM superminicomputer sample was evenly dispersed across industry boundaries.

- Exhibit III-L-1 demonstrates that IBM has improved their already high System 38 user hardware service ratings in 1986. More significantly, IBM exceeds their users' requirement levels in virtually all hardware service areas, as shown in Exhibit III-L-2. Even in the critical areas of FE skill level--spare parts availability and overall satisfaction--IBM meets their users' high requirements (note that the standard error of the mean covers what little distance exists between user requirements and received levels for parts and overall satisfaction). Not surprisingly, IBM succeeds in satisfying the vast majority of their users' service needs for all the hardware service components tested in Exhibit III-L-3.

- IBM benefits from a reputation for service and support of their users, which has helped build the user perception of excellent service, even though actual service provided might not be that far superior to the industry norm. Where IBM has been especially successful is in their ability to identify the current needs of their users and then provide services that address those needs. And, rather than concentrating on one or two specific areas which might result in lapses in other areas, IBM has demonstrated the ability to provide the correct amount of support in all service areas. Note that in Exhibit III-L-4, IBM users place most of their satisfaction ratings above, yet relatively close to the diagonal line representing their needs. More importantly, as the service

EXHIBIT III-L-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
IBM



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-L-2

1986 USER HARDWARE SERVICE RATINGS
IBM

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	6.4	8.3	1.9
Training	6.6	8.3	1.7
Consulting	6.3	8.1	1.8
Remote Support	5.2	7.3	2.1
Engineer Skill Level	8.6	8.8	0.2
Parts Availability	9.5	9.3	(0.2)
Hardware Service Overall	9.2	9.0	(0.2)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-L-3

USER SATISFACTION: HARDWARE SERVICE
IBM

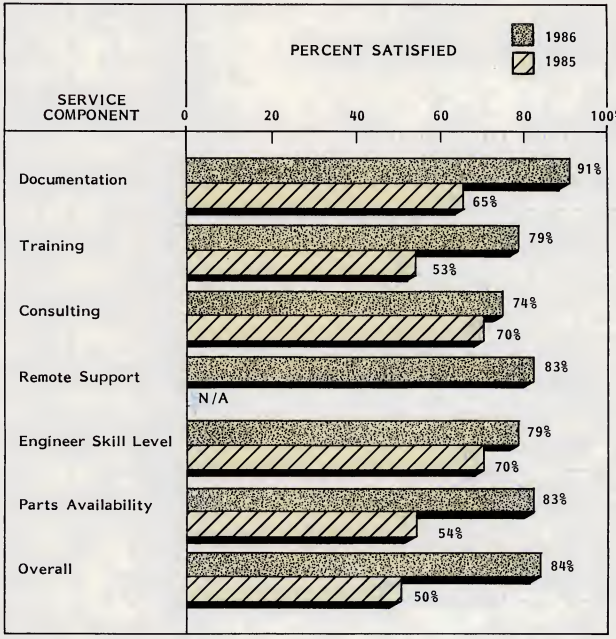
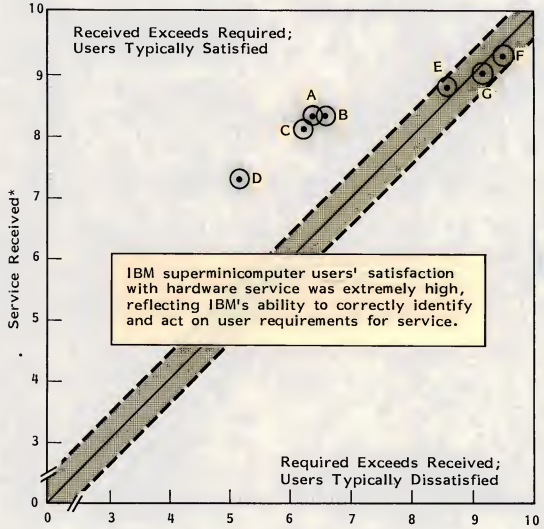


EXHIBIT III-L-4

HARDWARE SERVICES REQUIRED/RECEIVED

IBM



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

becomes more important to the user, and coincidentally more expensive to satisfy, IBM's ratings come even closer to that line.

- IBM System 38 service also shines in the area of systems software support. Exhibit III-L-5 shows that IBM users perceived a significant improvement in all components of software support, most notably in the area of engineer skill level, which was a weak spot last year. IBM's ability to target user requirement levels is no better illustrated than in Exhibits II-L-6 and III-L-7, which indicate that IBM is virtually dead on the mark for each service component. This is especially critical considering the rapidly increasing software support requirements that are associated with the superminicomputer market. Again, it is not surprising that the majority of IBM System 38 users report that they are satisfied with all systems software support components tested, as shown in Exhibit III-L-8.

- Exhibit III-L-9 demonstrates that IBM's actual performance is somewhat similar to industry (in this case, the superminicomputer market) standards, if not even below in certain areas. For example, the System 38's availability is below that of competitors DEC, Gould, Concurrent, Data General, and Hewlett-Packard, yet user satisfaction with system availability is very high. Response time for both hardware and software is very good, yet repair times are ordinary at best.

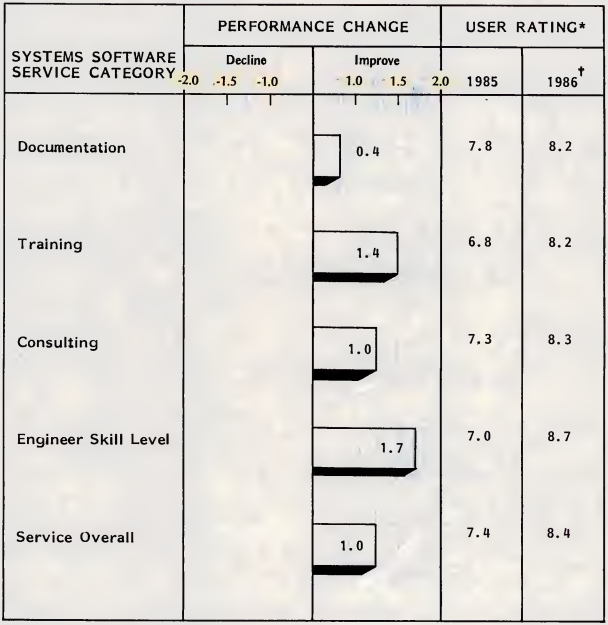
- The key to user satisfaction with service at IBM is that IBM successfully gauges the exact level of service necessary and supplies that level to their users. Exhibit III-L-10 shows that IBM meets or exceeds each component's user service requirement level. As a result, IBM user satisfaction in all service areas continues to remain high, even though other vendors may provide better service in one area or another. Best of all, IBM satisfies the majority of their users with little or no wasted effort (or resources).

- Not surprisingly, IBM users show little interest in increasing their own involvement in maintenance activities, as shown in Exhibit III-L-11. Further-

EXHIBIT III-L-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE

IBM



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.3

EXHIBIT III-L-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
IBM

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	8.2	8.2	0.0
Training	8.2	8.2	0.0
Consulting	7.5	8.3	0.8
Remote Support	6.4	6.5	0.1
Engineer Skill Level	9.3	8.7	(0.6)
Service Overall	9.1	8.4	(0.7)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-L-7

USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
IBM

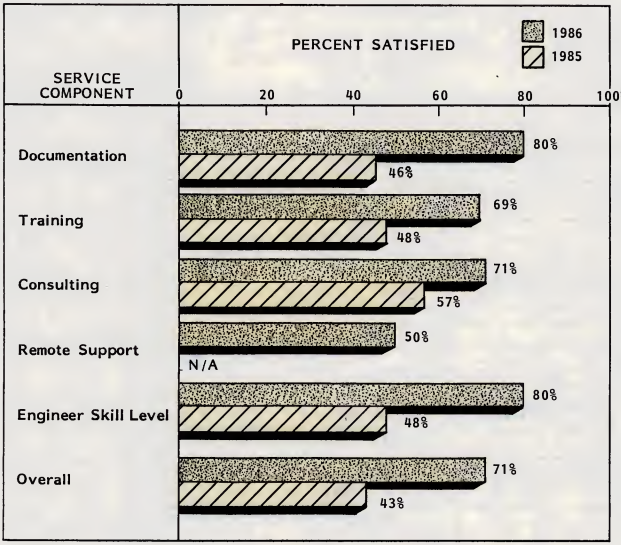
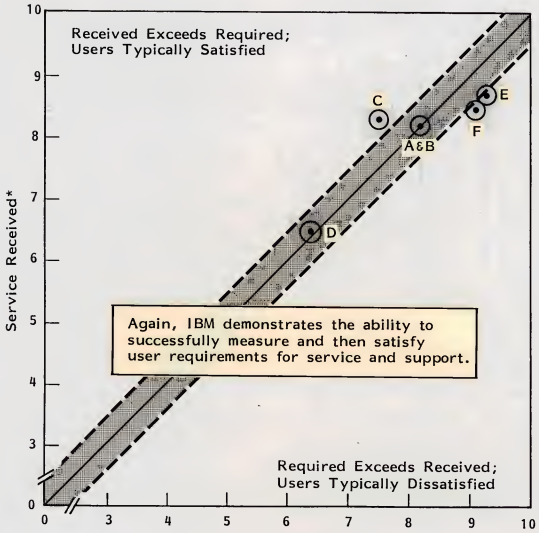


EXHIBIT III-L-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED

IBM



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-L-9

SERVICE PERFORMANCE
IBM

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	97.3%	96.8%
Average Number of Interruptions		
Per Month (Number)	0.7	0.5
Percent Hardware Caused	55.0%	67.0%
Percent Software Caused	15.0%	7.0%
Average Hardware Response Time (Hours)	1.4 hr.	1.8 hr.
Average Hardware Repair Time (Hours)	2.9 hr.	4.4 hr.
Average Systems Software Response Time (Hours)	6.2 hr.	3.2 hr.
Average Systems Software Repair Time (Hours)	9.4 hr.	12.6 hr.

EXHIBIT III-L-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE

IBM

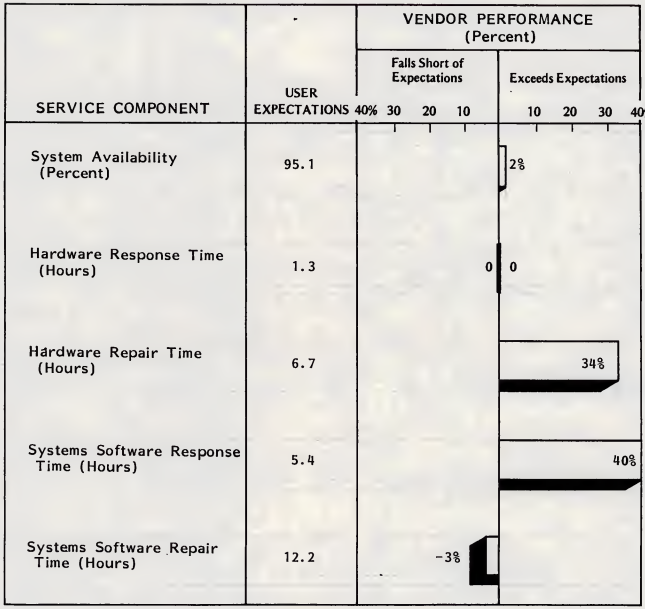
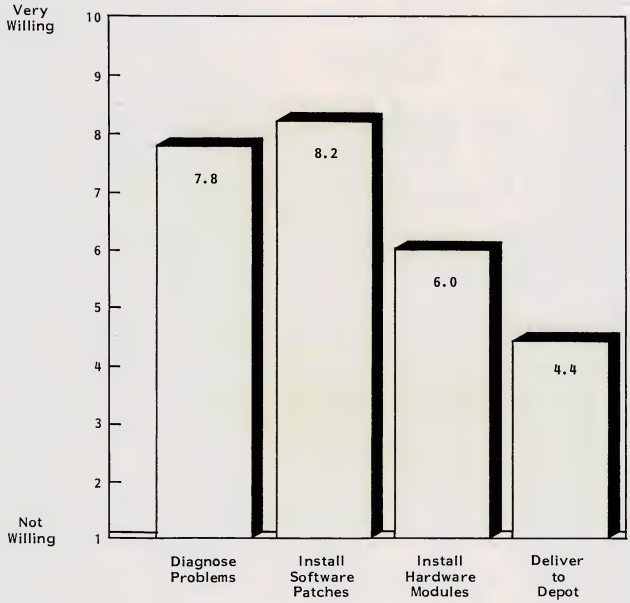
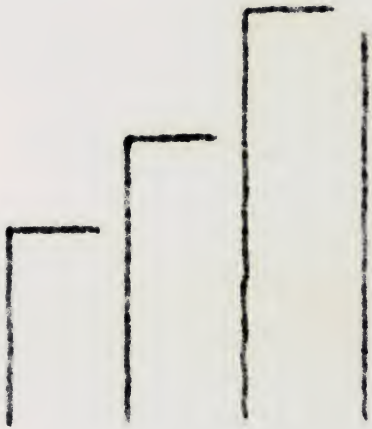


EXHIBIT III-L-11

USER WILLINGNESS TO PERFORM MAINTENANCE
IBM



* Average Standard Error: 0.3

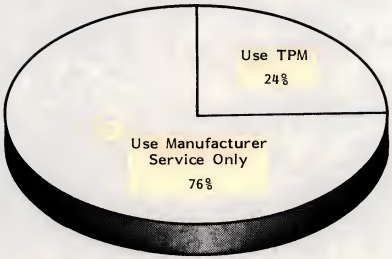


more, Exhibit III-L-12 suggests that IBM has been very successful in keeping users drawn to IBM service, even though the installed base of System 38 users must be large enough to attract TPM competition. The key to IBM's success is IBM's ability to target and meet their users' service and support needs.

- Exhibit III-L-13 suggests that there is considerable growth potential for premium service offerings. Over three-quarters of the System 38 users reported a requirement for standby coverage (76%), maintenance management--a form of single source service--(84%), and under two-hour response (88%). The last is puzzling, since the average IBM System 38 response time was already under two hours (1.8 hours). This curious result reflects the growing importance that users place on quick response time as a way of increasing system availability, a trend that is prompting many vendors to increase such activities as remote support and redundant systems.

EXHIBIT III-L-12

CURRENT TPM USE
IBM



A surprisingly small percentage of IBM system 38 users are experienced with TPM, most likely a reflection of high satisfaction with their current service.

EXHIBIT III-L-13

USER REQUIREMENTS FOR EXTENDED SERVICES

IBM

SERVICE CATEGORY	USERS REQUIRING EXTENDED SERVICES (Percent)	AVERAGE RATING OF REQUIREMENT* (Low 1 2 3 4 5 6 7 8 9 10 High)
Standby Coverage	76%	8.8
Remote Diagnostics	40	7.9
Preventive Maintenance during Non-Prime Hours	56	8.1
Deferred Response	36	7.0
Under Two-Hour Response	88	9.1
Maintenance Management	84	8.5

*Average Standard Error: 0.5

III M. DATA GENERAL

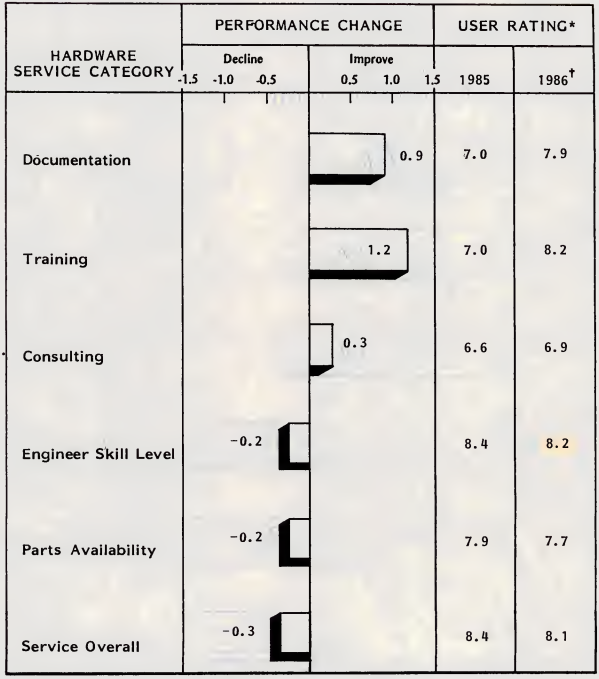
- In April and May 1986 INPUT interviewed 25 Data General MV/10000 superminicomputer users regarding their satisfaction with the service and support they received from their vendor. All interviews were performed by telephone and each interview lasted approximately 20 minutes. INPUT targeted data processing and computer operations managers as respondents. Predominant industries represented in the DG sample included education (with 28% of the sample), process manufacturing, services, medical (each with 16% of the sample), and discrete manufacturing (with 12% of the sample).

- Exhibit III-M-1 indicates that DG superminicomputer service has improved significantly in some areas like documentation and training, yet stayed about the same (considering standard errors of the mean) or slightly deteriorated in other, more important areas, like spare parts, FE skill level and overall service satisfaction. Exhibit III-M-2 shows that service in these last three areas falls below user requirements, and Exhibit III-M-3 reports that user satisfaction is also lowest in these components. The most critical problem appears to be spare parts availability, which satisfies only 39% of the DG superminicomputer sample, up slightly from last year's results. This continuation of user dissatisfaction with spares availability is surprising, considering the work that DG has done (and succeeded in, as reflected by the extremely high marks given to DG in the area of remote support) in remote diagnostics.

- Exhibit III-M-4 graphically demonstrates the inconsistency of DG superminicomputer hardware service. Note that user-reported actuals for training, consulting, and documentation far exceed the user requirement levels. At the same time, more critical areas, such as FE skill level, spare parts availability, and overall satisfaction fall below the users' requirement levels. These results suggest that DG needs to reemphasize efforts to improve user satisfaction with the more "logistics-oriented" areas, such as spares inventory management and distribution.

EXHIBIT III-M-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
DATA GENERAL



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-M-2

1986 USER HARDWARE SERVICE RATINGS
DATA GENERAL

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	5.6	7.5	1.9
Training	5.5	8.2	2.7
Consulting	6.5	6.9	0.4
Remote Support	7.0	7.9	0.9
Engineer Skill Level	9.1	8.2	(0.9)
Parts Availability	9.1	7.7	(1.4)
Hardware Service Overall	8.9	8.1	(0.8)

▨ User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-M-3

USER SATISFACTION: HARDWARE SERVICE
DATA GENERAL

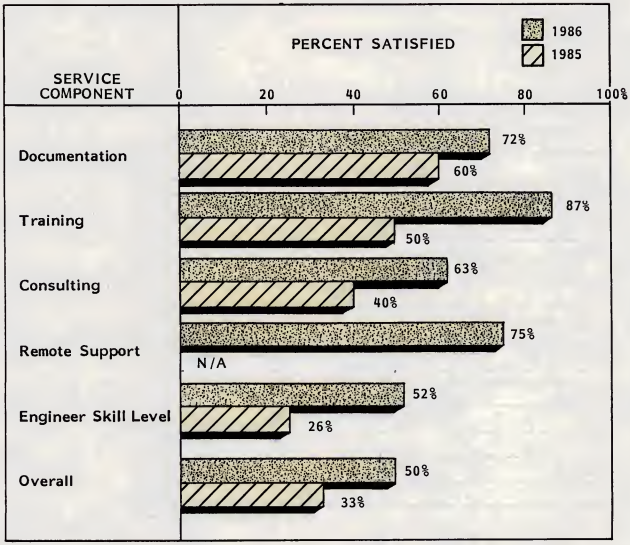
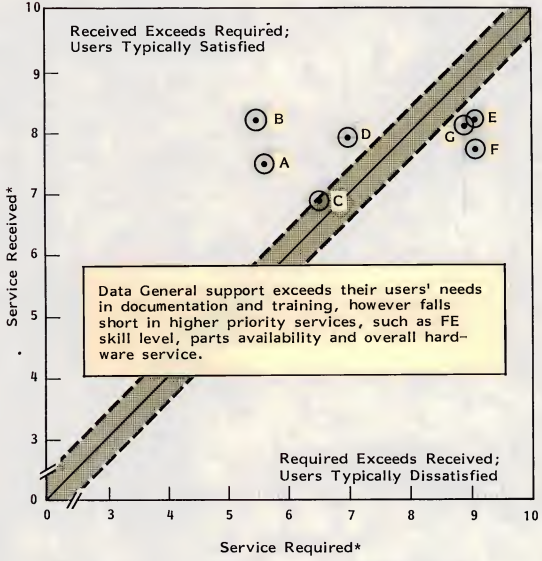


EXHIBIT III-M-4

HARDWARE SERVICES REQUIRED/RECEIVED
DATA GENERAL



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

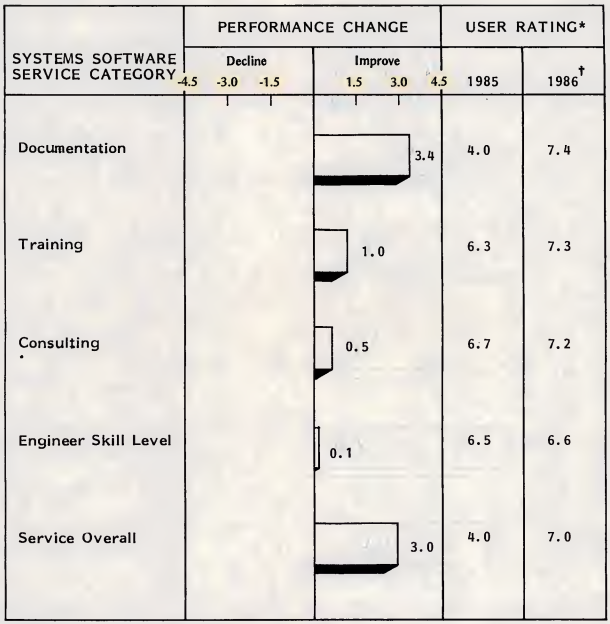
- System software support was a critical area of concern to last year's MV/10000 users. Exhibit III-M-5 indicates that DG has made improvements in most of these areas in 1986. Unfortunately, there is still a lot of room for improvement, as shown in Exhibit III-M-6. DG superminicomputer users have extremely high software support requirements, much higher than scientific/engineering superminicomputer users. Most immediate attention is needed in the area of software engineer skill level, which received an average rating well below the user requirement level. Exhibit III-M-7 further suggests that DG superminicomputer users are not satisfied with the support that they are receiving, particularly in the highest priority services, graphically shown in Exhibit III-M-8.

- Exhibit III-M-9 shows that Data General superminicomputer service performance, by more traditional measures, is very similar to last year's performance. System availability is nearly identical, hardware problem resolution time (response and repair time) is fairly close, and software problem resolution time is actually improved over last year's marks. Yet user satisfaction with the timeliness of software support is down, as shown in Exhibit III-M-10, as a result of the increasing user support requirements of DG MV/10000 users. Not surprisingly, DG superminicomputer users are extremely willing to increase their involvement in software support, as indicated in Exhibit III-M-11. This does not bode well for DG, as it will become increasingly difficult to sell additional software support to these users once they become self-reliant.

- INPUT has indicated that the superminicomputer market would become the next battlefront for third-party maintenance, and Exhibit III-M-12 supports that prediction--44% of DG MV/10000 users report experience with TPM, up slightly over last year's sample (40%). While this partly reflects the presence of "foreign" peripherals at DG sites, this also points to the potential of increased TPM penetration into DG sites if user service requirements are not met.

EXHIBIT III-M-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE
DATA GENERAL



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-M-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
DATA GENERAL

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	8.8	7.4	(1.4)
Training	7.6	7.3	(0.3)
Consulting	8.1	7.2	(0.9)
Remote Support	8.4	7.4	(1.0)
Engineer Skill Level	9.0	6.6	(2.4)
Service Overall	8.5	7.0	(1.5)

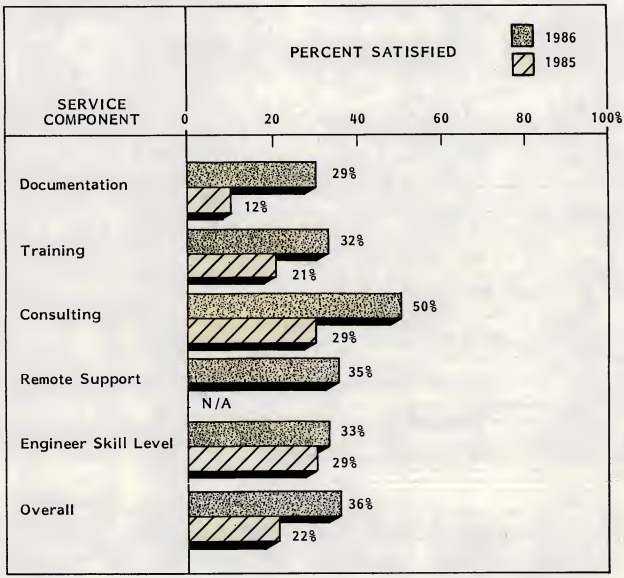
User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-M-7

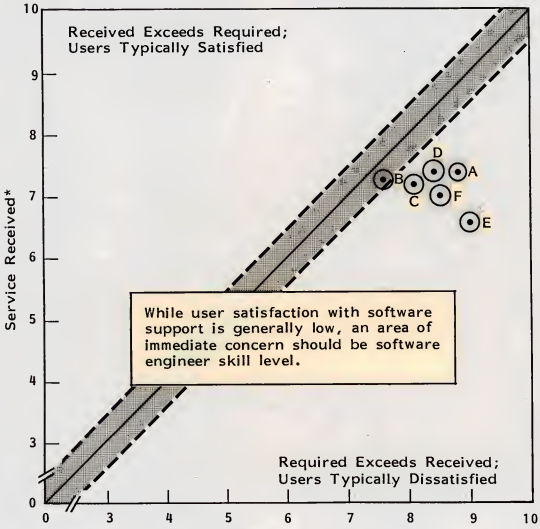
USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
DATA GENERAL



Parts Availability

EXHIBIT III-M-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
DATA GENERAL



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-M-9

SERVICE PERFORMANCE
DATA GENERAL

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	97.3%	97.1%
Average Number of Interruptions		
Per Month (Number)	1.9	1.4
Percent Hardware Caused	37.0%	49.0%
Percent Software Caused	46.0%	37.0%
Average Hardware Response Time (Hours)	4.2 hr.	3.0 hr.
Average Hardware Repair Time (Hours)	2.6 hr.	4.1 hr.
Average Systems Software Response Time (Hours)	2.2 hr.	3.6 hr.
Average Systems Software Repair Time (Hours)	26.0 hr.	13.4 hr.

EXHIBIT III-M-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE
DATA GENERAL

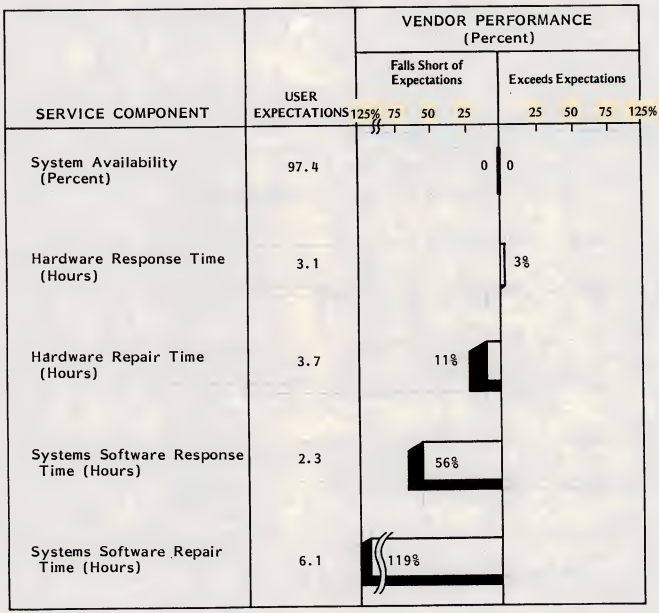
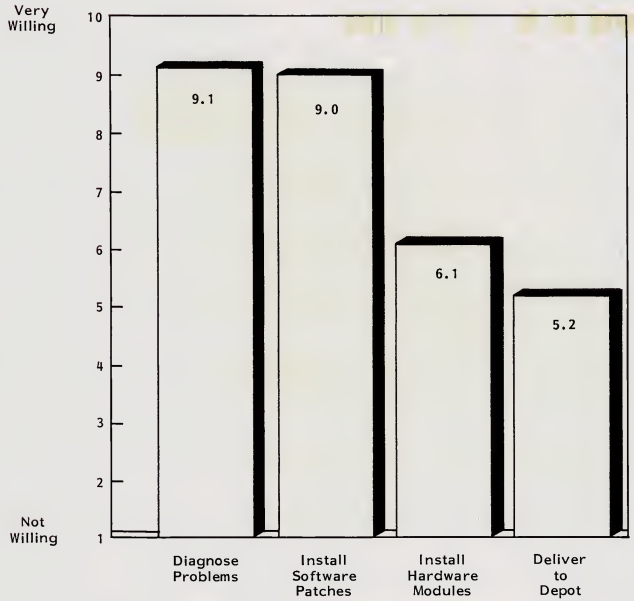


EXHIBIT III-11

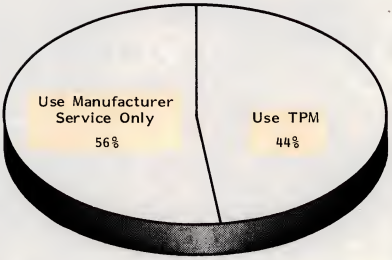
USER WILLINGNESS TO PERFORM MAINTENANCE
DATA GENERAL



* Average Standard Error: 0.3

EXHIBIT III-M-12

CURRENT TPM USE
DATA GENERAL

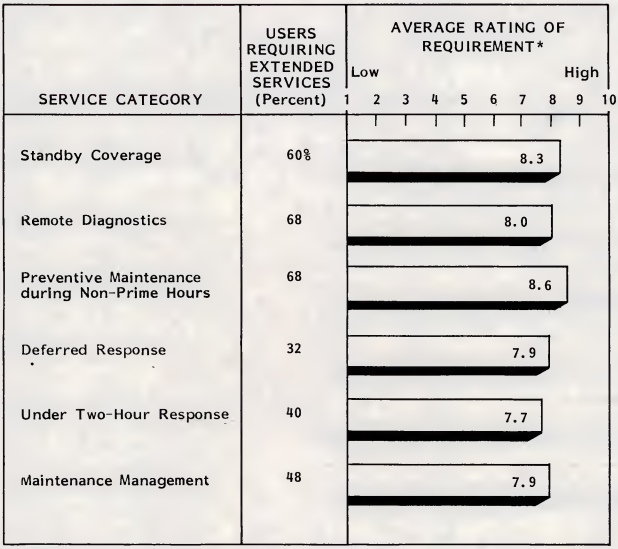


Forty-four percent of Data General MV/10000 users are experienced with TPM, up slightly from last year's sample.

- Exhibit III-M-13 presents DG superminicomputer user requirements for premium services. While user attraction to the majority of these services was higher than the industry norm, one service, PM's performed during non-prime hours, warrants particular attention, as the increased user interest hints at the growing multi-shift use of superminicomputers.

EXHIBIT III-M-13

USER REQUIREMENTS FOR EXTENDED SERVICES
DATA GENERAL



*Average Standard Error: 0.5

III N. DIGITAL EQUIPMENT CORPORATION

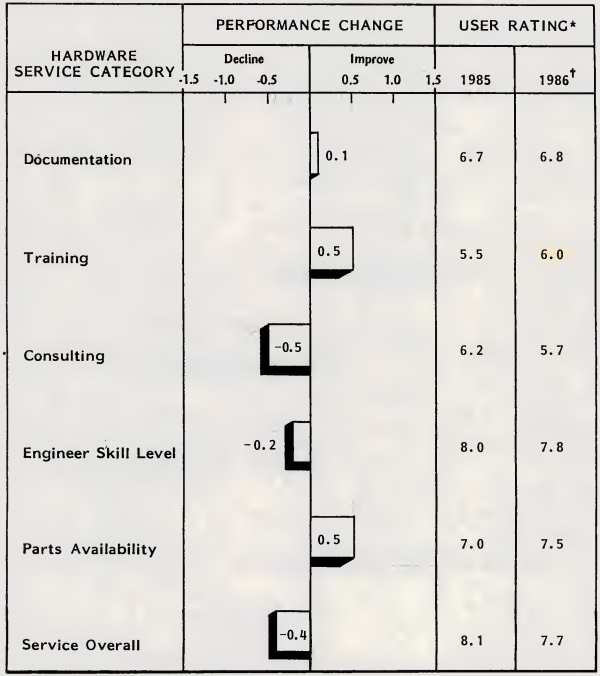
- In April 1986 INPUT interviewed 25 DEC VAX 11/7XX superminicomputer users concerning the quality of hardware maintenance and software support that they received from their vendor. All interviews were conducted by telephone and each lasted approximately 20 minutes. Respondents typically were directors or managers of data processing. The sample was weighted by two industries, services (which accounted for 36% of the sample) and discrete manufacturers (which made up an additional 32% of the sample). The rest of the sample were companies from the following industries: process manufacturing, education, and federal government.

- Exhibit III-N-1 demonstrates that DEC superminicomputer hardware service performance stayed relatively constant (considering the standard error of the mean) from 1985 to 1986. Exhibit III-N-2 presents a less favorable view of DEC hardware service performance, however, since the level of service received falls well below user requirements in the most critical service areas of FE skill level, spare parts availability, and overall satisfaction with hardware service. Not surprisingly, user satisfaction with these three areas is lowest, as shown in Exhibit III-N-3. In fact, DEC satisfies less than one-half of their superminicomputer users in the areas of parts availability and hardware service overall. Exhibit III-N-4 graphically demonstrates the gap between user requirements and actual service received in these high requirement areas.

- Systems software support is a slightly bigger problem for DEC. While DEC made significant improvements in the quality of system software documentation (as shown in Exhibit III-N-5), users perceived a decline in the ability of DEC software engineers in 1986. Exhibit III-N-6 indicates that while DEC users do not have exceptionally high service requirements in any one area, DEC comes close to meeting user requirements in only one service area (systems software training). While DEC users have been relatively accepting

EXHIBIT III-N-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
DEC



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-N-2

1986 USER HARDWARE SERVICE RATINGS
DEC

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	6.7	6.8	0.1
Training	6.2	6.0	(0.2)
Consulting	6.3	5.7	(0.6)
Remote Support	7.7	7.6	(0.1)
Engineer Skill Level	8.8	7.8	(1.0)
Parts Availability	9.0	7.5	(1.5)
Hardware Service Overall	8.7	7.7	(1.0)

▒ User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-N-3

USER SATISFACTION: HARDWARE SERVICE
DEC

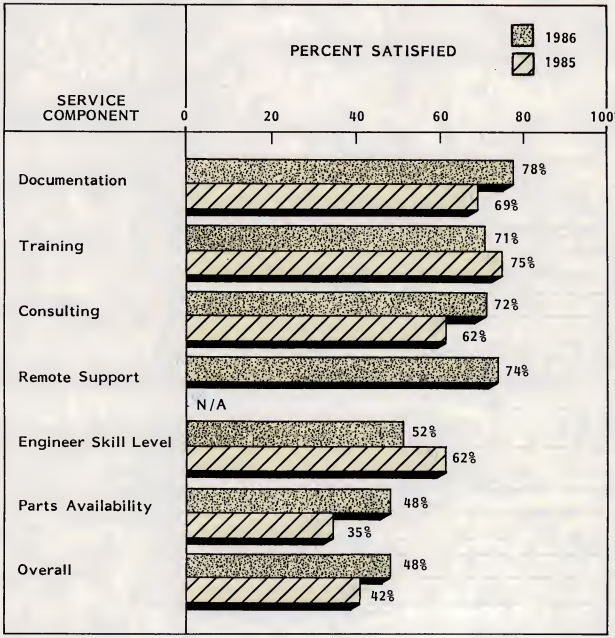
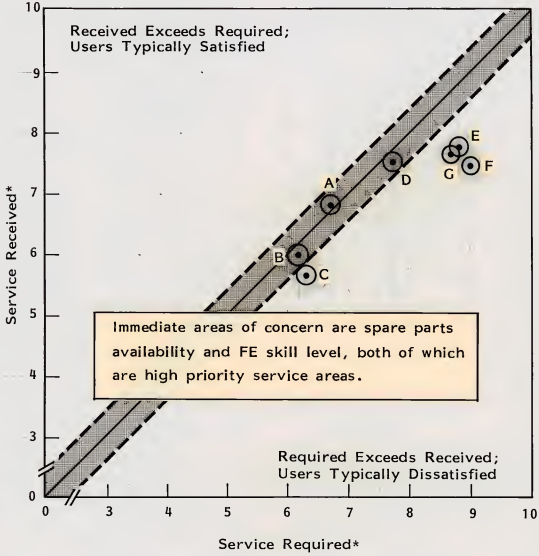


EXHIBIT III-N-4

HARDWARE SERVICES REQUIRED/RECEIVED
DEC

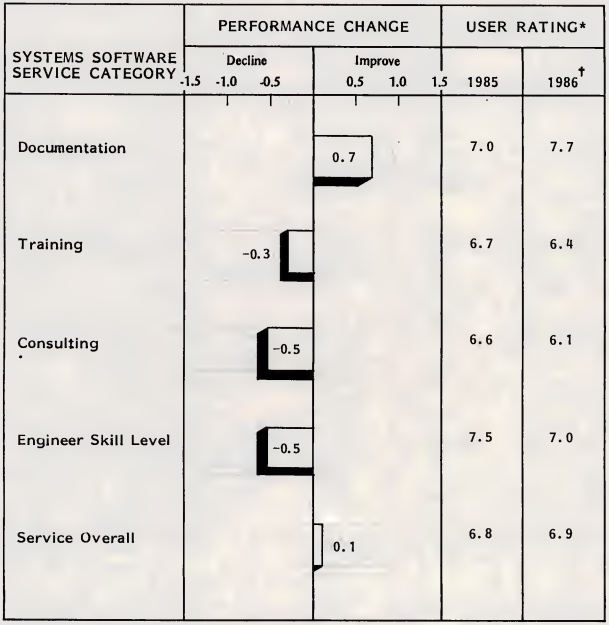


A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-N-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE
DEC



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-N-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
DEC

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	8.6	7.7	(0.9)
Training	6.5	6.4	(0.1)
Consulting	6.9	6.1	(0.8)
Remote Support	7.3	6.3	(1.0)
Engineer Skill Level	8.3	7.0	(1.3)
Service Overall	7.9	6.9	(1.0)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

of this, as indicated by satisfaction percentages shown in Exhibit III-N-7, note the significant drop in the percentage of DEC superminicomputer users who are satisfied with the skill level of their software engineer. Exhibit III-N-8 graphically shows the gap between user requirements and vendor actuals, particularly in the area of software engineer skill level.

- Exhibit III-N-9 indicates that DEC has improved system availability, both by improving product reliability (as indicated by a significant drop in the number of system interruptions) and by speeding up both hardware and software total problem resolution times. However, user software support requirements are growing very rapidly in the superminicomputer market, and Exhibit III-N-10 demonstrates that while software problem resolution improved, user requirements for problem resolution increased at a faster rate.

- Digital has been very effective in the marketing of their extensive support offerings. In most cases, their service menu has emphasized vendor-supplied services that tend to lock a customer into increased interaction with the vendor. Therefore, it is not surprising that DEC superminicomputer users are not extremely attracted to increasing their involvement in the servicing of their own equipment, as demonstrated in Exhibit III-N-11. In fact, Exhibit III-N-12 indicates that DEC users are increasingly attracted to additional premium service offerings, like non-prime PM visits, remote diagnostics, and maintenance management contracts.

- Digital's installed base has been a traditional target market for third-party maintenance companies, in part due to DEC's willingness, in fact encouragement, of users to go to OEM and VARS who provided the lowest complete system cost, regardless of peripheral manufacturer. As a result, a high percentage of DEC sites contained "foreign" peripherals, which encouraged TPM penetration into these locations. Exhibit III-N-13 demonstrates that 40% of all DEC users are experienced with TPM. DEC has actively participated in the TPM market by offering limited services to users of DEC systems with non-DEC peripherals.

EXHIBIT III-N-7

USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
DEC

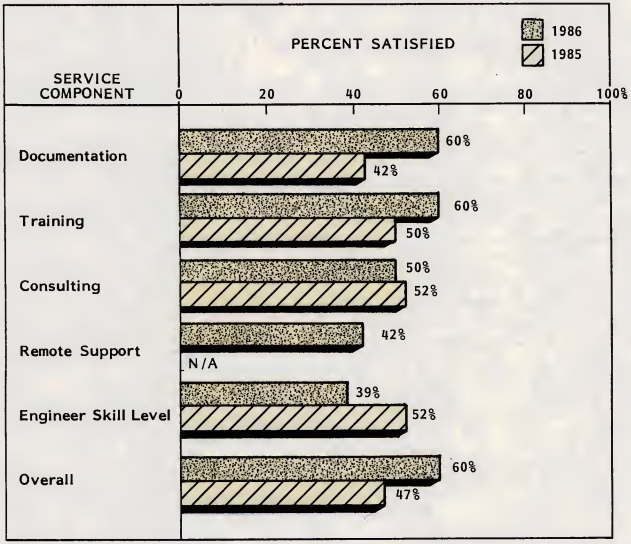
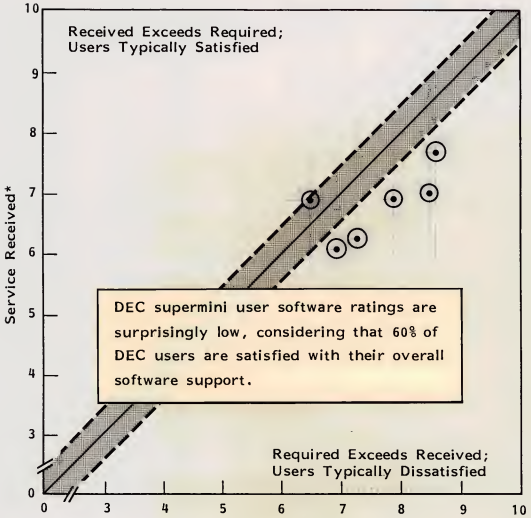


EXHIBIT III-N-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
DEC



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-N-9

SERVICE PERFORMANCE
DEC

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	96.6%	98.5%
Average Number of Interruptions		
Per Month (Number)	2.5	1.5
Percent Hardware Caused	70.0%	70.0%
Percent Software Caused	30.0%	25.0%
Average Hardware Response Time (Hours)	2.4 hr.	2.6 hr.
Average Hardware Repair Time (Hours)	3.9 hr.	2.8 hr.
Average Systems Software Response Time (Hours)	9.5 hr.	4.6 hr.
Average Systems Software Repair Time (Hours)	10.9 hr.	11.2 hr.

EXHIBIT III-N-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE
DEC

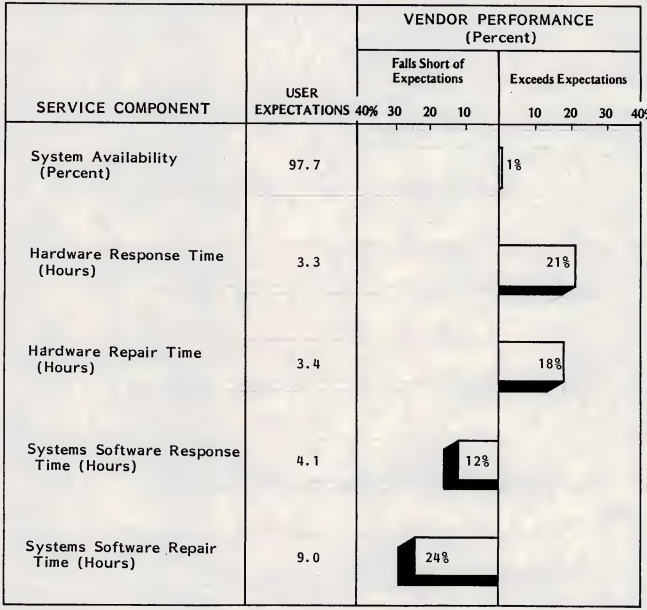
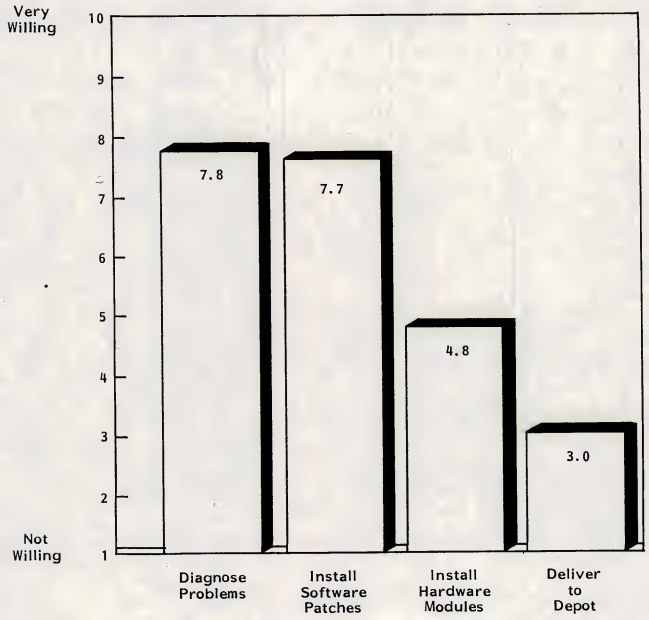


EXHIBIT III-N-11

USER WILLINGNESS TO PERFORM MAINTENANCE
DEC



* Average Standard Error: 0.3

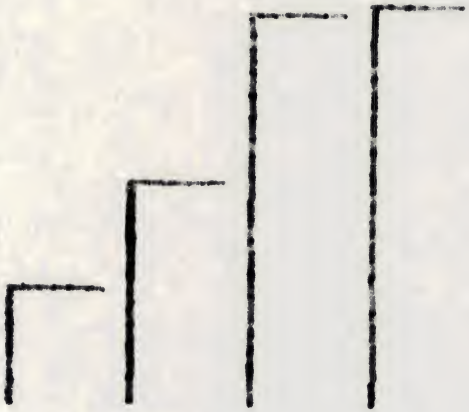
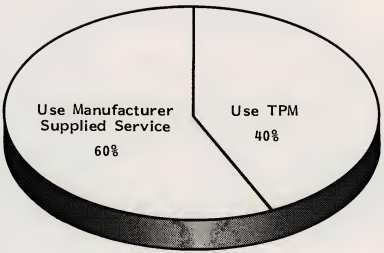


EXHIBIT III-N-12

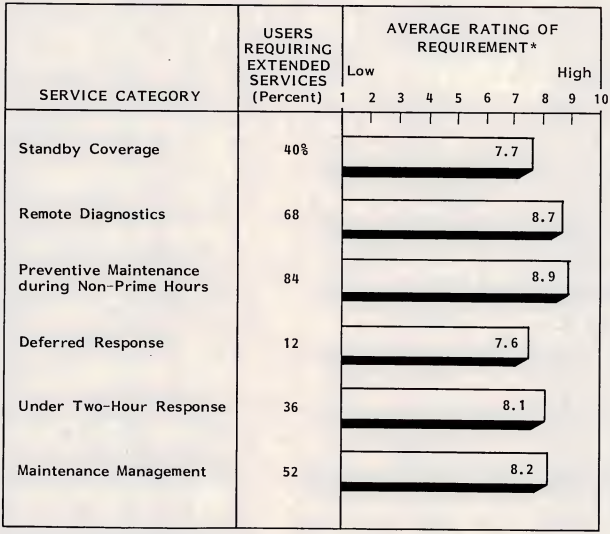
CURRENT TPM USE
DEC



DEC systems have traditionally been a large market for third-party maintenance.

EXHIBIT III-N-13

USER REQUIREMENTS FOR EXTENDED SERVICES
DEC



*Average Standard Error: 0.7

III O. AT&T

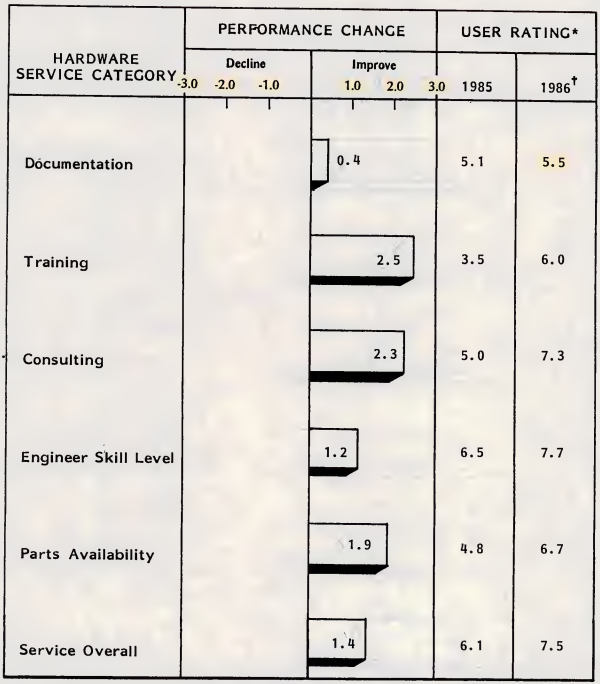
- In May 1986 INPUT interviewed 20 AT&T 3B/XXX superminicomputer users regarding their satisfaction with the hardware service and system software support that they have received from their manufacturer. All interviews were performed by telephone, each approximately 20 minutes in length. INPUT targeted the highest ranking data processing individual available, usually a director or manager of data processing; however, the smaller size of some of the AT&T user organizations required us to interview owners or vice presidents of these companies. Also, two respondents were involved more directly with the financial operations of their companies (as treasurers), perhaps reflecting the application of the AT&T 3Bs at their sites. The industry breakdown of the AT&T sample reflects an emphasis on business services, which made up 35% of the survey sample. Other industries represented by a number of respondents include discrete manufacturing, education, and retail distribution.

- Exhibit III-O-1 indicates that AT&T 3B users have recognized a significant improvement in virtually all hardware maintenance components tested in 1985 and 1986. Of course, 1985 was AT&T's first year in the computer maintenance industry, and, as "freshmen" in the business, demonstrated the uneven performance one would usually associate with a "rookie player." It is promising that users reported improvements in key areas such as parts availability, and in secondary service areas, such as consulting and training.

- However, there is still much room for improvement, as indicated by Exhibit III-O-2. After taking the standard error of the mean into account, AT&T succeeds in meeting their users' service requirement levels in only three of the seven hardware service categories analyzed in 1986. More importantly, only one of these areas of service satisfaction, FE skill level, can be considered a high priority service, at least as perceived by users.

EXHIBIT III-O-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
AT&T



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-O-2

1986 USER HARDWARE SERVICE RATINGS
AT&T

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	8.2	5.9	(2.3)
Training	6.3	6.0	(0.3)
Consulting	6.9	7.3	0.4
Remote Support	8.2	6.9	(1.3)
Engineer Skill Level	8.1	7.7	(0.4)
Parts Availability	8.9	6.7	(2.2)
Hardware Service Overall	8.5	7.5	(1.0)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

- Of particular concern should be the low user satisfaction reported in the areas of parts availability, which satisfies only 33% of AT&T 3B users (as shown in Exhibit III-O-3) and of hardware documentation, which satisfies only 12%. The user dissatisfaction with spare parts availability is also reflected in hardware response and repair times (which will be discussed later). The dissatisfaction with hardware documentation can also be more directly costly to AT&T, since a number of user problems that require dispatching are often documentation-related.

- Exhibit III-O-4 graphically demonstrates the gap between AT&T user hardware service requirements versus hardware service received.

- Software support is another area where AT&T has made significant progress, as shown in Exhibit III-O-5. Again, user satisfaction with AT&T's support was extremely low in 1985, so AT&T had a lot of room for improvement. Nevertheless, AT&T demonstrated much progress in all software support categories analyzed, particularly training and consulting.

- Exhibit III-O-6 indicates that, similar to hardware maintenance, AT&T has still a long way to go in meeting the rapidly growing software support requirements that are indicative of superminicomputer users. As was true on the hardware side, software documentation is an extremely critical problem at AT&T, satisfying only 20% of the 1986 AT&T 3B sample, as shown in Exhibit III-O-7. Furthermore, AT&T fails to satisfy 50% of their 3B users in every category analyzed, and only 25% of AT&T's users are satisfied with software support overall. Exhibit III-O-8 further demonstrates the work still ahead for AT&T in the area of software support.

- Exhibit III-O-9 illustrates the improvements that AT&T has made in the reliability of their equipment and the responsiveness of support. System availability improved from 90.9% in 1985 to an admirable 98.7% in 1986. The number of system interruptions improved from 4.4 per month to an acceptable 1.6 per month. Hardware problem resolution turnaround time went from an extremely high 35.7 hours to 13.9 hours in 1986.

EXHIBIT III-O-3

USER SATISFACTION: HARDWARE SERVICE
AT&T

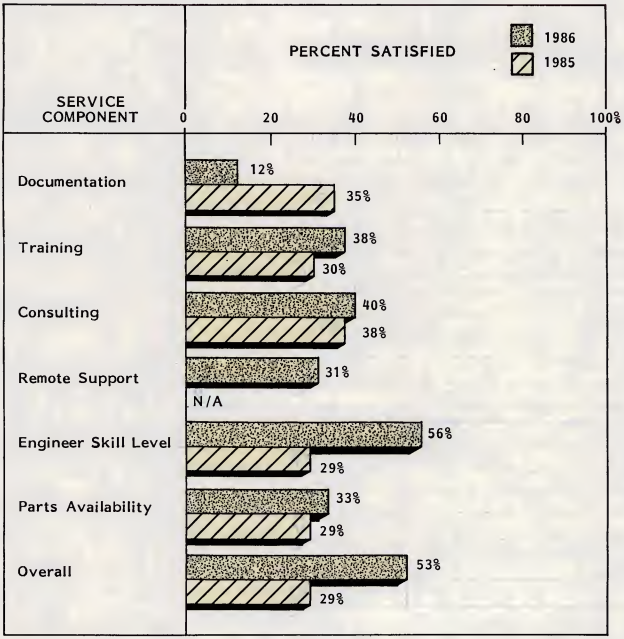
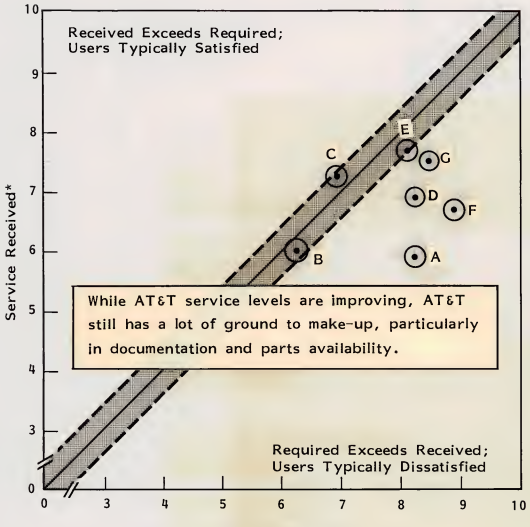


EXHIBIT III-O-4

HARDWARE SERVICES REQUIRED/RECEIVED
AT&T

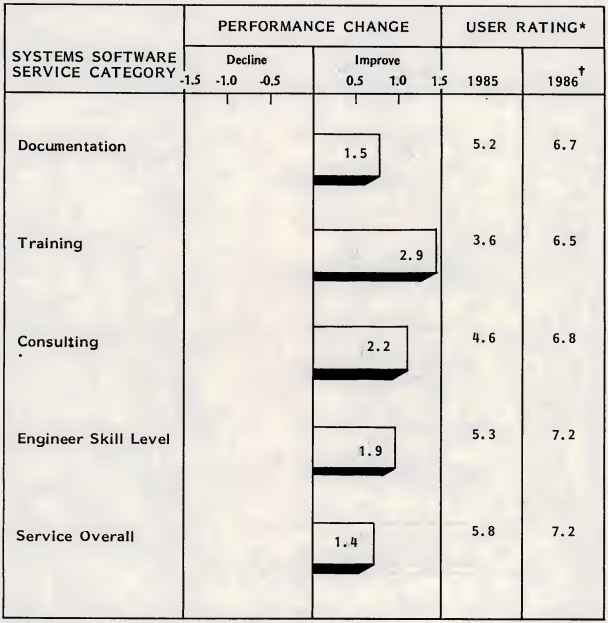


A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-O-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE
AT&T



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-O-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
AT&T

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	9.2	6.7	(2.5)
Training	7.4	6.5	(0.9)
Consulting	7.5	6.8	(0.7)
Remote Support	7.9	6.7	(1.2)
Engineer Skill Level	8.7	7.2	(1.5)
Service Overall	8.8	7.2	(1.6)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-O-7

USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
AT&T

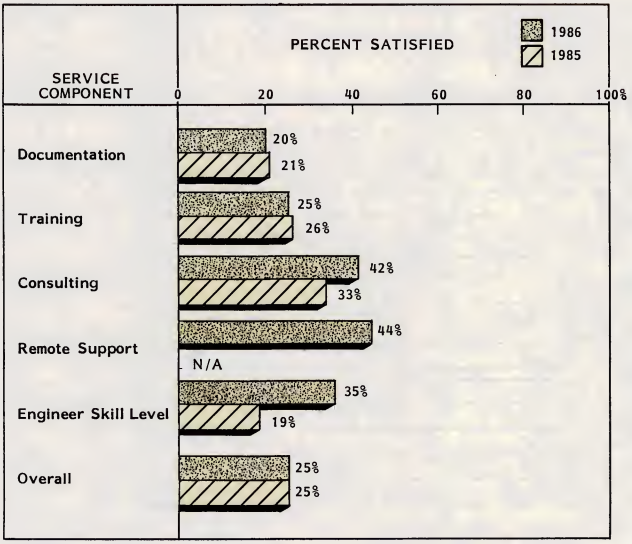
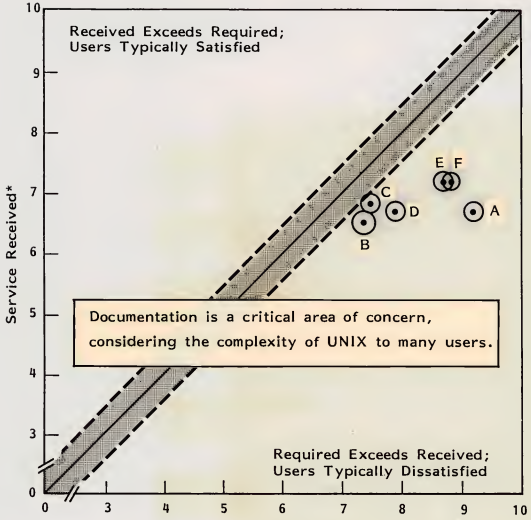


EXHIBIT III-O-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
AT&T



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-O-9

SERVICE PERFORMANCE
AT&T

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	90.9%	98.7%
Average Number of Interruptions		
Per Month (Number)	4.4	1.6
Percent Hardware Caused	35.0%	52.0%
Percent Software Caused	59.0%	38.0%
Average Hardware Response Time (Hours)	13.4 hr.	6.3 hr.
Average Hardware Repair Time (Hours)	22.3 hr.	7.6 hr.
Average Systems Software Response Time (Hours)	12.5 hr.	13.4 hr.
Average Systems Software Repair Time (Hours)	16.3 hr.	9.4 hr.

- While AT&T has managed to satisfy their 3B users' requirement for system availability, Exhibit III-O-10 indicates that problem resolution turnaround time continues to be of major concern to their users. Users are requiring that hardware problems be resolved within a single day, not by the next day. Also, AT&T's users clearly have perceived a problem in regard to system software support. More accessible spares and improved documentation will help alleviate both of these problem areas.

- Users are initially attracted to AT&T because of the allure of stability and support that AT&T carries with them from the telecommunications side. This is reflected by the users' limited willingness to assume increased responsibility for hardware maintenance or software support, as shown in Exhibit III-O-11. What AT&T should be concerned about is an increase in users who defect to third-party maintenance, since one-fourth of the AT&T user sample are already experienced with TPM, as shown in Exhibit III-O-12.

- Exhibit III-O-13 indicates that AT&T users do not show significant requirement for premium services, even though current service satisfaction is low. Non-prime hour preventive maintenance visits did appear attractive to 70% of the users.

EXHIBIT III-P-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE
AT&T

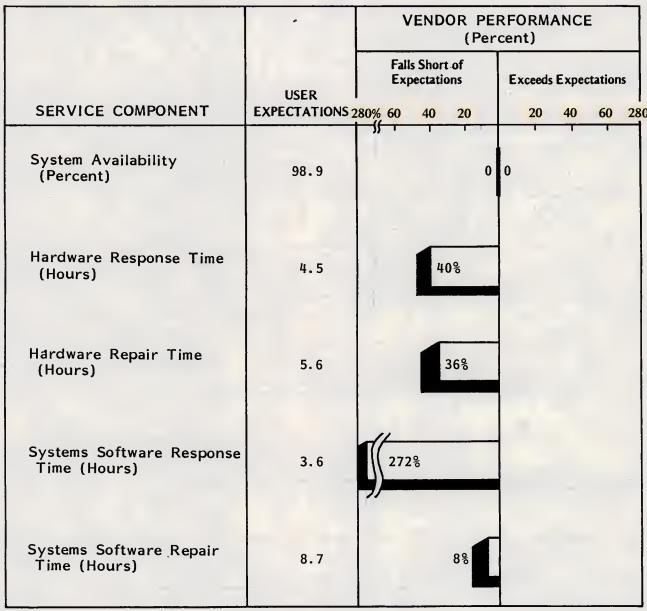
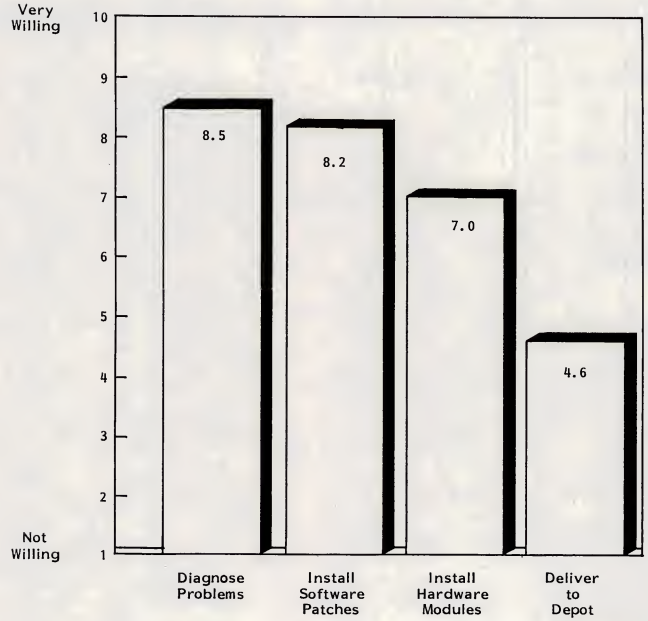


EXHIBIT III-O-11

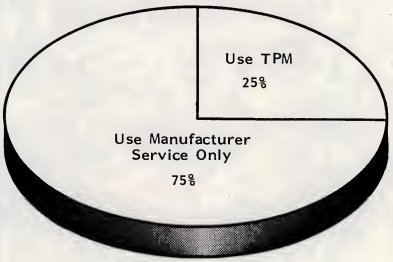
USER WILLINGNESS TO PERFORM MAINTENANCE
AT&T



* Average Standard Error: 0.5

EXHIBIT III-O-12

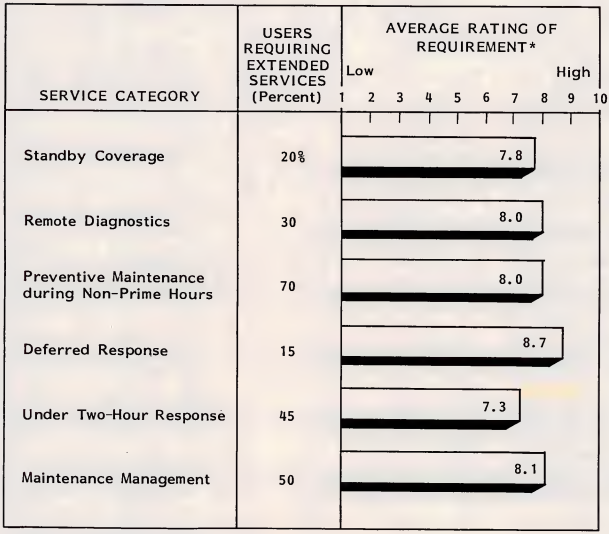
CURRENT TPM USE
AT&T



One-fourth of the AT&T sample have experience with TPM. This will grow quickly if AT&T fails to improve service quality.

EXHIBIT III-O-13

USER REQUIREMENTS FOR EXTENDED SERVICES
AT&T



*Average Standard Error: 0.3

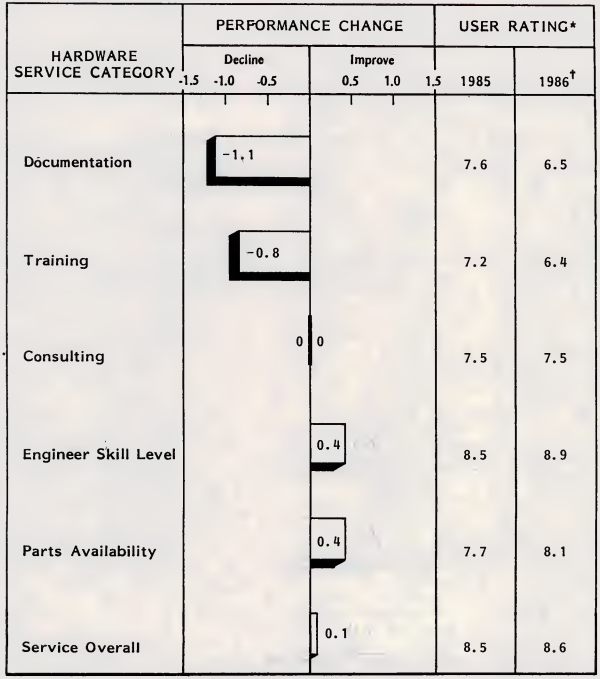
- In March 1986 INPUT interviewed 25 NCR 93XX superminicomputer users concerning their satisfaction with the level of hardware maintenance and systems software support that they received from their manufacturer. All interviews were performed by telephone and each interview lasted approximately 20 minutes. The NCR 93XX sample was relatively dispersed by industry with 10 of the 13 industry categories represented in the sample. Process manufacturers and educational users each accounted for 16% of the sample; discrete manufacturers, medical, services, and banking users accounting for an additional 12% each of the sample. As always, INPUT targeted directors and managers of data processing as respondents, although four respondents were controllers.

- Exhibit III-P-1 indicates that while NCR superminicomputer users perceived a drop in hardware documentation from 1985 to 1986, these users reported an improvement in key service areas, such as FE skill level and spare parts availability. More over, Exhibit III-P-2 demonstrates that NCR has successfully met or exceeded their superminicomputer user service requirements in virtually all of the hardware service categories analyzed in 1986 (with the exception of hardware documentation). Exhibit III-P-3 supports these findings, with NCR satisfying a high percentage of their users' needs in nearly all areas. Note that the high marks in service satisfaction even carry over into hardware documentation, where NCR still satisfies a majority (64%) of their superminicomputer users. Also note the cumulative effect on overall service satisfaction, where 8 out of 10 NCR 9300 users report satisfactory service. Exhibit III-P-4 graphically demonstrates NCR's success at meeting their superminicomputer user service requirements, particularly in high-requirement service areas.

- NCR's efforts to satisfy their superminicomputer users' software support needs are less successful. Exhibit III-P-5 indicates that NCR's "received"

EXHIBIT III-P-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
NCR



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-P-2

1986 USER HARDWARE SERVICE RATINGS
NCR

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	7.1	6.5	(0.6)
Training	6.4	6.4	—
Consulting	7.3	7.5	0.2
Remote Support	6.7	7.5	0.8
Engineer Skill Level	8.6	8.9	0.3
Parts Availability	8.3	8.1	(0.2)
Hardware Service Overall	8.5	8.6	0.1

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-P-3

USER SATISFACTION: HARDWARE SERVICE
NCR

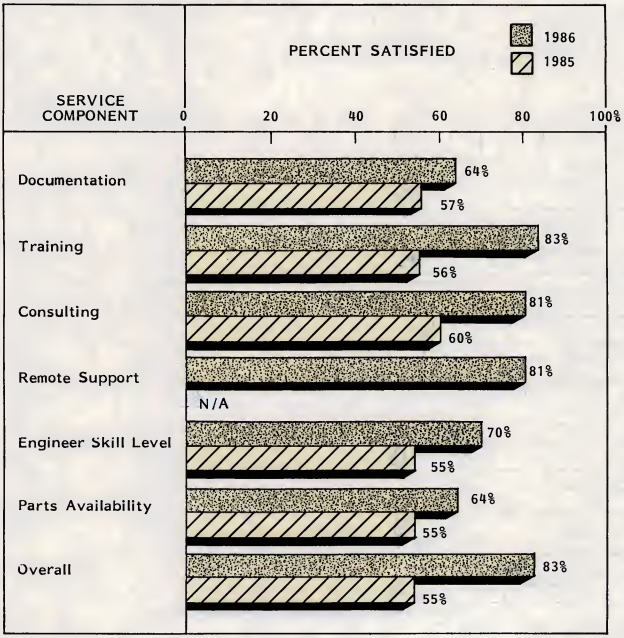
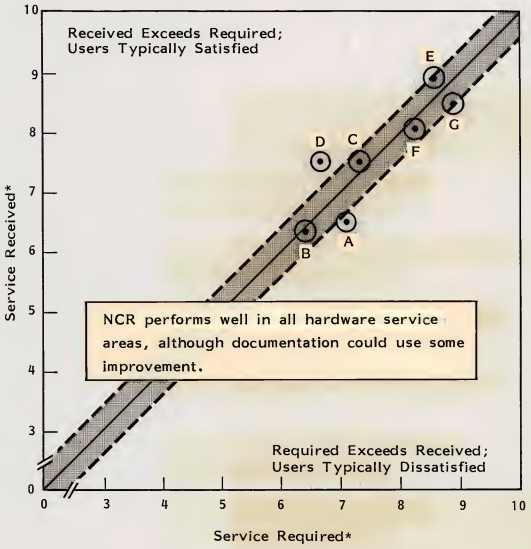


EXHIBIT III-P-4

HARDWARE SERVICES REQUIRED/RECEIVED
NCR

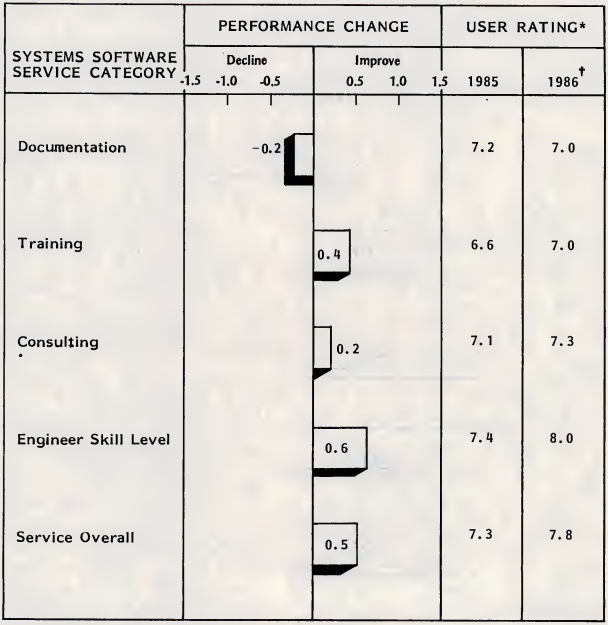


A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-P-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE
NCR



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.3

ratings improved slightly in all categories except for documentation. However, Exhibit III-P-6 shows that NCR still does not meet the average "requirement" level in any single service area. While NCR manages to satisfy a large percentage of their users in a few key service areas, such as software engineer skill level (71%), user satisfaction with software training is quite low (only 43% satisfied), as shown in Exhibit III-P-7. Training has a significant effect on overall satisfaction, since NCR superminicomputer users place a higher requirement on training than those of their competitors.

- Still, user satisfaction with NCR system software support is surprisingly high, considering the fact that NCR does not meet any single requirement level for their users, as shown graphically in Exhibit III-P-8.

- NCR service performance benefits from the relatively low service requirements of their superminicomputer users. As shown in Exhibit III-P-9, NCR 9300 users have extremely low system availability requirements (94% versus approximately 97% for their competitors), and extremely slow response and repair time requirements. As a result, NCR satisfies their users' needs in these areas, as indicated in Exhibit III-P-10, while increasing overall satisfaction with both hardware service and software support. Furthermore, NCR superminicomputer service satisfaction is high enough to limit both user requirement for alternative service delivery methods, as shown in Exhibit III-P-11, and third-party penetration into their installed base, as shown in Exhibit III-P-12. User satisfaction with NCR superminicomputer service is also reflected in the relatively large number of NCR users, shown in Exhibit III-P-13, who are attracted to the maintenance management concept, where NCR would act as a single source of service and support.

EXHIBIT III-P-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
NCR

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	8.3	7.0	(1.3)
Training	8.1	7.0	(1.1)
Consulting	7.9	7.3	(0.6)
Remote Support	7.7	7.6	(0.1)
Engineer Skill Level	8.6	8.0	(0.6)
Service Overall	8.5	7.8	(0.7)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-P-7

USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
NCR

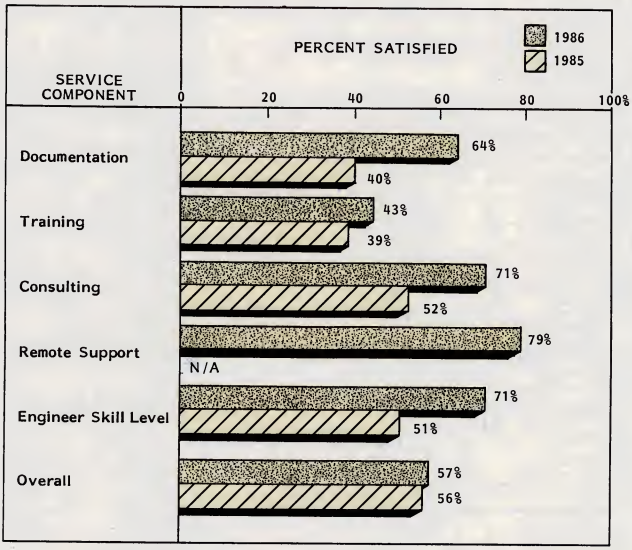
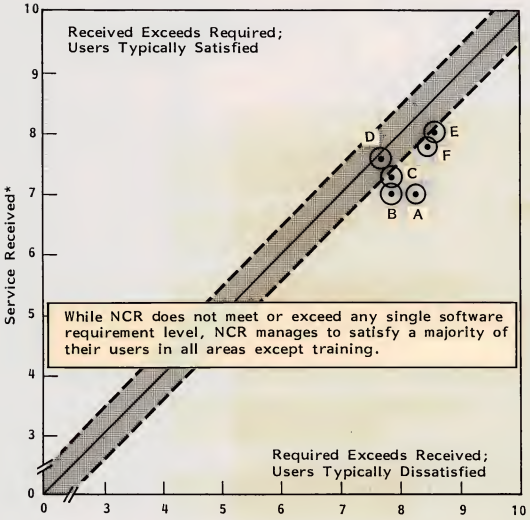


EXHIBIT III-P-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
NCR



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-P-9

SERVICE PERFORMANCE
NCR

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	93.5%	93.8%
Average Number of Interruptions		
Per Month (Number)	2.8	1.9
Percent Hardware Caused	50.0%	52.0%
Percent Software Caused	50.0%	27.0%
Average Hardware Response Time (Hours)	5.2 hr.	9.7 hr.
Average Hardware Repair Time (Hours)	2.8 hr.	11.6 hr.
Average Systems Software Response Time (Hours)	7.2 hr.	16.0 hr.
Average Systems Software Repair Time (Hours)	7.5 hr.	21.2 hr.

EXHIBIT III-P-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE
NCR

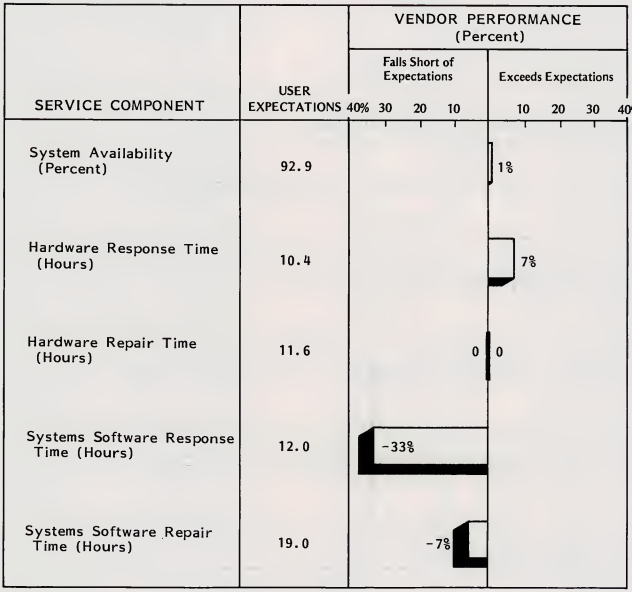
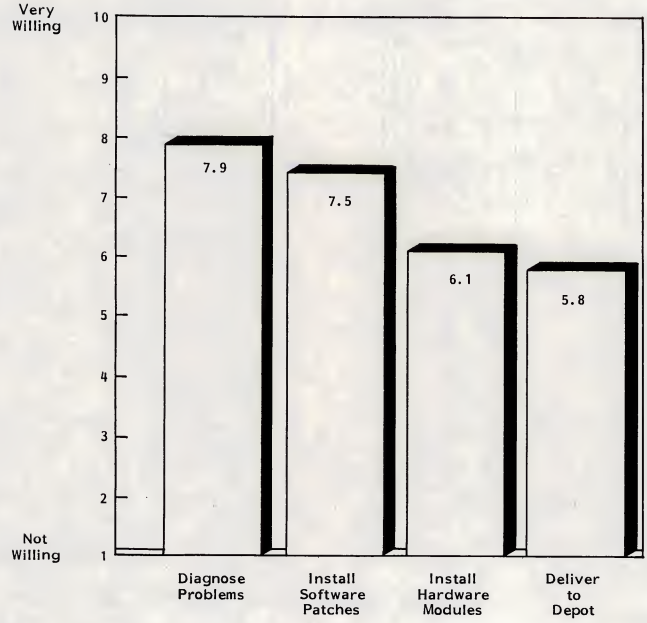


EXHIBIT III-P-11

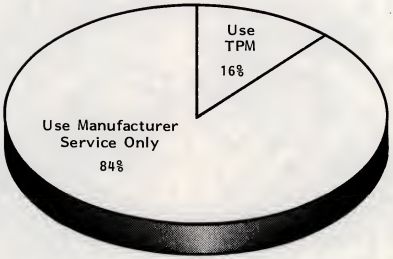
USER WILLINGNESS TO PERFORM MAINTENANCE
NCR



* Average Standard Error: 0.3

EXHIBIT III-P-12

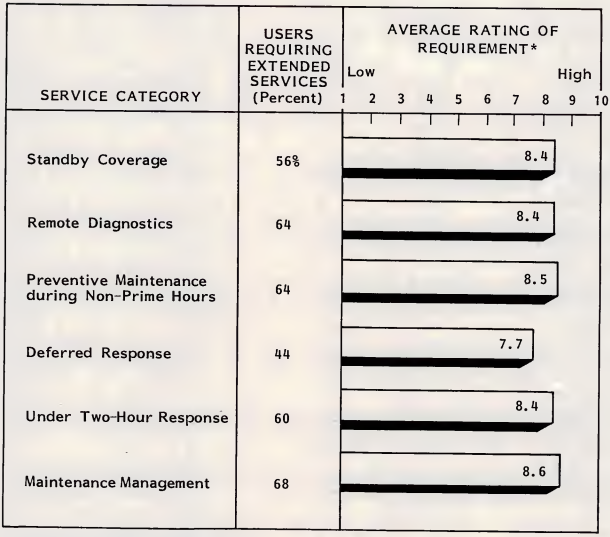
CURRENT TPM USE
NCR



NCR service satisfaction has slowed TPM penetration, however NCR's vertical markets are attractive to TPM.

EXHIBIT III-P-13

USER REQUIREMENTS FOR EXTENDED SERVICES
NCR



*Average Standard Error: 0.3

III Q. PRIME

- In March 1986 INPUT interviewed 25 Prime 2X5X superminicomputer users concerning their satisfaction with the level of hardware maintenance and systems software support they received. All interviews were performed by telephone and each interview lasted approximately 20 minutes. The 1986 Prime sample was dominated by educational users, who comprised 32% of the Prime sample, and business service users who made up another 25%. Other industries represented include discrete manufacturing, wholesale distribution, federal government, process manufacturing, medical, and utilities.

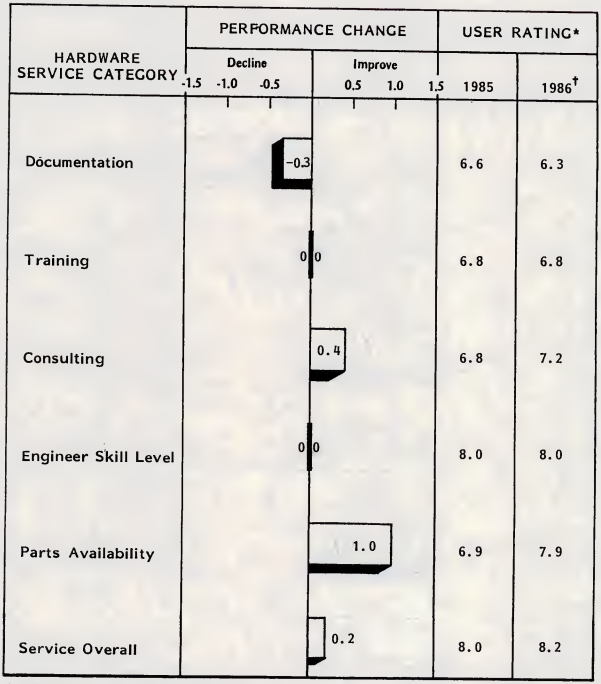
- According to Exhibit III-Q-1, Prime superminicomputer user 1986 ratings for hardware service "received" did not vary much from 1985 marks. What is increasingly evident concerning Prime's superminicomputer user base is an extreme segmentation of user requirements between low priority hardware services and high priority service areas. Exhibit III-Q-2 demonstrates that Prime meets or even exceeds their users' requirements for a number of low priority services, such as training, consulting, and especially remote support, but fails to meet the requirement levels of the high priority service areas of FE skill level, spare parts availability, and overall satisfaction with hardware service. Furthermore, Prime fails to satisfy a majority of their superminicomputer user needs in a large number of service areas.

- Exhibit III-Q-3 demonstrates that only 40% of Prime's superminicomputer users are satisfied with their FE skill level, 40% are satisfied with their service overall, and only 29% are satisfied with their spare parts availability.

- Exhibit III-Q-4 graphically demonstrates the clear segmentation in service priorities that Prime superminicomputer users report. While Prime meets or exceeds the requirements of the low priority services, Prime misses the mark for the higher priority services (FE skill level, parts availability, and hardware service overall). These high priority services have a far greater impact on a

EXHIBIT III-Q-1

HARDWARE SERVICE PERFORMANCE, 1985-1986
PRIME



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-Q-2

1986 USER HARDWARE SERVICE RATINGS
PRIME

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	6.7	6.3	(0.4)
Training	6.4	6.8	0.4
Consulting	6.6	7.2	0.6
Remote Support	4.8	7.3	2.5
Engineer Skill Level	9.1	8.0	(1.1)
Parts Availability	9.3	7.9	(1.4)
Hardware Service Overall	9.2	8.2	(1.0)

User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.5

EXHIBIT III-Q-3

USER SATISFACTION: HARDWARE SERVICE
PRIME

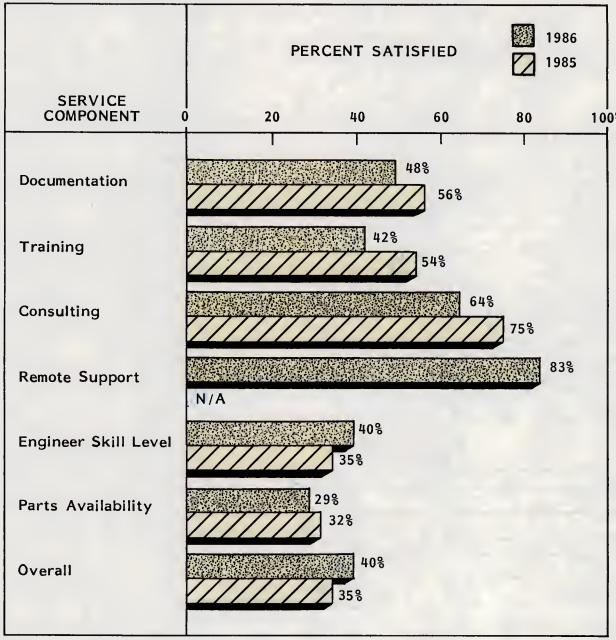
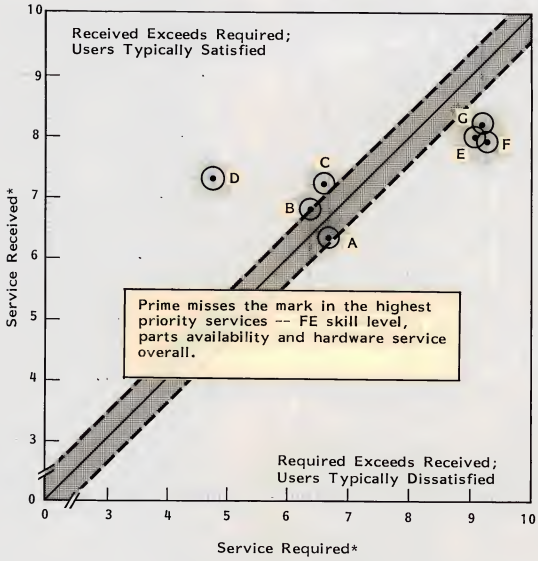


EXHIBIT III-Q-4

HARDWARE SERVICES REQUIRED/RECEIVED
PRIME



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Parts Availability
G = Hardware Service Overall

* Rating: 1 = Low, 10 = High

user's overall service satisfaction, and, as such, should be an immediate area of concern for Prime.

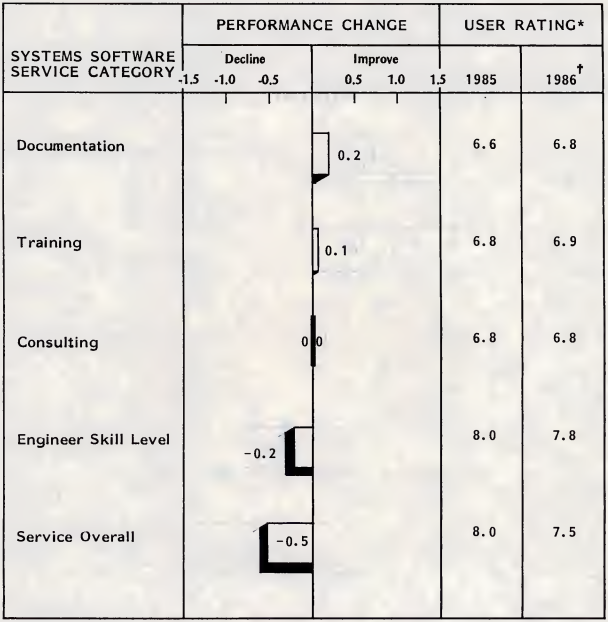
- Exhibit III-Q-5 shows that Prime's 1986 superminicomputer user ratings for systems software support received also did not vary much from 1985 to 1986. The one exception is software service overall, which dropped from 8.5 to 7.5. Exhibit III-Q-6 helps explain this drop in overall software support satisfaction. First of all, Prime superminicomputer users have extremely high software support requirements in nearly every support category; second, Prime does not come close to satisfying any key software support requirement. Accordingly, Prime succeeds in satisfying a relatively small percentage of their users' system software support needs, as shown in Exhibit III-Q-7. And since the superminicomputer market will become increasingly competitive on the software side, Prime should be extremely concerned about their users' perception of poor service. Exhibit III-Q-8 highlights the gap in user actuals reported versus their requirement levels for system software support.

- Exhibit III-Q-9 indicates that actual service performance, measured by system availability and response and repair times, is similar, if not better (in most areas), than last year's results. Even though user satisfaction with system software support declined, vendor responsiveness improved dramatically. Exhibit III-Q-10 indicates that Prime meets or exceeds the current performance requirements of their users, with the exception of software response time, which is 33% slower than what the Prime users require.

- Perhaps as a reflection of the slower than required software response times received by Prime superminicomputer users, these users are relatively anxious to increase their own participation in software support, as suggested by Exhibit III-Q-11. Prime superminicomputer users seem willing to install software patches when possible, and, to a greater extent, help in the diagnosis of problems. Prime should be able to take advantage of this willingness in attempting to meet the high software support requirements of their superminicomputer users.

EXHIBIT III-Q-5

SYSTEMS SOFTWARE SERVICE PERFORMANCE
PRIME



* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-Q-6

1986 USER SYSTEMS SOFTWARE SERVICE RATINGS
PRIME

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE*		SERVICE EXCEEDS (Falls Below) USER REQUIREMENTS
	Required†	Received†	
Documentation	9.4	6.8	(2.6)
Training	8.1	6.9	(1.2)
Consulting	7.8	6.8	(1.0)
Remote Support	6.5	7.4	0.9
Engineer Skill Level	9.2	7.8	(1.4)
Service Overall	9.3	7.5	(1.8)

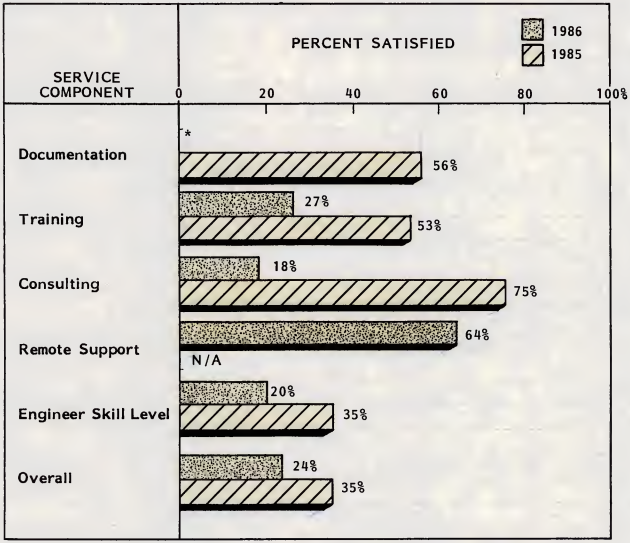
User Expectation Exceeds Vendor Performance

* Rating: 1 = Low, 10 = High

† Average Standard Error: 0.4

EXHIBIT III-Q-7

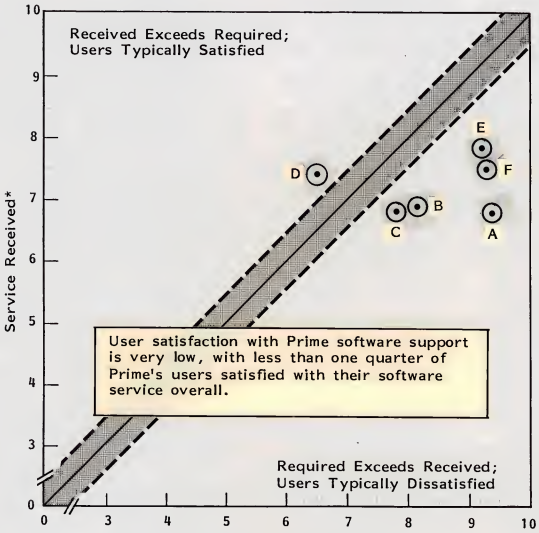
USER SATISFACTION: SYSTEMS SOFTWARE SERVICE
PRIME



*Insufficient response.

EXHIBIT III-Q-8

SYSTEMS SOFTWARE SERVICES REQUIRED/RECEIVED
PRIME



A = Documentation
B = Training
C = Consulting
D = Remote Support
E = Engineer Skill Level
F = Software Service Overall

* Rating: 1 = Low, 10 = High

EXHIBIT III-Q-9

SERVICE PERFORMANCE
PRIME

SERVICE COMPONENT	1985	1986
Average System Availability (Percent)	98.3%	98.2%
Average Number of Interruptions		
Per Month (Number)	2.6	1.0
Percent Hardware Caused	44.0%	45.0%
Percent Software Caused	23.0%	11.0%
Average Hardware Response Time (Hours)	3.9 hr.	5.2 hr.
Average Hardware Repair Time (Hours)	4.7 hr.	4.6 hr.
Average Systems Software Response Time (Hours)	7.5 hr.	5.6 hr.
Average Systems Software Repair Time (Hours)	23.0 hr.	11.8 hr.

EXHIBIT III-Q-10

USER EXPECTATIONS FOR SERVICE PERFORMANCE
PRIME

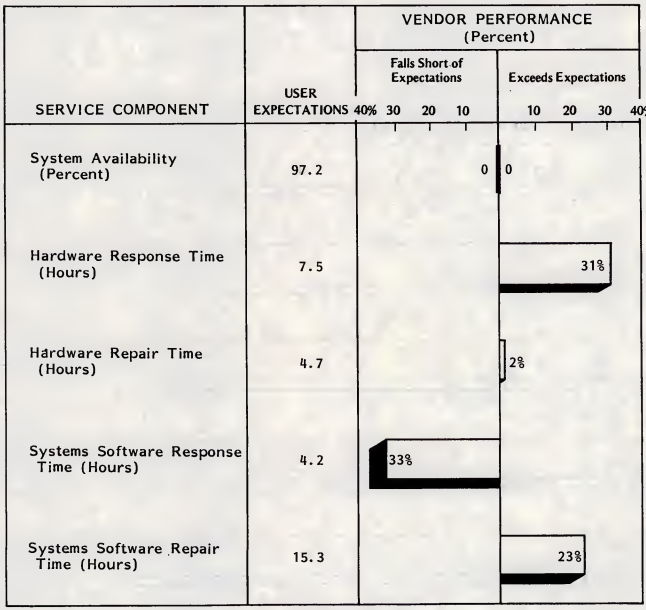
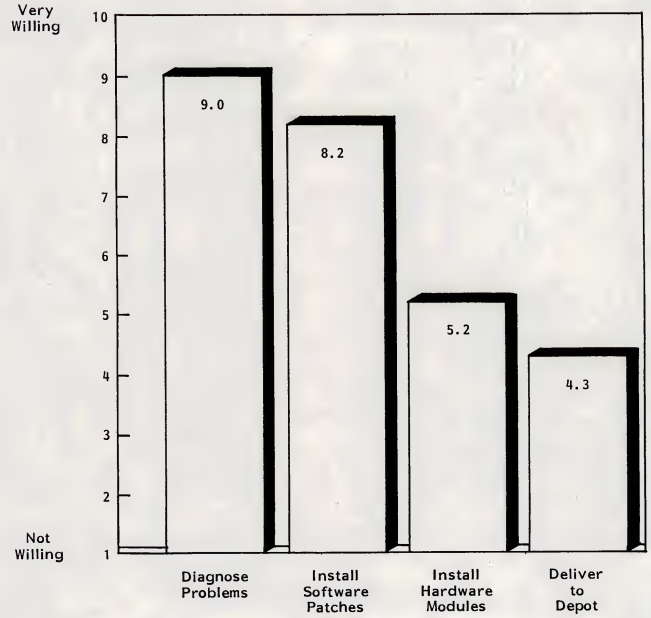


EXHIBIT III-Q-11

USER WILLINGNESS TO PERFORM MAINTENANCE
PRIME

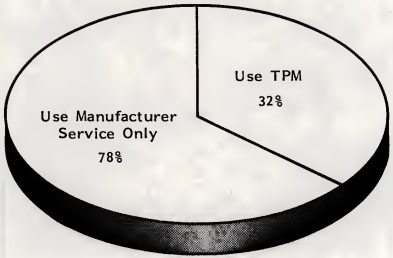


* Average Standard Error: 0.3

- Not surprisingly, a large number of Prime users are experienced with third-party maintenance, as shown in Exhibit III-Q-12. Not all of these users are disgruntled customers, since a significant number of Prime users also use non-Prime peripherals in their systems. Exhibit III-Q-13 demonstrates an extremely large percentage of Prime users who are attracted to the maintenance management (single source) concept.

EXHIBIT III-Q-12

CURRENT TPM USE
PRIME

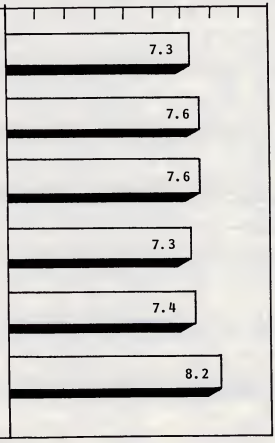


Almost one-third of Prime's users are experienced with third-party maintenance.

EXHIBIT III-Q-13

USER REQUIREMENTS FOR EXTENDED SERVICES
PRIME

SERVICE CATEGORY	USERS REQUIRING EXTENDED SERVICES (Percent)	AVERAGE RATING OF REQUIREMENT*
Standby Coverage	40%	7.3
Remote Diagnostics	44	7.6
Preventive Maintenance during Non-Prime Hours	44	7.6
Deferred Response	12	7.3
Under Two-Hour Response	28	7.4
Maintenance Management	72	8.2



*Average Standard Error: 0.3