QUALITY ISSUES

WESTERN EUROPEAN

CUSTOMER SERVICES

INPUT

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

Formed as a privately held corporation in 1974, INPUT has become a leading international research and consulting firm. Clients include more than 100 of the world's largest and most technically advanced companies.

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**Customer Service Programme in Europe
(CSPE)**

*Quality Issues in Western European
Customer Services*

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Abstract

This report identifies the major issues related to service quality within Western European customer services. Major issues discussed represent the views of both computer users and vendors, including:

- System availability
- Quality/price relationships
- Software product quality
- Skill levels
- Response performance

The report contains analysis illustrating the relationship between a vendor's service quality image and measurable service performance, including an assessment of how the computer vendors meet the criteria developed for assessing service quality image.

Also contained within this report is data relating to progress made in implementing formal service quality standards (ISO 9000).

This report contains 100 pages including 42 exhibits.

Table of Contents

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Exhibits

Exhibits (Continued)

I

Introduction

I

Introduction

A
Objectives

The objectives of this report were to:

- Identify and quantify some aspects of vendor service performance that can influence user perceptions of vendor service quality image

- Identify major quality issues viewed from the vendor's perspective

- Quantify the impact of formal service quality standards and the benefits that accrue from implementation

B
Methodology

The data presented in this report was compiled from the following sources:

- INPUT's 1988 survey of 1,711 computer users throughout Western Europe. The users were chosen at random and interviewed by telephone in their native language. The sample was comprised of users of 14 vendors' computer systems. The basis of the interview was a questionnaire relating to over 150 aspects of service, compiled in discussion with major vendors. The user questionnaire is included in Appendix B.

- Interviews with 14 respondents representing major computer vendors throughout Western Europe, including representatives at both the European headquarters and country levels. Interviews were conducted during February 1989. The vendor questionnaire is included in Appendix B.

C
Definitions and Interpretation of the Data

Within this report the research data is segmented by system size. System sizes are defined as follows:

- Large System - A system that is considered by the vendor to form part of that vendor's large system product range, i.e., IBM 308X and 309X

- Medium System - A system that is considered by that vendor to form part of the vendor's medium systems product range, i.e., IBM 43XX and S38

- Small System - A system that is considered by the vendor to form part of that vendor's small system product range, i.e., IBM S34 and S36

Importance ratings are on a scale of 0 to 10 and defined as follows:

0 = of no importance whatsoever
5 = of average importance
10 = extremely important

Satisfaction index (ΔSI) is derived from the difference between user importance and satisfaction ratings. User satisfaction ratings are defined as:

0 = totally and absolutely dissatisfied
5 = average satisfaction
10 = totally satisfied

Satisfaction index (ΔSI) is defined as:

(1) = overfulfilled or oversatisfied
0 = completely satisfied
1 = concerns and worries
2 = real dissatisfaction
3 = pain level

Standard error is used in this report to indicate the degree of uncertainty between the sample mean and the total population mean. It is calculated by dividing the standard deviation (SD) of the sample by the square root of the sample size.

The relationship between vendor quality "image" and service performance has been tested using correlation analysis. The product moment of correlation coefficient has been established from the covariance of the variables divided by the square root of the product of individual variable variances. A correlation coefficient of "+1" or "-1" indicates perfect correlation and 0 denotes total disassociation (or no correlation); therefore the degree of association can be estimated.

D

Report Structure

- Chapter II is the Executive Overview presenting the data in a condensed form to highlight major points that emerge from the report.

- Chapter III presents an analysis of the data obtained from the user survey.

- Chapter IV contains an analysis of the data obtained from interviews with vendors.

- Appendix A contains the user data used for analysis.

- Appendix B contains the user questionnaire.

- Appendix C contains the vendor questionnaire.

II

Executive Overview

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II
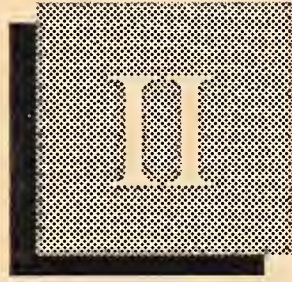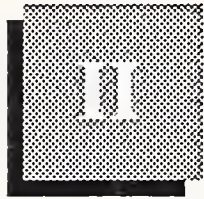
Executive Overview

This executive overview highlights the major findings from INPUT's research into service quality issues. These major findings are summarised in Exhibit II-1.

EXHIBIT II-1

SERVICE QUALITY—MAJOR FINDINGS

- Vendor quality image can be related to measurable service performance.

- Conflict between service price and quality

- 40% of vendors believe service quality is constrained by price.

- Vendor and user opinions differ over major issues.

- Implementation of formal service quality standards is being led by companies having European headquarters in the U.K.

- Impact of formal quality standards is more biased towards real quality improvements than image enhancing attributes.

A
Quality Image Relates to Measurable Service Performance

Each year INPUT conducts a survey of computer users throughout Western Europe with the objective to assess user satisfaction with hardware service and software support.

Data collected during the course of this survey includes:

- Importance and satisfaction ratings for the users' perception of a vendor's overall service performance levels. Answers to this question tend to provide a "reflex" response.

- Importance and satisfaction ratings for a list of 12 aspects of hardware service and 13 aspects of software support. Answers to these questions tend to provide a more considered or weighted response.

- Importance and satisfaction ratings for systems availability

- The number of total systems failures per year experienced by the user

- The user's expectation level for a vendor's response and repair/fix time performance and level of performance experienced

From answers to the first three of these items a satisfaction index is developed by subtracting the satisfaction rating from the importance rating. This index provides an assessment of the level of satisfaction achieved with users. Most importantly, a satisfaction index of 1.0 or greater suggests varying degrees of concern and dissatisfaction with the level of service provided.

When comparing "reflex" and "weighted" responses, significant differences between the two can often be observed. Analysis by INPUT has established a relationship between "reflex" response and service performance related factors.

- "Reflex" response is an assessment of a vendor's service quality image.

- Service quality image can be related to measurable service performance factors.

Factors influencing service quality image are illustrated in Exhibit II-2. Analysis of user data to establish this relationship was based on the following:

- Data scanning for repetitive patterns

- Observation of threshold levels that form boundaries between good and poor quality images

- Confirmation of the relationship by statistical correlation techniques

EXHIBIT II-2

FACTORS INFLUENCING QUALITY IMAGE

Reflex response rating

System failure rates

User response time expectation

Vendor Service Quality Image

Systems availability

User repair/fix time expectation

Concern with specific aspects of service
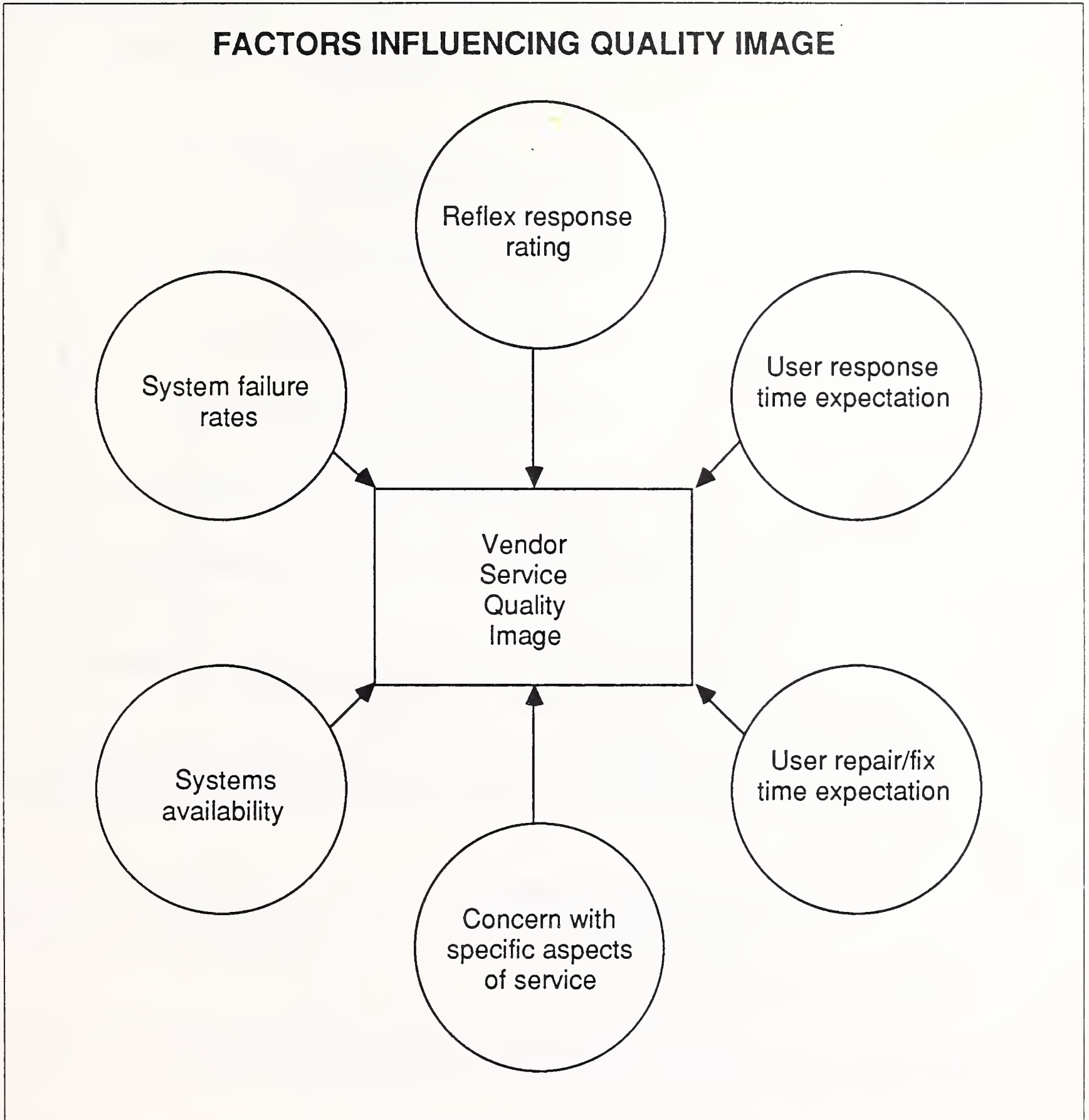
Threshold levels observed during analysis are listed in Exhibit II-3.

EXHIBIT II-3

SERVICE QUALITY THRESHOLD LEVEL PROFILE

- More than two specific aspects of service are cause for user concern.

- Satisfaction with systems availability is rated at the concern level.

- Three or more system failures per year

- Service response times fall short of user expectations by more than 5% to 20%.

- Repair/fix times fall short of user expectations by more than 5% to 20%.

The results obtained from analysis are illustrated in diagrammatic form in Exhibit II-4, and can be summarised as follows:

- A good-quality image tends to relate to a reflex response rating where the satisfaction index (ΔSI) is less than 1.0 and less than two aspects of service performance fall above the threshold levels listed in Exhibit II-3.

- A poor-quality image tends to relate to a reflex response rating where the satisfaction index (ΔSI) is 1.0 or greater and two or more aspects of service performance fall above the threshold levels listed in Exhibit II-3.

- A small number (3) of exceptions were observed where quality image appears to be related to other factors, for example, recent incidents or emotion.

- Statistical correlation between "reflex" response and measurable service performance was confirmed.

QUALITY IMAGE RELATIONSHIP

N = 2

Notes:

(i) Zone A identifies areas where performance ratings tend to influence quality image.

(ii) Zone B identifies areas where quality image tends to be influenced by other factors.

(iii) Δ SI = Importance rating—satisfaction rating

(iv) N = Number of items falling above hypothetical threshold level
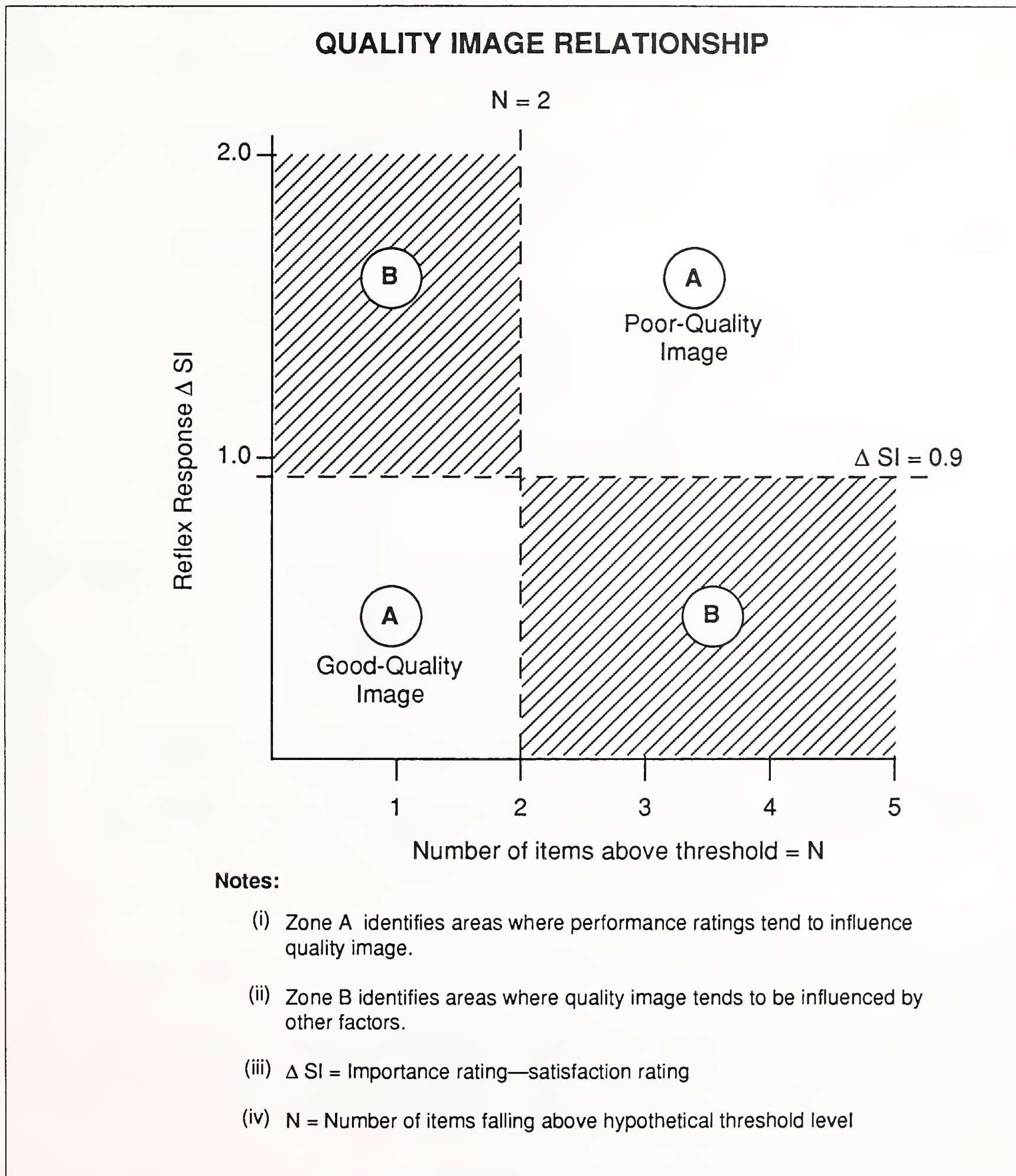
B
Quality-Price Conflict

Exhibit II-5 illustrates a conflict situation that emerged from INPUT's research. In simple terms this conflict can be summarised as follows:

- INPUT's user research indicates that the user community primarily requires quality service.

- Of the vendors interviewed, 55% expressed an opinion that quality of service was restricted by price or that it could be if pricing is put under any further pressure.

EXHIBIT II-5

QUALITY - PRICE CONFLICT

The Users

- Service quality more important than price

- 70% consider service has good price/performance

The Vendors

- 40% consider price restricts quality of service

- 15% express concern that pricing pressure may impact service quality
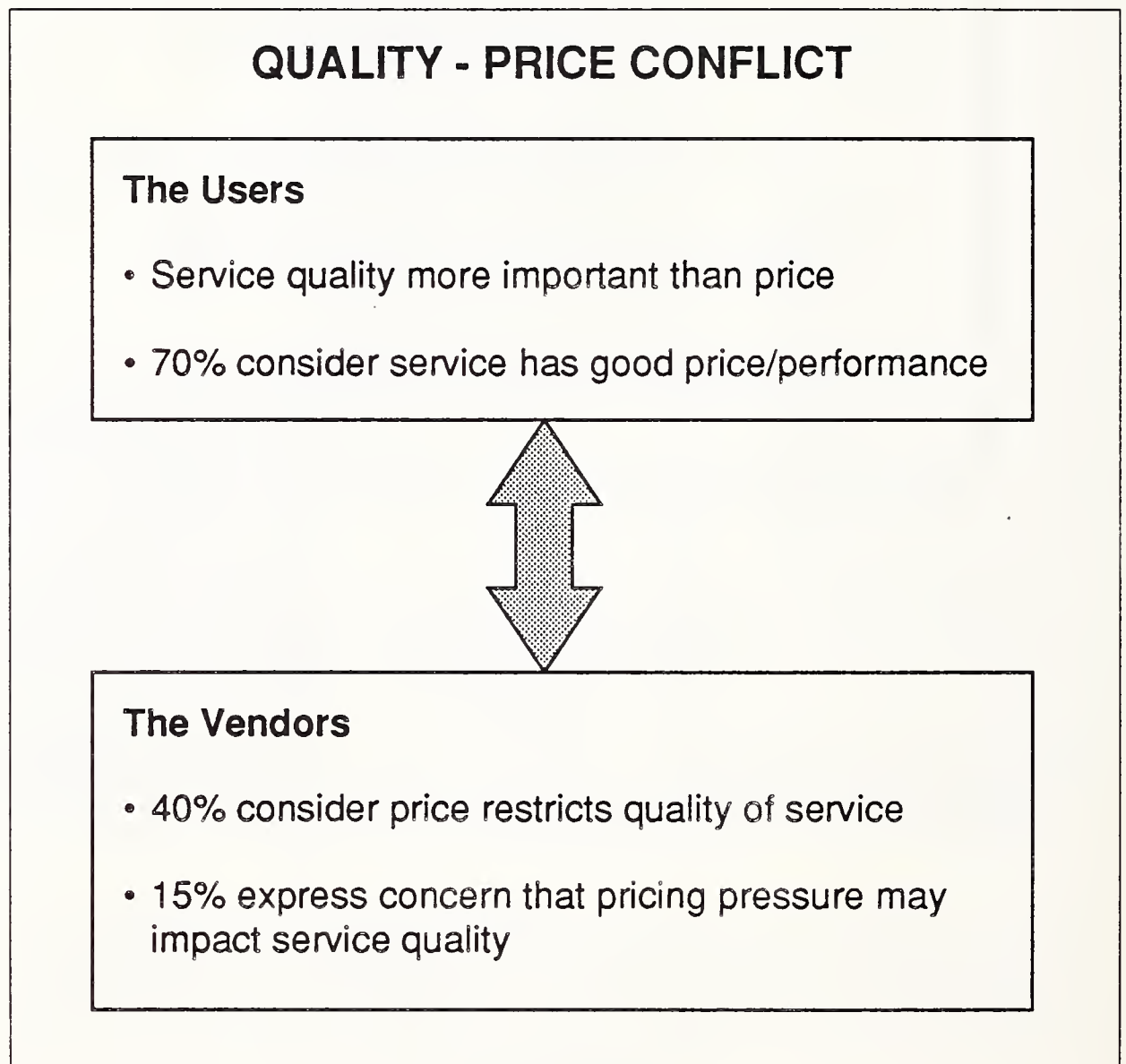
Whilst the above summary may be obvious, as there are likely to be continuing conflicts between price and quality, INPUT's user research indicates that the importance of service quality is rated higher than the importance of price. Overall price attracts an importance rating of 8.0 on a scale of 0 to 10 placing price in seventh or eighth place behind factors that relate to quality. This suggests that quality of service is a more contentious issue with users than price.

INPUT contends that provided a vendor delivers the quality of service a user expects, the price becomes a much less sensitive issue. Research data indicates that user expectations of quality service are not being

achieved in many areas. This is highlighted by the degree of user concerns and worries relative to a number of aspects of service. INPUT research also indicates that only 20% of users fall within the price sensitive category. Seventy percent consider service has a good price/performance ratio.

However, if the quality of service supplied by a vendor is considered to be unsatisfactory, the user may decide to investigate alternative sources. Independent maintenance companies can offer alternatives to vendor service and once the user invites competitive quotations, price can then become an issue.

INPUT recommends that vendors should place priority on quality of service first in terms of providing "value for money", quality can provide a method of addressing pricing issues. Vendor loss of business is more likely to be due to poor quality than price.

Perhaps applied psychology is a key to understanding. A user complaining about price is more likely concerned about quality or value for money.

C
Major Issues

Major issues resulting from INPUT's research are listed in Exhibit II-6. This exhibit shows a comparison between the issues raised by vendors and the issues that result from INPUT's user research programme.

A difference of opinion is apparent from comparison of the vendor and user issues related to hardware service. Availability of spare parts is indicated as a major issue by the user sample and is a cause for concern; yet this was only mentioned by two vendors. Failure by vendors to recognise this as a major concern suggests that vendors are unaware of the impact spare parts availability can have on user perception. User concern reflects a lack of confidence in the vendor's ability to respond effectively in the event of system hardware failure.

However, this concern is recognised by vendors to a degree in recognition of the need to provide for a fast "restore" time and also for service to have less impact on user operations. Highlighting these as major issues suggests that vendors are aware of the importance of systems availability but less aware of the nature of user concern expressed over the availability of spare parts. If user satisfaction levels are to be improved, the vendors should, where appropriate, focus on addressing the specific issues that are influencing quality performance levels.

EXHIBIT II-6

MAJOR ISSUES

The Vendors

- Hardware Service
  - Fast restore time
  - Quality/price relationship
  - Flexibility
  - Less impact on user operations

- Software Support
  - Software product quality
  - Skill levels
  - User satisfaction

The Users

- Hardware Service
  - Skill levels
  - Spares availability

- Software Support
  - Skill levels
  - Documentation
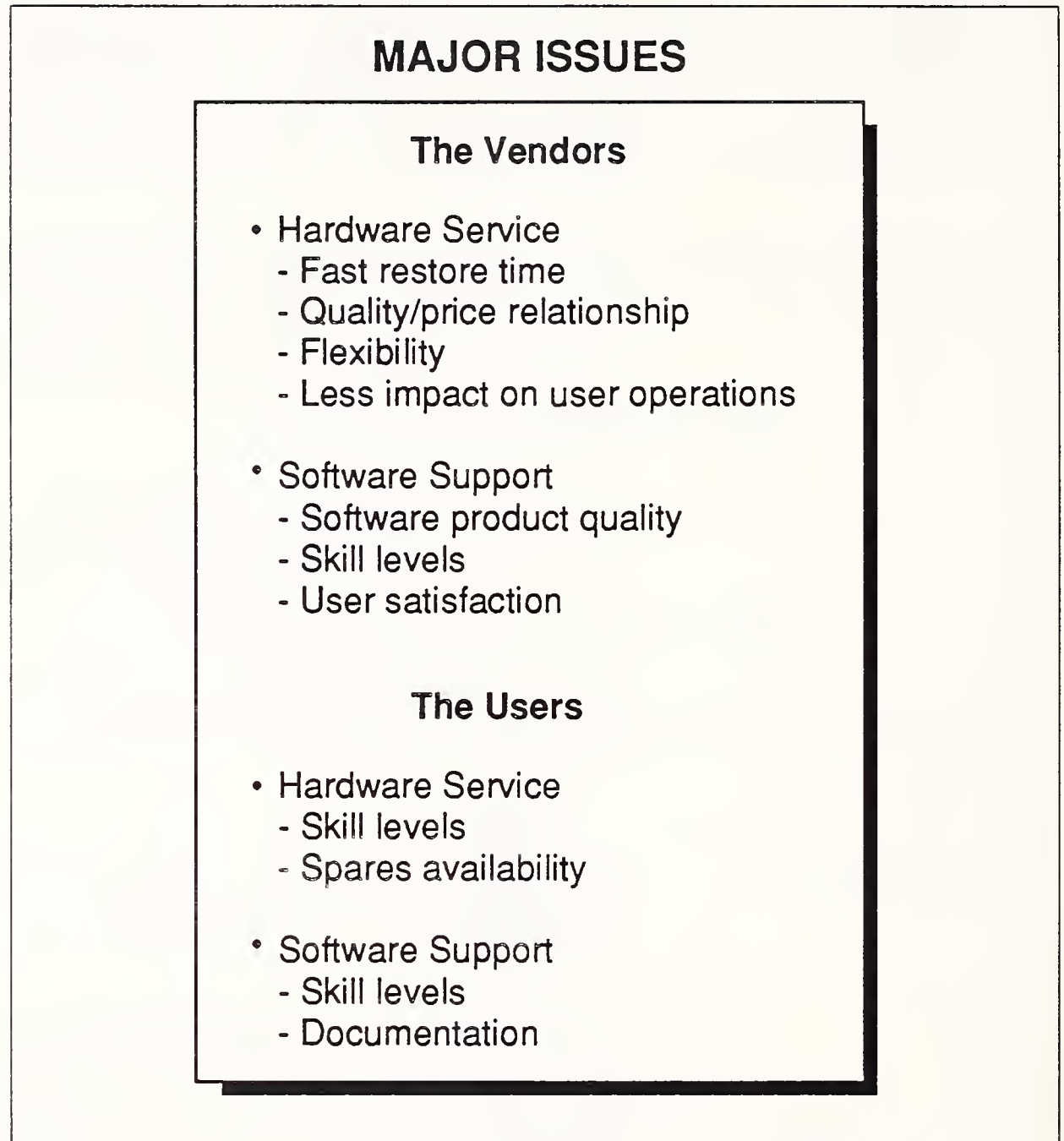
The relationship between quality of service and price has been discussed, but three vendors considered the situation of sufficient importance to highlight it as a major issue. INPUT underlines the relationship, revealed by user research, that quality of service is rated higher in importance than price. Reductions in the price of service are unwise where quality levels are impacted. Criticality of systems to business operations is highlighted by high importance ratings placed by users on systems availability.

If systems availability goals are to be achieved then quality of service should be a primary objective. INPUT considers that if pricing pressure reduces quality levels, a "domino" effect may develop, whereby the decreasing value for money could lead to increased pressure from users to reduce prices further.

In terms of major software support issues there was a higher level of agreement between the vendors and the results of INPUT's user research. Vendors are aware that user satisfaction with software support lags

behind the levels achieved for hardware service. One vendor commented that users seem reconciled to accept lower satisfaction levels but that there was no rational reason for this. If a degree of resignation exists within the user group, this could be a danger signal indicating decreasing confidence levels.

One of the major issues raised by both users and vendors concerned skill levels of software support personnel. INPUT's user research indicates that satisfaction with skill levels has deteriorated between 1987 and 1988 to the level that suggests concern and worries among the user community.

One possible explanation for skill levels being identified as a major issue is reliance on remote diagnostics. Vendors are investing heavily in technological solutions and relying less on field skill levels, likely resulting in less physical contact with users and at lower skill levels. If this is true, an opportunity exists for marketing remote techniques to ensure that users feel confident in the level of support available, rather than concerned that on-site personnel cannot provide adequate support.

Software product quality was raised as a major issue by six vendors. Product quality deficiencies create unique difficulties for the service organisation, and the problems tend to necessitate disproportionate involvement by service personnel. Need for considerable service activity can give rise to a situation that gives the appearance of service inefficiency. Product problems can be a "no win" situation for the service organisation, and if product problems are endemic this factor may in part be responsible for user concern with service skill levels. Service organisations faced with serious product quality problems need first to accept "ownership" of the problem from the users perspective and ensure overall company commitment to providing effective solutions. Good communication and customer relation skills can do much to reduce tensions by ensuring that users are fully appraised of the situation. Unfortunately, user perception tends to visualise a vendor's overall image in terms of ability to respond and provide solutions to problems.

User concern with software support documentation was not recognised by any of the vendors interviewed. Further discussions with vendors suggests that awareness of the nature of the problems does exist, although solutions are more difficult to derive. INPUT research in the U.S.A. suggests a similar problem exists, highlighting that compatibility with native European languages is not having a serious impact.

D

The Influence of Quality Standards

One approach to improving the quality of service is to introduce and implement formal quality standards and procedures. The objective of this approach is to provide a method by which conformance to standards can be measured and demonstrated, in this specific case the quality of service.

Implementation would involve clearly defined and documented quality systems and procedures that could be regularly checked, monitored and validated.

In Europe the overall procedural document that controlls service quality standards is ISO 9000. This document has been harmonised throughout most European countries to provide a common standard by which the quality of service can be judged and guaranteed. Computer hardware vendors have been conforming to manufacturing quality standards for 20 years or more (quality standards that relate to the quality of the product). However, until recently, the standards did not include service. The purpose of ISO 9000 was to establish broadly similar quality goals in the service organisation to those controlling manufacturing. Whereas quality standards are commonplace in manufacturing companies, this was not the case, for service organisations, particularly independent service organisations.

Implementation of service quality standards has been considered relatively successful by vendors within the United Kingdom as British Standard (BS) 5750. However, the impact of ISO 9000 outside the U.K. is relatively low with few organisations even being aware of the existence of service quality standards. INPUT estimates this awareness level to be less than 25% of service organisations.

Exhibit II-7 indicates the influence of quality standards on service organisations.

Vendor awareness within the sample was 12 vendors out of 14. However, this figure is inflated by the following:

• Awareness level within the United Kingdom was found to be 100%.

• Awareness at the pan-European level is influenced by vendors whose European headquarters are located geographically within the United Kingdom.

Interviews involving vendors with European headquarters based within the United Kingdom suggested they were playing a leading role in planning to implement ISO 9000 standards within European subsidiaries. However, an opinion expressed by one U.K. based multinational vendor was that this may not be sufficient to ensure success. The vendor believes that to be successful ISO 9000 needs to be promoted by a large body of people within continental Europe. Large bodies of people in this case are defined as:

• Standards organisations
• User groups
• Government organisations

INFLUENCE OF QUALITY STANDARDS

Vendor
Awareness
of Standards — 12

Benefits the
Service Organisation — 10

Provides Real
Improvement in
Quality Standards — 10

0   2   4   6   8   10   12   14

Number of Respondents

Number of vendors interviewed: 14

Benefits of formal quality standards accrue mainly from two areas.

- Benefits to the internal service organisation were claimed by about three quarters of the vendors interviewed. Implementation forces the service organisation to reassess internal policies, organisation, disciplines, and procedures to conform with the requirements of the standard. Previously verbal methods and procedures need to be documented.

- Real improvements to quality standards were claimed by three quarters of the vendor sample. One aspect of certification being achieved was the monitoring by the standards authority through the medium of unannounced visits to check and validate processes and procedures. In addition, recertification is necessary at specific intervals.

Most important is the commitment that is necessary for the vendor to achieve certification, a commitment to quality. However, the cost of certification can be high; figures as high as $500,000 have been quoted by some vendors. Actual cost is dependent on the degree and level of changes necessary to achieve certification.

E
Service Quality Needs

Vendors were asked to identify, in their opinion, the most important single factors that either enhance or detract from the vendor's quality image. Major items arising from answers to this question are summarised in Exhibit II-8.

EXHIBIT II-8

SERVICE QUALITY NEEDS

Vendor Image

- Enhancing Factors
  - Fast response and repair/fix
  - First-time fix
  - Professionalism
  - Competence
  - Caring

- Degrading Factors
  - Poor communication
  - Multiple actions
  - Unfulfilled user expectations

The factors that are considered by vendors to enhance quality image relate to those that create an environment of confidence and comfort among users. Confidence that when problems do occur the vendor has the ability to respond quickly, resolve the problem, and resolve it the first time. In creating this environment with users the vendor establishes a comfort factor that ensures relationships with users are free of the emotion that can result from system-related problems.

Factors that degrade a vendor's quality image are also summarised in Exhibit II-8. These factors refer to areas of service that are likely to cause concern by undermining the users level of confidence in the vendor's ability to respond effectively.

Poor communication with users can create uncertainty in situations where a problem has occurred and the user is not made aware of the vendor's plans for resolution. User perception in situations of this type is likely to lead to an assumption that the vendor is uncertain of the correct course of action to take. Unless the user is clearly appraised of the situation and remedial plans, expectation levels cannot be established. For example, telling a user that spare parts may take a week to arrive is likely to cause less dissatisfaction than that resulting from not knowing or misinformation.

The ability to provide a "first-time" solution to user problems was identified by vendors as enhancing the quality image. While, the inability to provide a "first-time" solution casts doubt on the vendor's competence and skill levels. In addition, the need for multiple actions to resolve problems results in a higher level of interruptions to the user's operations.

User expectations of service is, in INPUT's opinion, one of the key factors that relate to user satisfaction. It is also one of the most difficult aspects of service to deal with, and has two complimentary aspects that can degrade a vendor's quality image:

• Failure to clearly establish realistic user expectation levels

• Failure to comply with commitments

Unless the vendor takes appropriate action to establish user expectations consistent with deliverable service capability, the user is free to make assumptions. These assumptions may or may not be accurate, and failure by the vendor to match these assumed expectation levels will likely result in user dissatisfaction.

Once realistic expectation levels for service delivery have been established, the vendor has a responsibility to perform accordingly. Broken promises or failure to satisfy user expectation can seriously degrade the vendor's image.

There is one additional element of service quality that was not referred to by any of the vendors interviewed. The single most important factor in quality, not just service quality, is *commitment*. To achieve service excellence, an organisation must be committed to that task.

Commitment at an organisational or company level is the key to achieving quality goals and requirements. Individual or departmental commitment is considered insufficient by INPUT, and will likely dissipate over a period of time. Total company commitment to quality can succeed and is a necessary ingredient for success.

Service quality needs can be encapsulated in the following quotation from "Quality Is Free" by Philip B. Crosby:

"The customer deserves to receive exactly what we have promised to deliver."

III

User Perceptions of
Service Quality

III
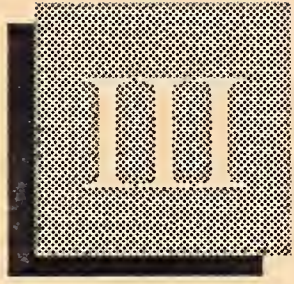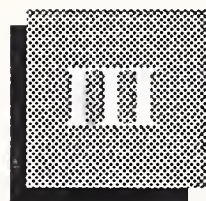
User Perceptions of Service Quality

This section of the report presents a hypothesis that, in INPUT's opinion, the users perception of a vendor's service quality image tends to be related to the users expectation of measurable service and product performance factors. The development of this hypothesis is based on the following criteria:

- Relationships between "weighted" and "reflex" user responses

- Identification of performance factors that tend to influence a vendor's quality image

- Examination of patterns in user data that can be related to a vendor's quality image

- Development of empirical threshold levels related to six service- or product-related performance factors that tend to influence the vendor's quality image

- Selective use of statistical correlation techniques to support the validity of a relationship between user perceived service/product performance and vendor quality image

A further objective of this section of the report is to identify those vendors whose quality image, in INPUT's opinion, is related to service performance factors and those whose quality image is related to factors other than those measured by INPUT.

A
Service Quality

There are many definitions of quality but the most appropriate definition related to the quality of service is provided by Philip B. Crosby in "Quality Is Free."

- "The user deserves to receive exactly what the vendor promises to provide."

This seemingly simple statement encapsulates the required image of service quality clearly and accurately. Among the many implied factors that influence user satisfaction and perceptions of service quality, one of the most important is user expectation. If one factor of service quality was singled out and rated as the most important, INPUT would identify user expectations as that single factor.

One of the most difficult relationships to establish in service is matching user expectation with the vendor's ability to deliver those expectations. Often the user has an expectation of both the product and the service that significantly exceeds the vendors delivery capability. The reasons for this situation would include:

- Poor communication between the vendor and the user. At worst, the user may not be made aware of the vendor's delivery capability and is therefore left to decide arbitrarily.

- "Overselling" of either the product or the service. If the item is "over-sold," user expectations are unrealistically raised and the vendors delivery capability exceeded.

- Product quality and reliability can exert a strong influence on the user's perception of service quality. If the product requires an "exceptional" level of repair and service, the user will likely consider that poor quality of service is partly or entirely to blame.

- User awareness. If the user is not made aware of the need for regular "housekeeping" and other necessary disciplines related to product usage, reliability and performance may suffer and in turn reflect on the perceived quality of service.

- "Caring" approach and individual personal relationships. Users have the right to expect that their requests and requirements will be handled promptly and politely. Failure by vendors to achieve a "caring" image can influence the user's perception of service quality.

INPUT considers that accurately establishing and defining user expectations has a significant influence on a vendor's image as a provider of quality service. However, there is an additional element of user expectation that also has a significant influence on the vendor's image. Having accurately established user expectation levels, the vendor has an obligation to ensure that service is delivered in line with commitments made. Therefore, two elements of user expectation can be defined:

- Accurately establishing and defining with the user a level of expectation that is realistic

- Ensuring that commitments and promises are fulfilled

Failure in either of these two areas can result in deterioration of the vendor's quality image. The need for quality of performance is all embracing and should extend to all aspects of customer service. From the first contact to the final invoice for payment, the approach of "total quality" must be used.

B
Vendor Quality Image

The "image" that a vendor has with users is, in part, a measure of the perception that users have of the vendor's quality of service. INPUT measures user satisfaction with service through the medium of an annual satisfaction survey of computer users. This survey provides an assessment of the degree to which user expectations are matched by the vendor's service performance. In conducting this survey INPUT questions users on the following areas of service performance:

- Satisfaction with the vendors overall service performance, both hardware service and software support

- Satisfaction with 12 specific aspects of hardware service, and 13 specific aspects of software support

- Satisfaction with systems availability

- The number of times each year the user's computer system fails completely

- The degree to which users expectations are met in terms of vendor response and repair time performance

The data from these five related items can provide an assessment of the vendor's service performance achievements. The first item in this list is designed to produce a reflex response from the user; the second item is designed to produce a more considered or weighted response.

Comparisons of weighted and reflex responses from users tend to indicate differences between the response ratings. The response ratings often differ by relatively significant degrees. However, it is this difference that provides an assessment of the vendor's image. A vendor's "image" can be related to the perception a user has of the quality of the vendor's service. The two responses are based as follows:

- Users are first asked a single question related to how important hardware maintenance and software support are to the users' business and

how satisfied they are with the service provided. The user gives an importance rating and a satisfaction rating. Differences between these ratings are expressed as a satisfaction index (ΔSI). Answers to this question tend to produce a "reflex" response which is a measure of the vendor's overall image with the user.

- The second question requires users to provide individual importance and satisfaction ratings for a list of service aspects. In answering these questions the user tends to consider each aspect separately and respond accordingly. The differences between importance and satisfaction ratings are again expressed as a satisfaction index (ΔSI). INPUT then calculates a mean value for the full list of items as an assessment of the vendor's service performance. Responses to this question tend to provide a considered or weighted assessment of the vendors service performance.

C

Relationships between Image and Performance

Exhibit III-1 shows a typical pattern of results obtained from answers to the "reflex" *and* weighted response questions for five derived companies (A to E). The exhibit illustrates the pattern of variances that typically emerge. A question that this data poses is why do these differences exist, and what do they mean? The differences can occur due to one, or a combination, of two factors:

- Other factors directly related to service performance that influences the user's responses

- A purely emotional response based on user perception and relationship with the vendor

Both of these two factors can influence the user's responses and hence the user's perception of the vendor's service quality image. However, the degree of influence exerted by each is important, as well as gaining an understanding of the factor which has the greatest influence. This understanding is necessary to allow vendors to evolve and implement corrective action plans successfully.

Satisfaction index (ΔSI) is derived from the difference between user importance and satisfaction ratings. An index of 1.0 indicates that users have concerns and worries (higher value indices are explained in Chapter I). Exhibit III-1 indicates that:

- All vendors (A to E) are rated by users with a considered or weighted response of less than 1.0, indicating that this measurement of service performance does not signify any concerns or worries.

- Vendors B and E are rated by users with a "reflex" response of less than 1.0, suggesting that the vendor's quality "image" is not subject to any user concerns or worries.

EXHIBIT III-1

TYPICAL USER RESPONSE PATTERNS

Vendor	Considered or Weighted Response ΔSI	"Reflex" Response ΔSI
A	0.5	1.4
B	0.9	0.9
C	0.3	1.3
D	0.7	1.6
E	0.4	0.6

2.0   1.0   0   1.0   2.0
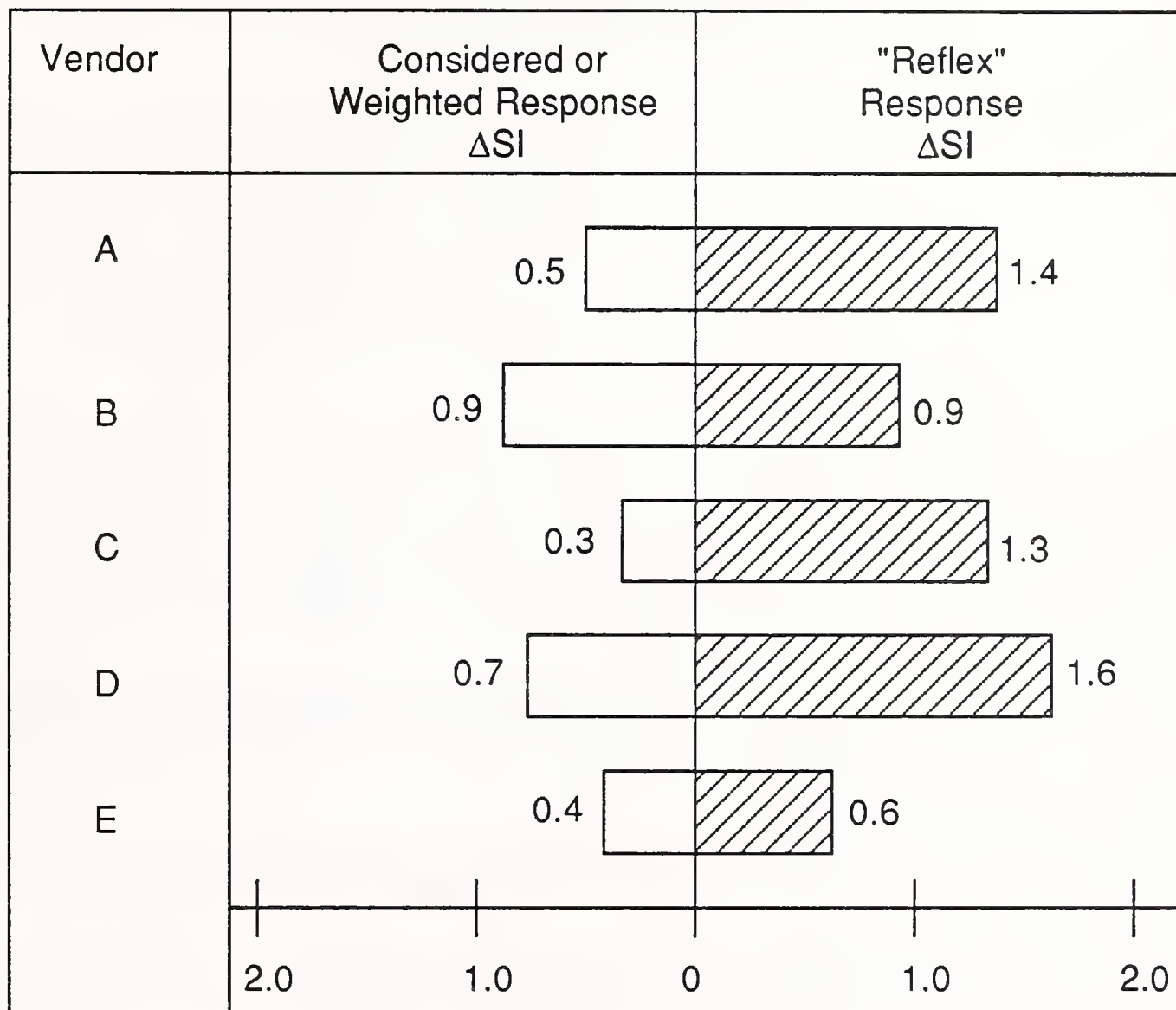
*Typical standard error=0.05

- Vendors A, C and D however are rated by users with a reflex response index of greater than 1.0, suggesting that the vendor's quality image is subject to concerns and worries. For some reason, the users feel uncomfortable or unhappy with the vendor's service performance. Vendor C is particularly interesting due to the large variance between the two responses.

At this stage of data analysis it is possible only to establish the degree of user concern, not the reason. In order to establish the reasons, further analysis of additional data is required to quantify and isolate the factors that tend to influence the user's perceptions.

INPUT's hypothesis that user perception of a vendor's quality image tends to be related to the user's expectation of measurable service and product performance factors was derived from analysis of research data. This involved an analysis of user data provided by the results of the 1988 user survey for repetitive patterns that indicated differentiation in the level of perceived user quality image.

Results of this analysis are illustrated in Exhibit III-2 and III-3. The data, plotted in scattergram form in these exhibits, was derived from the summary database included in Appendix A and resulted from categorisation in the form indicated in six exhibits entitled "Characteristics Consistent with Vendor Quality Image" presented later in this section of the report. Reference to Exhibit III-5, III-6, III-11, III-12, III-17 and III-18 indicate the patterns that emerged from analysis of the data.

Threshold levels, developed from analysis to define a differential in user perceived service quality levels, resulted from studying data patterns. Within these threshold levels, a data pattern emerges suggesting that vendors whose service performance falls within these boundaries tend to have a quality image related to measurable service performance factors. Threshold levels that were developed conform to the following criteria:

- Satisfaction index ratings that are equal to or greater than 1.0 represent the primary boundary (as defined by INPUT) between concerns and worries among users.

- Each vendor's performance, as perceived by the user ratings, is assessed separately for hardware service and software support.

- Weighted response ratings, provided by analysis of the list of specific service aspects, indicating more than two aspects rated at or above the user concern level of 1.0

- Satisfaction with systems availability is rated at or above the concern level of 1.0 by the user sample.

- A system failure rate that is equal to or greater than three failures per year as reported by the user sample.

- Vendor response and repair time performance falls short of user expectations by a specific margin. The magnitude of the margin does vary slightly depending on the system size. The point where differentiation occurs was defined by observing graphical curve "turnover" points which lie between 5% and 20% shortfall against user expectations.

- The total number of items above or below the thresholds chosen were summed to produce the number (N) representing the total. Hence, a second level of differentiation was found to be a boundary level where N = 2.

EXHIBIT III-2

HARDWARE SERVICE
RELATIONSHIP BETWEEN IMAGE
AND PERFORMANCE
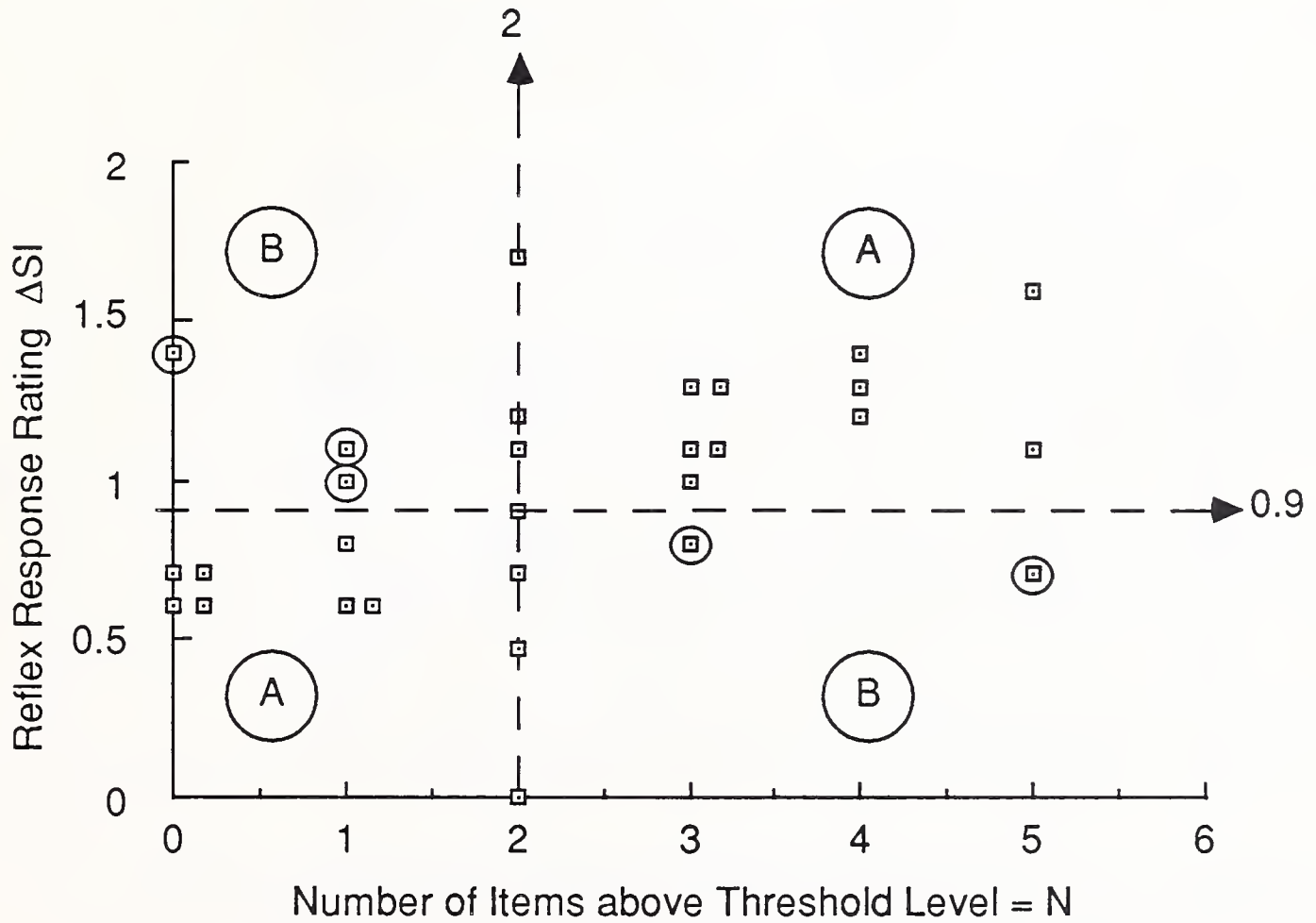
Notes

(1)　Sample size: 1,711

(2)　A = Zone where performance ratings tend to influence quality image; data = □

(3)　B = Zone where quality image tends to be influenced by other factors; data = ⊡

(4)　Standard error $\Delta SI = 0.28$
　　　　　　　　　　　　$N = 1.08$ } Selective Correlation

(5)　Product moment of (selective) correlation = 0.67

EXHIBIT III-3

SOFTWARE SUPPORT
RELATIONSHIP BETWEEN IMAGE AND PERFORMANCE
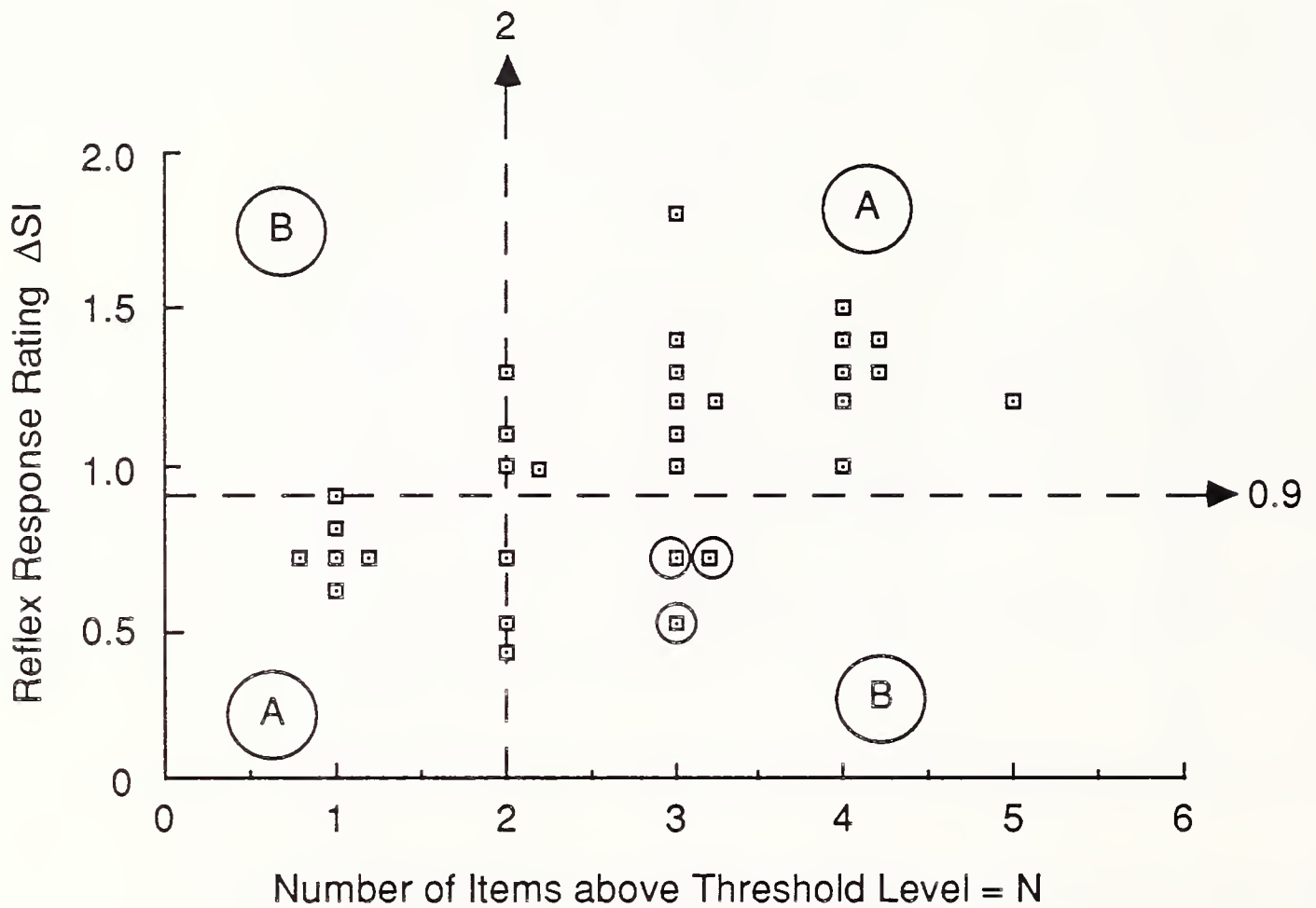
Notes

(1) Sample size: 1,711

(2) A = Zone where performance ratings tend to influence quality image; data =□

(3) B = Zone where quality image tends to be influenced by other factors; data =◉

(4) Standard error $\Delta SI = 0.19$
$N = 0.69$ } Selective Correlation

(5) Product moment of (selective) correlation = 0.81

Conclusions based on the results of applying the above criteria are as follows:

- Vendors whose service performance levels, as reported by the user sample, fall within the zones marked A on Exhibit III-2 and III-3, have a service quality image that tends to be related to measurable service performance rather than to other factors.

  - The first part of zone A, bounded by ΔSI equal to or less than 0.9 and N equal to or less than 2, is an area where the vendors service quality image is considered to be acceptable to the user.

  - The second part of zone A, bounded by ΔSI equal to or greater than 1.0 and N greater than 2, is an area where the vendors service quality image is a cause for concerns and worries among users.

- Vendors whose service performance levels, as reported by the user sample, fall within the zones marked B, have a service quality image related to other factors than the service performance factors measured by INPUT.

  - The first part of zone B, bounded by ΔSI equal to or less than 0.9 and N equal to or less than 2, is an area where the vendor's service quality image is considered to be acceptable.

  - The second part of zone B, bounded by ΔSI equal to or greater than 1.0 and N greater than 2, is an area where the vendor's quality image is a cause for concerns and worries among users.

To confirm the validity of a relationship between service quality image and measurable performance factors, the product moment of correlation was calculated. Calculations excluded points on the scattergram falling within zone B because these have already been defined as being outside the zones that apply to INPUT's relational hypothesis. Therefore, the correlation calculation was selective. Correlation figures obtained from the calculation were:

- Hardware service = 0.67
- Software support = 0.81

INPUT considers that the correlation figures confirm the validity of the hypothesis that vendor service quality image can be related to measurable service performance. (Maximum correlation coefficient for a perfect relationship would be +1). The expectation of a relationship between these factors is sufficiently high to suggest that correlation is not due to pure chance.

Based on the results of research analysis, INPUT suggests that vendors who have a poor service quality image tend to fall short of user expectations against more than two of the following criteria:

- Greater than two specific aspects of service are cause for user concern. (2 from 12 total aspects of hardware service, or 2 from 13 total aspects of software support)

- User satisfaction with systems availability is rated at or above the concern level.

- Three or more system failures per year

- Service response times fall short of user expectations by more than 5% to 20% (dependent on system size).

- Repair/fix times fall short of user expectations by more than 5% to 20% (dependent on system size).

D
Vendor Service Performance

This section of the report analyses the performance of specific vendors against the criteria established in the previous analysis. Vendors are positioned in a similar presentation to that illustrated in Exhibits III-2 and III-3, by system size, to indicate which vendors retain a quality image based on measurable service performance and those whose quality image is related to other factors.

In addition, the analysis is portrayed in a form that indicates the contribution of each performance factor to the quality image overall. From this analysis it is possible to highlight the factors that tend to contribute most to the vendor's quality image, relative to the large, medium and small systems segments.

1. Overall Relationship between Quality Image and Service Performance

Exhibit III-4 illustrates the following:

- The percentage of vendors whose service quality image can be related to aspects of measurable service performance

- The percentage of vendors whose service quality image is due to other factors

- A segmentation of the data by system size, hardware service and software support

EXHIBIT III-4

CQUE

RELATIONSHIP BETWEEN QUALITY IMAGE AND SERVICE PERFORMANCE

Percentage of vendors whose service quality image is due to:
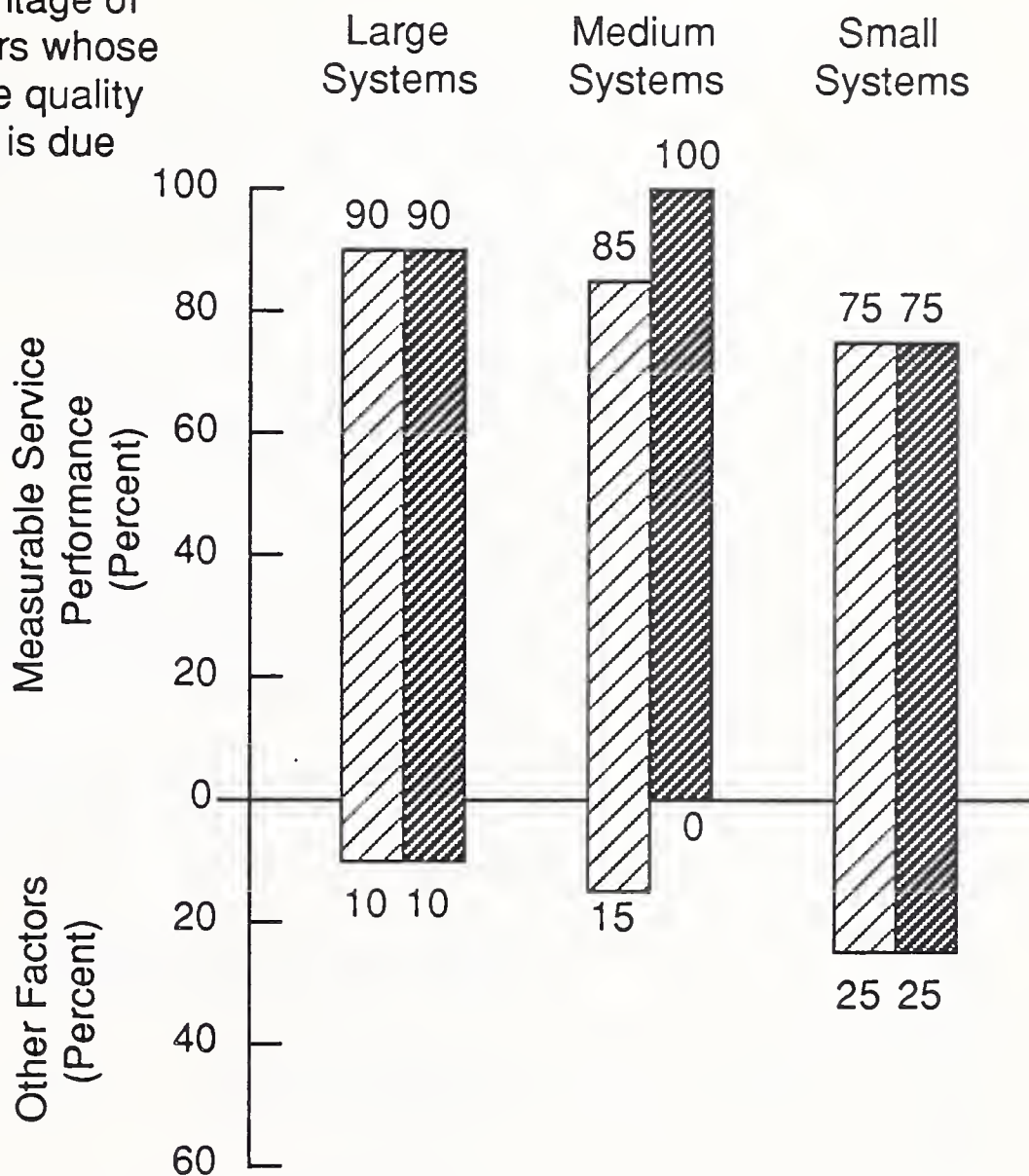
	Large Systems	Medium Systems	Small Systems
Sample Size	480	867	364
No. of Vendors	10	13	8

Measurable Service Performance (Percent)

Other Factors (Percent)

Large Systems: 90 90 / 10 10
Medium Systems: 85 100 / 15 0
Small Systems: 75 75 / 25 25

Hardware Service

Software Support

		ΔSI	N	
Standard HW Service		0.28	1.08	} Selective
Error	SW Support	0.19	0.69	} Correlation

Percentages have been rounded

Data illustrated in Exhibit III-4 indicates that a relatively significant proportion of vendors retain a service quality image that is related to measurable service performance factors. Only a minority of vendors retain a service quality image that is related to other factors.

2. Large Systems

Data relating to the large systems segment of INPUT's user satisfaction survey is listed in Exhibits III-5 (hardware service) and III-6 (software support). These exhibits show the vendor performance data categorised according to the criteria explained previously in this chapter. Visual examination will show:

* Patterns that emerge to differentiate between those vendors that have an apparent quality image problem, and those that have no apparent quality image problem

* Highlighting of exceptions to the hypothesis that a vendor's service quality image can be related to measurable service performance factors (i.e., Siemens hardware service performance and Bull's software support performance)

The data has been plotted in scattergram form in Exhibits III-7 (hardware service) and III-8 (software support). From these exhibits it can be seen that:

* Vendors who have a good service quality image based on measurable service performance are:

    - Hardware service

        ° Digital
        ° Concurrent
        ° Olivetti

    - Software support

        ° Digital
        ° Olivetti
        ° Concurrent

* Vendors who have a quality image that is subject to concern among users, based on measurable service performance are:

    - Hardware service

        ° Amdahl
        ° Bull

EXHIBIT III-5

CHARACTERISTICS CONSISTENT WITH VENDOR QUALITY IMAGE
LARGE SYSTEMS HARDWARE SERVICE

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >5%	Repair Time Falls Short of Expectation by >5%	Total No. of Items = N
Vendors with Apparent Quality "Image" Problem							
AMDAHL	1.1		X		X		2
BULL	1.7		X	X		X	3
IBM	1.2		X	X	X		3
ICL	1.0			X	X	X	3
SIEMENS	1.4						0
UNISYS	1.4		X	X	X	X	4
WANG	1.6	X	X	X	X	X	5
Vendors with No Apparent Quality "Image" Problem							
CONCURRENT	0.5			X			1
DIGITAL	0.9			X		X	2
OLIVETTI	0.0				X	X	2

Sample Size: 480   X - indicates above threshold

EXHIBIT III-6

CHARACTERISTICS CONSISTENT WITH VENDOR QUALITY IMAGE
LARGE SYSTEMS SOFTWARE SUPPORT

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >5%	Repair Time Falls Short of Expectation by >20%	Total No. of Items = N
Vendors with Apparent Quality "Image" Problem							
AMDAHL	1.5	X	X		X	X	4
IBM	1.4	X	X	X	X		4
ICL	1.0			X	X	X	3
SIEMENS	1.2	X			X	X	3
UNISYS	1.2	X	X	X	X		4
WANG	1.3		X	X	X	X	4
Vendors with No Apparent Quality "Image" Problem							
CONCURRENT	0.4			X		X	2
DIGITAL	0.6			X			1
BULL	0.5		X	X	X		3
OLIVETTI	0.7				X		1

Sample Size: 480   X-indicates above threshold

EXHIBIT III-7

QUALITY IMAGE RELATIONSHIP
LARGE SYSTEMS HARDWARE SERVICE
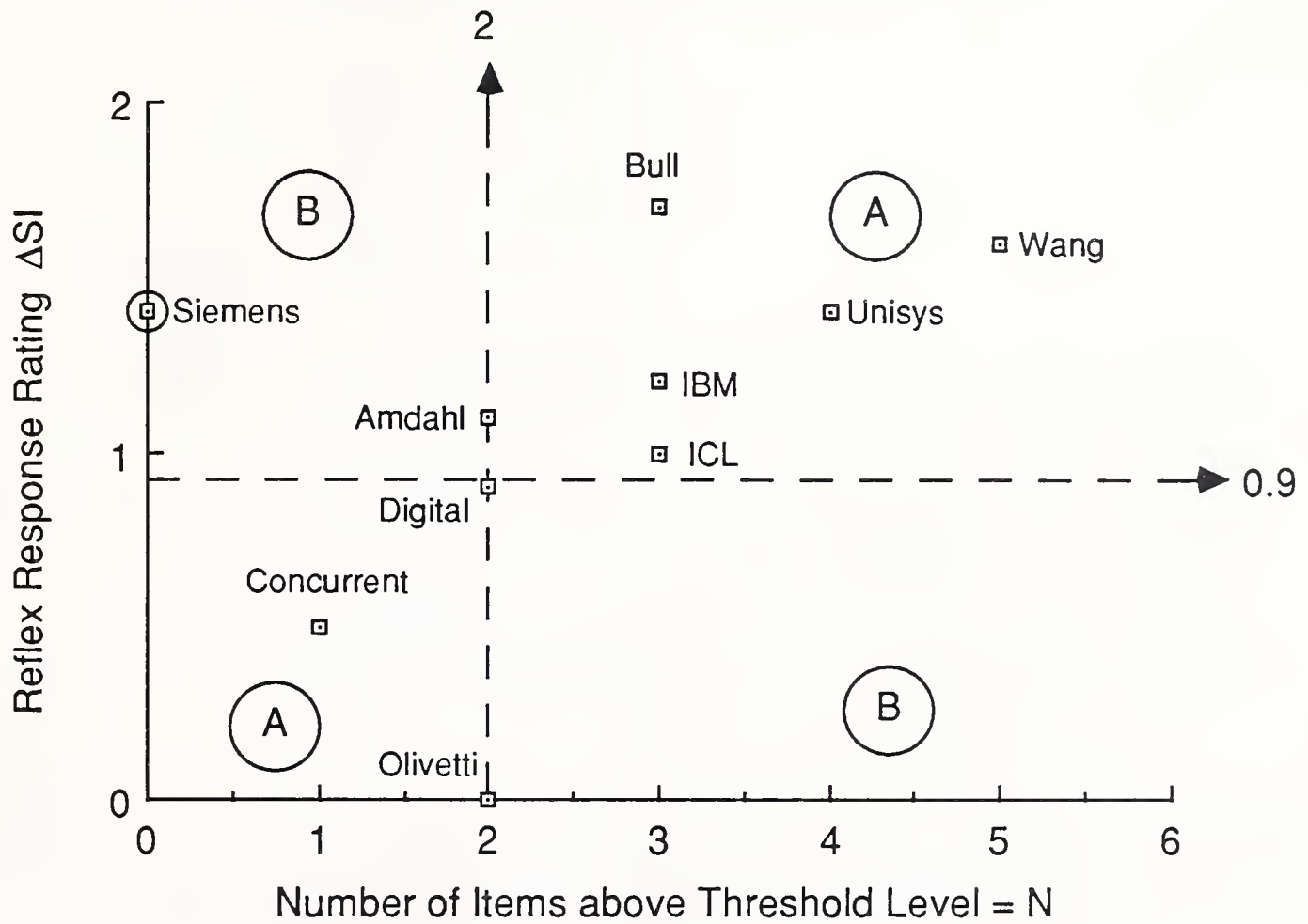
Notes

(1) Sample size: 480

(2) A = Zone where performance ratings tend to influence quality image; data = □

(3) B = Zone where quality image tends to be influenced by other factors; data = ⊡

EXHIBIT III-8

QUALITY IMAGE RELATIONSHIP
LARGE SYSTEMS SOFTWARE SUPPORT
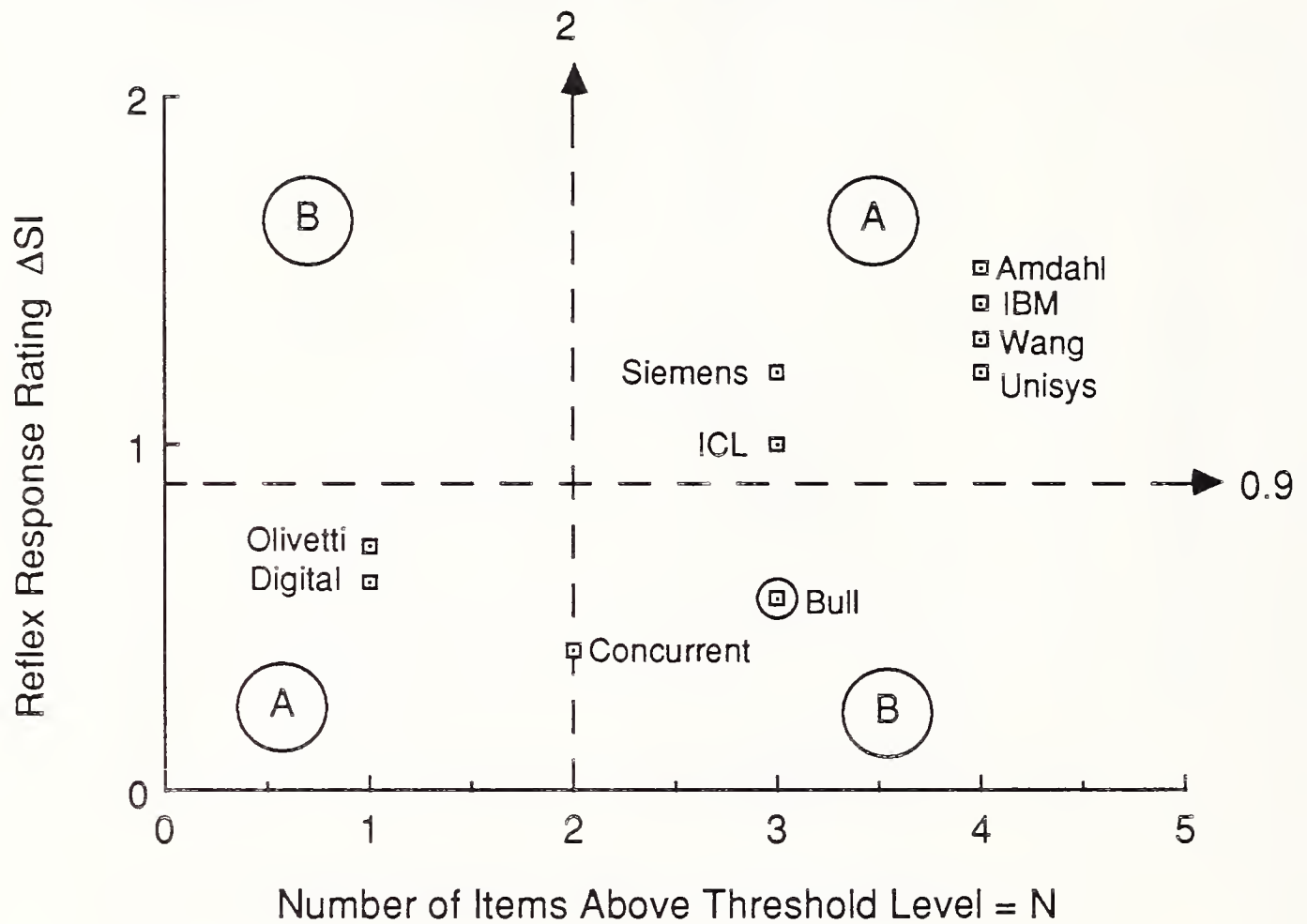
Notes

(1) Sample size: 480

(2) A = Zone where performance ratings tend to influence quality
     image; data = ▫

(3) B = Zone where quality image tends to be influenced by other
     factors; data = ⊡

- ° IBM
- ° ICL
- ° Unisys
- ° Wang

- Software support

  - ° Siemens
  - ° ICL
  - ° Amdahl
  - ° IBM
  - ° Wang
  - ° Unisys

• Vendors who retain a quality image that is based on factors other than aspects of service performance measured by INPUT are listed below.

- Hardware service

  - ° Siemens

- Software support

  - ° Bull

To provide an indication of the level to which specific aspects of service performance contribute to service quality image the data has been analysed as follows, and is illustrated in Exhibit III-9 (hardware service) and III-10 (software support).

• Vendor reflex response ratings have been represented as a mean value for the population sample, in this case the large-systems segment. Reflex response ratings, that provide an assessment of the vendor's service quality image, are separated depending on whether the rating is above or below the user concern level.

• Data representing vendors is also separated depending on whether the reflex response rating is above or below the user concern level.

• Comparisons for each aspect of service performance measured by INPUT are illustrated based on the percentage of vendors with reflex response ratings above the user concern level and the percentage of vendors with reflex response ratings below the user concern level.

Presenting the data in this format allows differences in service performance profiles to be observed. Therefore, an assessment can be made of the relative significance of differentials between vendors who retain a good service quality image and those whose quality image is a subject of user concern.

Exhibit III-9 indicates that for large systems hardware service the primary differential between the profiles is concern with systems availability.
A secondary differential is indicated where vendor response time falls short of user expectation by more than 5%. Further support for the significance of concern with systems availability is provided by INPUT's research indicating that 70% of system failures reported by the user sample are hardware related.

Exhibit III-10 indicates that for large systems software support the primary differential between the profiles is concern with more than two of the 13 aspects of software support surveyed by INPUT. Secondary differentials are indicated by concern with systems availability and vendor response times falling short of user expectation by more than 10%.

In the case of both the hardware service and software support satisfaction index for reflex response ratings, means vary by a ratio of 2:1 between the two categories of service quality image. A variation of this level suggests that the type of quality image a vendor retains is relatively well defined.

3. Medium Systems

Data relating to the medium systems segment of INPUT's user satisfaction survey is listed in Exhibits III-11 (hardware service) and III-12 (software support). These exhibits show the vendor performance data categorised according to the criteria explained previously in this chapter. Visual examination will show:

- Patterns that emerge to differentiate between those vendors that have an apparent quality image problem, and those who have no apparent quality image problem

- Highlighting of exceptions that do not conform to INPUT's hypothesis (i.e., ITL and Olivetti hardware service performance)

The data has been plotted in scattergram form in Exhibits III-13 (hardware service) and III-14 (software support). From these exhibits it can be seen that:

- Vendors who have a good service quality image based on measurable service performance are:

  - Hardware service

    ° Concurrent
    ° IBM
    ° Hewlett-Packard

EXHIBIT III-9

QUALITY IMAGE PROFILE DIFFERENTIATION
LARGE SYSTEMS HARDWARE SERVICE
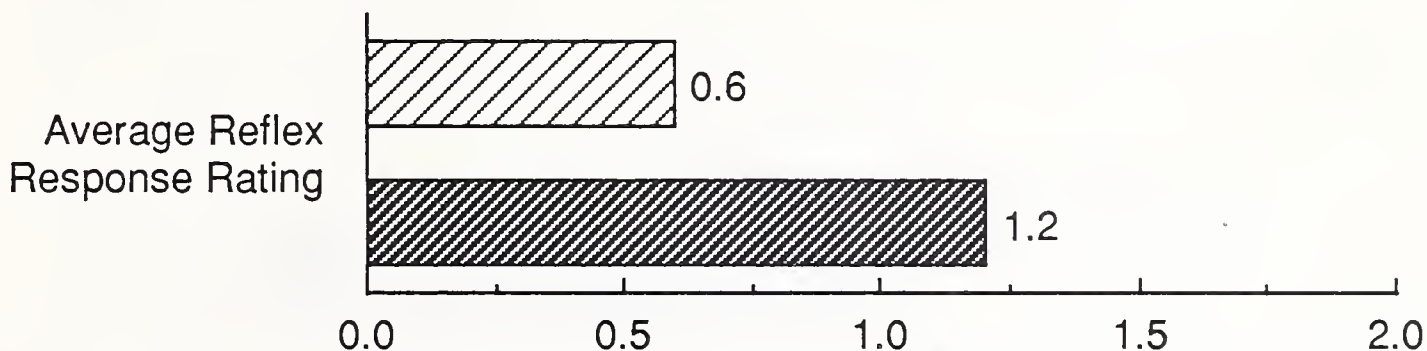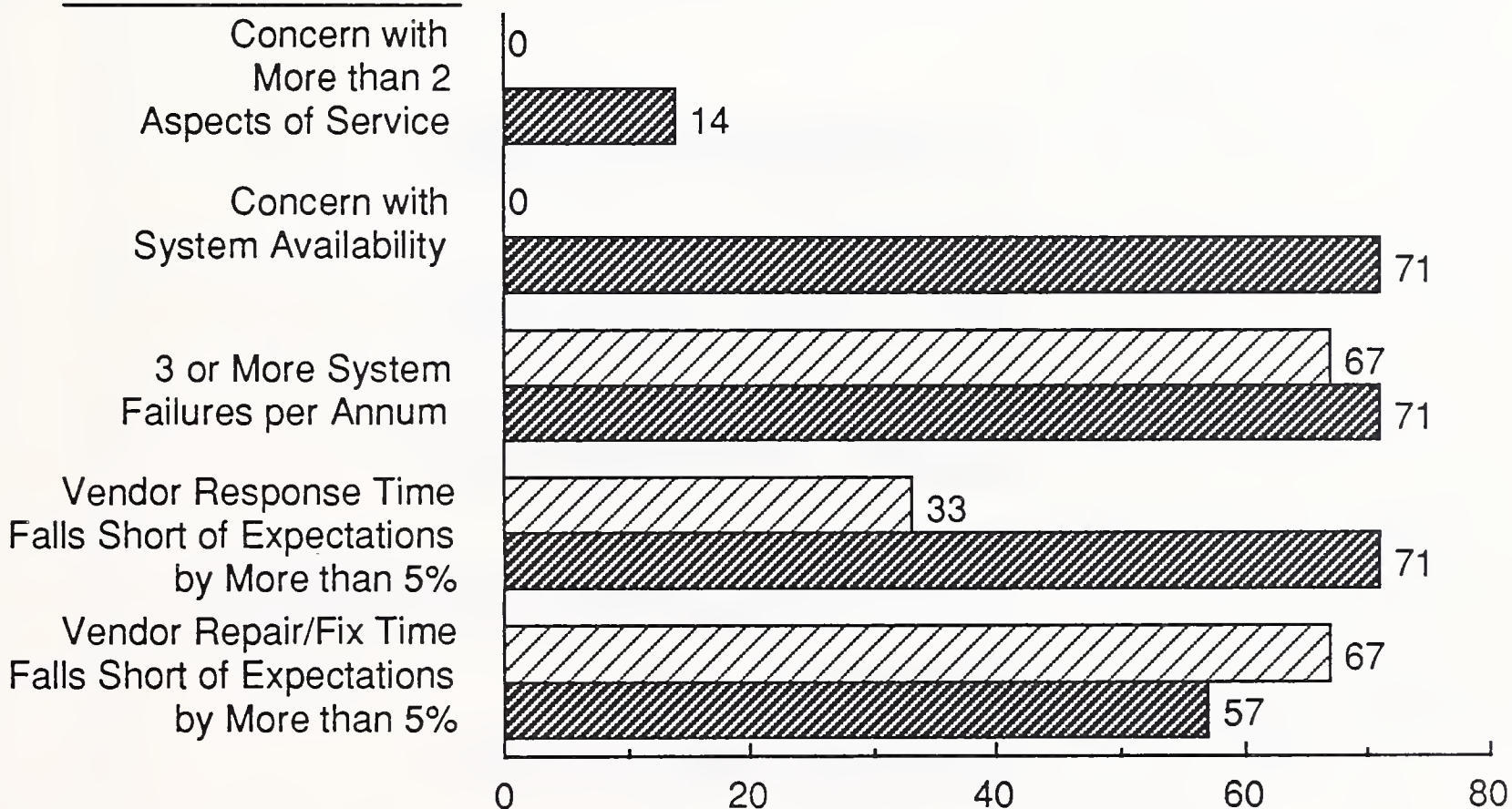
Average Reflex Response Rating

- 0.6
- 1.2

Scale: 0.0 0.5 1.0 1.5 2.0

Service Aspect Criteria

Concern with More than 2 Aspects of Service
- 0
- 14

Concern with System Availability
- 0
- 71

3 or More System Failures per Annum
- 67
- 71

Vendor Response Time Falls Short of Expectations by More than 5%
- 33
- 71

Vendor Repair/Fix Time Falls Short of Expectations by More than 5%
- 67
- 57

Scale: 0 20 40 60 80

Percent Reporting

Sample Size: 480

☐ Reflex Response Rating below Concern Level

▨ Reflex Response Rating above Concern Level

EXHIBIT III-10

QUALITY IMAGE PROFILE DIFFERENTIATION
LARGE SYSTEMS SOFTWARE SUPPORT
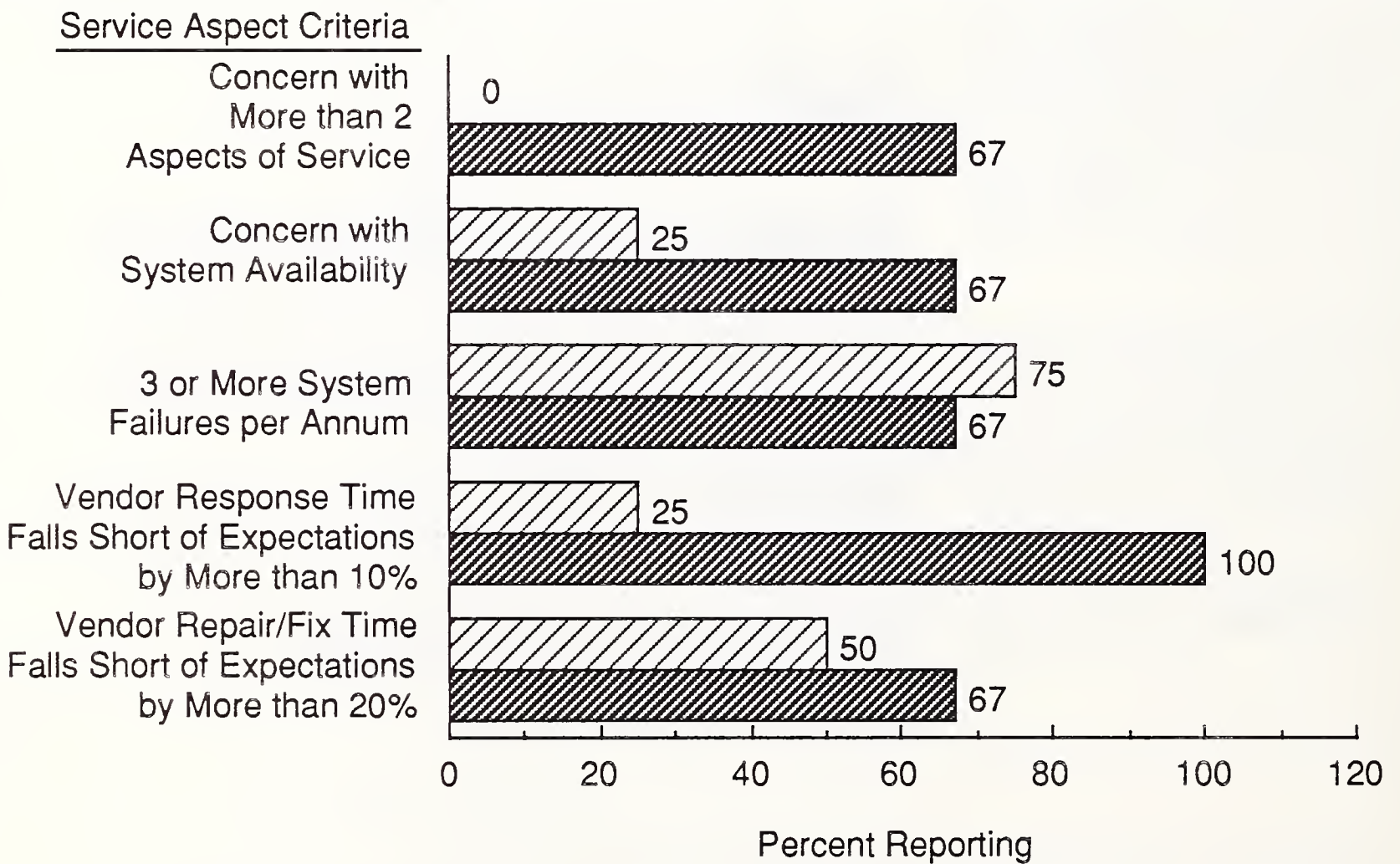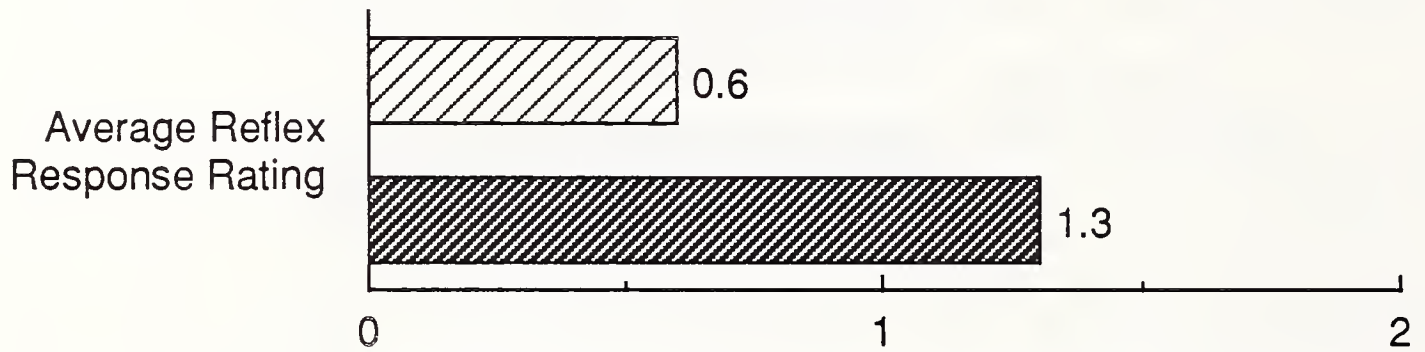
Average Reflex
Response Rating

0.6

1.3

0   1   2

Service Aspect Criteria

Concern with
More than 2
Aspects of Service

0

67

Concern with
System Availability

25

67

3 or More System
Failures per Annum

75

67

Vendor Response Time
Falls Short of Expectations
by More than 10%

25

100

Vendor Repair/Fix Time
Falls Short of Expectations
by More than 20%

50

67

0   20   40   60   80   100   120

Percent Reporting

Sample Size: 480

▨ Reflex Response Rating
below Concern Level

▨ Reflex Response Rating
above Concern Level

EXHIBIT III-11

CHARACTERISTICS CONSISTENT WITH VENDOR QUALITY IMAGE
MEDIUM SYSTEMS HARDWARE SUPPORT

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >20%	Repair Time Falls Short of Expectation by >20%	Total No. of Items = N
BULL	1.1	X	X	X	X	X	5
NCR	1.2			X	X		2
NIXDORF	1.1	X		X	X		3
UNISYS	1.3	X	X	X		X	4
WANG	1.3	X			X	X	3

Vendors with Apparent Quality "Image" Problem

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >20%	Repair Time Falls Short of Expectation by >20%	Total No. of Items = N
CONCURRENT	0.7						0
DIGITAL	0.8			X			1
HP	0.6						0
IBM	0.7						0
ICL	0.9		X	X			2
ITL	0.8	X			X	X	3
OLIVETTI	0.7	X	X	X	X	X	5
SIEMENS	0.6						0

Vendors with No Apparent Quality "Image" Problem

Sample Size: 867   X-indicates above threshold

EXHIBIT III-12

CHARACTERISTICS CONSISTENT WITH VENDOR QUALITY IMAGE
MEDIUM SYSTEMS SOFTWARE SUPPORT

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >20%	Repair Time Falls Short of Expectation by >20%	Total No. of Items = N
Vendors with Apparent Quality "Image" Problem							
DIGITAL	1.0			X		X	2
BULL	1.2	X	X	X	X	X	5
IBM	1.1	X			X	X	3
ICL	1.3	X	X	X	X		4
NIXDORF	1.8	X	X	X	X		3
OLIVETTI	1.0	X	X	X	X		4
UNISYS	1.4	X	X	X		X	4
WANG	1.3	X				X	2
Vendors with No Apparent Quality "Image" Problem							
CONCURRENT	0.9				X		1
HP	0.8				X		1
ITL	0.7	X			X		2
NCR	0.7			X			1
SIEMENS	0.5	X				X	2

Sample Size: 867   X-indicates above threshold

EXHIBIT III-13

QUALITY IMAGE RELATIONSHIP
MEDIUM SYSTEMS HARDWARE SERVICE

Number of Items above Threshold Level = N

Notes

(1) Sample size: 867

(2) A = Zone where performance ratings tend to influence quality image; data = □

(3) B = Zone where quality image tends to be influenced by other factors; data = ⊡

EXHIBIT III-14

QUALITY IMAGE RELATIONSHIP
MEDIUM SYSTEMS SOFTWARE SUPPORT
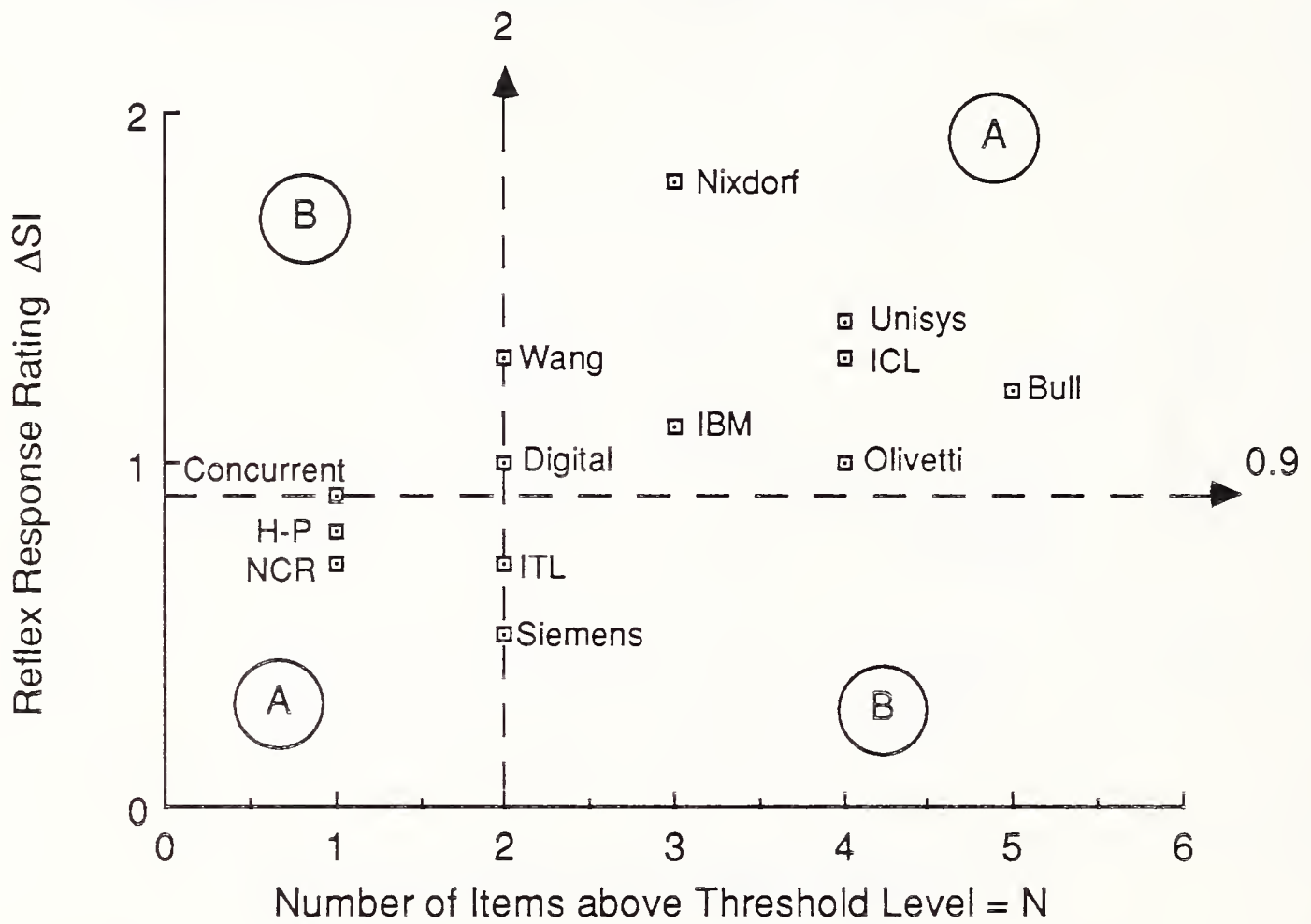
Notes

(1) Sample size: 867

(2) A = Zone where performance ratings tend to influence quality image; data = □

(3) B = Zone where quality image tends to be influenced by other factors; data = ⓞ

° Siemens
° Digital
° ICL

- Software support

  ° Concurrent
  ° Hewlett-Packard
  ° ITL
  ° NCR
  ° Siemens

• Vendors who have a quality image that is subject to concern among users, based on measurable service performance are:

  - Hardware service

    ° Bull
    ° NCR
    ° Nixdorf
    ° Unisys
    ° Wang

  - Software support

    ° Digital
    ° Bull
    ° IBM
    ° ICL
    ° Nixdorf
    ° Olivetti
    ° Unisys
    ° Wang

• Vendors who retain a quality image that is based on factors other than those aspects of service performance measured by INPUT are listed below.

  - Hardware service

    ° ITL
    ° Olivetti

To provide an indication of the level that specific aspects of service performance contribute to service quality image, the data has been analysed as follows, and is illustrated in Exhibits III-15 (hardware service) and III-16 (software support).

EXHIBIT III-15

QUALITY IMAGE PROFILE DIFFERENTIATION
MEDIUM SYSTEMS HARDWARE SERVICE

EXHIBIT III-16

QUALITY IMAGE PROFILE DIFFERENTIATION
MEDIUM SYSTEMS SOFTWARE SUPPORT

Average Reflex
Response Rating — 0.8 / 1.3

(scale: 0.0 0.5 1.0 1.5 2.0)

Service Aspect Criteria

Concern with
More than 2
Aspects of Service — 40 / 88

Concern with
System Availability — 0 / 50

3 or more System
Failures per Annum — 25 / 75

Vendor Response Time
Falls Short of Expectations
by More than 20% — 60 / 63

Vendor Repair/Fix Time
Falls Short of Expectations
by More than 20% — 20 / 63

(scale: 0 20 40 60 80 100)

Percent Reporting

Sample Size: 867

☐ Reflex Response Rating
below Concern Level

▨ Reflex Response Rating
above Concern Level

- Vendor reflex response ratings have been represented as a mean value for the population sample, in this case the medium systems segment. Reflex response ratings that provide an assessment of the vendor's service quality image are separated depending on whether the rating is above or below the user concern level.

- Data representing vendors is also separated depending on whether the reflex response rating is above or below the user concern level.

- Comparisons for each aspect of service performance measured by INPUT are illustrated based on the percentage of vendors with reflex response ratings above the user concern level and the percentage of vendors with reflex response ratings below the user concern level.

Presenting the data in this format allows differences in service performance profiles to be observed. Therefore, an assessment can be made of the relative significance of differentials between vendors who retain a good service quality image and those whose quality image is a subject of user concern.

Exhibit III-15 indicates that for medium systems hardware service the primary difference between the profiles is concern with more than two of the twelve aspects of hardware service surveyed by INPUT. Secondary differentials are indicated by the level of system failure rates and vendor repair times falling short of user expectations by more than 20%.

Exhibit III-16 indicates that for medium systems software support the primary difference between the profiles is concern with systems availability. Secondary differentials are indicated by:

- Concern with more than two of the 13 aspects of software support surveyed by INPUT

- System failure rates greater than three failures per year

- Vendor repair time falling short of user expectations by more than 20%

Differentials between the reflex response ratings, related to both hardware service and software support, vary by a large enough degree to clearly differentiate between the two categories of quality image.

4. Small Systems

Data relating to the small systems segment of INPUT's user satisfaction survey is listed in Exhibits III-17 (hardware service) and III-18 (software support). These exhibits show the vendor performance data categorised according to the criteria explained previously in this chapter. Visual examination will show:

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EXHIBIT III-17

CHARACTERISTICS CONSISTENT WITH VENDOR QUALITY IMAGE
SMALL SYSTEMS HARDWARE SERVICE

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >20%	Repair Time Falls Short of Expectation by >30%	Total No. of Items = N
Vendors with Apparent Quality "Image" Problem							
DIGITAL	1.0	X					1
BULL	1.1			X			1
SIEMENS	1.1		X	X	X		3
UNISYS	1.2	X	X	X			3
WANG	1.2		X	X	X	X	4
Vendors with No Apparent Quality "Image" Problem							
IBM	0.7	X			X		2
ICL	0.6			X			1
NCR	0.6	X					1

Sample Size: 364   X-indicates above threshold

EXHIBIT III-18

CHARACTERISTICS CONSISTENT WITH VENDOR QUALITY IMAGE
SMALL SYSTEMS SOFTWARE SERVICE

Vendor	Reflex Response Rating	Concern on >2 Service Aspects	Concern with System Availability	≥ 3 System Failures per Annum	Response Time Falls Short of Expectation by >20%	Repair Time Falls Short of Expectation by >20%	Total No. of items = N
Vendors with Apparent Quality "Image" Problem							
DIGITAL	1.1	X				X	2
BULL	1.0			X		X	2
ICL	1.4			X	X	X	3
UNISYS	1.3		X	X	X		3
WANG	1.2		X	X	X		3
Vendors with No Apparent Quality "Image" Problem							
IBM	0.7	X			X	X	3
NCR	0.7	X					1
SIEMENS	0.7	X	X	X			3

Sample Size: 364   X-indicates above threshold

- Patterns that emerge to differentiate between those vendors that have an apparent quality image problem, and those who have no apparent quality image problem

- Highlighting of exceptions that do not conform to INPUT's hypothesis (i.e., Bull and Digital hardware service performance, IBM and Siemens software support performance)

The data has been plotted in scattergram form in Exhibits III-19 (hardware service) and III-20 (software support). From these exhibits it can be seen that:

- Vendors who have a good service quality image based on measurable service performance are:

  - Hardware service

    ° ICL
    ° NCR
    ° IBM

  - Software support

    ° NCR

- Vendors who have a quality image that is subject to concern among users based on measurable service performance are:

  - Hardware service

    ° Unisys
    ° Siemens
    ° Wang

  - Software support

    ° Digital
    ° Bull
    ° ICL
    ° Unisys
    ° Wang

EXHIBIT III-19
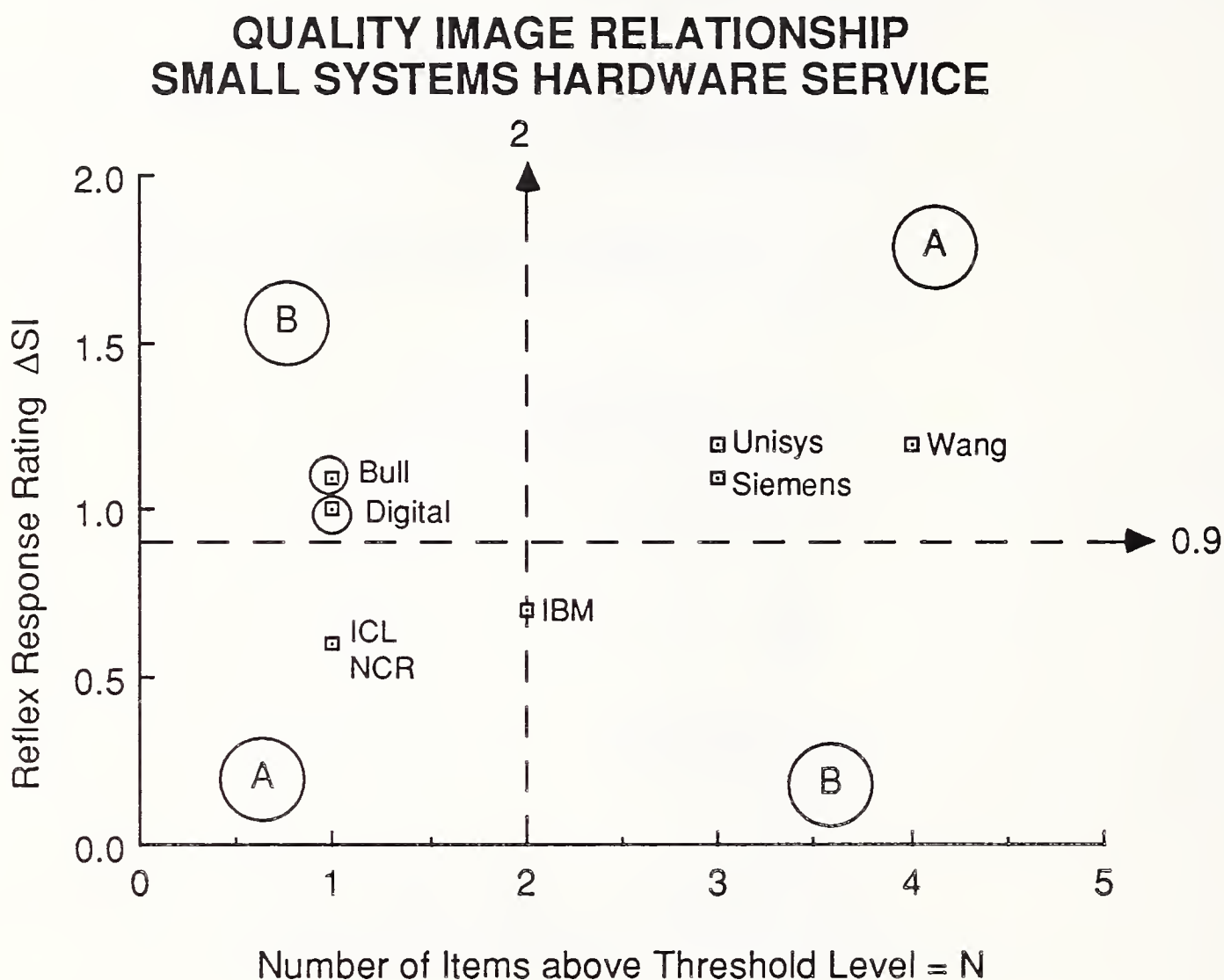
QUALITY IMAGE RELATIONSHIP
SMALL SYSTEMS HARDWARE SERVICE

Number of Items above Threshold Level = N

Notes

(1) Sample size: 364

(2) A = Zone where performance ratings tend to influence quality image; data = □

(3) B = Zone where quality image tends to be influenced by other factors; data = ⊡

EXHIBIT III-20

QUALITY IMAGE RELATIONSHIP
SMALL SYSTEMS SOFTWARE SUPPORT
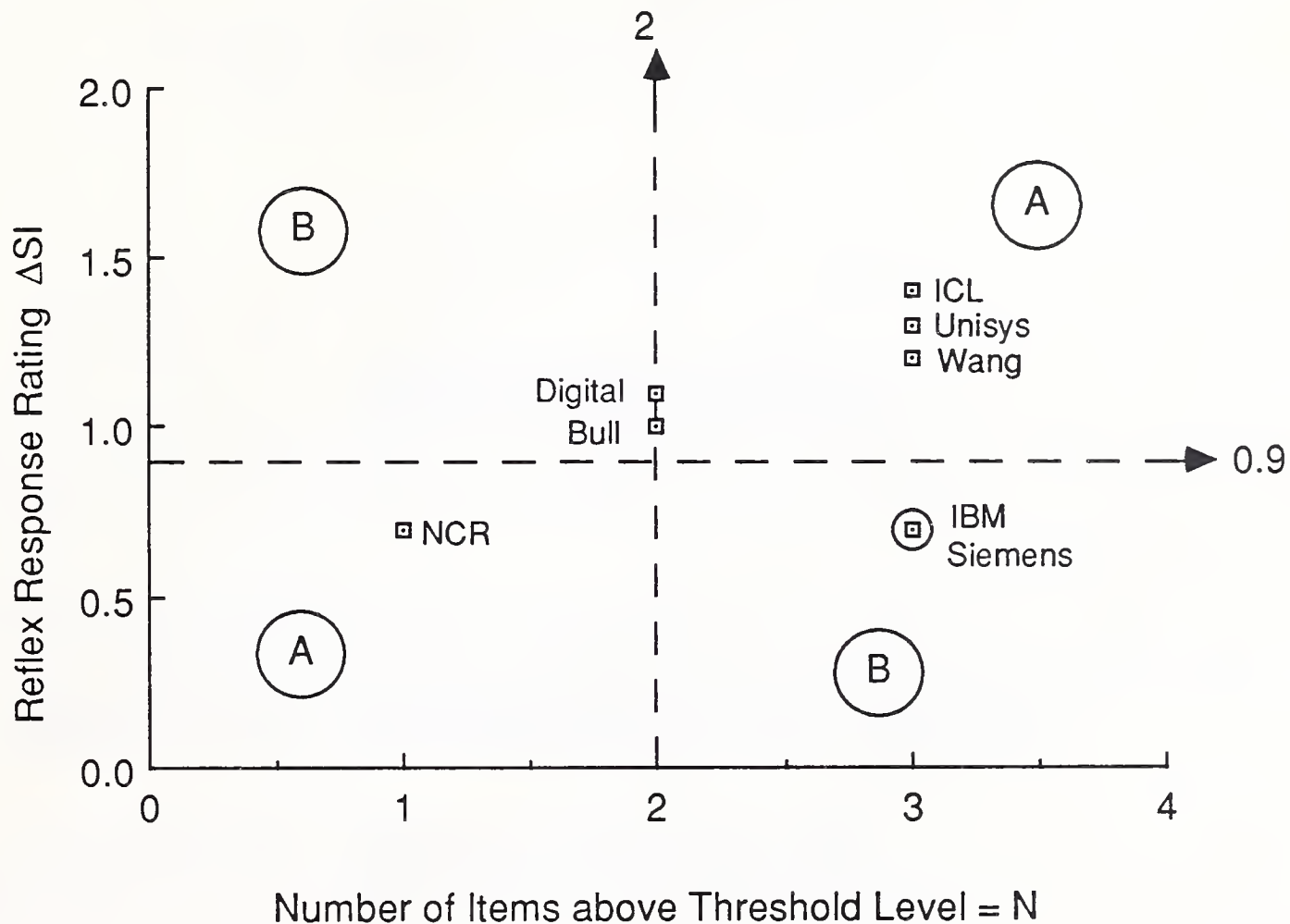
Number of Items above Threshold Level = N

Notes

(1)   Sample size: 364

(2)   A = Zone where performance ratings tend to influence quality
      image; data = □

(3)   B = Zone where quality image tends to be influenced by other
      factors; data = ⊡

- Vendors who retain a quality image that is based on factors other than those aspects of service performance measured by INPUT are listed below.

  - Hardware service

    ° Bull
    ° Digital

  - Software support

    ° IBM
    ° Siemens

To provide an indication of the level that specific aspects of service performance contribute to service quality image the data has been analysed as follows, and is illustrated in Exhibits III-21 (hardware service) and III-22 (software support).

- Vendor reflex response ratings have been presented as a mean value for the population sample, in this case the small systems segment. Reflex response ratings that provide an assessment of the vendor's service quality image are separated depending on whether the rating is above or below the user concern level.

- Data representing vendors is also separated depending on whether the reflex response rating is above or below the user concern level.

- Comparisons for each aspect of service performance measured by INPUT are illustrated based on the percentage of vendors with reflex response ratings above the user concern level and the percentage of vendors with reflex response ratings below the user concern level.

Presenting data in this format allows differences in service performance profiles to be observed. Therefore, an assessment can be made of the relative significance of the differentials between vendors who retain a good service quality image and those whose service quality image is a subject of user concern.

Exhibit III-21 indicates that for small systems hardware service the primary difference between the profiles is concern with systems availability. A secondary differential is indicated by the level of system failure rates.

Exhibit III-22 indicates that for small systems software support the primary difference between the profiles is the level of system failure rates. Secondary differentiation is indicated by both vendor response and repair times falling short of user expectations by 20% to 30%.

service and software support vary by a large enough margin to clearly differentiate between the two categories of image.

EXHIBIT III-21

QUALITY IMAGE PROFILE DIFFERENTIATION
SMALL SYSTEMS HARDWARE SERVICE
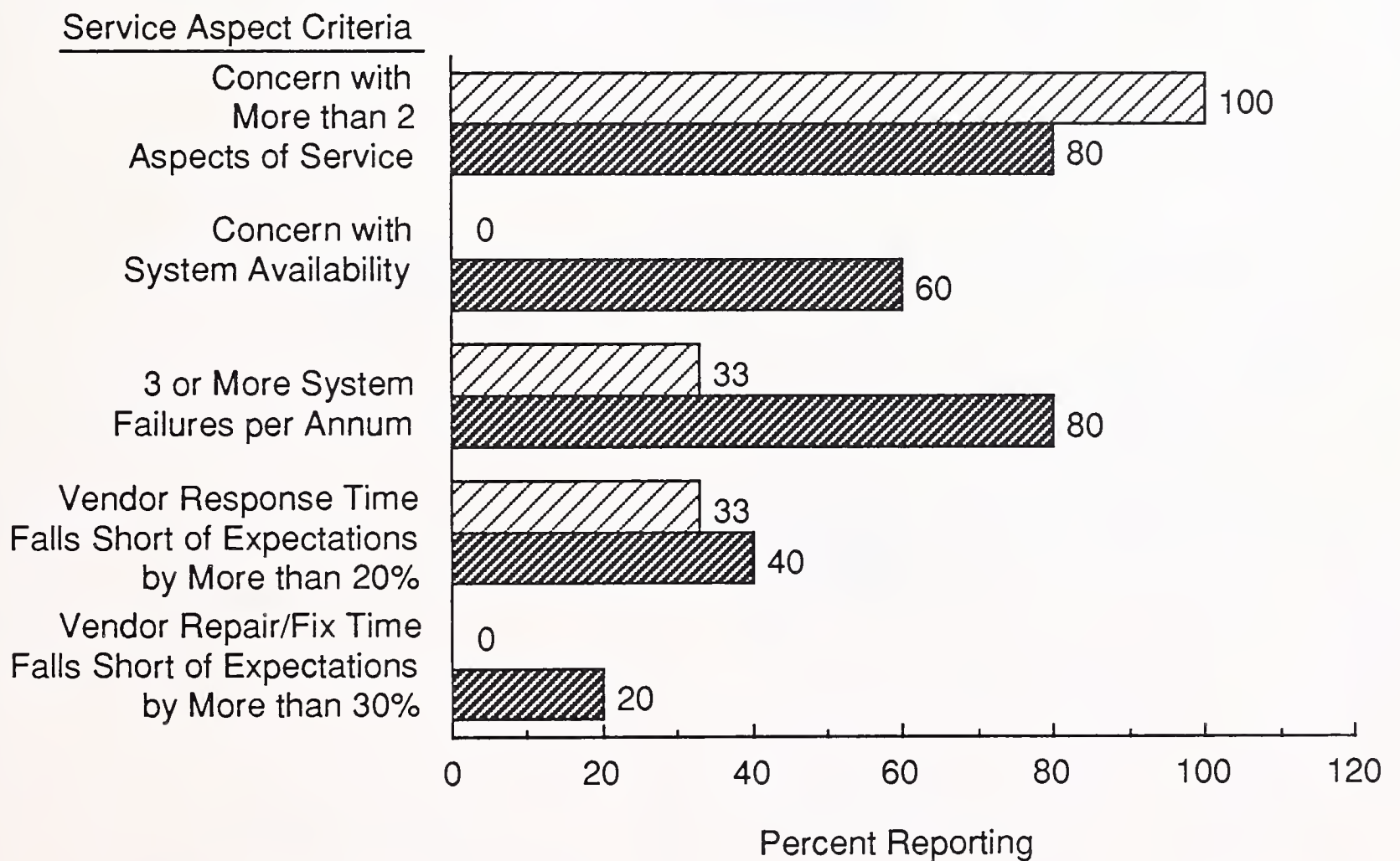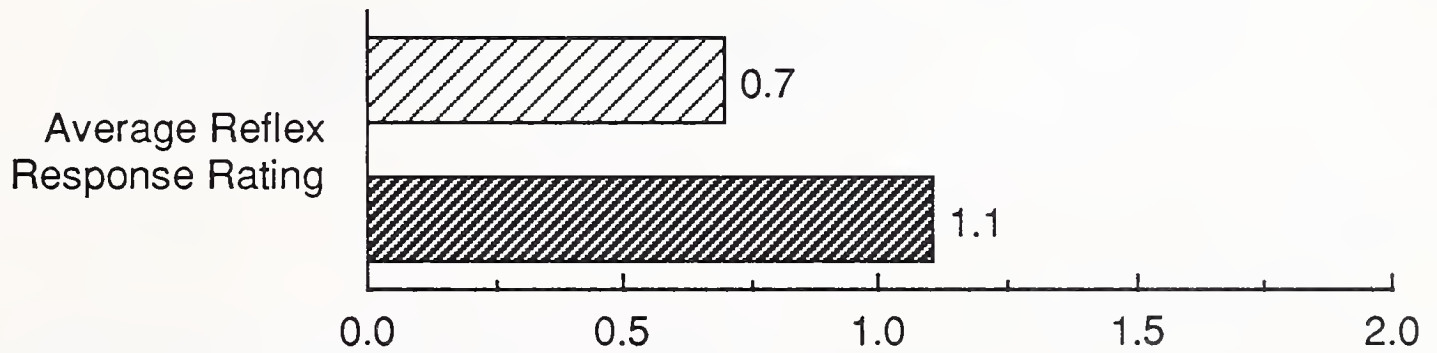
Average Reflex
Response Rating
- 0.7
- 1.1

(scale: 0.0 — 0.5 — 1.0 — 1.5 — 2.0)

Service Aspect Criteria

Concern with
More than 2
Aspects of Service
- 100
- 80

Concern with
System Availability
- 0
- 60

3 or More System
Failures per Annum
- 33
- 80

Vendor Response Time
Falls Short of Expectations
by More than 20%
- 33
- 40

Vendor Repair/Fix Time
Falls Short of Expectations
by More than 30%
- 0
- 20

(scale: 0 — 20 — 40 — 60 — 80 — 100 — 120)

Percent Reporting

Sample Size: 364

▨ Reflex Response Rating below Concern Level

▨ Reflex Response Rating above Concern Level

EXHIBIT III-22

QUALITY IMAGE PROFILE DIFFERENTIATION
SMALL SYSTEMS SOFTWARE SUPPORT
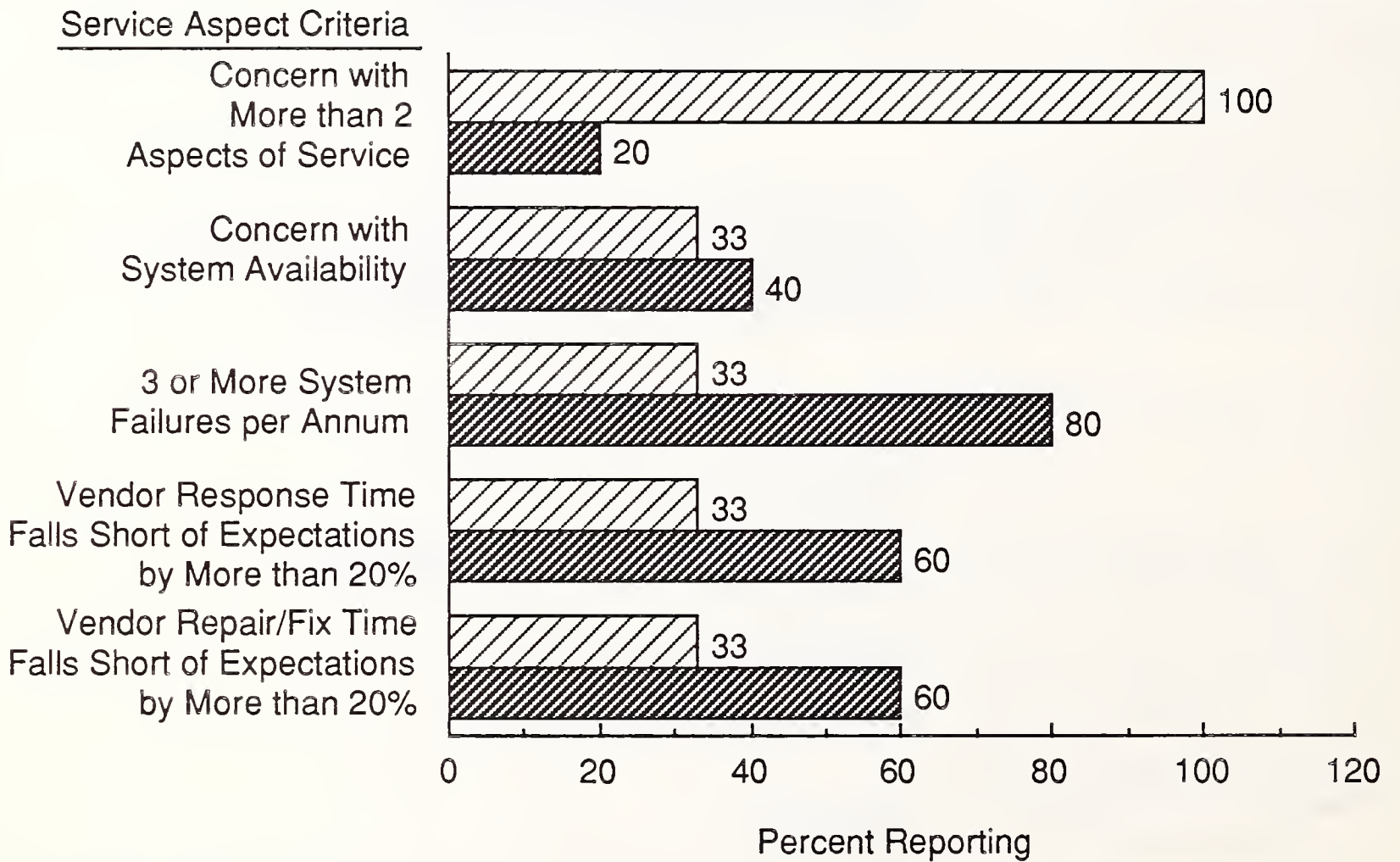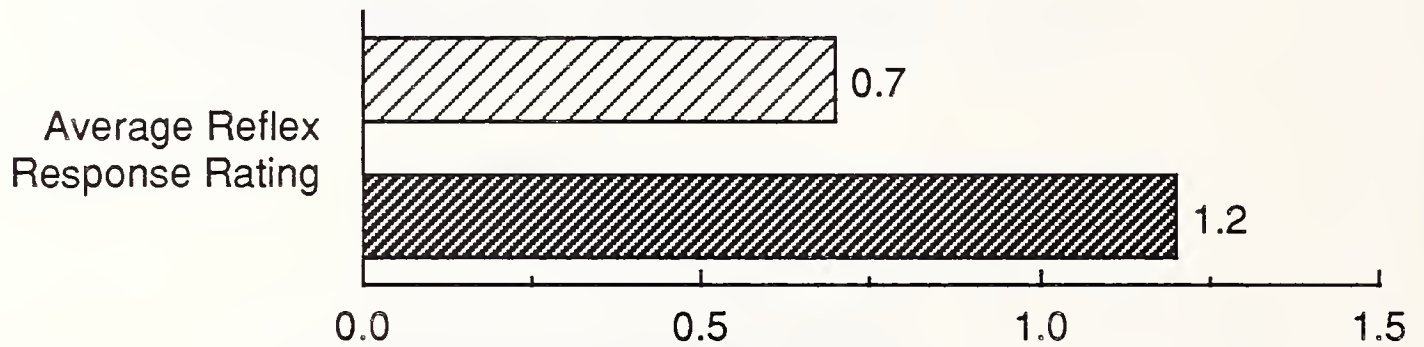
Average Reflex
Response Rating

0.7

1.2

0.0	0.5	1.0	1.5

Service Aspect Criteria

Concern with
More than 2
Aspects of Service

100

20

Concern with
System Availability

33

40

3 or More System
Failures per Annum

33

80

Vendor Response Time
Falls Short of Expectations
by More than 20%

33

60

Vendor Repair/Fix Time
Falls Short of Expectations
by More than 20%

33

60

0	20	40	60	80	100	120

Percent Reporting

Sample Size: 364

☑ Reflex Response Rating
below Concern Level

▨ Reflex Response Rating
above Concern Level

54

CQUE

IV

Vendor View of Service Needs

IV
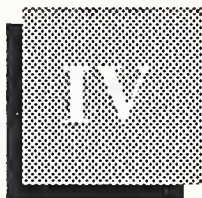
Vendor View of Service Needs

A

Major Issues

Vendors were asked by INPUT to give an opinion of what they considered to be the major issues confronting service. A consensus of the issues identified by the vendors interviewed is listed in Exhibits IV-1 and IV-3.

EXHIBIT IV-1

MAJOR HARDWARE SERVICE ISSUES

Issue	No. of Mentions
• User pressure for fast restore time	5
• Relationship between service quality and price	3
• Flexibility of service offerings and need to understand user requirements	3
• Need for service to be more proactive and have less impact on user operations	3
• Need for a "one-time" flx	2
• Quality and reliability of products	2
• Quality and availability of spare parts	2

No. of vendors interviewed: 14

Note: Multiple responses permitted

1. Hardware Service

a. Restore Time

The issue that received the highest number of mentions from vendors was user need for a fast restore time in the event of system hardware failure or problems. Included within the term "restore time" is the importance of systems availability and vendor response and repair time performance. In addition, the availability of spare parts to resolve hardware related problems is inferred by the need for fast restore times, but this was only referred to specifically by two vendors.

Need for fast restore time and pressure from users is confirmed by INPUT's user research programme. Results from INPUT's 1988 user survey indicated that users place high levels of importance on the availability of the system and related aspects of service. For example:

• Systems availability is given an importance rating of 9.4 on a scale of 0 to 10 by users.

• Hardware response and repair time performance is given an importance rating of 9.0 on a scale of 0 to 10 by users.

• User satisfaction with systems availability is given a rating of 8.5 indicating that the gap between importance and satisfaction (ΔSI) of 0.9 is approaching the level of dissatisfaction (1.0) that suggests a degree of user concern.

Five vendors out of a total of fourteen interviewed identifying restore time as a major issue suggests an insufficient recognition of user needs and perceptions of service performance.

b. Quality and Price

A conflict situation appears to be developing within the vendor community in the relationship between service quality and price. Three vendors identified the relationship between service quality and price as a major issue. In addition, all vendors interviewed were asked a specific question on whether or not price was a constraint on the quality of service supplied. Data resulting from answers to this question are shown in Exhibit IV-2.

INPUT considers that based on the results of user research vendors have not yet achieved a full understanding of the dynamics of service pricing strategy. Reasoning behind this statement is as follows:

• It was believed that some responses to the question relating price and quality were political. Respondents gave the impression that it was not company policy to admit concern.

EXHIBIT IV-2

SERVICE PRICE/QUALITY RELATIONSHIP

Quality of Service Not Restricted by Price — 6

Further Pressure on Pricing Could Impact Quality — 2

Price Does Restrict Quality of Service — 6

Number of Respondents
1 2 3 4 5 6 7 8

No. of vendors interviewed: 14
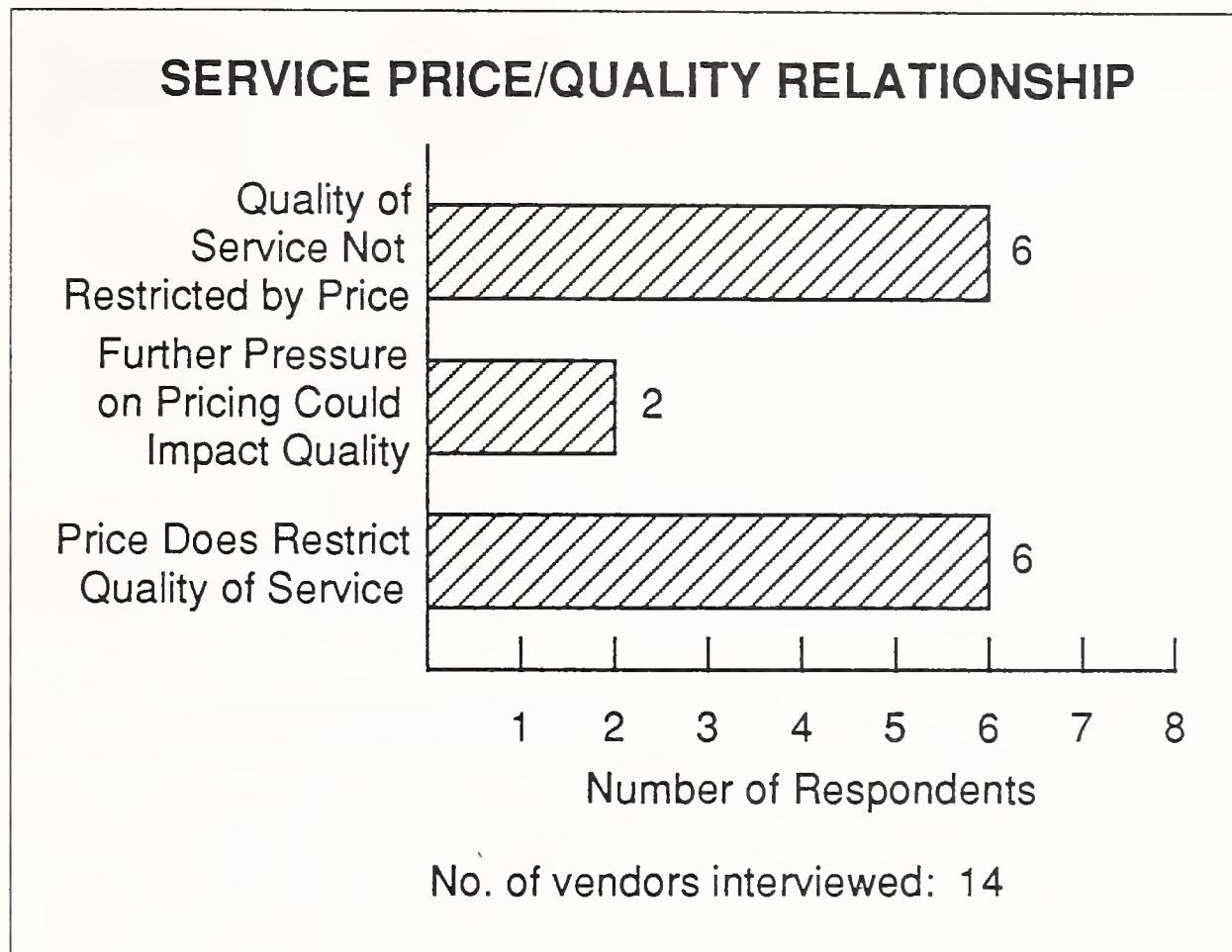
- One respondent, while agreeing that price was influencing quality, offered the opinion that it is the vendor's responsibility to provide an acceptable quality of service at a price the user is prepared to pay.

- One impression gained from the interviews was that user wants, in terms of pressure to reduce prices, had been considered rather than user needs for quality service. INPUT research indicates that quality of service rates higher in importance with users than price, suggesting that vendors should concentrate more on responding to quality needs than overreacting to pricing pressure.

- Exhibit IV-3 indicates a consensus of opinion where vendors are equally divided on whether or not price is a constraint on service quality. The views of vendors indicate that pricing pressure is exerting a higher influence on smaller systems, than on larger systems.

User research performed by INPUT in 1988 indicated that users rate the importance of price between 7.9 and 8.3 on a scale of 0 to 10. This rating places price in seventh or eighth place in importance ratings behind factors that relate to quality of service. INPUT concludes from this rating that the primary user need is for quality of service first and price second. Furthermore this pattern of ratings is consistent regardless of system size, hardware service or software support. INPUT's data does not take into account the pressure and aggression that some users may apply when negotiating contracts, but it does assess user needs and provide a true perspective.

EXHIBIT IV-3

58

MAJOR SOFTWARE SUPPORT ISSUES	
Issue	No. of Mentions
• Software quality	6
• Need for increased skill levels	5
• User satisfaction levels	3
• Need to extend support to cover systems and applications software	2
• Access to source codes and support for "standard" software	2
• Increased vendor flexibility	1

Sample size: 14

Note: Multiple responses permitted

Also, recent INPUT research indicates that 70% of users consider that service has a good price/performance ratio and that only 20% of the customer services market is price sensitive.

In the event that the quality of a vendor's service is impacted by price, resulting user dissatisfaction would most likely prompt the user to search for an alternative vendor. One exception to this situation is where prior agreement with the user on reduced quality of service has been made in advance. The user should have full understanding of the implications of such an agreement. Three vendors highlighted the need to have flexible service offerings and the need to understand user requirements. This is an example of how adopting this approach can be beneficial to both user and vendor.

c. Flexibility

In today's marketplace, and even more so in the future, the need for flexibility and understanding user requirements is of prime importance. The use of computer systems is becoming more widespread and expanding the diversity of user applications. Therefore, recognition by vendors of the need for flexibility is extremely important in order to meet the needs of a wide variety of users. One respondent commented on the

need for service to become more "user friendly." By this, the vendor was suggesting a need for new initiatives to make service more easy to obtain and to streamline service administration. Greater use of computers is being made by less sophisticated users who would likely prefer "user friendly" service (free of any complications or frustration), but at the same time providing a level of service appropriate to the application. Although not highlighted as a major issue by all respondents, recognition of the need for flexibility was apparent in discussions with vendors.

d. Proactive Service

Proactive service was highlighted as a major issue by three vendors as well as a recognition of the importance of systems availability to users. Proactive service was identified together with two main features:

- Provision of early warning of system hardware failures that allows remedial action to be taken prior to failure occurrence thus minimising the impact of potential failure on the user's operations

- Providing service at a time that is most convenient to users. Servicing can be performed during noncritical times or outside normal hours of operation.

One factor normally associated with proactive service is either local or remote hardware monitoring technology. However, there is one additional element of technology that can have a major impact on user perception of service quality. This element is the use of leading edge field communications equipment such as mobile cellular telephones and terminals. Recently, INPUT learned that Rank Xerox (in the copier market) had invested $8.5 million in equipping the field personnel with cellular telephones. One of the major advantages quoted was the ability for the engineer to call forward and give users an impression of improved response times.

In addition, the engineer, through use of the mobile telephone, can at times resolve a proportion of user problems remotely. Rank Xerox has an intention to implement service technology at a higher level by equipping the field engineering force with a package including a cellular telephone, a portable microcomputer and a modem. Justification is based on the need to invest in:

- Productivity
- Customer satisfaction and requirements
- Quality

Investment in practical technology that provides a measurable improvement in the quality of service can bring worthwhile benefits in terms of user satisfaction and hence enhance the quality image of service. User

awareness is an important component in the visible benefits. Since users cannot appreciate improvements they are not aware of, there is a need for parallel marketing and promotional activity.

e. First-Time Fix

Once a problem has been identified, it is important for the vendor not only to repair the hardware promptly but also to ensure that the fault is fully repaired the first time. Two vendors highlighted the need for first-time repair as a major issue, and that failure to achieve this caused frustration and loss of user confidence. User confidence and comfort factors are important elements of a service quality image. These elements are instrumental in convincing the users of the vendor's competence and skill level to resolve problems quickly and efficiently.

f. Product Quality

Product quality and reliability was identified by two vendors as a major issue. If the product is immature, the probability of failure due to insufficient development can lead to a need for disproportionate levels of service. Increased need for service can suggest to the user that poor-quality service is to blame for lack of product reliability. This situation presents a problem that the service organisation may find difficult to address.

g. Spare Parts

Quality and availability of spare parts was highlighted by two vendors as a major issue. INPUT has no data related to the quality of spare parts, but availability is a major issue confirmed by user research. INPUT user research in 1988 indicated availability of spare parts as the major cause of user dissatisfaction throughout Europe. The fact that only two vendors recognised this as a major issue may suggest that many vendors are not aware of what the user feels, is a major problem. Availability of spare parts, in the event of hardware failure, can impact systems availability when the replacement part is critical to the system. In 1988 INPUT user research indicated that users of eight vendors' equipment (out of 14 surveyed) were expressing dissatisfaction to the point of concern relative to spare parts availability. An additional three were very close to this level, making a total of 11 vendors out of 14 (or 78%) whose user base would likely highlight spares availability as a major issue. This compares with a figure of 14% based on INPUT's vendor sample.

2. Software Support

Major software support issues highlighted by the vendor sample are listed in Exhibit IV-3.

a. Software Quality

Six vendors identified software product quality as a major issue. By doing so, they are commenting on the immaturity of the product and the inherent level of faults that exist in the product. Figures released by IBM during early 1989 indicated improvements in the quality of software— measuring software quality as the number of faults per one thousand lines of code. Since 1960, the number of faults per thousand lines of code have decreased from 20 to 2.0, an improvement factor of 10 to 1. However, during the same time period, the complexity and size of software packages has increased significantly therefore offsetting the impact of improvements as perceived by users.

If, due to the basic quality of the software product a high level of support is needed, then this can have a relatively significant influence on user perception of the quality of support that is provided. At the same time, a disproportional level of support can lead to a loss of confidence with users, and cause doubts related to the skill and competence level of the vendor's support personnel. In the event that the vendor finds it necessary to introduce temporary corrections, this can further undermine the user's confidence level.

A situation of this nature, as is the case with hardware product unreliability, indicates that product and service quality are often very closely related, even inseparable at times.

b. Skill Levels

A need for improved software skill levels was identified by five vendors as a major issue. Recognition of this factor shows a high degree of perception by those five vendors. Engineer skill levels was identified in INPUT's 1988 user survey as a major cause for concern in the user sample. Users representing service from seven vendors, of 14 surveyed, reported ratings that suggest dissatisfaction at the concern level. Further, the 1988 survey indicated a decline in user satisfaction with engineer skills between 1987 and 1988.

One vendor, in recognising a need for increased skill levels, expressed concern that investment may not necessarily attract increased business. The vendor also expressed concern for the length of time required to train suitable candidates to the required skill level. INPUT contends the witholding of required investment is acceptance of continuing user dissatisfaction levels. Poor return on investment would not be considered a satisfactory position to adopt with dissatisfied users. Two possible solutions to this situation are suggested by INPUT.

- Implementation of technology solutions such as remote support and diagnostic capability. Use of artificial intelligence and expert systems can do much to supplement individual skill levels. Investment is still required but can be retained by the vendor, as opposed to investment in people who may leave the company.

- Investment in technology can provide relatively significant gains in productivity, allowing the vendor to improve skill level capability without necessarily increasing labour costs. Most likely a cost reduction may result.

c. Extended Skills

Consistent with recognition of a need to improve skill levels, two vendors identified a need to extend the skill range to cover both systems and applications software support. Interaction between systems software and applications can be a difficult area, especially where compatibility problems are concerned. Ownership of problems is one of the key issues in this case. User satisfaction and comfort is not enhanced by disagreements concerning the nature of software faults.

d. User Satisfaction

Recognition of a need to improve user satisfaction with software support was given by three vendors, with comments suggesting that users are "apparently" resigned to accepting lower levels of satisfaction with software support.

The vendors considered this to be an unsatisfactory situation, stating that there was no rational reason why users should be resigned to continuing lower satisfaction levels. INPUT user research confirms that satisfaction with software support is lower than that reported by users with respect to hardware service. Further confirmation is provided by INPUT's research indicating a decline in satisfaction with software support between 1987 and 1988.

e. Source Code

One major issue highlighted concerned access to source codes and consequent reliance on third parties to provide assistance. This issue refers mainly to vendors using either "standard" software such as UNIX or those manufacturing IBM compatible hardware to use IBM software. Among the possible solutions to these issues are:

- The vendor should develop an in-house knowledge and skill base. This capability has been developed successfully by some vendors marketing UNIX-based systems.

- Although time and investment are required, closer relationships with the "owner" of the software can be established to ensure that a responsive working relationship is developed.

- Agreements with one of the independent specialist software houses. Some of these specialists have the necessary knowledge and skill levels required to investigate and resolve source code related issues.

B
Service Quality Factors

During the course of interviews, vendors were asked to identify the most important factors, that in their opinion:

- Enhance a vendor's service quality image

- Detract most from the vendor's service quality image

1. Enhancing the Quality Image

Factors that, in the opinion of vendors interviewed, enhance the vendor's service quality image are listed in Exhibit IV-4. Ten factors are listed that can be summarised under four headings:

- Professionalism
- Caring attitude
- Competence
- Listening

The importance of each of these factors is variable dependent on individual and specific circumstances. Therefore, it would be safe to assume overall equal importance for each. Further, it is INPUT's opinion that the four factors are of relatively similar importance and closely related.

There is, however, one additional factor that, in INPUT's opinion, is of primary importance. The value of *commitment* rates higher than any of the four factors previously mentioned. Quality cannot be achieved easily without a total commitment to ensuring that required standards are met. None of the vendors interviewed related the image of service quality to commitment in achieving quality goals and requirements. Commitment is one level above involvement, and is an essential component of achieving quality as a primary goal. Insufficient emphasis or value is placed on commitment by both organisations and individuals within organisations to achieve quality.

Among a number of definitions for commitment in *The New English Dictionary* (published by Collins), "to perform" is the most appropriate in describing commitment to service quality.

EXHIBIT IV-4

FACTORS THAT ENHANCE SERVICE QUALITY IMAGE

Factor	No. of Mentions
• Ability to respond and fix problems fast	2
• Ability to fix problem first time	2
• Professionalism in all aspects	2
• Achieving an acceptable level of systems availability	2
• "Caring" attitude of service personnel	1
• Competence and skill level of service personnel	1
• Listening to the customer	1
• Availability of spare parts when needed	1
• Accurately establishing user requirements— then delivering	1
• Good product reliability	1

No. of vendors interviewed: 14

The previous four factors, summarised from vendor comments, relate more to the involvement in quality. All four are important ingredients of the involvement in delivery of service quality, but the vendor must be committed to delivering a level of service that comprises those four ingredients. Commitment to quality originates from the highest level in an organisation and is perpetrated downwards. Success is unlikely under any other circumstances. At lower levels individuals or groups may be committed to quality, but unless the whole organisation has the same level of commitment, their efforts may well pass unnoticed or at worst be dissipated quickly.

Two additional factors identified by the vendors interviewed involve the importance of being:

- Responsive
- Flexible

When faced with a user situation requiring a specific action, it is important to be responsive, but also important to be seen to be responsive. This involves ensuring that the user understands that you accept ownership of his request and is informed accurately and precisely regarding the course of action being taken and the time scales involved. If a user has a particularly difficult problem, solution of that problem may take some time. Ensure that, if the problem requires three months of work to find a solution, the user is made aware of that factor and appraised of the reasons. Failure to communicate accurately and clearly will likely result in the user not fully appreciating the situation and expecting a solution within hours or days.

Flexibility rates very highly as a quality factor. That is the flexibility to provide not only what the customer needs, but also the willingness to listen to the customer and understand accurately what the real needs are. If for example a user's application places very high demands on system usage for only brief but highly critical periods, then flexibility and a customized service agreement is recommended (i.e. a contract providing brief periods of intensive service cover and support as an element of an overall more "relaxed" level of support at other times). A standard service contract will likely not support the user at the time most needed, whereas a total support contract would provide a high level of support that the user does not require at all times, and be much less cost effective.

If two factors were to be singled out as primary service quality attributes, these would be:

- Commitment throughout the organisation to providing quality of service

- Flexibility of approach in providing levels of service that match user needs

2. Degrading the Quality Image

Vendors interviewed were also asked to define, in their opinion, the most important single factor that detracts from a vendor's image as a provider of quality service. Comments by vendors are listed in Exhibit IV-5.

In defining factors that degrade the quality image, vendors showed a high degree of agreement in two important areas:

- More than one visit or attempt to resolve a problem, invariably leads to a loss of confidence in the vendor's ability or competence. User dissatisfaction and frustration also usually result from the vendor's failure.

EXHIBIT IV-5

FACTORS THAT DEGRADE SERVICE QUALITY IMAGE

Factor	No. of Mentions
• Poor communications	4
• Multiple attempts to fix problems	3
• Shortfall against user expectations	2
• Failure to establish user requirements	2
• Poor levels of system availability	1
• Not listening to the customer and taking them for granted	1
• Poorly designed products	1

No. of vendors interviewed: 14

- Poor communication can create extreme nervousness among users, and also can encompass a number of different aspects of service.

  - Failure to ensure that the user knows the intended course of action being taken to deal with a request or problem, and who is responsible for implementation.

  - Failure to establish an understanding with users regarding the level of system and service performance that is realistic. There are many instances of products being "over sold" in terms of probability of failure and the need for preventive maintenance, as well as understating the "housekeeping" and other disciplines required of the user.

As the application of computer systems expands, the likelihood of lower levels of sophistication among users also increases. These less sophisticated users may be unaware of the need for service, believing that a computer system is the final solution to their problems. The vendor retains a responsibility to establish a working relationship with users by ensuring that they are fully aware of the servicing needs of the equipment and establishing an expectation level with the user that can be achieved through the delivery of service.

At the same time the vendor has a responsibility to establish the needs of the user and to ensure that these are realistic and can be met. One vendor underlined the level of user dissatisfaction that can be caused by broken promises. Promises made in respect of service performance are seen by users as a commitment. Therefore, it is imperative that promises can be delivered. Delivery of user expectations in all respects is important.

Most service vendors are capable of responding to urgent needs, and making exceptional efforts when required. However, users also expect the same level of commitment on the part of the vendor when problems are of a less critical nature, not necessarily treated with the same degree of urgency but nonetheless handled competently and professionally. A user will normally have a larger number of less critical or noncritical items requiring the vendor's attention. Often, the noncritical items either take a disproportionate length of time to resolve or they may even be forgotten all together. It is relatively easy for a vendor to forget noncritical items; however, the user rarely does. These negative situations accumulate over time and subsequently can do serious damage to the vendor's quality image.

A number of vendors commented that when assessing a vendor's service quality image the users perception is base on:

• A recent event that caused operational problems

• Only remembering problems while forgetting the intervening periods

INPUT considers that there is justification for these comments, however the vendor can do much to neutralise this type of criticism by good communication. Perhaps, regular performance review meetings would prematurely defuse these situations before they become overpowering. A further comment by one vendor was that users will never admit problems caused by their own staff. This is a difficult situation to handle. Again, close contact can be of great value in monitoring site operations.

How many instances exist where communication only occurs between vendor and user when a problem arises? Regular monitoring of site operations and communication is considered by INPUT to be a key issue related to a vendor's quality image. Meeting with the user when operations are running smoothly can be very beneficial to the vendor's image. Also, a nonemotional discussion will give the user an opportunity to raise noncritical issues at a time of accord.

C

Formal Approach to Quality

During the course of interviews, vendors were questioned on the subject of formal quality standards relating to service.

1. Formal Quality Standards (ISO 9000)

Introduction of formal quality standards, procedures, and processes is one approach that can be adopted by vendors as a means of establishing a framework that will:

- Establish an internal structure and procedures necessary for implementing effective methods for monitoring and measuring quality performance of the service organisation

- Provide a platform that enables the vendor to demonstrate service quality achievements to users in quantifiable terms

- Provide additional benefits to the service organisation in terms of:

  - A marketing tool

  - Real improvements in quality standards and performance

  - Enhancing the vendors image with users

- Ensure that standards are maintained through the medium of unannounced visits by the standards monitoring authority

Companies involved in the manufacture of products have long established procedures and processes that relate to product quality, but until recently, similar controls of service quality were either left to the individual efforts of companies or tended to be informal. To achieve objectives of establishing similar formal quality standards in service organisations, ISO 9000 was evolved from the basis of existing manufacturing standards as an overall procedural document relating to service quality requirements and standards. This document has been harmonised throughout most European countries to provide a common standard by which quality of service can be measured and controlled.

To obtain approval to the standard, a service organisation needs to be certified by the standards authority and submit to periodic unannounced audits and regular recertification.

Exhibit IV-6 illustrates the success achieved so far in Europe in acceptance of the need for formal standards. Of the 14 vendors interviewed 12 were aware of ISO 9000 and 4 had achieved certification status. An additional six vendors declared an intention to achieve certification within the next 12 months. However, this data relates to the sample of vendors interviewed and some qualifying remarks are appropriate.

EXHIBIT IV-6

PENETRATION OF FORMAL SERVICE QUALITY STANDARDS

Vendor Awareness Level — 12

Certification Complete — 4

Certification Planned in Next Twelve Months — 6

2   4   6   8   10   12   14   18

Number of Respondents

No. of vendors interviewed: 14
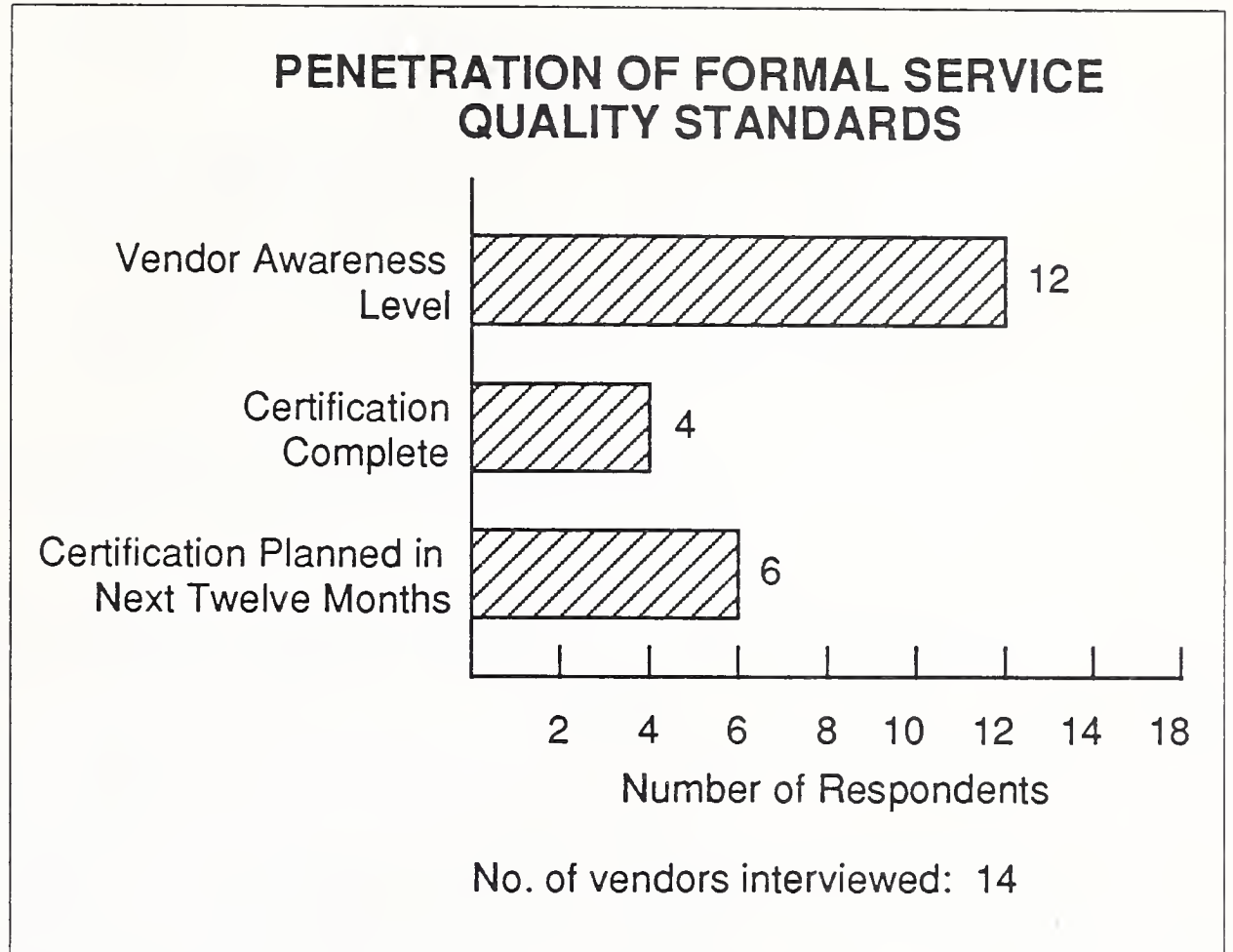
• The vendor sample included only those companies that are involved in the manufacture of computer hardware. Independent maintenance companies were excluded.

• Awareness of service quality standards is higher among companies based within the United Kingdom and those multinational companies having European headquarters within the United Kingdom.

• Awareness of service quality standards outside the United Kingdom is much lower. INPUT estimates that this figure is likely to be less than 25% of service vendors.

Implementation of service quality standards within the United Kingdom has been relatively successful as British Standard (BS) 5750. However, implementation outside the United Kingdom has yet to be achieved.

Vendors with European headquarters located within the United Kingdom appear to be playing a leading role in planning for ISO 9000 implementation within European subsidiaries. However, this level of effort is unlikely to be a recipe for total success. A comment made by one vendor interviewed was that ISO 9000 needs to be promoted by a large body of interested parties if success is to be achieved in continental Europe. Success is likely to be dependent on promotion by groups such as:

- Standards organisations
- User groups
- Government organisations

Success of ISO 9000 (BS 5750) within the United Kingdom has been mainly due to two factors.

- Promotion by:

  - British Standards Institute
  - Association of Field Service Managers

- Acceptance by:

  - Independent maintenance companies first and second by computer vendors

  - Departments of the United Kingdom government and public utilities

INPUT considers that certification is more important to independent maintenance companies who need to establish higher levels of credibility in order to compete with the major computer vendors. This factor has been a major driving force within the United Kingdom.

2. Service Quality in Practice

Vendors were asked to express opinions relating to the benefits that they felt could be gained from achieving certification against formal quality standards.

Exhibit IV-7 illustrates responses from vendors, indicating that of the 14 vendors interviewed close to 75% claimed real rather than fiscal benefits. The real benefits claimed by vendors fall within two categories: providing for improvements within the vendors services organisation and providing a real improvement in quality standards.

Before certification can be achieved, the vendor needs to satisfy the standards authority that organisation, processes, and procedures comply with the requirements of the standard. Vendors claimed that preparing for certification forced the service organisation to look critically at the way it operates. For example, informal or verbal procedures need to be formalised and documented, then tested for validity. Also, controls and monitoring facilities need to be formalised. In brief, the service organisation is structured such that real quality performance can be measured and demonstrated, and unannounced visits by the standards authority ensure that standards are maintained consistently.

EXHIBIT IV-7

IMPACT OF FORMAL SERVICE QUALITY STANDARDS

Benefit to the
Service Organisation — 10

Useful as a
Marketing Tool — 7

Provides a Real
Improvement in
Quality Standards — 10

Enhances Vendor's
Image with Users — 7

1 2 3 4 5 6 7 8 9 10 11

Number of Respondents

No. of vendors interviewed: 14

Multiple and partial responses allowed
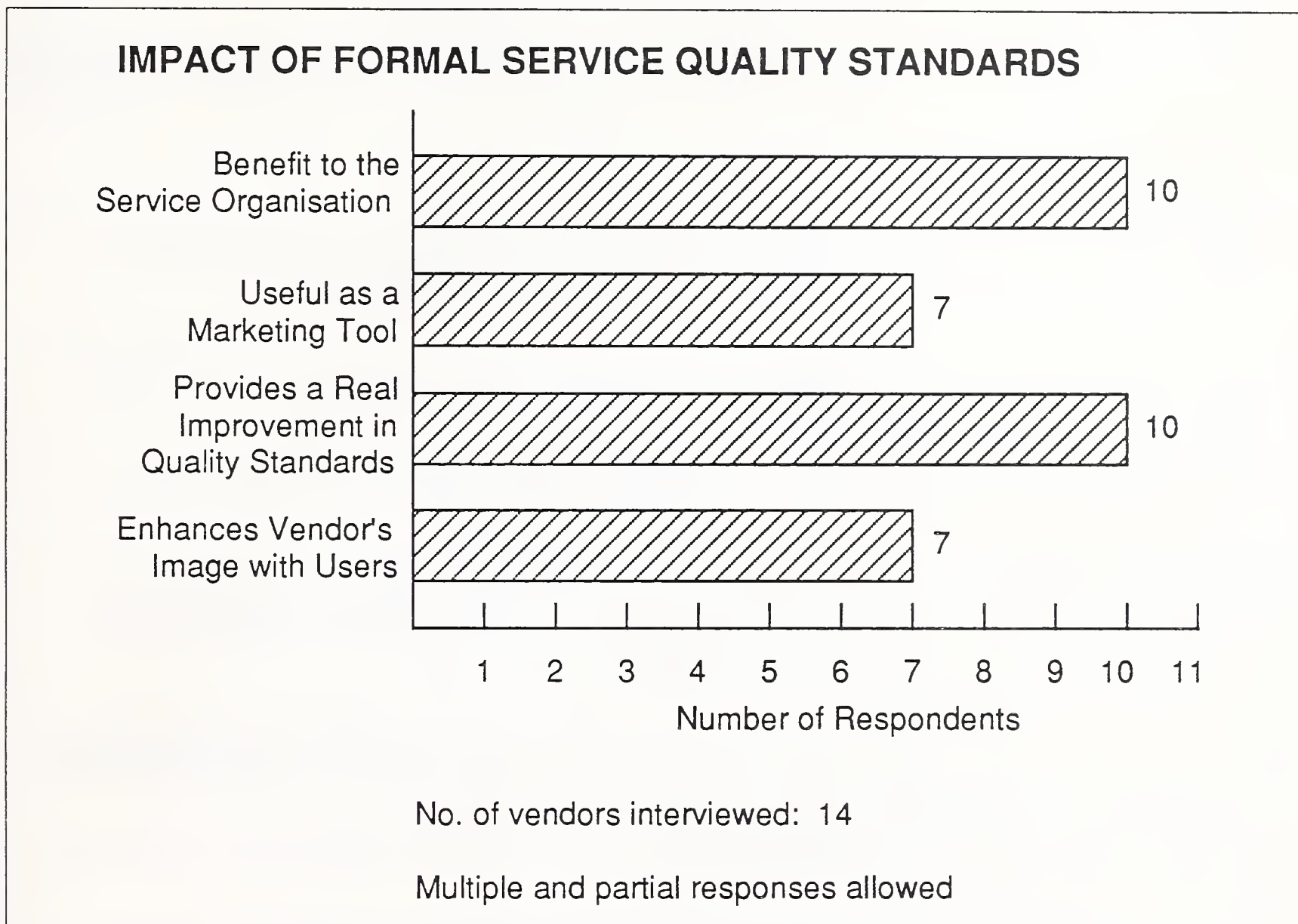
Real improvements in quality standards are a result of the process of obtaining certification. Once formal procedures and certification are achieved the performance of the service organisation can be measured in absolute terms, highlighting problem areas and providing a basis for continuous monitoring. The key is measurement to substantiate performance.

Vendors interviewed considered the possible fiscal benefits resulting from formal service quality standards were less significant. Usefulness as a marketing tool and a means of enhancing the vendor's image was rated at approximately 50% for the vendor sample. Likely reasons for these ratings include the existing image and credibility factors that major computer manufacturers have. There is less of a need to enhance their image by other means. However, the usefulness of fiscal benefits to independent maintenance companies would likely be rated much higher. Independent companies have a greater need than the vendors to enhance an image of credibility to gain competitiveness. One vendor did com-

ment that certification was more important and more appropriate to independent maintenance companies.

Vendor comments relating to formal service quality standards are listed in Exhibit IV-8. Resulting from these comments, INPUT considers that four key issues are identified.

EXHIBIT IV-8

FORMAL SERVICE QUALITY STANDARDS
VENDOR COMMENTS

- Obtaining certification is costly and requires a lot of hard work. But, the benefits outweigh the costs.

- There is no evidence that certification is a requirement or an issue in continental Europe.

- Provides the vendors with the ability to demonstrate and prove the quality of service, thus enhancing the image of professionalism.

- The standard is evolving with time, therefore early qualifiers may need to implement further changes to retain certification.

- Demonstrates a vendor's "caring" approach to provide high quality service.

- The internal benefits of achieving certification are more valuable than the external benefits, by improving the performance of the service organisation.

- Certification was anticipated as becoming a mandatory requirement with specific users in the U.K. As yet, this has not happened suggesting that some of the original urgency has dissipated.

- Not achieving certification will likely cause concern internally within the company.

- Standardisation approach to service quality needs to be promoted and marketed by a significant body of people to achieve success throughout Europe.

- The cost of obtaining certification is high; costs as high as $500,000 have been quoted by one company that is certified. Although benefits may outweigh costs, the high costs may exclude smaller companies from obtaining certification, particularly smaller independent maintenance companies.

- ISO 9000 has yet to make an impact in continental Europe; it is not viewed as a major requirement or an issue. However, with the approach of the 1992 target relating to trade barriers and harmonisation between countries, this situation may change. The question of the impact of 1992 on formal service quality standards remains unanswered.

- Interviews with vendors identified the positive impact of formal service quality standards on the vendor image of professionalism and caring. INPUT considers that these are two key ingredients of improved user satisfaction with service.

- The true situation surrounding formal service quality standards is still evolving. INPUT considers that successful maturity is dependent on:

  - Wide ranging acceptance by vendors

  - Promotion

  - Demonstration of improved user satisfaction levels. There is no evidence at present to suggest any influence on user satisfaction levels.

  - Support and positive acceptance by the user community

In addition to the activities related to formal service quality standards, vendors are generally looking for ways to improve user satisfaction levels and service quality. Exhibit IV-9 illustrates some of the activities of vendors related to service quality. Of the vendors interviewed, all had implemented formal customer relations training and 11 had implemented formal training relating to service quality. More significantly, 12 of the vendors interviewed retained a manager responsible for service quality.

The level of management quality responsibility varies between vendors. Of the vendors interviewed that have a manager responsible for service quality, appointments were made at least at the headquarters level. One vendor had advanced much further by appointing managers not only at the subsidiary level, but also at the branch or geographic level. Another vendor advised that this was an important component of its service and technical support strategies, with intentions to extend implementation at the subsidiary level.

EXHIBIT IV-9

ENHANCING SERVICE QUALITY

Respondents with Formal
Training Programmes For:

Service Quality ⬛ 11

Customer Relations ⬛ 14

Respondents Having
a Manager Responsible
for Service Quality ⬛ 12

2   4   6   8   10   12   14   16

Number of Respondents

No. of vendors interviewed: 14

A

Appendix: User Data

EXHIBIT A-1

LARGE SYSTEMS USER DATA

Vendor	Satisfaction Index ΔSI				Number of Service Aspects Rated at Concern Level ΔSI→1.0		Systems Availability ΔSI	System Failure Rate per Year	Response/Repair Time Deviation from Expectation—Exceeds Expectation ( )			
	Hardware Service		Software Support		Hardware Service	Software Support			Hardware Service		Software Support	
	Weighted Response	Reflex Response	Weighted Response	Reflex Response					Resp	Rep	Resp	Fix
AMDAHL	0.7	1.1	0.6	1.5	2	5	1.2	2.7	1.21	1.04	1.23	1.23
CONCURRENT	0.2	0.5	0.5	0.4	1	1	0.6	6.3	(0.70)	(0.95)	(0.91)	2.74
DIGITAL	0.3	0.9	0.4	0.6	1	1	0.7	6.6	(0.93)	1.23	(0.97)	1.17
HP	-	-	-	-	-	-	-	-	-	-	-	-
HONEYWELL BULL	0.2	1.7	0.4	0.5	2	1	1.2	4.1	1.00	1.16	1.11	1.11
IBM	0.3	1.2	0.8	1.4	0	4	1.2	3.1	1.29	1.04	1.54	1.13
ICL	0.1	1.0	0.5	1.0	1	1	0.7	3.6	1.12	1.07	1.19	1.20
ITL	-	-	-	-	-	-	-	-	-	-	-	-
NCR	-	-	-	-	-	-	-	-	-	-	-	-
NIXDORF	-	-	-	-	-	-	-	-	-	-	-	-
OLIVETTI	0.4	0.0	0.7	0.7	0	2	0.4	0.3	1.15	1.26	1.08	1.30
SIEMENS	0.5	1.4	0.4	1.2	1	5	0.9	2.4	(0.96)	(0.79)	1.31	2.43
UNISYS	0.6	1.4	0.8	1.2	2	4	1.2	3.7	1.08	1.35	1.35	1.19
WANG	0.8	1.6	0.5	1.3	7	2	1.0	3.0	1.21	1.54	1.81	1.49

Sample Size: 480

EXHIBIT A-2

MEDIUM SYSTEMS USER DATA

Vendor	Satisfaction Index ΔSI				Number of Service Aspects Rated at Concern Level ΔSI→1.0		Systems Availability ΔSI	System Failure Rate per Year	Response/Repair Time Deviation from Expectation—Exceeds Expectation ( )			
	Hardware Service		Software Support		Hardware Service	Software Support			Hardware Service		Software Support	
	Weighted Response	Reflex Response	Weighted Response	Reflex Response					Resp	Rep	Resp	Fix
AMDAHL	-	-	-	-	-	-	-	-	-	-	-	-
CONCURRENT	(0.2)	0.7	0.5	0.9	1	2	0.8	2.3	(0.89)	(0.95)	1.25	(0.91)
DIGITAL	0.2	0.8	0.3	1.0	2	2	0.8	3.4	1.02	1.12	1.17	2.00
HP	0.0	0.6	0.2	0.8	0	1	0.6	2.3	(0.86)	(0.90)	1.51	(0.76)
HONEYWELL BULL	0.6	1.1	0.6	1.2	3	4	1.2	3.4	1.52	1.69	1.29	1.70
IBM	0.4	0.7	0.6	1.1	0	5	0.8	2.6	1.15	(0.98)	1.27	1.40
ICL	0.5	0.9	0.6	1.3	2	3	1.0	3.5	1.13	1.10	1.35	1.13
ITL	0.6	0.8	0.4	0.7	5	3	0.9	1.5	1.21	1.58	1.33	(0.80)
NCR	0.5	1.2	0.3	0.7	2	2	0.7	3.1	1.24	(0.92)	1.16	(0.08)
NIXDORF	0.9	1.1	1.1	1.8	7	9	0.9	3.3	1.56	(0.81)	1.37	1.14
OLIVETTI	0.2	0.7	0.5	1.0	3	4	1.2	3.8	1.39	2.04	1.87	1.11
SIEMENS	0.3	0.6	0.6	0.5	2	3	0.3	1.6	1.13	0.07	(0.94)	1.60
UNISYS	0.4	1.3	0.5	1.4	3	3	1.1	4.0	1.04	1.28	1.02	1.46
WANG	0.5	1.3	0.0	1.3	5	1	0.0	1.8	1.33	1.73	(0.99)	2.86

Sample Size: 867

EXHIBIT A-3

SMALL SYSTEMS USER DATA

Vendor	Satisfaction Index ΔSI				Number of Service Aspects Rated at Concern Level ΔSI←1.0		Systems Availability ΔSI	System Failure Rate per Year	Response/Repair Time Deviation from Expectation—Exceeds Expectation ( )			
	Hardware Service		Software Support		Hardware Service	Software Support			Hardware Service		Software Support	
	Weighted Response	Reflex Response	Weighted Response	Reflex Response					Resp	Rep	Resp	Fix
AMDAHL	-	--	-	-	-	-	-	-	-	-	-	-
CONCURRENT	-	-	-	-	-	-	-	-	-	-	-	-
DIGITAL	0.7	1.0	0.8	1.1	4	4	0.6	2.7	1.04	1.05	(0.94)	1.32
HP	-	-	-	-	-	-	-	-	-	-	-	-
HONEYWELL BULL	0.3	1.1	0.2	1.0	0	1	0.8	4.6	1.19	1.08	1.16	1.35
IBM	1.0	0.7	1.0	0.7	7	7	0.2	1.4	1.45	1.22	1.81	1.79
ICL	1.1	0.6	0.5	1.4	1	2	0.6	3.5	1.08	1.21	1.79	1.38
ITL	-	-	-	-	-	-	-	-	-	-	-	-
NCR	0.8	0.6	0.2	0.7	7	3	0.4	1.4	1.15	1.05	1.19	(0.89)
NIXDORF	-	-	-	-	-	-	-	-	-	-	-	-
OLIVETTI	-	-	-	-	-	-	-	-	-	-	-	-
SIEMENS	0.5	1.1	0.2	0.9	2	3	1.6	3.1	1.28	(0.82)	(0.96)	(0.81)
UNISYS	0.6	1.2	0.5	1.3	3	1	1.0	3.7	1.19	1.12	1.48	1.19
WANG	0.2	1.2	0.3	1.2	1	0	1.4	3.3	1.36	1.48	1.67	(0.71)

Sample Size: 364

B

Appendix:
Vendor Questionnaire

B
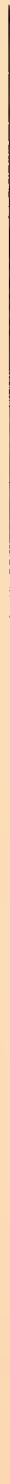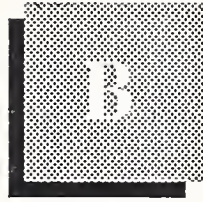
Appendix: Vendor Questionnaire

1. What do you think are the major issues related to service quality, say the top three related to hardware maintenance and the top three related to software support (operating system) ?

a) Hardware Maintenance

1. _____

   _____

   _____

2. _____

   _____

   _____

3. _____

   _____

   _____

b) Software Support

1. _____

   _____

   _____

2. _____

   _____

   _____

3. _____

   _____

   _____

2 . INPUT assesses user satisfaction with service based on importance and satisfaction ratings for 12 aspects of hardware service and 13 aspects of software support.

Could you indicate the importance you, as a vendor, would place on the following aspects of service, on a scale of 0 - 10 ?

a) Hardware Service   Importance Rating

    Spares availability   _____
    Engineer skills   _____
    Problem escalation   _____
    Call handling   _____
    Back-up support   _____
    Training on hardware   _____
    Telephone support   _____
    Service administration   _____
    Documentation   _____
    Consultancy/Planning   _____
    Remote diagnostics   _____
    Out of hours service   _____

b) Software Support   Importance Rating

    Engineer skills   _____
    Telephone fix speed   _____
    Telephone access   _____
    Documentation   _____

c) Provision of Software updates   Importance Rating

    Software installation   _____
    Software training   _____
    Hotline   _____
    Capacity timing   _____
    On-site support   _____
    Consultancy/planning   _____
    Remote diagnostics   _____
    Software problems database   _____

3. Does your user base have contracted:

a) Response times

    Do you achieve these   Yes   No
        Hardware   ☐   ☐
        Software   ☐   ☐

b) Repair times

    Do you achieve these   Yes   No
        Hardware   ☐   ☐
        Software   ☐   ☐

4. a) Are you aware of ISO 9000/BS 5750 certification for service organisations ?

                         Yes   No
                         ☐   ☐

b) Does your organisation have certification to this standard, or do you plan to ?

                         Yes   No
        Certified   ☐   ☐
        Intention   ☐   ☐
        Time Scale   _____

c) Do you consider that successfully obtaining certification benefits the service organisation ?

	Yes	No
	☐	☐

d) In what manner:

	Yes	No
As a marketing tool ?	☐	☐
A real improvement in the quality of service ?	☐	☐
By enhancing the vendor's image with users ?	☐	☐

Any other benefits ?

_____

_____

_____

Any other comments ?

_____

_____

_____

5. Referring back to the list of service aspects discussed in Question 2, 1NPUT analyses this data to produce an overall satisfaction index which is an assessment of the vendor's service performance. This index provides a weighted assessment.

However, when we ask users a single question "How do you rate your vendor's current service performance?" we get answers that are often very different to those produced by the weighted mean derived from the list of service aspects.

Have you an opinion as to the reason for this difference ?

a) Other factors related to service performance influencing the user's answer ?

	Yes	No
	☐	☐

b) An emotional response based on pure user perception and relationship with the vendor?

               Yes   No
               ☐   ☐

c) Other reasons ?

_____

_____

_____

_____

6. We have discussed a listing of service aspects. However, there are some additional items that INPUT uses to assess user perception of service performance.

I would like you to rate the importance of the following items on a scale of 0 - 10 .

		Rating
a) Systems availability		_____
b) Response time	Hardware	_____
	Software	_____
c) Repair/Fix time	Hardware	_____
	Software	_____

7. From your own company's data, on average how many times per year do your users experience a total failure of their computer system where the period of system failure extends beyond one hour ?

And what failure rate do you consider is acceptable for users ?

	Actual Failure Rate	Acceptable Failure Rate
Large systems	_____ pa	_____ pa
Medium systems	_____ pa	_____ pa
Small systems	_____ pa	_____ pa

8. In your opinion, what is the most important single factor that contributes to a vendor's image as a provider of "quality" service?

_____

_____

_____

_____

_____

And in your opinion, what is the most important single factor that detracts from a vendor's image as a provider of "quality" service ?

_____

_____

_____

9. Do you consider that the price users are prepared to pay for service restricts the quality of service that can be provided ?

Yes   No
☐   ☐

If the answer is YES, what percentage increase in price would be needed in order to provide the quality of service users require or demand ?

Hardware	_____	%
Software	_____	%

10. Do you have a formal training programme related to:

	Yes	No
a) Service quality	☐	☐
b) Customer relations	☐	☐

11. Do you have a manager dedicated to, or responsible for service quality?

	Yes	No
	☐	☐

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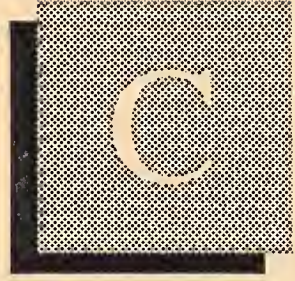
Appendix:
User Questionnaire
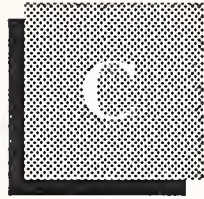
Appendix: User Questionnaire

1. What is the make and model number of the main computer on your site, and how many do you have?

   Make   _____

   Model   _____

   Units   _____

2. Do you have a second system? What is the make and model number of that and how many do you have?

   Make   _____

   Model   _____

   Units   _____

   All the following questions that I am going to ask are related to the main system (**Read out make and model number of Q1 above).**

3. So that we can ensure that we get a proper cross-section of industry and commerce, can you tell me what is the main business sector of your company?

   Manufacturing   1

   Finance   2

   Distribution   3

   Public Sector   4

   Government   5

   Services   6

   Other (Write In) _____

Business Sector

4.   What is the principal use to which you put the computer?

Administration	1
Product Design	2
Software Development	3
Real Time	4
Industrial Automation	5
Other	6

Business Use

5.   How many of each of the following units do you have attached to your main system?

Local VDUs/PCs/Workstations	_____
Remote VDUs/PCs/Workstations	_____
Printers	_____
Disc Drives	_____

System Size

We classify system size according to the total installed (sales) value of the CPU and all the attached local and remote peripherals, into:

U.S. Dollars:
Large: $500K or more, **Medium:** $75K to $499K, **Small:** less than $75K

6.   In which range is your system?

Large	1
Medium	2
Small	3

7.   Who services the CPU? (**Read Out**)

Manufacturer	1
Dealer	1
Third-Party Maintenance	1
Own Company	1
Other (Write In)	_____

8. Who services the peripherals? (**Read Out**)

Manufacturer	1
Dealer	1
Third-Party Maintenance	1
Own Company	1
Other (Write In) _____	

9. What type of maintenance contract do you have?

Full Contract	1
Warranty	1
Time and Material	1
Other	1

10. If you have had a warranty on your CPU in the last two years, how long was it in months?

_____ Months

If respondent answered "yes" to third-party maintenance Q7 and Q8 then ask the following questions, otherwise go on to Q13.

Third-Party Maintenance

The following questions apply to your CPU model _____ and your peripherals.

11. Why do you use TPM?

	CPU	Peripheral	CPU and Peripheral
Lower Cost	1	2	3
Local Service	1	2	3
One Source	1	2	3
TPM Does a Better Job Than Manufacturer	1	2	3
TPM Offers More Flexible Contract	1	2	3
Other (Write In)	_____		

If the respondent quotes cost as a reason under Q11 ask Q12.

12. What percentage saving did you make from your original contract by going to a TPM? _____%

Go to Q14.

13. Is there any reason why you do not use a TPM?

	CPU	Peripheral
Satisfied With the Maker	1	1
Manufacturer Has an Advantage	1	1
TPM Can't Support Operating Software	1	1
Tied to Maker With Contract	1	1
Fear of Vendor Response	1	1
Considered and Rejected TPM	1	1
TPM Financial Weakness	1	1
Unaware of TPMs	1	1
Other (Write In)	1	1

14. Would you prefer all hardware and software maintenance and support to be provided by one vendor at each site?

Yes   1
No   2

15. Would you prefer that vendor to be ...

The Manufacturer of your Main Hardware   1
Value-Added Reseller   2
TPM   3
One of Your Hardware Suppliers   4

Hardware Service

As manager of the computer hardware at your company, I would like to ask you some questions concerning the service you get from your maintenance vendor and the degree of satisfaction you have with the service.

All the questions with ratings are scaled from 0 to 10, where 0 represents zero importance or satisfaction, 5 is average and 10 represents top importance or fully satisfied.

16. What is your rating of the importance of hardware maintenance to your business? And what is your satisfaction with it?

Importance Rating   _____
Satisfaction Rating   _____

17. If we define **systems availability** as the percent of your normal working hours that the system is operational (disregard noncritical peripheral breaks), what percentage has that been for your system over the last twelve months? And how many hours per day do you need the system?

Percentage   _____
Hours per Day   _____

18. How many times each year does your system fail completely for periods over one hour?

Per Year   _____

19. What are the percentages of the breaks which are hardware originated and software originated?

Hardware   _____%
Software   _____%

20. What is your rating for the importance of **systems availability**? And your satisfaction with it?

Importance Rating   _____
Satisfaction Rating   _____

21. Defining **hardware response time** as the time it takes between reporting a fault and the arrival of the service engineer on-site (in working hours, that is to say that 8 hours = 1 day), what response time do you find acceptable and what did you actually experience as an average over the preceding 12 months?

Acceptable   _____
Experienced   _____

22. How important is the "acceptable" response time to you on the 0 to 10 rating?

Response Rating   _____

23. If **repair time** is defined as the time taken to get the system fully operable from engineer arrival on-site, then what time (in working hours) do you find acceptable, and what did you experience in the preceding 12 months? Note: 8 hours = 1 working day.

Acceptable   _____
Experienced   _____

24. How important is **repair time** to you on a 0 to 10 rating?

Repair Importance Rating   _____

25. I would now like to go through a short list of hardware service aspects for your main system (reconfirm main system) and ask you to give and importance and satisfaction rating for each.

	Importance	Satisfaction
Spares Availability	_____	_____
Engineer Skill	_____	_____
Problem Escalation	_____	_____
Call Handling	_____	_____
Backup Support	_____	_____
Training on Hardware	_____	_____
Telephone Support	_____	_____
Service Administration	_____	_____
Documentation	_____	_____
Consultancy/Planning	_____	_____
Remote Diagnostics	_____	_____
Out-of-Hours Service	_____	_____

Hardware Service Pricing

26. What percentage increase or decrease did you pay for your hardware maintenance in 1987?

Increase   _____%
Decrease   _____%
No Change   _____%

27. What do you expect the price changes for hardware maintenance will be in the future in percentage terms per annum?

Increase   _____%
Decrease   _____%
No Change   _____%

28. Expressing the maintenance charges as a percentage of the overall system hardware cost, what approximate percent do you feel you ought to be paying, and what do you actually pay?

Expect   _____%
Actual   _____%

29. How important do you rate **hardware maintenance pricing**, and how satisfied are you with the current levels?

    Importance Rating   _____
    Satisfaction Rating   _____

30. Would you prefer **hardware maintenance** offerings to be "bundled" or would you prefer individual prices?

Individual Prices	1
Bundled	2
Don't Know	3

31. Which of the following statements reflect your views on **hardware maintenance**?

Good Value	1
Expensive but Worth It	1
Expensive but Not Worth It	1
Too Expensive	1
Don't Know	1
Other	1

Systems Software
Operating Systems Support

I would like to ask you some questions concerning the services you get form your software support vendor and the degree of satisfaction you have with the service.

Please note that these questions **do not** relate to application software.

All the questions with ratings are scaled from 0 to 10, where 0 represents zero importance or satisfaction, 5 is average, and 10 represent top importance or fully satisfied.

32. Who supports the systems software on your main system?

Hardware Manufacturer	1
Software House	1
Software Product Vendor	1
In-House	1
Value-Added Reseller	1
None of the Above	1

33. What is your rating for the importance of operating system software service to your business, and what is your satisfaction with it?

    Importance Rating   _____
    Satisfaction Rating   _____

34. What percentage of systems software problems are solved by telephone, and how long (on average) does this take in elapsed time?

Solved by Phone   _____%
Elapsed Time   _____%

35. For those problems not possible to solve over the phone, what **response time** would you find acceptable and what time (on average and in working hours) have you experienced over the last 12 months (take **response time** to mean from time of call to the arrival on site of the engineer).

Acceptable   _____
Experienced   _____

36. How important is your "acceptable" response time to you on the 0 to 10 rating?

Importance Rating _____

37. If **fix time** is defined as the time taken to get the system fully operable from engineer arrival on site, then what times (in working hours) do you find acceptable, and what did you experience in the preceding 12 months?

Acceptable   _____
Experienced   _____

38. How important is **fix time** to you in a 1 to 10 rating?

Importance Rating _____

39. I would now like to go through a short list of operating systems software aspects and ask you to give an importance and a satisfaction rating for each.

	Importance	Satisfaction
Engineer Skill	_____	_____
Telephone Fix Speed	_____	_____
Telephone Access	_____	_____
Documentation	_____	_____
Software Updates	_____	_____
Software Installation	_____	_____
Software Training	_____	_____
Hotline	_____	_____
Capacity Tuning	_____	_____
On-Site Support	_____	_____
Consultancy/Planning	_____	_____
Remote Diagnostics	_____	_____
Software Problem Database	_____	_____

Operating Software Support Pricing

40. What percentage increase or decrease did you pay for your software support in 1987 year?

    Increase   _____%
    Decrease   _____%
    No Change   _____%

41. What do you expect the price changes for software support will be in the future in percentage terms per annum?

    Increase   _____%
    Decrease   _____%
    No Change   _____%

42. Expressing the software support charges as a percentage of the overall system software cost, what approximate percentage do you feel you should be paying, and what do you actually pay?

    Expect   _____%
    Actual   _____%

43. How important do you rate **operating software support pricing**, and how satisfied are you with the current levels?

    Importance Rating   _____
    Satisfaction Rating _____

44. Would you prefer **software support** offerings to be "bundled" or would you prefer individual prices?

    Individual Prices   1
    Bundled   2
    Don't Know   3

45. Which if any of the following statements reflect your views on **software support pricing**?

    Good Value   1
    Expensive But Worth It   1
    Expensive But Not Worth It   1
    Too Expensive   1
    No Opinion   1
    Other (Write In)   1

    _____

Other Services (Both Hardware and Software)

I am particularly interested in your views on other services or modified current service offerings that your service suppliers could provide that would help to improve the running of your systems.

46. Please say which of the following services you have, and which you would like if the price were right, giving a **level of interest (LOI)** rating against each, in the range 0 to 10, where 0 = no interest, 5 = average interest and 10 = must have:

	Have	Have Not	LOI
Configuration Planning	1	2	_____
Capacity Planning	1	2	_____
Environmental Planning	1	2	_____
Cabling	1	2	_____
Software Evaluation	1	2	_____
Training	1	2	_____
Consultancy	1	2	_____
Network Planning	1	2	_____
Network Management	1	2	_____
Disaster Recovery	1	2	_____
Media Services (Supplies)	1	2	_____
Facilities Management	1	2	_____
Problems Management	1	2	_____

Training

I am now going to ask you questions about your computer training.

47. Could you please first tell me if you have had training on any of the following items, and indicate where this training took place.

If Respondent Has Had Training Ask if It Was

1 No Training
2 In-House
3 Vendor
4 Independent Service Company
5 Specialist Training Company
6 Other

If respondent has had no training on any of the following, insert only the importance rating.

48. How important is this aspect of training to you on a scale of 0 to 10?

_____

49. How satisfied were you with this training again on a scale of 0 to 10?

	Q47	Q48	Q49
Pre-installation Hardware	_____	_____	_____
Pre-installation Software	_____	_____	_____
Post-installation Software	_____	_____	_____
Post-installation Hardware	_____	_____	_____
Operator	_____	_____	_____
Operations Management	_____	_____	_____
Debugging	_____	_____	_____
Hardware Fixes Self Help	_____	_____	_____
Systems Analysis	_____	_____	_____
New Applications	_____	_____	_____
System Efficiency	_____	_____	_____

Documentation

50a. How important do you believe **hardware technical** documentation is to the successful use of your equipment? And how satisfied are you with the documentation that you have read or have assessed?

Hardware Technical   Importance _____ Satisfaction _____

For **hardware technical** please indicate which of the following apply:

Hardware Technical

Poorly Written	1
Wrong Language	1
Index Poor	1
Contents Poor	1
Printing Poor	1
Insufficient	1
Not Enough Diagrams	1
Acceptable	1
Good	1

50b. How important do you believe **hardware operating** documentation is to the successful use of your equipment? And how satisfied are you with the documentation that you have read or have assessed?

Hardware Operating   Importance _____ Satisfaction _____

For **hardware operating** please indicate which of the following apply:

Hardware Operating

Poorly Written	1
Wrong Language	1
Index Poor	1
Contents Poor	1
Printing Poor	1
Insufficient	1
Not Enough Diagrams	1
Acceptable	1
Good	1

50c. How important do you believe **software technical** documentation is to the successful use of your equipment? And how satisfied are you with the documentation that you have read or have assessed?

Software Technical   Importance _____ Satisfaction _____

For **software technical** please indicate which of the following apply:

Software Technical

Poorly Written	1
Wrong Language	1
Index Poor	1
Contents Poor	1
Printing Poor	1
Insufficient	1
Not Enough Diagrams	1
Acceptable	1
Good	1

50d. How important do you believe **software operating** documentation is to the successful use of your equipment? And how satisfied are you with the documentation that you have read or have assessed?

Software Operating   Importance _____ Satisfaction _____

For **software operating** please indicate which of the following apply:

Software Operating

Poorly Written	1
Wrong Language	1
Index Poor	1

Contents Poor	1
Printing Poor	1
Insufficient	1
Not Enough Diagrams	1
Acceptable	1
Good	1

Views of Service Performance in Five Years Time

51a. Overall, how well do you believe that your principal maintenance and support vendor is performing now?

_____

51b. What do you think this will be like in five years time?

	51a	51b
Appalling	_____	_____
Poor	_____	_____
Average	_____	_____
Good	_____	_____
Excellent	_____	_____

Personal Computers

52. What is the total number of personal (micro) computers installed at this location?

_____

53. What are the makes of the two most numerous ones installed and what are the model numbers, how many of each are there?

Make 1 _____   Model _____   Units _____
Make 2 _____   Model _____   Units _____

54. Who services these micros?

	Make 1	Make 2
Maker	_____	_____
Dealer	_____	_____
TPM	_____	_____
Self	_____	_____
No One	_____	_____

Contract

55. What type of contract do you have?

Maintenance Contract	1
Time and Materials	1
Done In-House	1
Warranty	1
Insurance Policy	1
Other (Write In)	1

    _____

56. How many, if any, of your micros are networked independently of your mini or mainframe?

    _____

57. How many of your micros are ported into your mini or mainframe?

    _____

Application Software

Finally just three questions on applications software.

58. Do you use **standard package** software, **customised standard packages**, or **specially written application software?**

Standard	1
Customised Standard	1
Specially Written	1

59. Who supports your application software?

Hardware Manufacturer	1
Software House	1
Software Product Vendor	1
In-House	1
Value-Added Reseller	1
None of the Above	1

60. What importance do you attach to this applications support, and how satisfied are you with the support you have received, on a rating of 0 to 10.

Importance Rating	_____
Satisfaction Rating	_____