THE CHALLENGE OF NETWORK SERVICE IN CUSTOMER SERVICES

INPUT

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INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions.

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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.

INPUT OFFICES

North America

Headquarters
1280 Villa Street
Mountain View, CA 94041-1194
(415) 961-3300
Telex 171407 Fax (415) 961-3966

New York
959 Route 46 East, Suite 201
Parsippany, NJ 07054
(201) 299-6999
Telex 134630 Fax (201) 263-8341

Washington, D.C.
1953 Gallows Road, Suite 560
Vienna, VA 22182
(703) 847-6870 Fax (703) 847-6872

International

Europe
Piccadilly House
33/37 Regent Street
London SW1Y 4NF, England
(071) 493-9335
Fax (071) 629-0179

Paris
52, boulevard de Sébastopol
75003 Paris, France
(33-1) 42 77 42 77 Fax (33-1) 42 77 85 82

Tokyo
Saida Building
4-6, Kanda Sakuma-cho
Chiyoda-ku, Tokyo 101, Japan
(03) 864-0531 Fax (03) 864-4114

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INPUT®

Piccadilly House 33/37 Regent Street, London SW1Y 4NF

071-493-9335

Researched by
INPUT
Piccadilly House
33/37 Regent Street
London SW1Y 4NF
England

Published by
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Abstract

This INPUT report identifies vendor opportunities and user requirements for network service.

The report contains a market forecast for the growth of network service in Western Europe and the U.S. The report also provides INPUT's recommendations for customer service vendors aiming to penetrate the network service market.

Key user and vendor issues related to network service are identified and discussed, together with discussion on the future development of networks and the influence of networks on service development.

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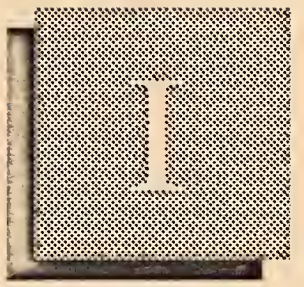
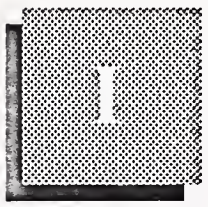


Introduction



Introduction

This report is produced by INPUT as part of the 1990 Customer Service Programme.

A

Objectives

The objectives of this report are to assess user needs for network services and to identify network service opportunities for customer service vendors. The report will:

- Identify user and vendor issues related to network service
- Assess trends in network and network service development
- Provide a market forecast for the network service markets in the U.S. and Western Europe
- Provide an overview of the status of the network market environment

B

Methodology

Research for this report was conducted during February and March 1990 and involved:

- Focussed telephone or face-to-face interviews with 25 network users—including 5 in-depth interviews
- Focussed telephone or face-to-face interviews with 11 equipment vendors. These interviews were conducted at the headquarters and at the country organization level.

Exhibit I-1 provides details of the user interview sample.

EXHIBIT I-1

User Sample

Country	Number of Interviews
France	5
Italy	6
Norway	6
Spain	1
West Germany	3
United Kingdom	4
Total	25

C

Scope

The initial scope of the report was to assess service requirements in the local-area network (LAN) market. However, initial research indicated that this limitation was too restrictive; the scope was therefore extended to cover the wider aspects of network service.

D

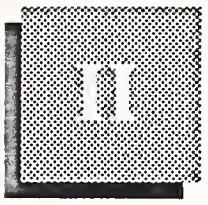
Report Structure

The remaining chapters of this report are organised as follows:

- Chapter II contains an Executive Overview, which provides a concise summary of the entire contents of the report.
- Chapter III contains a market forecast and discusses factors relevant to the network market environment.
- Chapter IV provides identification and discussion of user requirements for network service and analysis of the sources of user network services.
- Chapter V provides identification of vendor opportunities and discusses the key vendor issues related to network service and its future development.
- Chapter VI contains INPUT's recommendation for customer services.

II

Executive Overview



Executive Overview

A Full Support—The Key to Network Customer Services

Data communication networks continue to become increasingly critical to user organisations, but the service and support necessary to maintain uptime and accessibility remains fragmented. Few vendors offer comprehensive approaches to network support, thus leaving users underserved and exposed in a vital area of their information systems infrastructure. INPUT's new research study *The Challenge of Network Service in Customer Services* recommends that vendors develop a full-service offering to exploit the opportunities available in a market that will grow more than 20% per annum to reach over $1.6 billion worldwide by 1995.

As networks become more critical, the support of networks also becomes critical. The support of data communications networks is a complex task because of the technical complexity of network systems, the existence of a multitude of standards, the lack of network operational experience and the needs of network management not being fully understood. Additionally, considerable user confusion exists over network support needs and the likely development of networks.

A high proportion of vendors have made little progress in addressing the key issues and the full scope of network services needs. Many vendors approach the market on a narrow product basis and do not meet requirements for full network support.

Full network system support requirements can extend from outlying terminals or workstations through the data communications network to the central computer control system. Users take a wide view of what constitutes a network and consider the term to include all connected terminals and the computer system, irrespective of whether the arrangement is a true network, a clustered system, or a distributed data processing system. The users' strongest need is for high levels of uptime and accessibility.

INPUT's new study has revealed that a high proportion of networks are not supported by formal service contracts and that users are not sure where responsibility for network services should be placed.

The customer services opportunity available in this service market is estimated to be growing by at least 20% per year. INPUT forecasts that the level of opportunity in the network services market will reach almost $1,000 million in the U.S. and $600 million in Western Europe by 1995.

The full network support opportunities for customer services are summarised in Exhibit II-1. INPUT recommends the development of multivendor support services in a market that is served by many different manufacturers. Vendors should also develop service offerings beyond the traditional boundaries of customer service, which currently lean heavily towards hardware maintenance. The network services market is offering a wide range of professional services opportunities in consultancy and is taking shared management responsibility for network operations and disaster recovery.

EXHIBIT II-1

Full Support—The Key to Network Customer Services

- Multivendor opportunities
- Consultancy/shared management
- Disaster recovery
- Training and skill levels

Training and skill levels are also an important issue for vendors who intend to become more involved in the highly complex area of network support, particularly as networks are supported by a wide range of software products as well as equipment types.

Consequently, INPUT recommends that vendors seeking to address the network services market should gradually extend their service offerings with the strategic aim of providing a complete support service for networks.

B

Network Service Market Opportunities

1. Market Growth, 1990-1995

Exhibit II-2 provides INPUT's forecast for growth of the network services market over the five-year period 1990 to 1995, for both the U.S. and Western Europe.

EXHIBIT II-2

Network Services
Market Growth, 1990-1995

Market	User Expenditure ($ Millions)		CAGR (Percent)
	1990	1995	
U.S.	420	960	18
Western Europe	220	580	22

The pattern of network implementation between the U.S. and Western Europe is likely to follow similar trends, the major differences being the relative sizes of the two markets.

Market growth of network services is forecast at about 20% CAGR; although this rate does not reduce the need for vendors to be cautious in addressing this market it must be recognized that growth figures forecast are significantly higher than those for the overall customer services market where growth is forecast at around 6-7% CAGR and as such represent a potentially good opportunity.

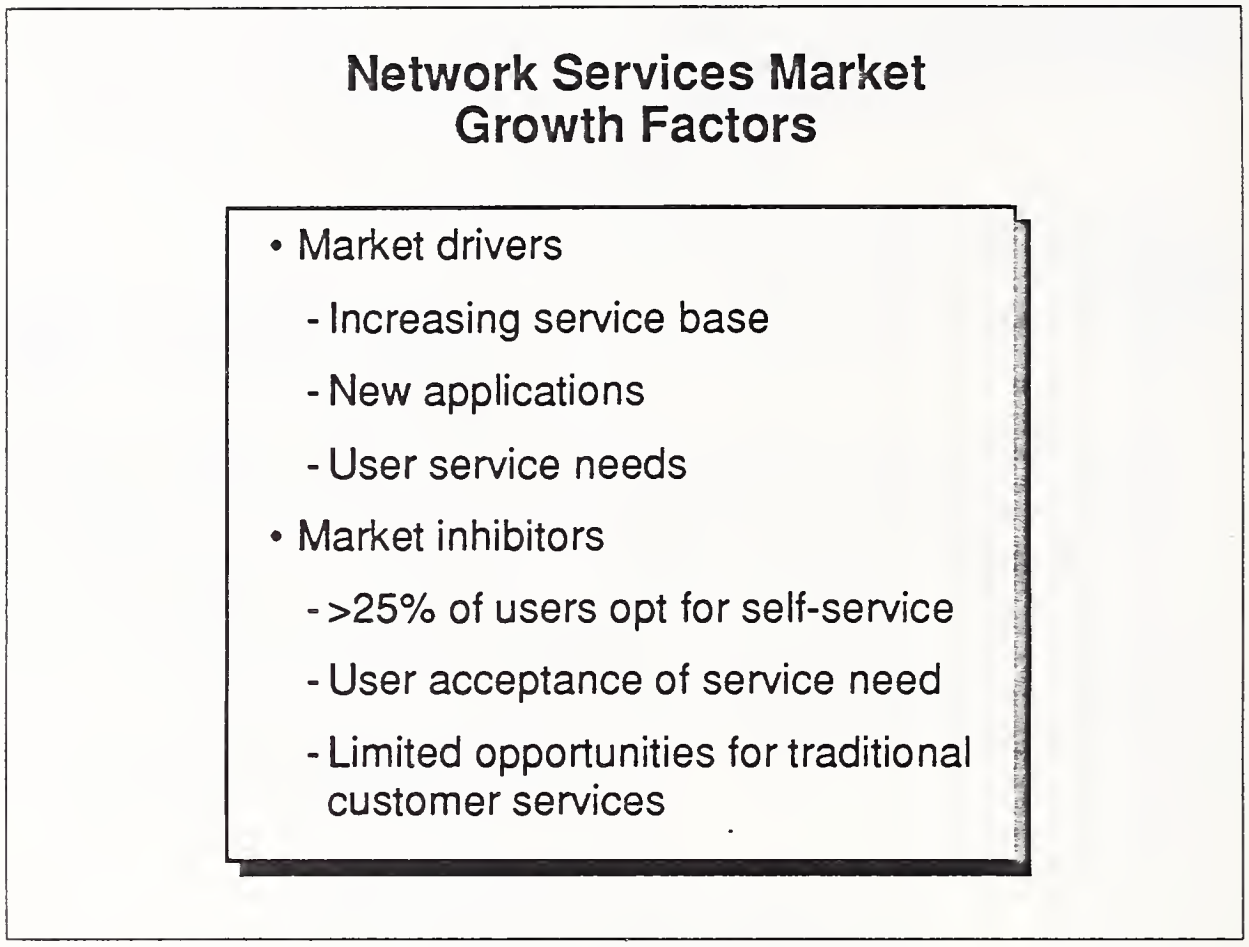
One feature of network services that was mentioned by both vendors and users is the relative reliability of equipment—thus reducing the requirement for maintenance and hence opportunities in this aspect of service.

2. Market Growth Factors

Factors that influence the growth of network services are listed in Exhibit II-3.

One of the major factors driving the growth of network services is the increasing base of network installation. Growth of installed equipment in the U.S. and Western Europe is in the region of 30% CAGR. For example, INPUT estimates that almost 60% of all personal computers in the U.S. will be networked by 1991, a percentage similar to that in Western Europe.

EXHIBIT II-3



Part of the growth in the installed base of networks is driven by new user applications; the result is an influence on the growth of user service needs.

One factor inhibiting the growth of network services is the relatively high percentage of users who opt for self-service, usually experienced users in larger companies. A second factor is the high percentage, about one-third of users, that does not recognise the existence of a formal network services contract.

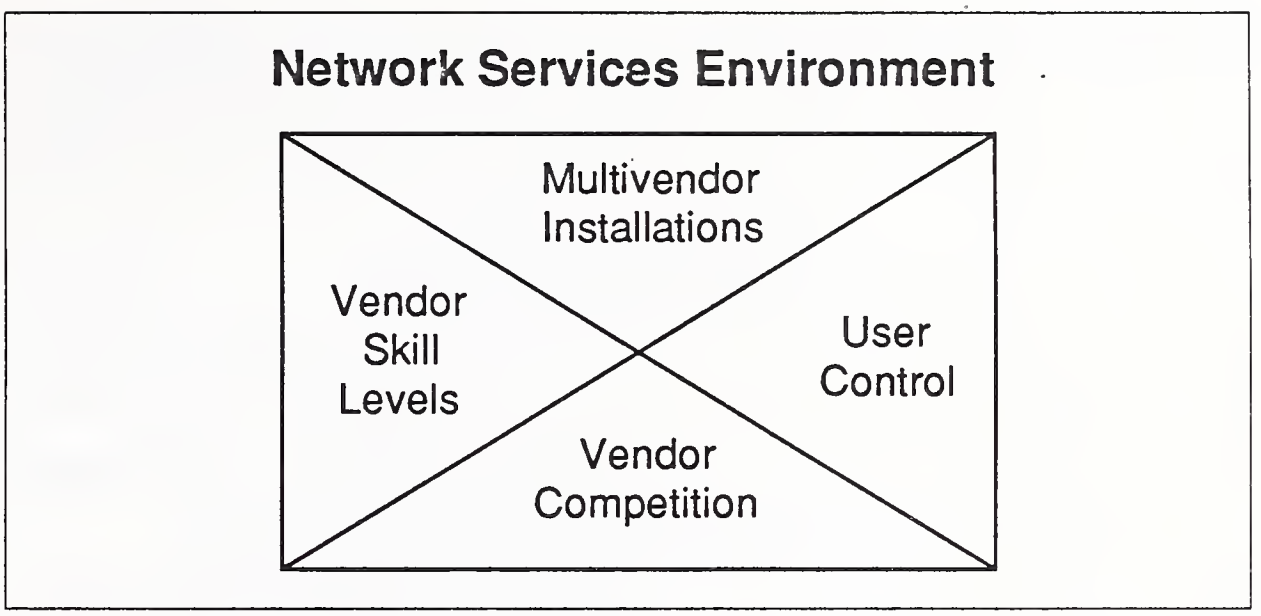
Limited opportunities for traditional customer services relate mainly to equipment maintenance. Once installed, network equipment is seen to require relatively little maintenance compared with computer equipment; the result is a reduction in demand for maintenance relative to other services.

3. Market Environment

The factors that interrelate to form the network services market environment are illustrated in Exhibit II-4.

Network installation tends to be a mix of equipment and software from a variety of sources: for example, equipment from IBM, Hewlett-Packard and Compaq—and system software from Novell, IBM and 3Com. Multivendor installations are potentially demanding of vendor skill levels, particularly in the areas of connectivity and compatibility.

EXHIBIT II-4



If a vendor is to remain competitive in the network environment, skill levels are of primary importance. Software skills are most important; the network environment is more software-orientated than computer systems because of the relative simplicity and reliability of equipment. The less traditional customer services skills—for example, consultancy—are of greater importance in the network environment, particularly when working with less experienced users.

Two of the factors illustrated in Exhibit II-4 interrelate:

- User reluctance to lose control
- Vendor competition

The combined effect of users' opting for self-service (25%) and of the existence of multivendor networks is that there could be intense competition between vendors, or with the user, to decide who services the network.

4. New Skill Profile

Servicing of computer systems and networks requires a different mix of skills. Exhibit II-5 presents INPUT's views on the relative importance rating of skills in these two differing environments.

The predominant difference in the importance of skills is in relation to the network environment.

- Equipment maintenance plays a less-significant role because of the relative high reliability of network equipment.

- More emphasis is placed on the need for software orientation and consultancy skills. The reason for this emphasis is the need to support users who implement networks, particularly less experienced users, and to provide the specific type of support required by networks.

EXHIBIT II-5

Network Services Skill Profile

Service	Importance Rating	
	Computer Systems	Networks
Consultancy	Medium	High
Environmental/ installation services	Medium	High
Project management/ implementation	Low	Medium
Applications support	Low	Medium
Systems software support	High	High
Equipment maintenance	High	Low/ Medium

These new skills can be applied in the areas of network management and applications support.

The network environment tends to be more solution-oriented than computer systems, and more complex. Also there is a likelihood that some users will be less experienced in networks than in computer systems. Importance ratings for the various services could vary, depending on the experience level of the user.

The requirement of network service is for skill profiles to be more biased towards professional services and less towards the "traditional" customer services.

C
Key User Needs

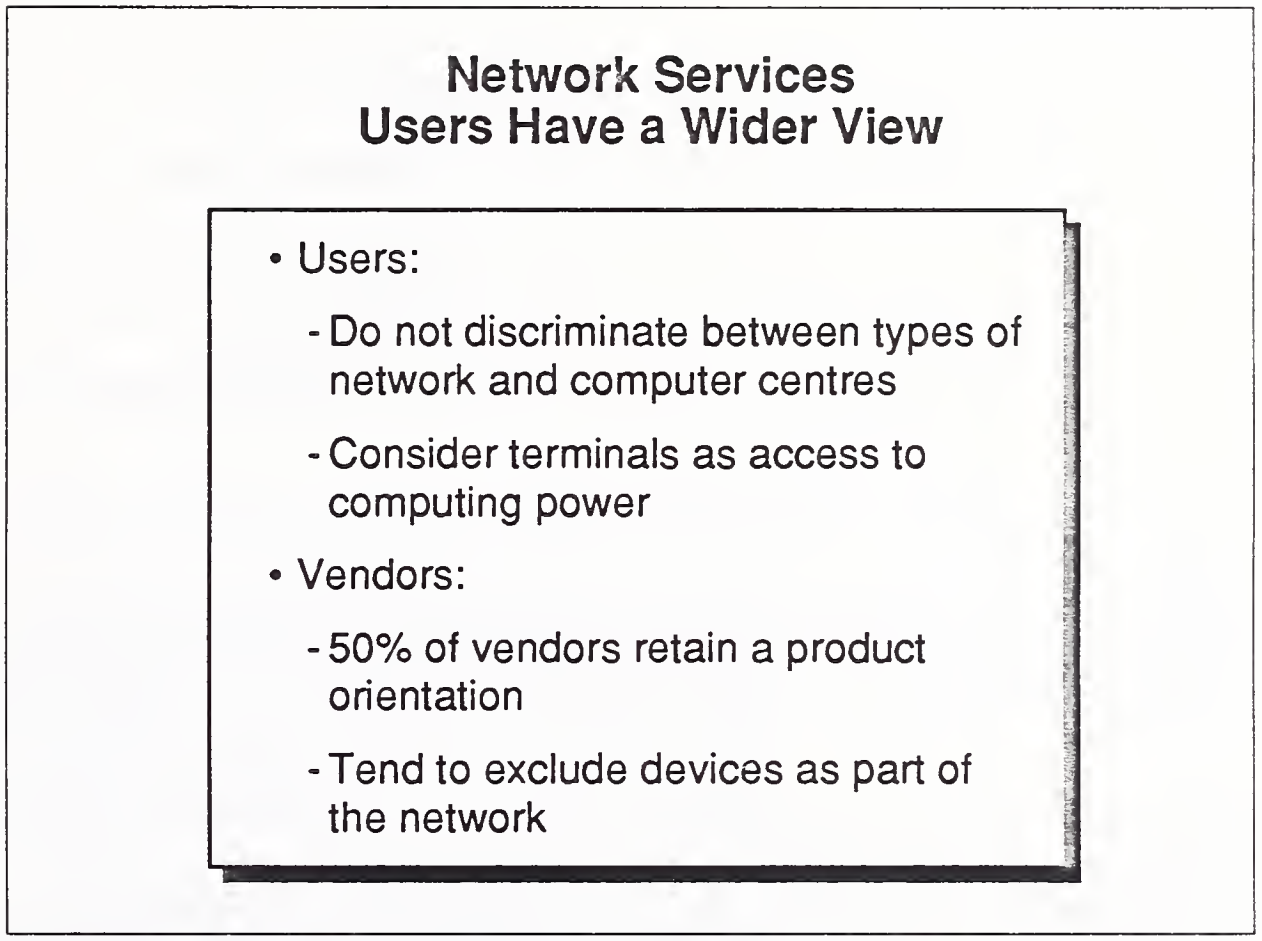
1. Users Have a Wider View

As indicated by Exhibit II-6, users tend to take a wider view of networks than do vendors. This view can be summarised as follows:

- Users tend to consider that a network encompasses all the elements that are connected. For example, interconnection between LANs WANs, file servers and the main computer centre is considered to be a network by users.

- A terminal is considered a means of providing desktop access to a company's computing power—including access to graphics, CAD/CAM, databases and communications.

EXHIBIT II-6

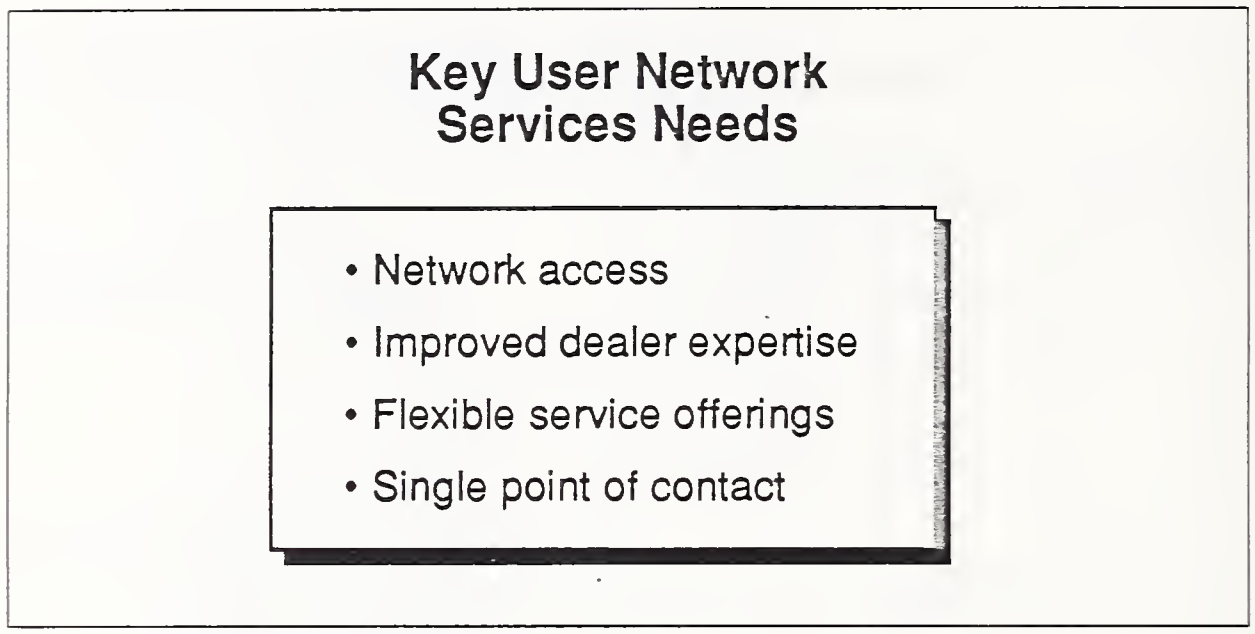


This wider view is shared to varying degrees by vendors, but approximately 50% of vendors take a narrower view than users. For example, the narrowest view encountered during INPUT's survey of service vendors defined a LAN as dedicated cabling and device connections. Vendors who are more attuned to the network environment expressed a view that more closely matched that of the users. Vendors need to reappraise their more product-oriented approach in order to better understand the needs of users.

2. Key User Network Service Needs

Exhibit II-7 lists the key user needs for network services; in generic terms these needs could be consolidated into a need for access to the network on demand. One requirement is to keep the network open for the needs of users and the users' business requirements. Embedded in this basic user need is a requirement for early detection of potential network problems in order to allow proactive responses.

EXHIBIT II-7



Support of smaller or inexperienced users requires special consideration.

- Smaller users tend to be driven towards the equipment vendor's distribution or dealer channels, a process that isolates the small users from the level of support that can be provided by the equipment vendor. Lack of dealer network knowledge and expertise can be an issue; the small user encounters difficulty in accessing the equipment vendor.

- Inexperienced users require above-normal levels of support when installing and operating networks. Inexperienced users also tend to be the smaller users. Equipment vendors need to develop service offerings, through dealer channels if necessary, to ensure that adequate levels of support are provided.

Flexible service offerings are required to satisfy the needs of a wide range of users, from large experienced users to smaller or inexperienced ones. Options are for the vendor to match individual needs or to provide a tiered structure of services.

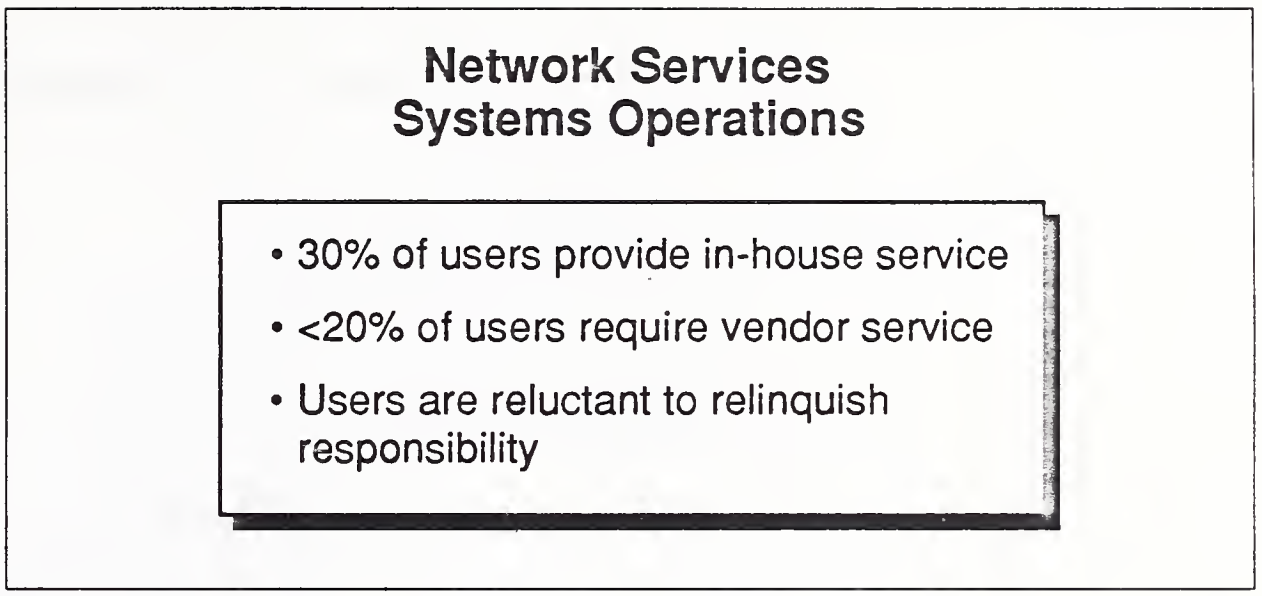
Users highlighted the need for a single point-of-service contact because of the requirement of dealing with a number of suppliers and the possibility of falling between responsibility demarcation lines. Also highlighted was the need for a central help desk facility.

3. Systems Operations

Exhibit II-8 lists the key factors surrounding user systems operations.

More than 30% of the user sample provided in-house systems operations service, with an additional 20% being contracted to vendors. Of the remaining 50%, only a small proportion would like to contract systems operations to the vendor.

EXHIBIT II-8



User attitudes to vendor-provided systems operation are mixed:

- Larger users expressed doubts concerning the vendor's ability to provide a systems operations service that would satisfy business needs and priorities. The wealthier large users are also reluctant to risk losing control.

- Internal politics within the user's organisation may result in resistance to external systems operations contracts. For example, if a subsidiary of a large company is contemplating vendor systems operations, the parent company could well impose central resources to undertake the responsibility.

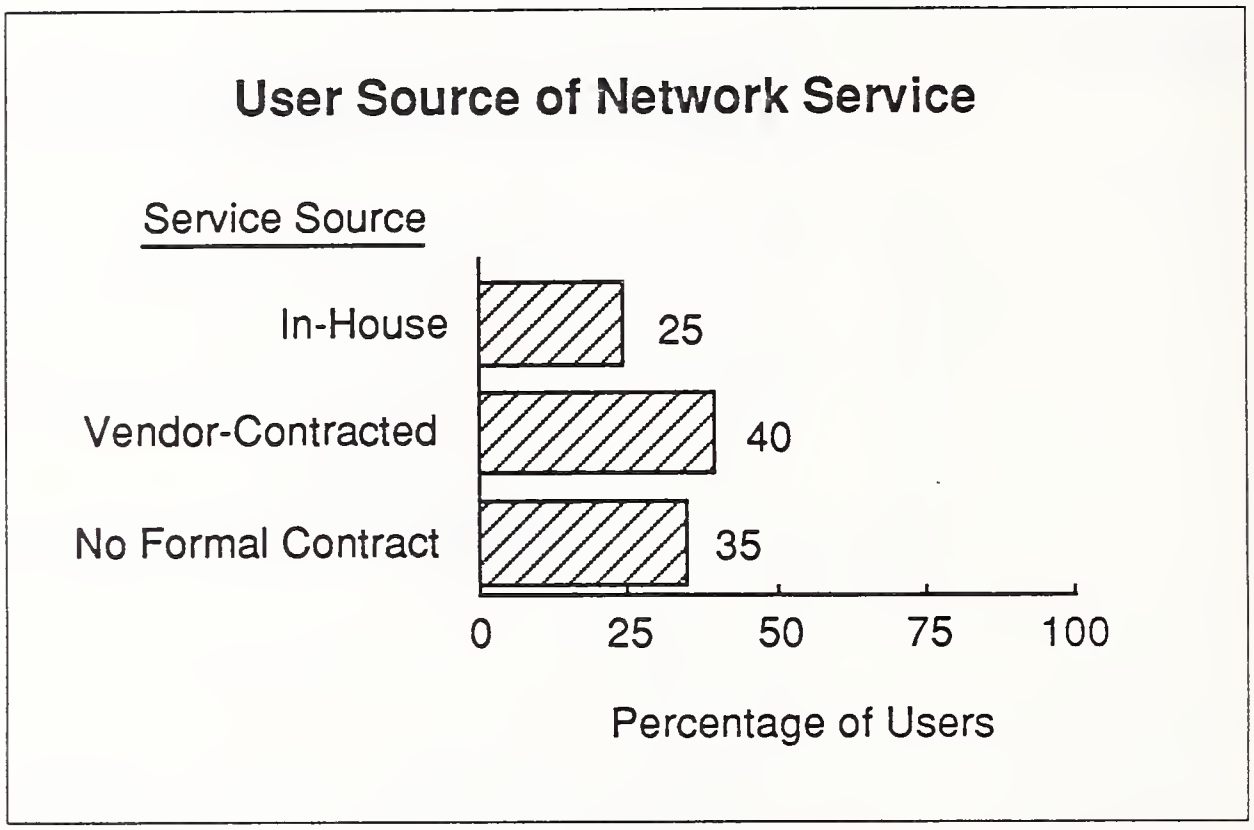
- Users feel that the vendor may not be able to compete long-term with in-house costs, even though initial contract terms may seem attractive.

On the basis of this data INPUT believes that opportunities for full systems operations contracts are limited. Opportunities are more likely to exist for the service vendor to provide a systems operation service where responsibility for network operation is shared with the user.

4. User Source of Network Services

Exhibit II-9 illustrates the source of network services reported by the sample of users. This exhibit indicates that 65% of network services are provided by either in-house resources or vendor-contracted services. These figures have been averaged from a range of services.

EXHIBIT II-9



The remaining 35% of users did not reveal the presence of a formal service contract. In the case of these users, service could be as follows:

- Time and materials as required
- Ad hoc
- Informally provided in-house
- Service is not provided
- Service is not required or considered necessary

Although 35% of the user sample did not reveal the presence of a formal service contract, only 10% of the sample would be willing to contract services to an equipment vendor.

An opportunity exists for service vendors to create awareness of the need for network services in the 35% of users that do not appear to have formal service contracts. Conversion of the 25% of network users who have currently opted for in-house service to vendor service may present more of a challenge to service vendors.

D

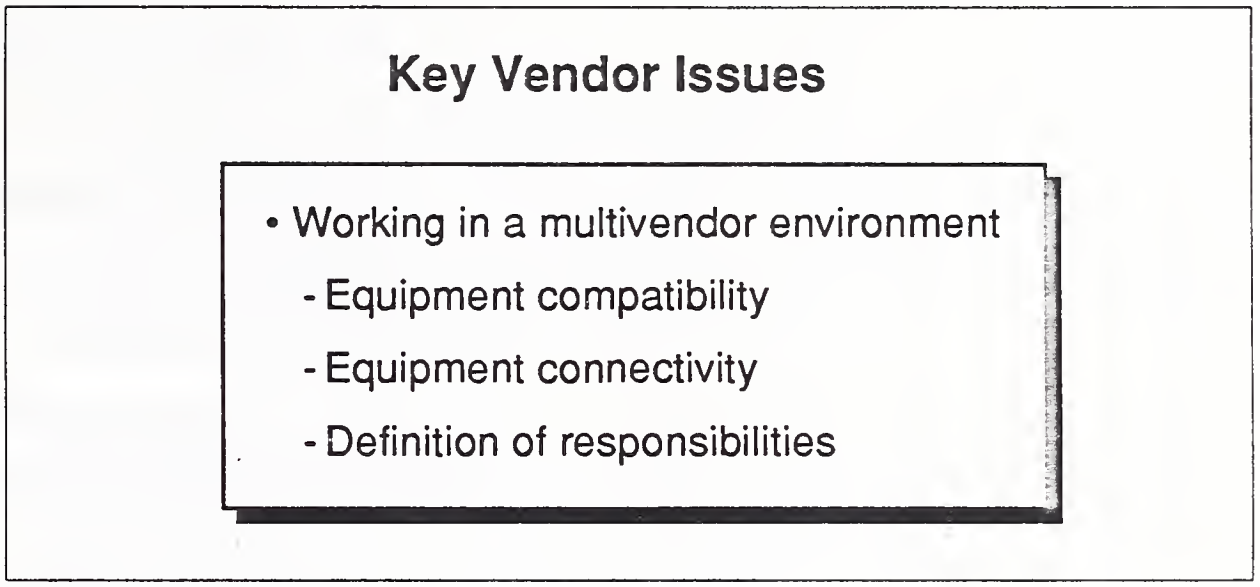
The Vendor Challenge

1. Key Vendor Issues

a. Working in a Multivendor Environment

Vendors highlighted three key issues related to network services. The first of these issues was the need to work in a multivendor environment, the main aspects of which are listed in Exhibit II-10.

EXHIBIT II-10



Multivendor environments can create a number of problems for service vendors, and the networking environment can be especially demanding of a vendor's skills in that the network environment tends to be a complex mix of multivendor equipment, software and applications. A wider range of skills is required by vendors working in a multivendor environment, in order to support not only their own products but also those manufactured by other vendors.

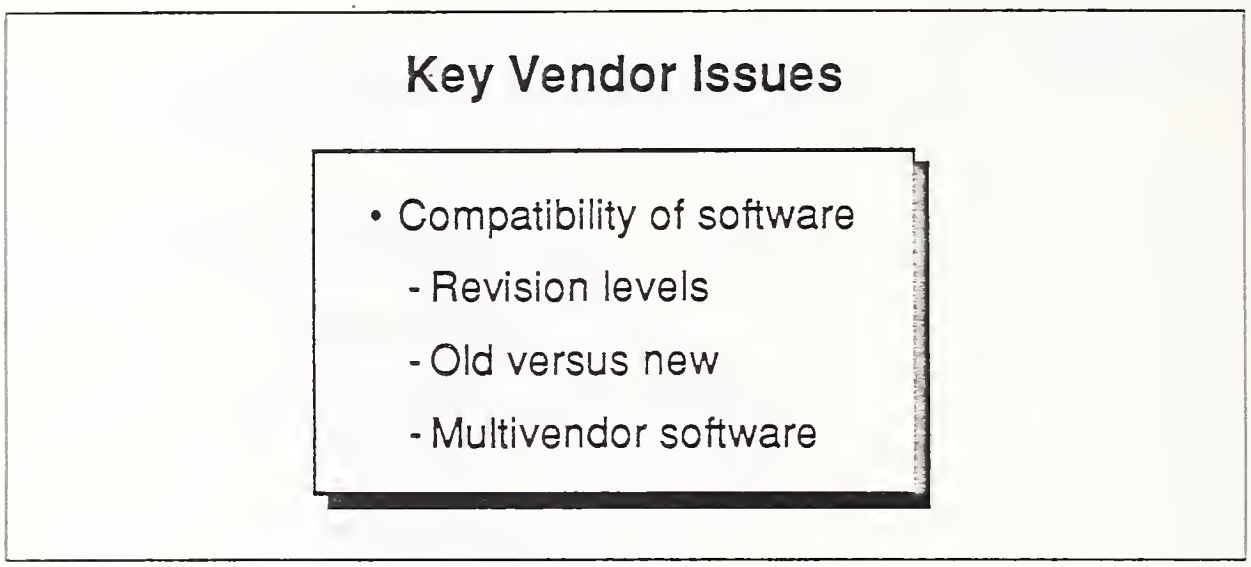
One of the key problems related to supporting multivendor environments is the potential for compatibility and connectivity problems between equipment supplied by a number of different vendors. Service vendors need those skills to not only resolve this type of problem, but also the experience and knowledge to define the source of incompatibility. One example of this type of situation is the IBM-compatible PC, where in most standalone installations, compatibility is not an issue. However, the IBM-compatible PC is a popular intelligent terminal used in networking and connecting devices from different manufacturers in a network, and requires both compatibility and connectivity at a much higher level than may exist in the products used. The service vendor will likely be expected to resolve these difficulties.

Definitions of responsibility in a multivendor environment need to be clear and well understood; otherwise disputes between vendors can arise. If these disputes are protracted, user network operations can be affected.

b. Compatibility of Software

Software compatibility was an issue raised by vendors. The key issues are listed in Exhibit II-11.

EXHIBIT II-11



- Mixed software revision levels in a network can give rise to compatibility problems that the service vendor is expected to resolve. In cases where it is not possible to match revision levels, engineers will be required to undertake any patching or bug fixing required.

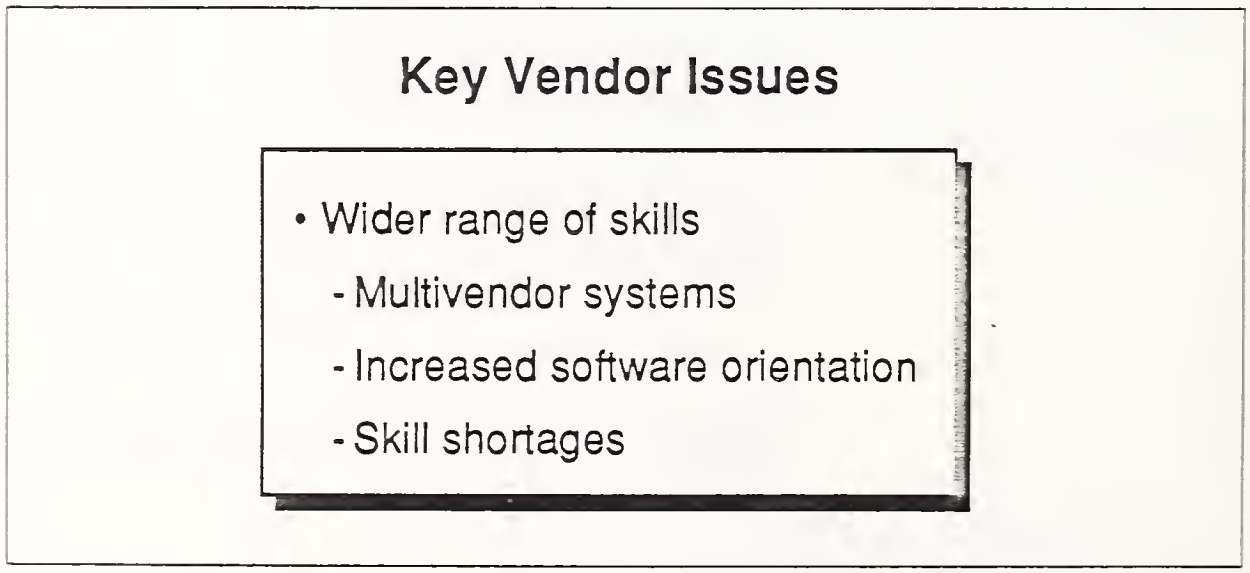
- A further potential complication is the requirement for new software to interface with older software that is often not designed for network environments.

- Mixing multivendor software in a network system can also create difficulties for service vendors. These difficulties can encompass compatibility problems and interfacing difficulties, and in these cases the service engineer must have the skill to resolve the problems.

c. Wider Range of Skills

Engineers working in network environments require a wider range of skills, which are listed in Exhibit II-12.

EXHIBIT II-12



The wider range of skills required can be summarised as follows:

- Where engineers are working in multivendor environments, the equipment and the software require an extended range of skills. This range is required not only to service multivendor equipment, but also to resolve compatibility and connectivity problems. Vendors generally agreed that the network environment requires an increased software orientation over that normally required by customer services.

- Vendors expressed a concern that, because of the higher skill requirements of network services, recruiting and training suitable personnel was a key issue. Shortages of skills, particularly related to software, were considered to be an increasing problem as the network market expands.

- Supporting user network operations allows the service vendor to provide services that range from shared responsibility to total service. For example, the vendor could share systems operations with the user or have total service responsibility for equipment maintenance or systems software support.

2. Wider Opportunities

The breadth of opportunities available to customer service vendors across a wide range of network activities is listed in Exhibit II-13.

EXHIBIT II-13

Network Services
Wider Opportunities

Network Aspect	Customer Services Opportunity
Design	Consultancy
Project management	Consultancy
Implementation	Project management/consultancy
Operations	Shared/managed/total

These opportunities can be summarised as follows:

- Provide consultancy services at the design phase, which includes technology selection, architecture/structure and capacity planning.

- Provide consultancy services at the project management phase, which includes preparing specifications, analysis/source selection, project management and procurement.

- At the network implementation phase, the same vendor has the opportunity to provide consultancy or full project management services. This phase includes installation, integration, testing/acceptance and facility wiring and cabling.

Once the network is installed and operational, a wide variety of opportunities is available to vendors. Examples of these opportunities are as follows:

- Network monitoring and problem management gives the service vendor an opportunity to provide a total service

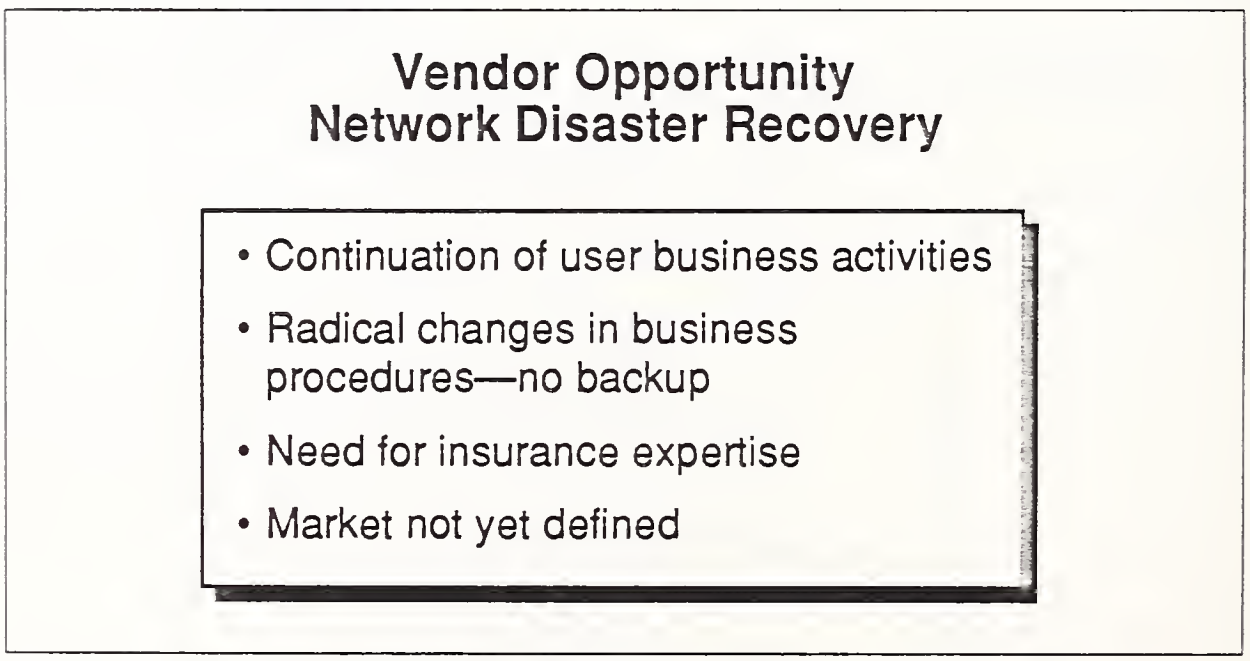
- The area of communications and PTT-related service could be an opportunity for the vendor to provide a managed service

- Application support, which would normally be an area of user responsibility, offers opportunities for the service vendor to provide consultancy

3. Network Disaster Recovery

Exhibit II-14 indicates that provision of disaster recovery services is a key opportunity for customer service vendors.

EXHIBIT II-14



Implementation of networking in the user's business environment requires a radical change in the methodology of office and business procedures and practices. Once the methodology has been changed, the older processes will quickly disappear. Therefore, in the event of a major network failure, the user is unlikely to have a satisfactory manual system to substitute.

Users may also require insurance against major network failure. Customer service vendors have an opportunity and the expertise needed to provide consultancy services to users and insurance underwriters to develop an effective protection plan.

As the network disaster recovery market has yet to be defined, an opportunity exists for vendors to play a leading role in its definition and implementation. Exhibit II-15 provides an example of the revenue and growth opportunities presented by disaster recovery. These forecasts are related to computer installations; network disaster recovery would add revenue and growth.

EXHIBIT II-15

Computer Equipment
Disaster Recovery Market

Market	User Expenditure ($ Millions)		CAGR (Percent)
	1990	1995	
U.S.	400	800	15
Western Europe	180	550	25

The earthquake which caused such devastation when it hit San Francisco in October 1989 was responsible for increased interest in disaster recovery services. Ten key companies are located in the area affected by the earthquake, including Amdahl, Hewlett-Packard, Unisys and IBM Storage Products, and although the operation of many of these companies was disrupted, the disruptions were less than was originally feared. However, this is just one example of how vulnerable computer operations can be to natural disasters and it underlines the critical need for effective disaster recovery services.

In Western Europe, interest in disaster recovery has also been high and a number of companies have launched services over the last 12 to 18 months. Examples are:

- Comdisco has entered a joint venture with Ageris SA, a French company, with intent to provide a pan-European disaster recovery service
- IBM has announced a disaster recovery service for AS 400 users

- Unisys has formed a joint venture/partnership to provide disaster recovery services in France

As yet the market for network disaster recovery has not been defined to any great degree, but the opportunities available to vendors are worthy of investigation. Networks are no less critical to users' business operations than a computer system, and may be more vulnerable to unexpected occurrences.

4. Network Implementation

a. Challenges

The implementation of a network can pose special challenges for users; these challenges are listed in Exhibit II-16. The severity of any problems associated with network implementation is heavily dependent on both the experience of the user and the methodology chosen for implementation.

EXHIBIT II-16

Network Implementation Challenges

1. User methodology
2. Definitions
3. Responsibility
4. Specifications

The potential for network implementation problems is at its highest when the user is not only inexperienced but also decides to subcontract implementation to a number of different suppliers or vendors. Briefly, those problems can be summarised as follows:

- In the case where the user is inexperienced in networks, it is likely that the requirements for defining the network will only be understood at a superficial level. Further, the need to specify the network in sufficiently definitive and specific terms may be beyond the user's capability. The result may be that the user produces a document that relates to an idea, not to a network specification, and may not have clearly thought out all the implications and business needs for the network.

- Effective implementation of a network using a number of different subcontractors requires that the user also has a good appreciation of the need for project management and the skills to apply them. Failure to

achieve effective project management control and coordination of the activities of subcontractors can be a recipe for disaster. Responsibilities of subcontractors need to be very clearly defined; otherwise, disputes can arise, resulting in protracted delays and ineffective implementation.

- When implementing a network, the design phase needs to consider future as well as current needs. Failure to achieve an implementation that allows for future growth can result in premature obsolescence and subsequent need or unnecessary and unplanned expenditure to correct deficiencies.

b. Opportunities

Lack of user skills to achieve successful implementation of a network can create opportunities for service vendors. These opportunities are listed in Exhibit II-17.

EXHIBIT II-17

Network Implementation Opportunities

- Consultancy
- Project management
- Integration
- Environmental services

Network implementation opportunities for vendors range from consultancy services to full project management. At the consultancy level, the vendor is able to advise and assist the user in defining and specifying the implementation required, and also to help ensure that adequate potential for future expansion and growth of the network is planned at the implementation phase.

Should the opportunity exist, the vendor could assume full project management responsibility for the network implementation, and could:

- Verify and monitor the specifications related to the implementation
- Coordinate and define the activities of the subcontractors involved in the project
- Undertake the tasks associated with verification and testing of the network when completed

Additional opportunities for vendors also exist. If the vendor can provide a cabling service, the opportunity to take advantage of using those resources is presented. The vendor could also undertake the task of integrating the network with the user's computer system, and could provide consulting services for software development.

Vendors undertaking project management responsibility, particularly for inexperienced users, can prevent the risk of unsatisfactory implementation which can cause problems for the vendor providing network services.

E

Recommendations for Customer Service

INPUT's recommendations for customer service vendors are listed in Exhibit II-18.

EXHIBIT II-18

Network Services Recommendations for Customer Service Vendors

- Investment and training to provide new skills
- Develop flexible service offerings
- Market uptime and access
- Promote services with product sales

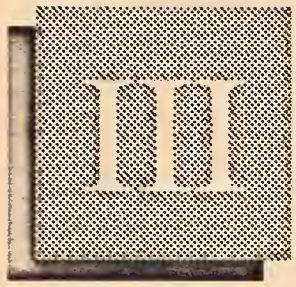
In order to be positioned to provide a wide range of services, vendors will need to invest in training and recruitment to develop the skill levels required. Two such skills are consultancy and installation.

Network services are required by a wide range of users. Customer service vendors should structure a range of flexible service offerings that will meet the needs of large, small, experienced and inexperienced users.

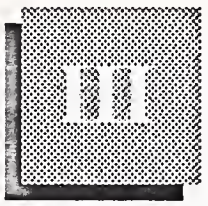
The key user need is for network access. Vendors should market uptime and access.

User interest in network services is likely to be higher at the network conception/implementation phase. Vendors should develop a solution-orientated approach and promote services at the time of initial network negotiations.

Due to the early stage of development of the network market, and taking into account the confused and complex nature of the market, INPUT recommends cautious tactical development of service offerings. INPUT also recommends that vendors consider investment in training and skill levels to take advantage of opportunities for providing multivendor, consultancy/shared management and disaster recovery services.



Market Opportunities



Market Opportunities

A
Market Forecast

1. Market Growth

Exhibit III-1 provides INPUT's forecast for the growth of network services in the U.S. and Western Europe over the period 1990 to 1995. Also shown in this Exhibit is INPUT's estimate for the growth of network equipment over the same five-year period, to allow comparison of the relative growth rates.

EXHIBIT III-1

Network Service Market Growth 1990-1995

Market	Market Sector	User Expenditure ($ Millions) 1990	User Expenditure ($ Millions) 1995	CAGR (Percent)
U.S.	Network Equipment	3,100	12,400	32
	Network Service	420	960	18
Western Europe	Network Equipment	1,600	6,800	34
	Network Service	220	580	22

Network services over this period are estimated to have a of 20% compound annual growth rate (CAGR). Although vendors are recommended to be cautious, growth rates are significantly higher than those forecast for the customer services market overall, which are likely to have a 6-7% CAGR over the same five-year period.

2. Forecast Definition and Assumptions

In keeping with INPUT's standard practice, market forecasts are expressed in current rates (1990) and therefore include an allowance for inflation.

The market forecast has been restricted to include only the local-area network (LAN) market for equipment and services. For the purposes of the market forecast, LAN equipment has been defined as comprising cabling, bridges, file servers, interfaces and modems.

The forecast for network service refers to the service market for LAN equipment as defined above.

The LAN service market is expected to grow at a slower rate than the LAN equipment market, due to the impact of new technology continuing to improve the reliability of equipment and reduce the need for service.

3. Growth Factors

Exhibit III-2 lists the factors that INPUT considers the primary influences on the growth of network service.

One of the key factors driving the growth of network service is the increasing base of network installations. Network installations will have a CAGR of more than 30% over the period 1990 to 1995, both in the U.S. and in Western Europe. In support of this growth INPUT estimates that by 1991 almost 60% of all personal computers in the U.S. will be networked and that similar parallel developments of the market are occurring in Western Europe.

A portion of the growth of the installed base of networks is driven by users' implementing new applications that increase the installed base and extend existing networks.

As the installed base of networks increases, so does the complexity of existing and new installations. This environment creates and stimulates a user need for service, which in turn stimulates the growth of customer service revenues for network service.

EXHIBIT III-2

Network Service Market Growth Factors

- Drivers
  - Increasing service base of installed equipment
  - New user applications
  - User service needs
  - At least one-third of users do not have formal service contracts
- Inhibitors
  - >25% of users opt for in-house-provided services
  - Only 10% of users indicate a requirement for additional vendor service
  - Users resist the need for a formal service contract
  - Opportunities for traditional customer services are limited

The fact that at least one-third of users do not appear to have formal network service contracts could be a temporary situation. As the complexity of networks increases and as networks become more mission-critical, it is likely that some of these users will realize the value of and need for formal service.

Factors inhibiting the growth of network service can be summarized as follows:

- A relatively high percentage of users (about 25%) have opted for the provision of self- service covering a wide range of network services. Users making this choice tend to be the larger, more experienced users; penetration of this portion of the market by customer service may be difficult and long term.

- Only 10% of users indicated they would like to contract additional services to vendors.

- The relatively high percentage of users—at least one-third—who do not reveal the presence of any formal service contract is a likely indication that there is user resistance to formal vendor service—or that there is a degree of ignorance related to the value of and need for service. This user resistance could restrict potential growth of the network service market.

- Opportunities for traditional customer service—equipment maintenance—are limited because of the high reliability and reduced complexity of network equipment compared to computer systems. The growth of network service is likely to be significantly slower than the growth of network equipment.

B

Competitive Environment

Factors identified by INPUT as influencing the network service market competitive environment are listed in Exhibit III-3.

EXHIBIT III-3

Network Service Market Competitive Environment

- Multivendor installations
- User capability and reluctance to lose control
- Equipment vendors
- Independent service vendors
- Vendor skill levels

The network market is a multivendor environment—that is, equipment and software at a user site are likely to originate from a number of suppliers. For example, a typical user site could include equipment from IBM, Hewlett-Packard and Compaq; system software could be from IBM, Novell, or 3Com. For the service vendor, working in a multivendor environment can impose special requirements on the skill levels needed, for example the resolution of compatibility and connectivity problems. The competitive position of a vendor is decided not only by the vendor's ability to provide the skill levels required, but also by how the relative skill levels of competing vendors are judged by the user.

The capability of the user to undertake responsibility for self-service is a key element against which service vendors will need to compete. Reluctance, on the part of the users, to lose control of many aspects of network operations creates an additional competitive element for the service vendor. This reluctance is particularly strong among some larger, more experienced users.

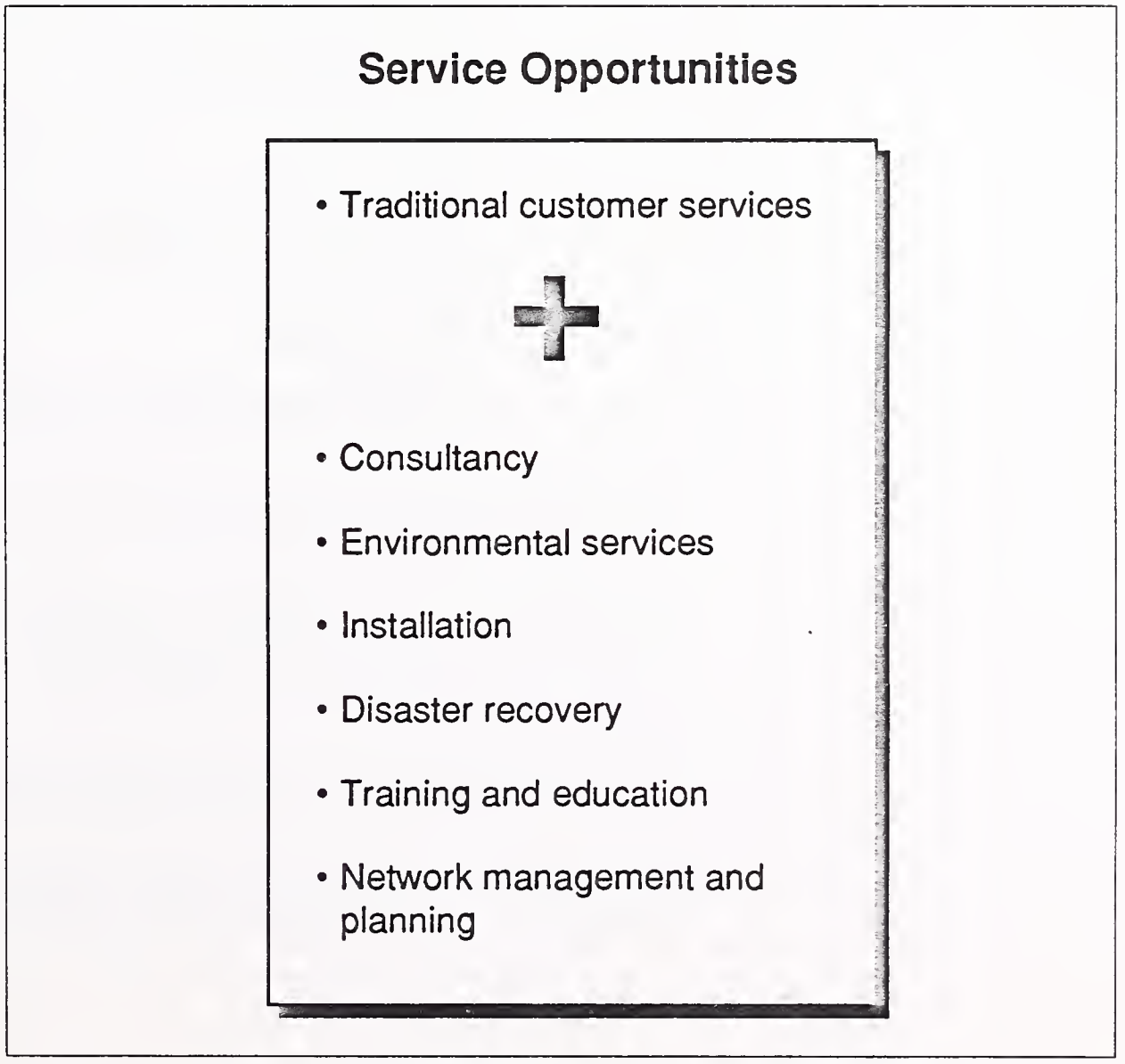
Because the network environment is multivendor, competition between equipment vendors and independent service organisations could become intense. A trend in user requirements for a shift in emphasis from proprietary to open standards is likely to add to the intensity of competition between vendors.

Vendor skill levels play a key role in the network service competitive environment. Service personnel require more software orientation for the network service market than for the servicing of computer equipment. The importance of other skills, such as consulting, is also high. In order to remain competitive across a broad range of services, the vendor must match or better the capability offered by competitors.

C
Service Opportunities

The service opportunities presented by the network service market are illustrated in Exhibit III-4.

EXHIBIT III-4



These service opportunities cover a potentially wide range. The traditional customer services activities, predominantly equipment maintenance, play a less important role in network service.

The servicing of networks provides a range of opportunities outside the confines of traditional customer service. Examples are consultancy and installation services.

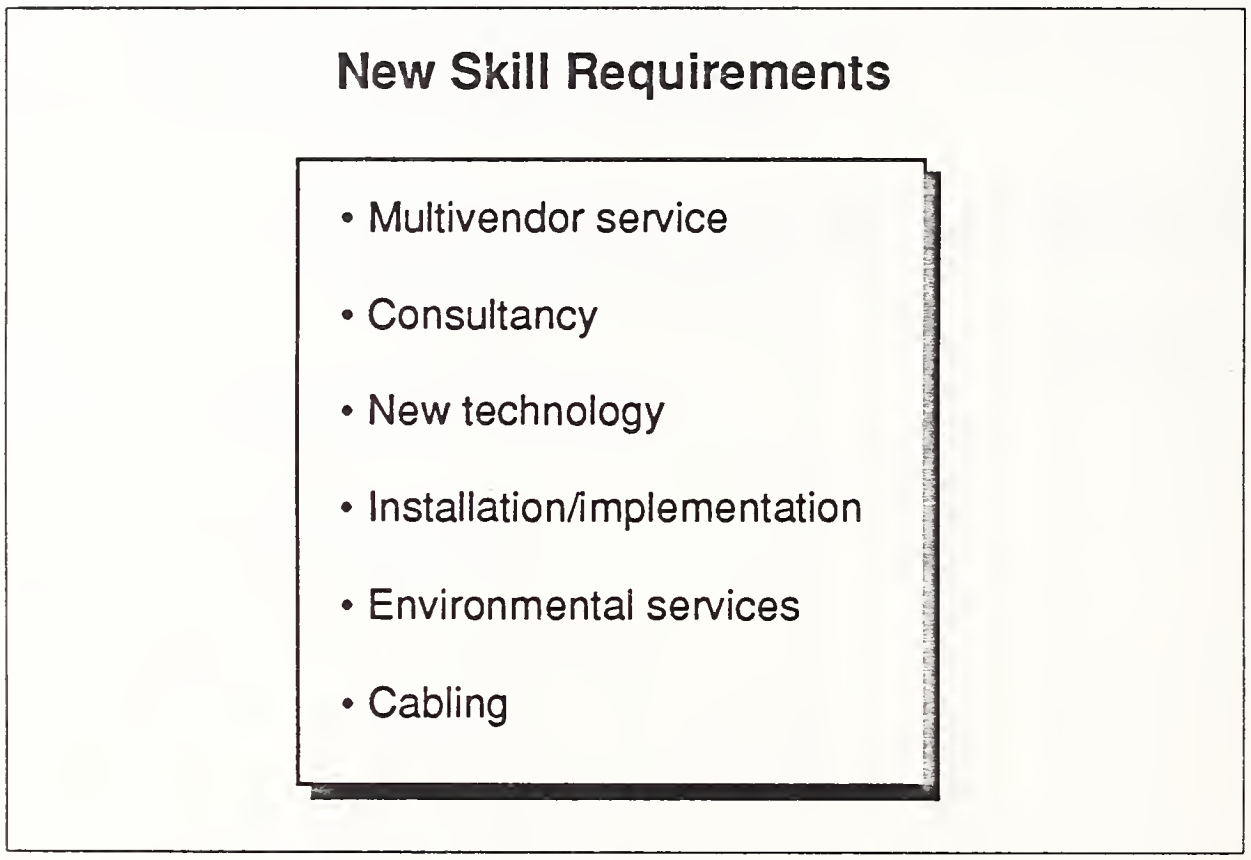
Vendors that are not positioned to take advantage of the wide range of opportunities available will likely find themselves relegated to second place in the drive to provide network services.

D

New Skill Requirements

In order for vendors to be positioned to take advantage of the opportunities offered by network service, new skills are required. Exhibit III-5 lists the areas of network service in which new skills are appropriate.

EXHIBIT III-5



The skill requirements of network service are:

- The ability to work in a multivendor environment comprising multivendor equipment and software. Particularly important is the ability to support and service multivendor software.

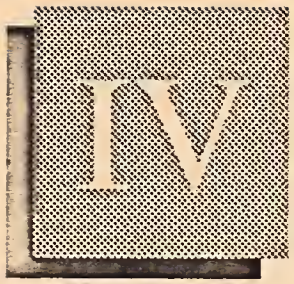
- Provision of consultancy skills for a wide range of services. Examples are network management and network configuration.

- New technology requires not only the capability to emprace new technology, but also continual upgrading of skills as new technology con-

tinues to emerge. Examples of new technology are remote network management and monitoring techniques and fibre optic data transmission lines.

- Development of the skills required for installing networks in user environments and undertaking network implementation projects on behalf of users. Skills required for network implementation range from consultancy to project management.

- Skill in providing environmental services will be required. These skills include involvement in the provision of regular power and standby power systems, network environmental planning, and the provision and installation of cabling systems.



Key User Needs

IV

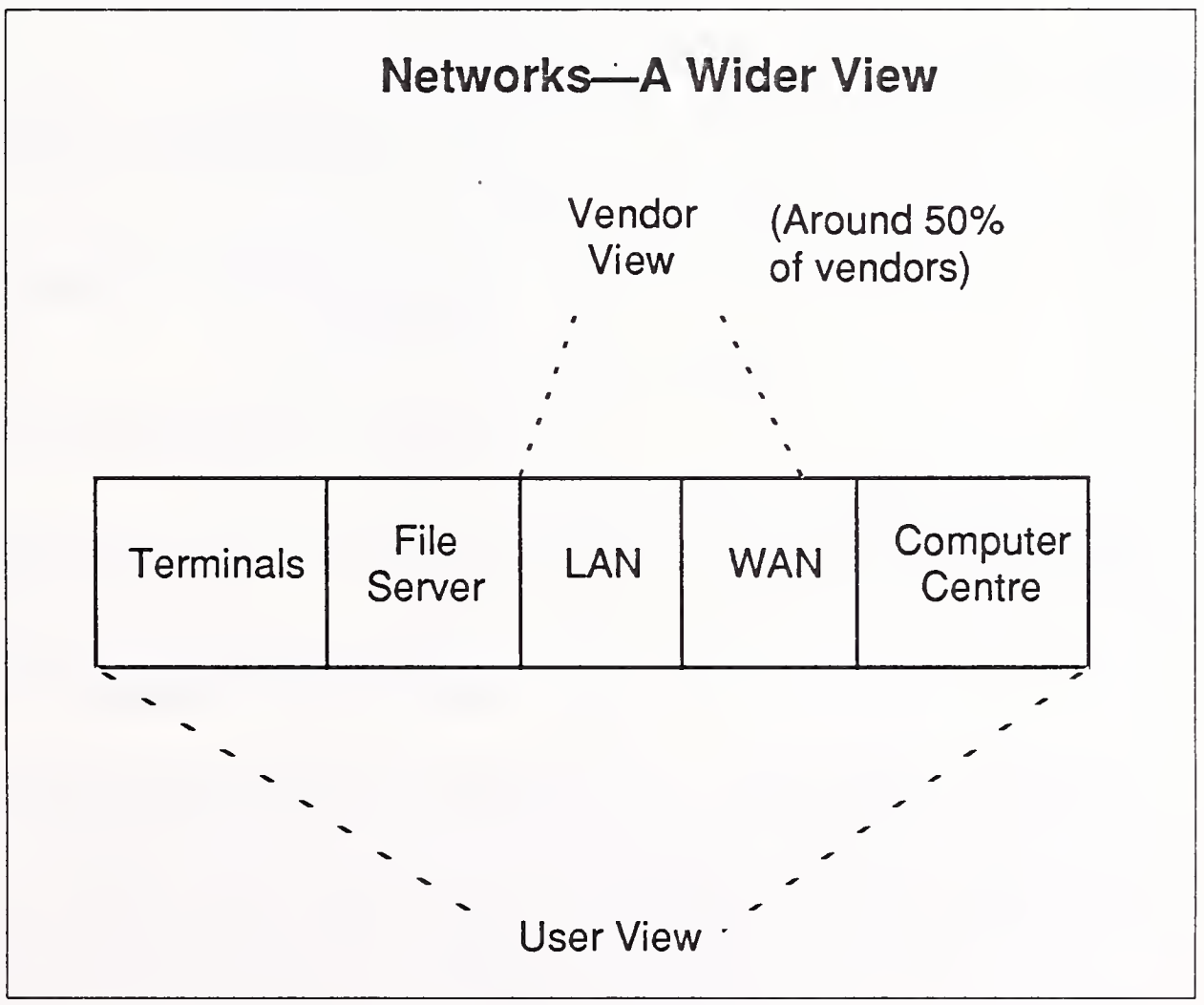
Key User Needs

A

User Networking

Users tend to have a wider view of networks than do vendors. The differences in viewpoint are illustrated diagrammatically in Exhibit IV-1.

EXHIBIT IV-1



Vendors tend to have a narrower view than users. About 50% of vendors show a more product-oriented approach to networks, discriminating between a local-area network (LAN) and a wide-area network (WAN). An example of this narrower view was provided during interviews with

vendors when a LAN was described as including only the dedicated cabling system and the connections to the terminals. Those vendors representing the narrower view believe that connected devices, such as terminals, are not part of the network.

Those vendors who are more attuned to the networking environment tend to take a much less restrictive view which matches that taken by users.

Compared with this vendor view, users have a much wider view of networks, a view that encompasses networking as opposed to networks. As illustrated by Exhibit IV-1, users believe that a network includes all connected devices without any real discrimination between LANs, WANs, clustered systems or distributed processing systems.

Factors that describe the user conception of networking are listed in Exhibit IV-2. Apart from not discriminating between types of networks, users tend to consider networks as providing desktop access to computing power in the form of messaging, transaction processing, graphics, files and databases. This conception applies whether the system is localised or dispersed.

EXHIBIT IV-2

User Conception of Networking

- Little discrimination between types of networks
- Terminals provide access to computing power
- Network services and products merge
- Network includes all connected hardware and embedded software

As network products and services merge, users are more solution-oriented. For example, a network provides a solution to a business need—whether the need is the network or supporting services. Therefore the following items tend to merge to form a network solution:

- Computer equipment
- File servers
- Cabling

- Terminals
- Applications
- Network management and support services
- Communications

B

User Network Service Requirements

Exhibit IV-3 lists the key user requirements for network service.

EXHIBIT IV-3

Key User Network Service Requirements

1. Access and uptime
2. Early detection of problems
3. Resolution of small-user problems
   - Lack of vendor support
   - Lack of dealer expertise
4. Resolution of difficulties of inexperienced users
   - Vendor service offerings and effectiveness
   - Security and prevention of system corruption
5. Vendor flexibility in service offerings
6. Provision of
   - Single point of service contract
   - Central help desk
7. Remote network monitoring and management

1. Access

The primary user requirement is for access to the network on demand. Waiting for access—to files, for example—can be a source of user frustration and annoyance. Delayed access can also result in productivity losses for the user. For example, a network comprised of 1,000 terminals, with each individual user experiencing a 5-second access delay, equates to a 1.4-hour productivity loss per access across the user base. Part of this requirement is a need for the early detection of problems or potential problems, a requirement becoming more critical as networks evolve, become more complex and have higher levels of line traffic. Early detection of problems allows the user to take proactive action and if necessary implement contingency plans—for example, restricting nonessential traffic.

2. Small Users

The requirements of smaller network users raise specific issues for vendors. These requirements can be summarised as follows:

- Smaller users tend to be directed towards the equipment vendor's dealer or distributor channels for supply of equipment. The issue raised by users was the lack of dealer expertise in most aspects of network implementation and support. The fact that smaller users tend to be less experienced compounds the lack of dealer expertise.

- Small users being supplied through the equipment vendor's dealer channels tend to become isolated from the equipment vendor's support services in circumstances where the need for expertise is high.

3. Inexperienced Users

Inexperienced users tend also to be the smaller users and suffer not only from the same problems, such as lack of dealer expertise, but also require additional support. One characteristic of this group of users is that they lack the experience to operate the network effectively and also lack the budget required to fund external support services. The term *inexperienced user* also applies to the personnel accessing the network via terminals. One problem raised by a user was inexperienced terminal users who inadvertently accessed the terminal or network operating system and consequently corrupted files.

4. Service Needs

The result of the issues raised by users is to highlight a number of service requirements:

- The need for vendors to structure flexible service offerings that will satisfy the needs of a wide range of network users

- The need to improve the expertise and capability of dealer channels in servicing smaller users

- An opportunity for training and education programmes aimed at improving the knowledge and expertise of users to support their own network operations. This opportunity is particularly important for users who lack the necessary budgets to fund extensive external services.

User interviews also identified a need and opportunity for single-source service by stating a preference for a single point of service contact. Users find dealing with a number of vendors in a multivendor installation can be frustrating and time consuming. Also, infrequently, disputes

between vendors do occur and the primary need of users is for problem resolution with minimum disruption. An integral part of the user need for a single-point service contact is the requirement for a central help desk. Larger users tend to provide their own help desk service, the primary aim of which is to resolve minor problems quickly and ensure reaction to more-critical problems.

One user claimed that the help desk was handling between 100 and 500 calls per day and achieving resolution of problems within one hour on average. This user provided all network services using in-house resources and handled over 1,500 terminals.

The subject of remote network management and monitoring was raised by users only when prompted. One conclusion that could be drawn from this fact is that users consider remote monitoring and management as a tool; provided that network access is available, the means of achieving smooth operation are transparent. An alternative conclusion, prompted by a user comment, was that users prefer to retain control and view remote services as at least a partial loss of network control.

C

Future User Requirements

When questioned about future requirements, the responses from users focussed on network developments rather than service developments, providing further confirmation that products and service are merging. Key user requirements for network evolution are listed in Exhibit IV-4.

EXHIBIT IV-4

Network Evolution—Key User Requirements

1. Move from proprietary to nonproprietary network solutions
2. Increased desk-level processing power
3. Increased network access to computing power
4. Remote network management and monitoring
5. Improvements in user friendliness of networks

The primary future requirement mentioned by users was a need for open network standards. Larger users are concerned that proprietary standards will restrict growth and flexibility and create a captive environment for

the equipment vendors (*lock-in* was the term used). However, the differing views of users reflect concerns and confusion over open standards, for example:

- One user commented that future network development contracts will likely go to an independent vendor that would supply a customised network using standard elements, thereby allowing a future progression path that incorporates flexibility.

- A second user remarked that any company decision regarding network development would need very careful consideration because of concern over the continuity of current standards.

Users see a need for increased desk-level processing power and access to computing power. This trend has two aspects. The first is replacing existing dumb terminals with intelligent terminals, and the second is a need for increased sophistication of intelligent terminals. One objective is to reduce line traffic demands; the other objective is to increase desk-level processing power.

The implementation of remote network monitoring and management was considered a likely future development. However, a need for caution was highlighted, and that implementation needs careful consideration. The larger users tend to feel that as networks increase in complexity and traffic levels increase, remote management technology is the key to ensuring that the network is kept open.

A requirement for increased user friendliness of networks was also indicated by users. One aspect of this need was for DOS application packages that will do what the user wants. A further aspect was the need to accommodate and provide ease of access for less experienced terminal users because of the continuing penetration of the office environment by networked terminals. Improvements in the user friendliness of networks has the potential to reduce user training costs and allow the use of less-skilled terminal operators who enable further cost savings. Improvements in user friendliness reduce the chance that individual terminal users will inadvertently disrupt network operations.

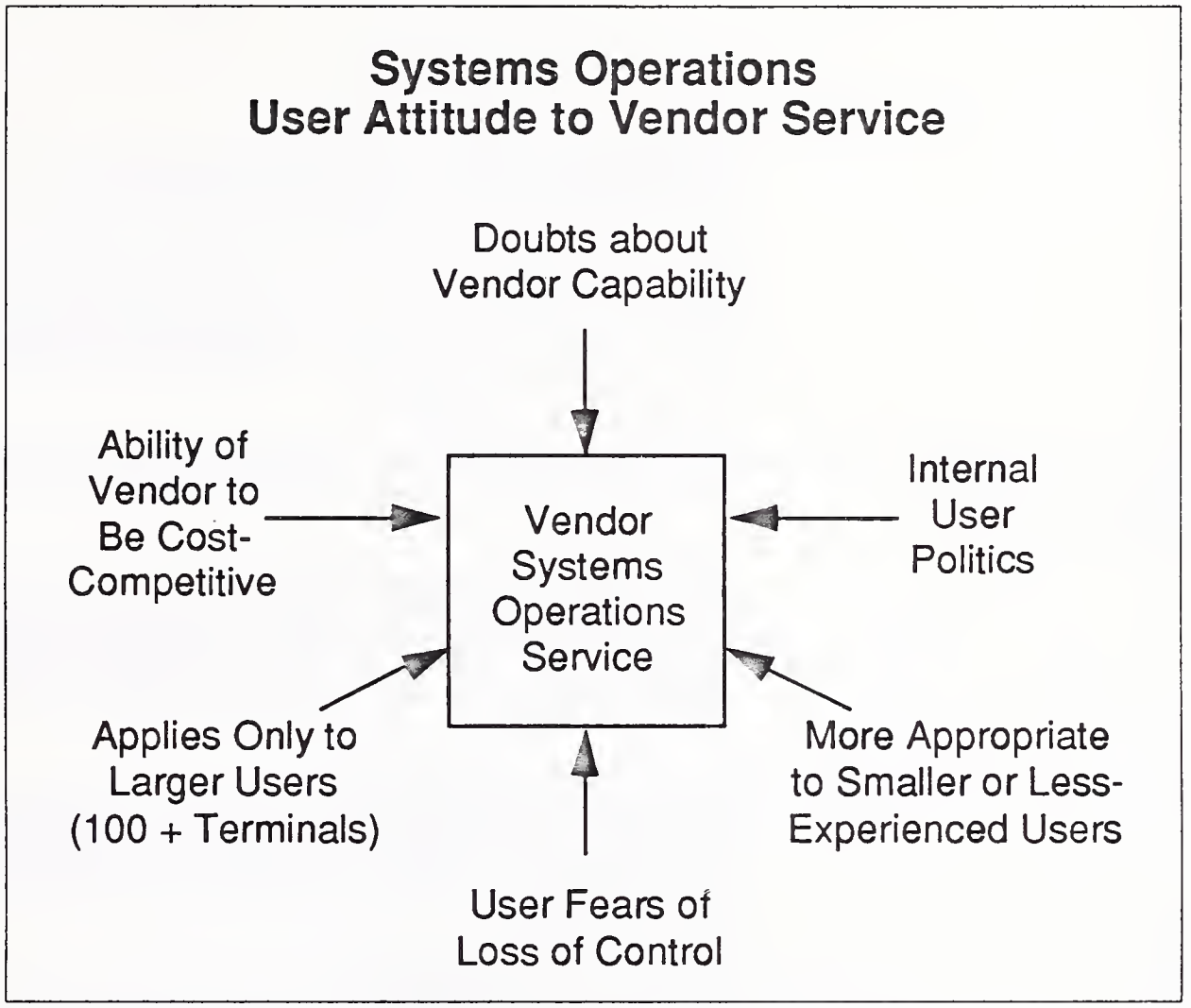
D

User Attitude to Systems Operations

Exhibit IV-5 illustrates the users' attitude to vendor-provided systems operation service. User attitudes relate to four key issues:

- Users have doubts regarding the vendor's ability to provide a service that will satisfy the needs of the user's business and the vendor's ability to match the effectiveness of in-house resources. These doubts include concern over the vendor's ability to fully understand the user's business environment.

EXHIBIT IV-5



- Larger users expressed concern about the vendor's ability to be cost-competitive with the user's own resources in the long term. The vendor may be able to prove cost-effectiveness initially, but users feared that once the vendor assumed responsibility, the running cost of providing the service could escalate. Smaller users indicated that although a service of this type could prove attractive, particularly to less-experienced users, the cost would be out of proportion to the users' budget allocations.

- Larger users expressed concern over losing control in the event that systems operations responsibility was contracted to an external service vendor. Large users were concerned about the vendor's ability to fully understand the user's business needs and priorities. Users also doubted the vendor's ability to react fast to change. Users felt that the requirements of their business environments contained a degree of specialisation that was inappropriate to relinquishing control to external vendors.

- Any move to contract systems operations responsibility to an external vendor could cause a clash of internal politics. An example was provided by a subsidiary of a large petrochemical company. Here users felt that any such move would likely result in the parent company's imposing central resources to undertake systems operations responsibility. A further factor could arise on user sites that are unionised; the trade union concerned would most likely resist any move to contract

services to outside vendors if such contracts would result in union members being affected.

A conflicting view is that some users thought external systems operations responsibility was applicable only to larger sites. Whereas other users belived that the contracting of systems operations to an external vendor was more appropriate in the case of smaller or inexperienced users, INPUT contends that systems operations contracts are appropriate in both cases and that flexibility of implementation is key.

E

Source of User Services

Exhibits IV-6 to IV-8 provide data relating to the source of user services.

- Data relating to the percentage of the user sample with vendor-contracted services are presented in Exhibit IV-6. This Exhibit indicates the percentage of users having vendor contracts for each individual service aspect.

- Data relating to the percentage of the user sample using in-house-provided services are presented in Exhibit IV-7. This Exhibit indicates the percentage of users using in-house resources for each individual service aspect.

- Exhibit IV-8 indicates the percentage of the user sample for which no formal source of service was for against each individual service aspect.

In overall terms, these Exhibits indicate that on average, 40% of network service is contracted to vendors, and 25% of network service is provided using in-house resources. The remainder (35%) was not covered by any formal service agreement, either with vendors or in-house.

Aspects of network service most commonly contracted to vendors include systems software support and hardware maintenance. The aspect of network service least commonly contracted to vendors was network/systems operations.

The aspects of service most commonly provided using in-house resources include applications support and evaluation and network/systems operation. Aspects of network service least commonly provided in-house are customising and communication evaluation.

Aspects of service most commonly not covered by any formal agreement include network/systems operations and network planning. Confirmation that these services tend to be neglected was provided during discussions with equipment vendors who commented that some users provide these services informally. Moreover, users tend to provide these services on an ad-hoc basis without any formal organisational responsibility being allocated. The result, according to equipment vendors, is that network/systems operations and network planning are not handled effectively.

EXHIBIT IV-6

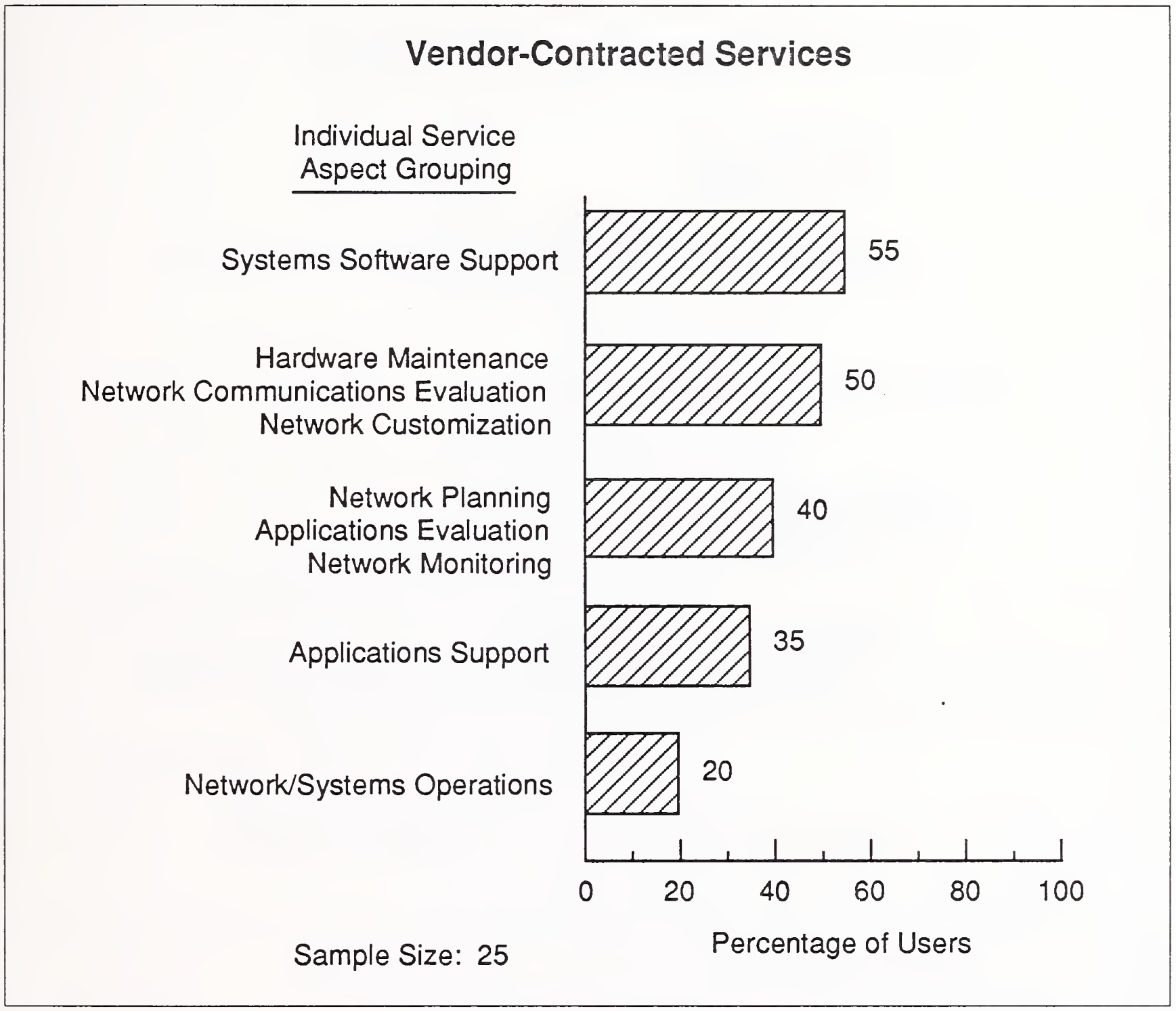


EXHIBIT IV-7

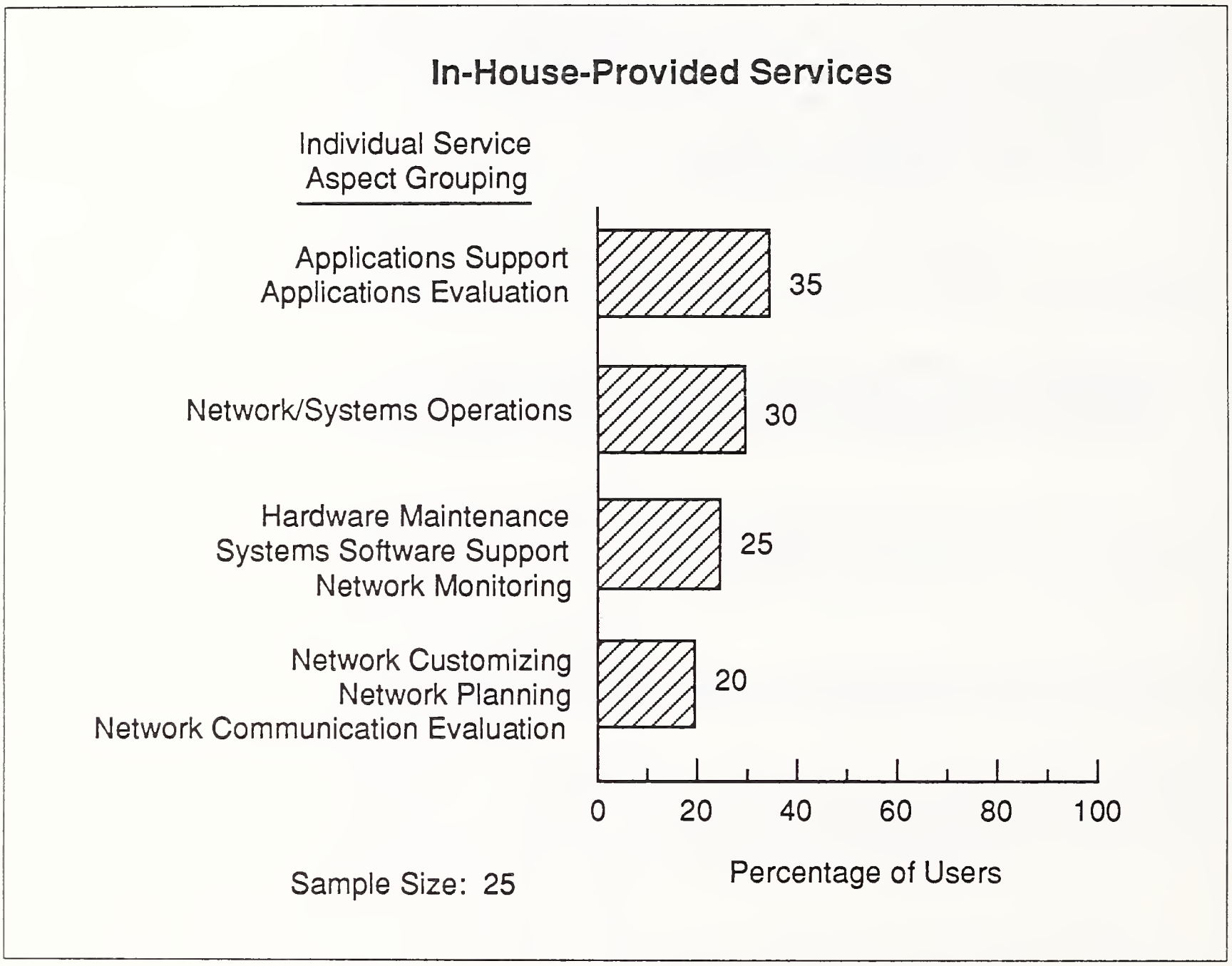
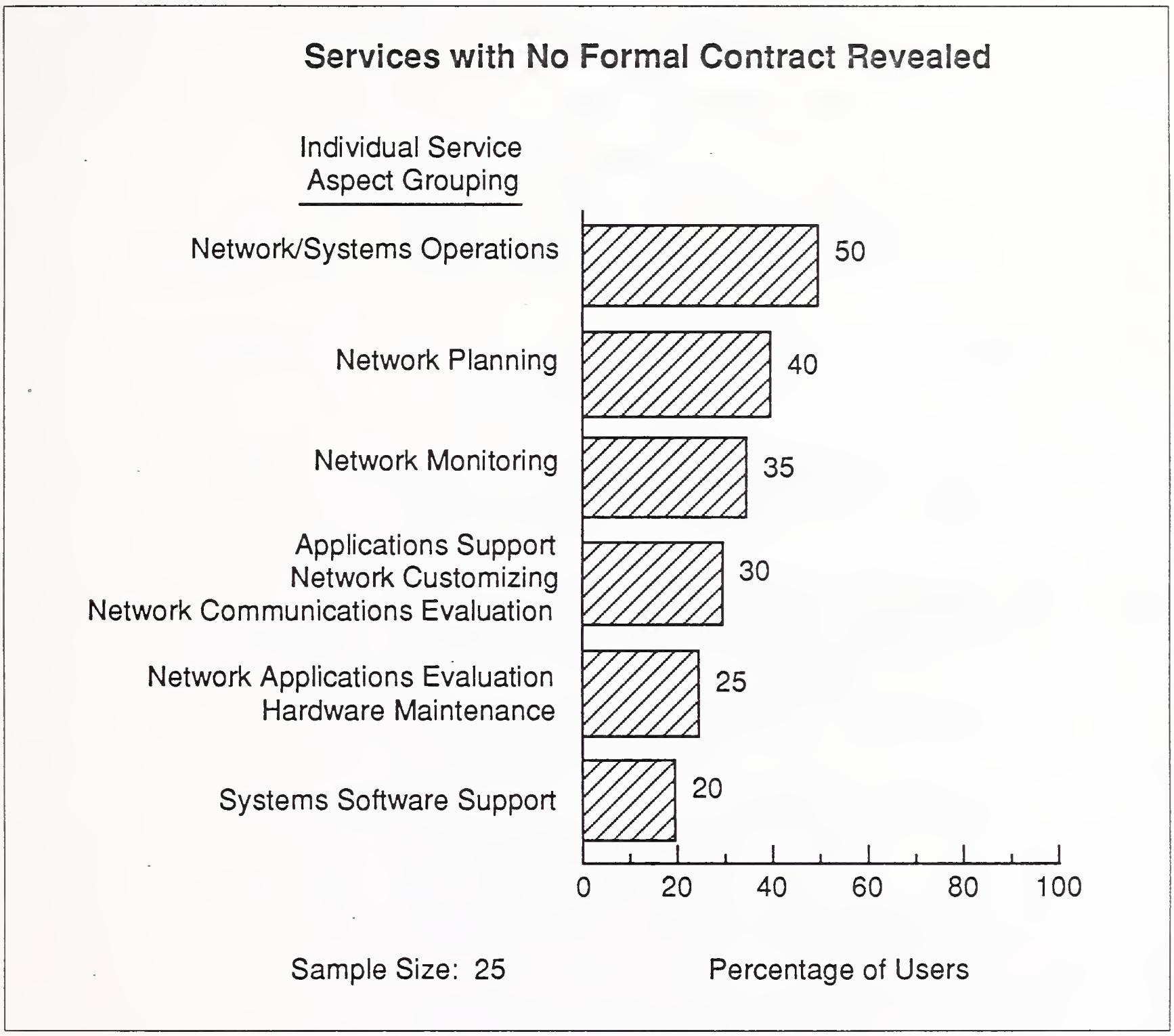


EXHIBIT IV-8

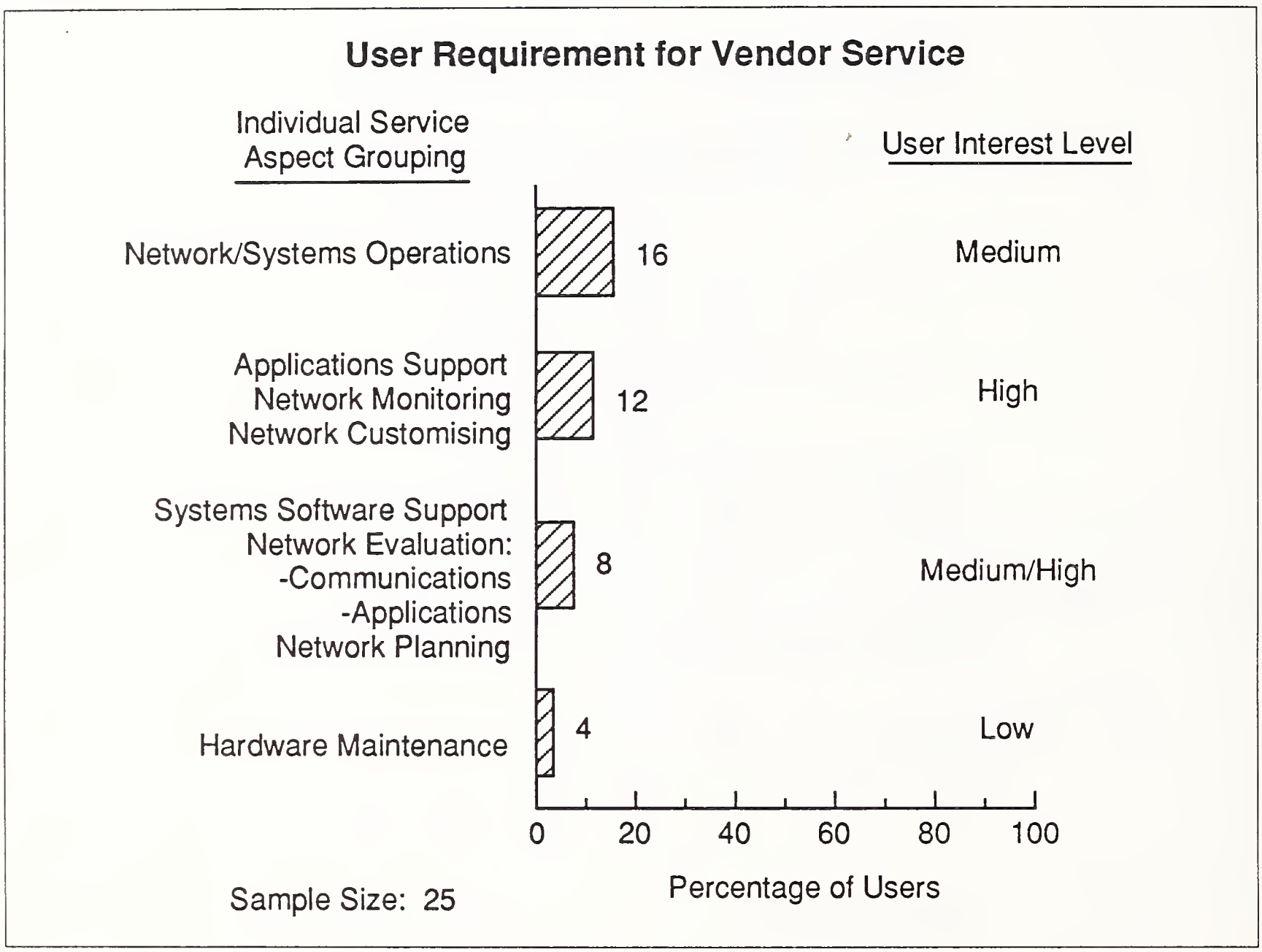


F

User Requirement for Vendor Services

During the course of interviews, users were asked to indicate which aspects of network service they would like to contract to the equipment vendor. Results of the user sample response to these questions are presented in Exhibit IV-9.

EXHIBIT IV-9



Based on the data contained in Exhibit IV-9, opportunities available to vendors can be rated as only moderate. The highest percentage of users requiring vendor-contracted service is indicated for network/systems operations. Taking into consideration the fact that overall, about one-third of users do not reveal the presence of a formal service contract, user awareness of the need for service is relatively low.

The low level of user awareness or appreciation of the benefits of formal service presents service vendors with a marketing challenge to change user attitudes.

The mean value of the data contained in Exhibit IV-9, across the range of network services, indicates that about 10% of users would like formal vendor-contracted service.

G

User Interview Comments

To give a more in-depth understanding of the views presented by users, Exhibit IV-10 lists some of the comments made by users during interviews.

EXHIBIT IV-10a

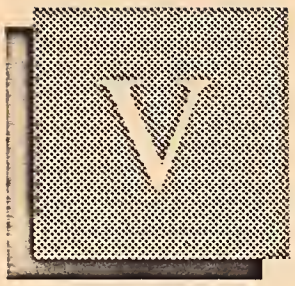
User Interview Comments

- We are examining our network strategy very carefully due to the concern over being locked out of a logical growth path if we make the wrong decision. The problem is the lack of true network standards.
- For the next two or three years the need for early problem detection will become increasingly critical.
- We service our own network via a help disk and handle between 100 and 500 problems a day, with an objective to resolve these within an average time of one hour.
- We feel nervous about vendor proprietary networks due to being locked into that vendor's products; OSI/open standards would appear to be the way to progress.
- Remote network management is an interesting concept, but needs very careful consideration before implementation.
- On-site vendor FM (systems operation) is an attractive proposition for larger sites, say more than 500 terminals. But it is doubtful if smaller operations could afford the cost of on-site vendor services.
- Only real improvements and benefits to the user are of interest. We have no interest in fashion changes or trends.
- Equipment suppliers have an axe to grind; they like to sell networks as part of an overall solution and these tend to be proprietary. We would prefer to go to a third-party specialist who can provide a customised solution using standard network components.
- Our real interest is in flexibility of the solution—whether this is the network itself or the service.

EXHIBIT IV-10b

User Interview Comments

- We like the idea of vendor-provided network services but are cynical about the vendor's ability to provide some services, for example network performance tuning.
- As a very large user and a relatively wealthy company, we can afford to provide our own network services, and these tend to be very specialised.
- Implementation of network standards—for example, OSI—needs to resolve the problem of the continuity of standards.
- Networking seems to be at a crossroads where users are polarised between the IBM route and open standards.
- As a potential network user, we are concerned about network management:
  - What is it?
  - How is it achieved?
  - We hear a lot of talk about monitoring.
- Interest in vendor-provided network services tends to be high during the initial phases of implementation but decreases after installation. At present we have only 20 terminals and can manage our own network; when we have over 100 terminals, a vendor-provided management service would be interesting.
- I take a rather cynical view of vendor-provided consultancy services due to the lack of forward-looking responsibility and commitment on behalf of the vendor.
- There is a need for equipment vendors to put a "peg in the ground"—to define where we are today and what future directions and strategies are being adopted.



The Vendor Challenge

V

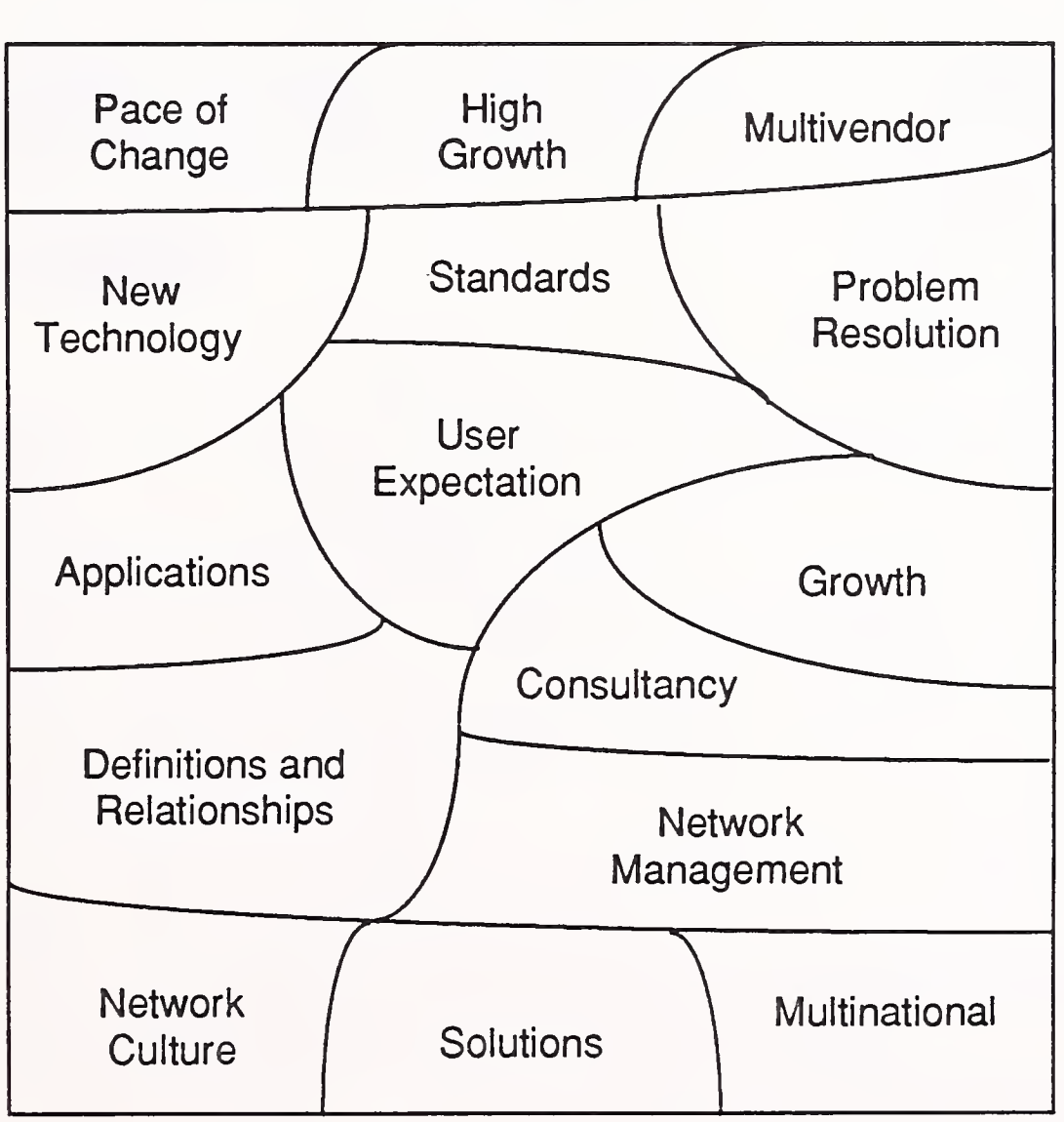
The Vendor Challenge

A Need for Focus

Exhibit V-1 illustrates some of the elements that contribute to the network environment. This environment is a relatively complex mix of interelated elements and highlights the need for vendors to have clearly focussed strategies. Otherwise, the elements can become confused.

EXHIBIT V-1

A Need for Focussed Strategies



During interviews, users indicated the following views and concerns:

- The need for open standards, such as OSI, to provide a future vendor-independent growth path
- Concern over the lack of true standards
- Doubts over the future continuity of existing standards
- Need for vendors to define their current positions and future directions clearly

These comments refer to network solutions and include implications for products and service. The comments also indicate a degree of confusion and uncertainty in the user community.

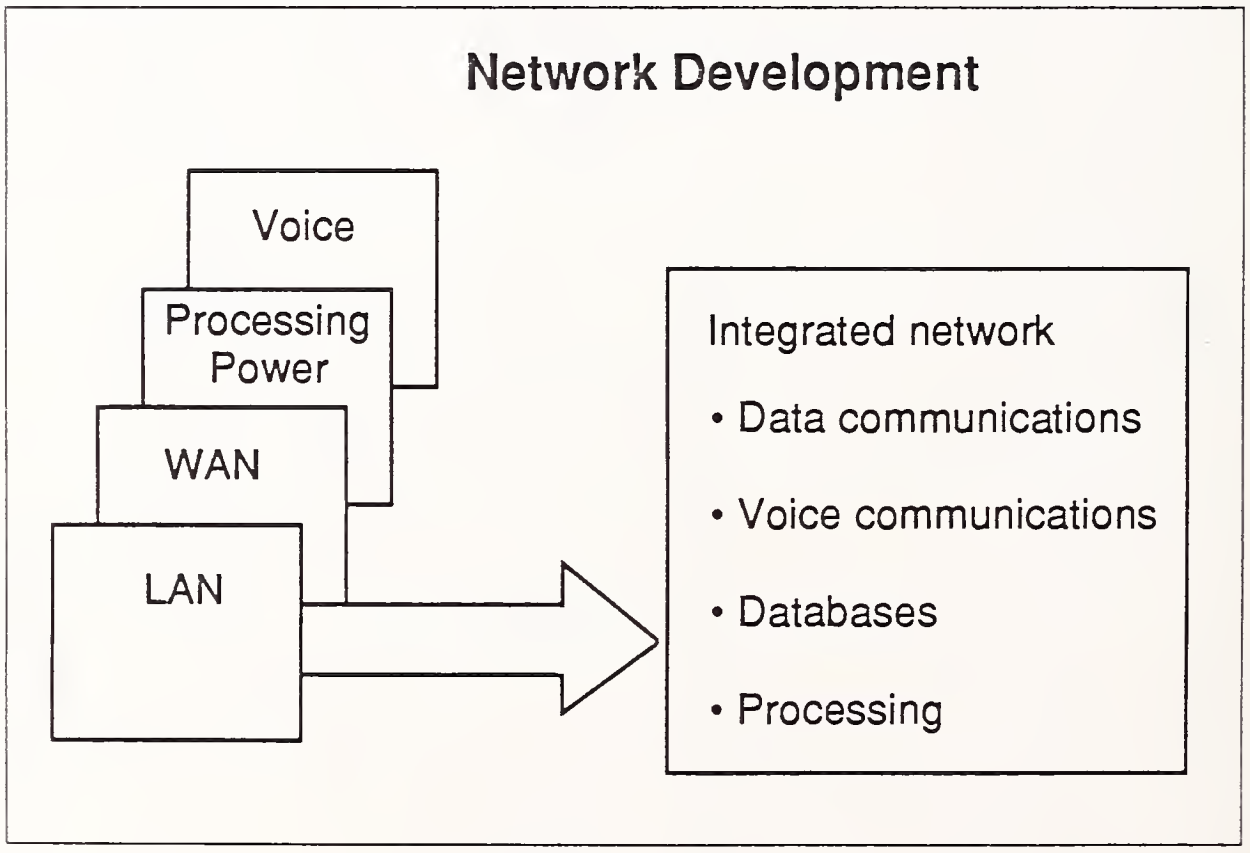
The comments from users indicate that vendors need to develop clear strategies to define the future of network developments and growth. In developing these strategies, vendors need to consider all the elements of networks and give users a focussed approach to rectify the current confusion and uncertainty. Product and service plans should be developed in parallel.

B

Network Development

Discussion with users and vendors identified a development path for networks. This development path is illustrated in Exhibit V-2.

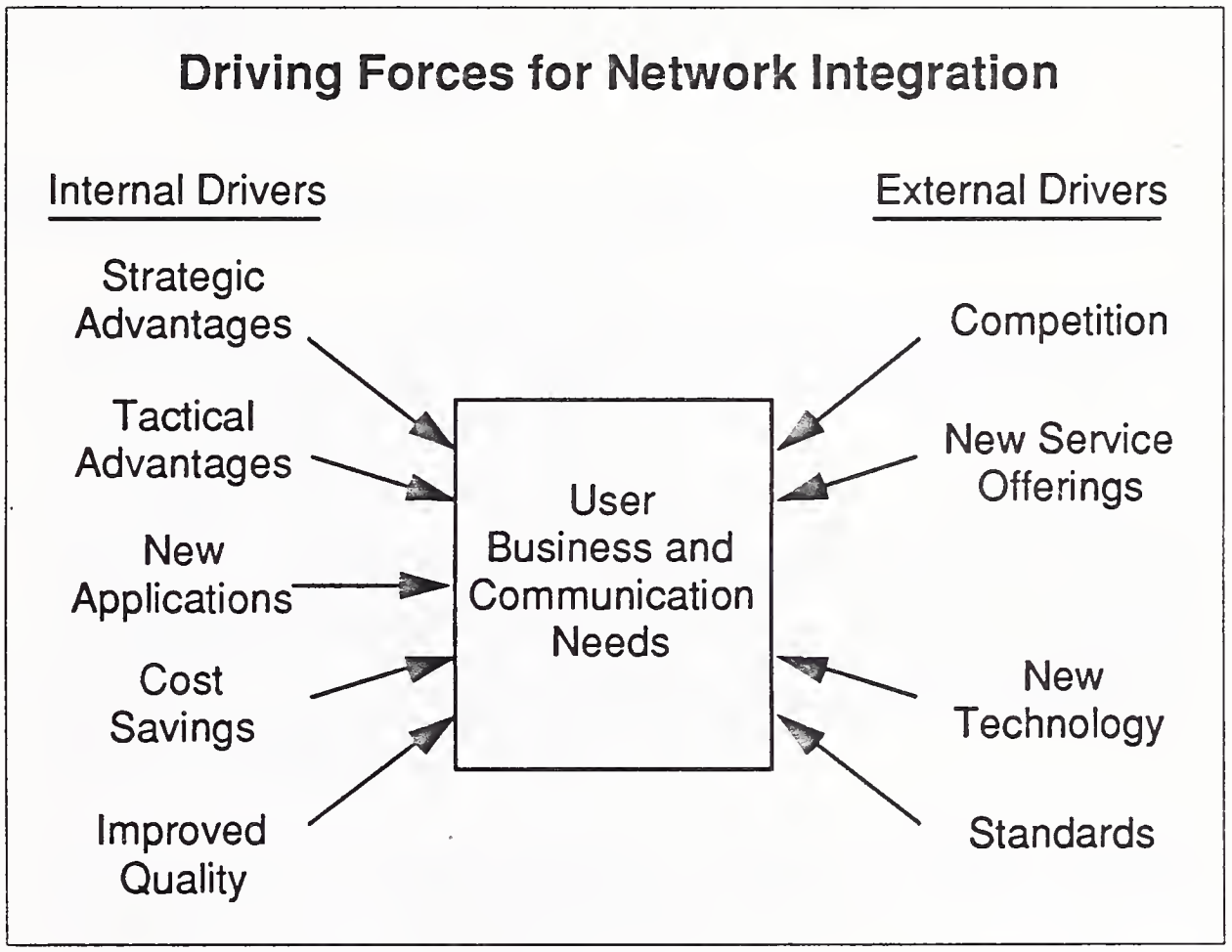
EXHIBIT V-2



The general trend is that the boundaries between various elements of networks and computer systems are disappearing with the formation of integrated networks. Integrated networks will combine voice and data communications with processing power and access to databases.

The driving forces behind the integration of networks are illustrated in Exhibit V-3. The primary goal is to meet user business and communication requirements.

EXHIBIT V-3



The trend towards integrated networks is driven by internal and external factors:

- Internal driving factors include the need for:
  - Improved business efficiency and consequent cost savings
  - Tactical and strategic competitive advantages
- External driving factors include:
  - Competition between businesses
  - Continuing availability of new technology—such as packet switching, fibre optics and increasingly powerful network terminals
  - The emergence of standards for interconnection and data interchange

Networks are becoming increasingly more complex in terms of their configuration and traffic demands.

C

Key Vendor Issues

The key issues raised by vendors are listed in Exhibit V-4.

EXHIBIT V-4

Key Vendor Network Service Issues

Vendor Issue	Importance Rating
• Need to work in multivendor environment	High
- Connectivity	
- Compatibility	
- Definition of responsibilities	
• Need for a wider range of skills	High
- Multivendor systems	
- Increased software orientation	
- Skill shortages	
• Compatibility of software	Medium
- Old/new	
- Revision levels	
- Multivendor	
• Need to structure a wider-ranging service	Medium
- Hardware becoming more reliable	
- Other services offer more opportunity	

1. Multivendor Environments

The major issue raised by vendors is the need to work in a multivendor environment. A network may contain equipment and software supplied by a number of vendors—for example, ICL and Nixdorf equipment, and ICL and Novell software.

Connectivity and compatibility between different suppliers' equipment and software can create difficult problems for service vendors. Often the

resolution of problems of this type may require referral to the original manufacturer. Service engineers require a higher degree of skill to perform successfully in a multivendor environment.

A further problem that can arise in multivendor environments is disputes between suppliers as to the cause of specific problems. Disputes indicate a need for very clear definition of responsibilities between suppliers and the user, but unfortunately these definitions are often less than clear. Service personnel are required to manage these situations while maintaining credibility and user confidence.

2. Wider Range of Skills

The need for a wider range of skills can be summarised as follows:

- Engineers working in the multivendor environments that are typical of networking require higher levels of skill to service multivendor equipment and software and to be capable of resolving equipment and software compatibility problems.

- Working in a network environment requires a higher degree of software orientation than that normally required by customer services. Vendors claim that network equipment is very reliable and that most problems that arise are software-related. Because of the complex nature of the network environment, resolution of software problems can provide a significant challenge to customer services.

- Consistent with the need for higher skill levels, vendors are concerned with their ability to recruit and train personnel at the level necessary to satisfy increasing requirements for network services.

3. Software Compatibility

The mixing of different revisions of software within networks can cause problems for service vendors. Problems can arise in a number of ways—for example, different revision levels of systems software installed in two interconnected networks. In this situation the service engineer must resolve compatibility problems by patching or by defining problems for the supplier to provide resolution.

Mixing of multivendor software within networks can cause similar problems that are complicated by the need to interface the software.

Further problems can be caused by mixing older application software with new software. An example is when the user implements a new application that is not necessarily intended to run on an older revision of the system software. Problems can also arise when networking software is required to interface with other software within the computer system.

Software compatibility problems tax the skill level of service engineers and underline the need for improved skills and a higher degree of software orientation.

4. Need for a Wider Range of Services

The need to provide a wider range of services was raised as an issue by vendors in recognition that network equipment is inherently reliable and offers less opportunity for traditional customer services to service vendors. The result of this equipment reliability is to cause vendors to look towards nonequipment maintenance for revenue growth and service opportunities. Part of the issue is the need to invest in training and skill levels in order for the vendor to be positioned to take advantage of opportunities that range outside the traditional skills of customer services.

D

Service Development

Vendors were asked to identify key factors that, in their opinion, would influence the development of network service. Exhibit V-5 lists the major factors that emerged from vendor interviews.

1. Influence of Standards

The increasing move towards open standards for computer systems and networks such as OSI and UNIX were considered by vendors to influence the development of service. Standards will increase competition between equipment vendors for service contracts and also tend to open the market to independent service vendors as vendors compete to service similar installations. A further impact of standards is likely to be an increase in user requirements for flexibility of service offerings.

2. Growth of Networking

Growth of networking because of the factors listed in Exhibit V-5 will also create an influence on service development. Vendors cautioned that user expectations of service could exceed the vendor's ability as a result of limitations being imposed by availability of skills/resources and user demand for transparent access to the network. Vendors felt that the attitude of the PTT organisations was critical to the development of service and suggested that user pressure may force a more flexible attitude. Management of PTT service is seen as an opportunity by vendors but would need a wider understanding of the communications environment.

EXHIBIT V-5

Customer Services
Network Service Development
Influencing Factors

- Availability of standards
  - OSI
  - Turnkey solutions
  - Data interchange
- Growth of networking
  - Increased installed base
  - Increased use
  - Merging of voice/data/graphics
- Development of purpose-built buildings
- Relationships between vendors and users
  - Business planning
  - Security
  - Confidentiality
- Development of service technology
  - Service delivery methods
  - Remote management and monitoring
  - In-built diagnostics

3. Intelligent Buildings

The development of purpose-built buildings (intelligent buildings) was considered by vendors to offer opportunities for network and cabling installation services. A negative aspect of this trend is the likely competition, in these areas, from project management and contracting companies.

4. User Relationships

In order to plan and provide long-term service contracts, vendors felt a need to develop secure relationships with users. The purpose of these relationships is that the two parties would enter into confidentiality agreements in which the user would provide long-term visibility of business plans in return for access to the vendor's long-term strategies, directions and product plans.

5. Service Technology

Implementation and growth of service technology would also have an impact on the development of network service. These developments related to the delivery of service changing as a consequence of remote network management and monitoring and embedded diagnostic aids within network equipment. However, based on some of the comments made by users, vendors may need to approach these areas with caution. The views of some users retain a degree of cynicism whilst accepting that remote techniques may be the correct approach for ensuring smooth network operations.

E

Customer Service Opportunities

1. Wider Opportunities

Exhibits V-6 to V-9 list opportunities for network service available to customer service vendors and include INPUT's opinion on the level of service that could be offered. These levels of service range from providing a service that is shared with the user, to consultancy, to total service.

Exhibit V-6 lists the opportunities available during the engineering and design phase of the network. The network design phase also includes selection of the technology to be used, the architecture/structure of the network and the initial planning of the network to define the capacity requirement.

Exhibit V-7 lists the opportunities available during the project management phase of the network. This phase includes the preparation of specifications, analysis and source selection, and procurement.

Exhibit V-8 lists the opportunities available during the network implementation phase. This phase includes planning, scheduling, ordering, installation and testing. It is during this phase that the service vendor may also have the opportunity to undertake project management responsibility. More details of this opportunity are provided in section E-3 of this chapter.

Exhibit V-9 lists the opportunities for providing network operations service once the network is installed and running.

EXHIBIT V-6

Network
Engineering and Design Activities

Aspect	Customer Service Opportunity
Network Design	Consultancy
Network Control Centre Design	Consultancy
Facilities Design	Consultancy

EXHIBIT V-7

Network
Project Management

Aspect	Customer Service Opportunity
Specification Preparation	Consultancy
Analysis and Source Selection	Consultancy
Project Management	Consultancy
Procurement	Consultancy

EXHIBIT V-8

Network Implementation

Aspect	Customer Service Opportunity
Installation	Total Service
Software Development	Consultancy
Integration	Consultancy
Test and Acceptance	Total Service
Facility Wiring and Cabling	Total Service

EXHIBIT V-9

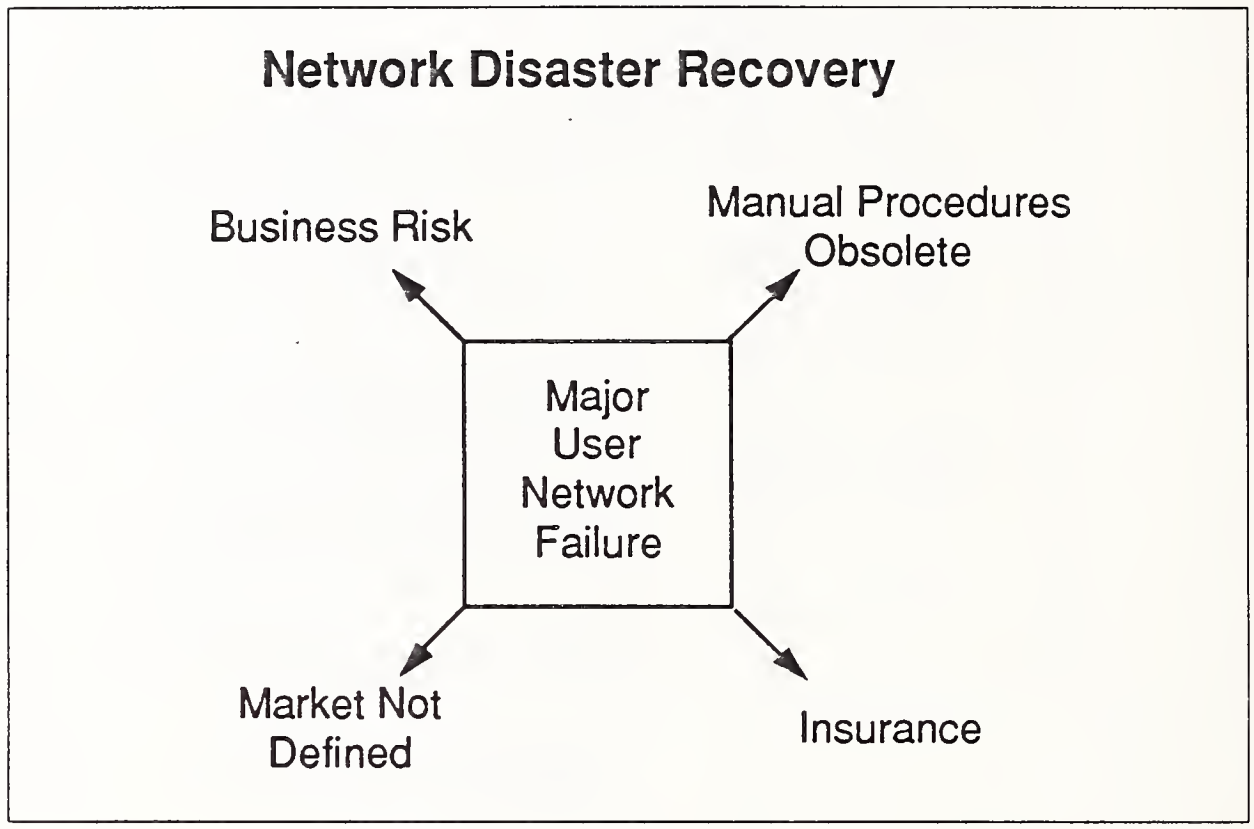
Network Operations

Aspect	Customer Service Opportunity
Network Monitoring	Total Service
Problem Management	Total Service
Communications/PTT Problem Management	Vendor-Managed Service
Network Modification/ Expansion	Shared with User
Terminal Installations	Total Service
Network Operations Staffing	Shared with User
Performance Analysis and Reporting	Total Service
Systems Operations	Shared with User
User Help Desk	Total Service
Equipment Service	Total Service
Systems Software Support	Total Service
Applications Support	Consultancy
Training and Education	Total Service
Disaster Recovery	Total Service

2. Network Disaster Recovery

The key elements resulting from a major user network failure are illustrated diagrammatically by Exhibit V-10.

EXHIBIT V-10



Network disaster recovery is yet to be defined; this fact indicates the opportunity for equipment vendors to play a leading role in the definition. The computer equipment disaster recovery market provides an example of the growth opportunities available. Exhibit V-11 provides data relating to the computer equipment disaster recovery market and highlights the revenue growth opportunities. Because of higher growth in the network equipment market (over 30% CAGR compared with 9% CAGR for computer equipment), potential growth of network disaster recovery is much higher.

EXHIBIT V-11

Computer Equipment Disaster Recovery Market

Market	User Expenditure ($ Millions)		CAGR (Percent)
	1990	1995	
U.S.	400	800	15
Western Europe	180	550	25

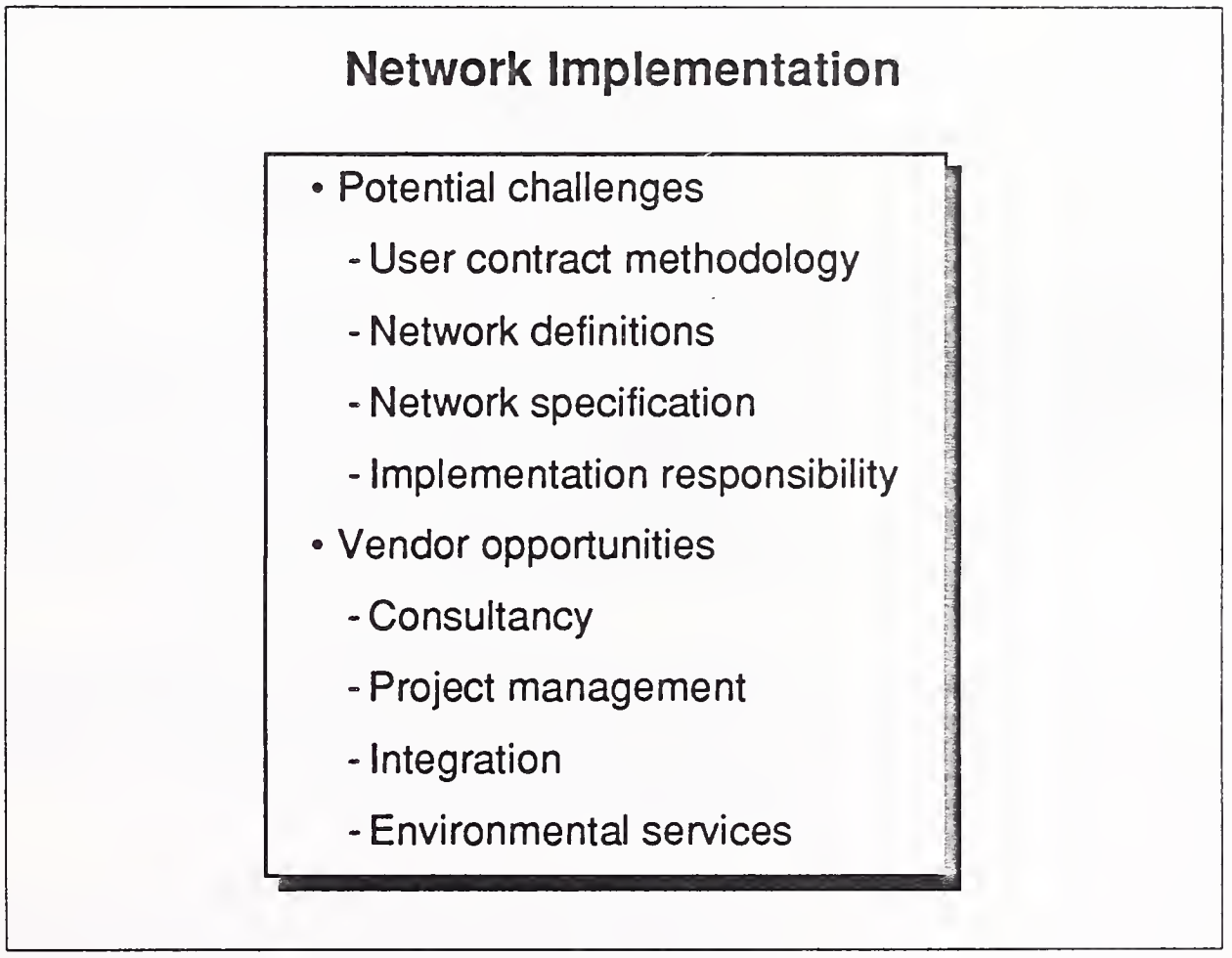
Implementation of networking causes users to implement radical changes in business and office policies and procedures. Once networks are implemented, previous manual procedures become obsolete and are disregarded. Therefore, in the event of a major network failure, the user is unlikely to have any satisfactory manual backup system.

A major network failure has the potential to place the user's business at risk. Users will most likely wish to insure against this risk. This wish presents an opportunity for customer service vendors to provide consultancy services and expertise to the insurance underwriters and to the user, to formulate effective protection plans.

3. Network Implementation

Exhibit V-12 lists the potential challenges that could confront users who implement networks and the consequent opportunities for vendors.

EXHIBIT V-12



Potential problems can occur when a user decides to undertake network implementation without sufficient experience or subcontracts to a number of different suppliers. Problems can arise from a combination of:

- The user's failing to define clearly the responsibilities of the various subcontractors involved and the responsibilities of the user
- The inability of the user to provide clearly defined specifications for the network

- The user's failing to allow for future growth and expansion of the network to meet the developing needs of the business and consequential increases in applications and traffic requirements

These potential problems can result in a network implementation that fails to meet user needs and retains the potential for being a cause of continual service problems and consequent user dissatisfaction.

In situations of this type, vendors can assist the user to ensure that the implementation meets user needs and is successful. Vendors have the opportunity to provide:

- Consultancy services to advise the user of the necessary requirements of defining and specifying the network. Vendors can also define the responsibilities of the various parties involved in implementation.

- Project management services to undertake management responsibility on behalf of the user for implementation of the network

  In undertaking project management responsibility, the vendor creates additional opportunities to gain additional revenue from supplying the resources required for installation, cabling, testing and integrating the network with the user's computer system.

F

Customer Service Challenge

Exhibit V-13 illustrates in diagrammatic form the challenge facing service vendors, derived from data relating to the source of service for the sample of users interviewed. The purpose of this form of presentation is to indicate the magnitude of the challenges presented to customer service vendors and the opportunities available. The data are presented as an average for the user sample.

Opportunities relate to the 10% (on average) of users that would like to contract additional services to vendors. These opportunities could be considered modest—although the interest levels are medium/high, the percentage of users is low.

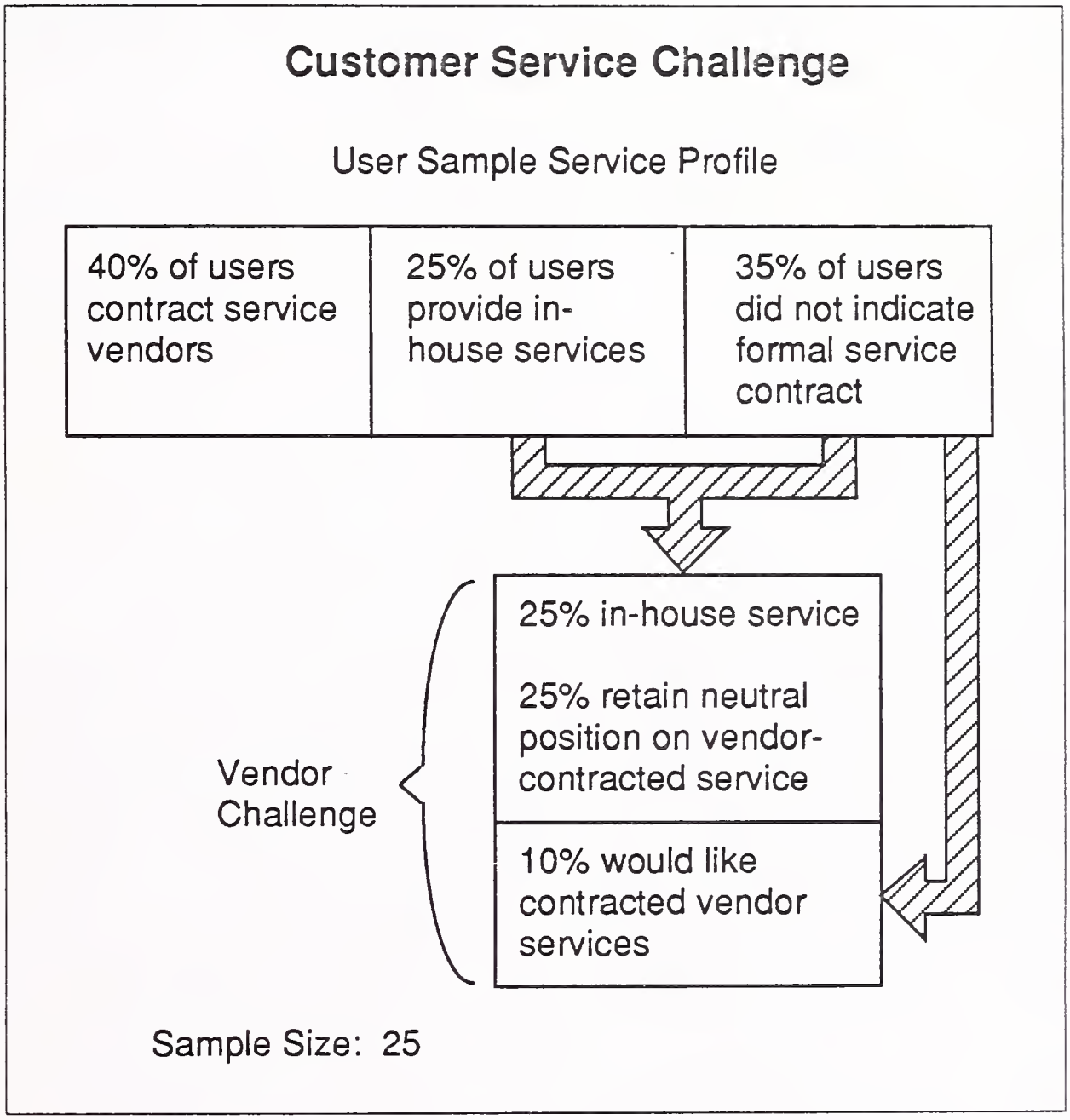
The challenge to vendors is related to successful penetration of the remaining 50% of users that in the main do not have vendor-contracted services. This portion of users divides equally:

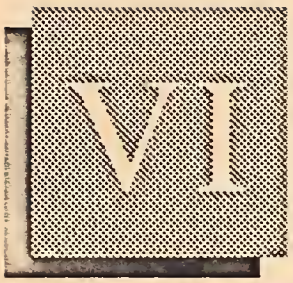
- About 25% of users provide service using in-house resources.

- About 25% of users retain a neutral position relative to vendor-contracted services.

Success in penetrating this portion of the market likely represents a more significant opportunity for vendors, even though penetration may be difficult.

EXHIBIT V-13





Recommendations for Customer Service

VI

Recommendations for Customer Service

A Vendor Recommendations

INPUT's recommendations for vendors are listed in Exhibit VI-1 and can be summarised as follows:

EXHIBIT VI-1

Vendor Recommendations

- Develop flexible offerings to meet a wide variety of user needs
- Implement training and investment to develop a full range of skills
- Promote services at initial negotiation phase
- Market network uptime and user access

- Invest in the training and recruitment of people having the required skill levels in order to be positioned to provide as full a range of network services as possible. To enable vendors to take full advantage of network services opportunities, INPUT recommends a proactive response to skill requirements.

- Develop a wide range of service offerings to meet the wide range of user requirements. Vendors should also structure a range of flexible service offerings to satisfy the differing needs of individual users.

- A key user need is for transparent access to the network on demand. In response, vendors should develop services to meet these needs and promote uptime and access.

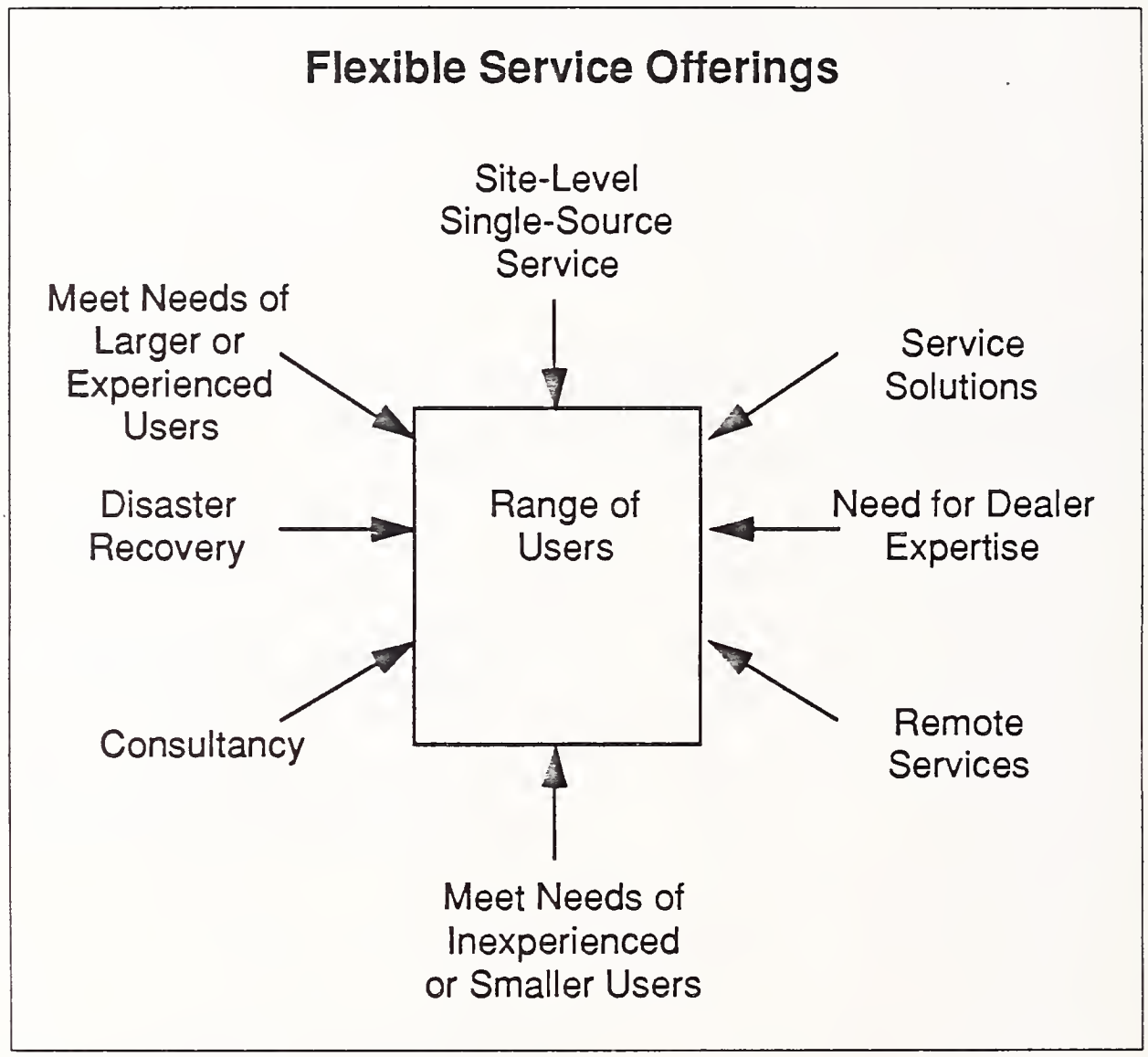
- Service should be promoted to users at the initial negotiation phase of network implementation. User interest in vendor service is likely to be higher initially, therefore increasing the vendor opportunity for contracted services.

B

Flexible Service Offerings

Exhibit VI-2 provides a diagrammatic representation of the elements of a flexible service package.

EXHIBIT VI-2



The installed base and future implementation of networks cover a wide range of users—from large corporations to small companies, and from experienced to inexperienced users. The service requirements of these users also span a wide range, from basic equipment maintenance to total-solution service.

Vendors should structure their service offerings to cover this range of user requirements. Delivery of service can be achieved either through direct channels or through dealer channels. If service to smaller users is provided through dealer channels, the vendor should ensure that a sufficient level of expertise is available.

The flexibility and range of services offered can be extended by the addition of consultancy, project management and disaster recovery services.

The key factor is that the service offered should be sufficiently flexible to closely match the needs of individual users.

C

Approach to Systems Operations

The attitude of users to vendor-provided systems operations service is mixed.

INPUT recommends that vendors take a flexible approach in structuring a systems operation service. Exhibit VI-3 lists a selection of differing levels of systems operations service that could be offered to users and that would match a wide range of user requirements and budgets. These levels vary from the vendor's taking full responsibility to a consultancy level of service.

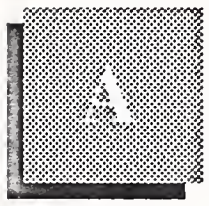
EXHIBIT VI-3

Approach to Systems Operations

- Full vendor responsibility
- Shared responsibility with user
- On-site
- Shared between sites
- Consultancy level

When approaching larger users who may be resistant to losing control of systems operations, a shared responsibility may prove to be an acceptable solution. However, in the case of the smaller user who needs a system operations service, but who also has a limited budget, the vendor has an opportunity to structure a service that can be shared between a number of users.

Appendixes



Appendix: User Questionnaire

A

All Interviews

1. Do you have a local-area network (LAN)?
   Yes/No

2. What type of LAN is it?
   (i.e. Novell, Ethernet etc.)

   _____

3. (a) How many terminals or users does the network serve?

   _____users/terminals

   (b) What type and quantity of terminals do you use?

   _____ Dumb Terminals

   _____ Intelligent Terminals
   (PC or Workstation)

4. Who provides service to your LAN?
   (Please circle)

   - Principle equipment manufacturer 1
   - One of the equipment manufacturers 1
   - Dealer/Distributor 1
   - TPM/Independent company 1
   - Software house 1
   - In-house 1

5. Is your service vendor contracted to provide the following services to your network (LAN)?

   If not, which would you like your service vendor to provide and what is your level of interest (LOI) on a scale of 1 - 10?

	Contracted	Would Like	LOI
a) Hardware maintenance	1	1	_____
b) Network software support:			
- Operating system	1	1	_____
- Applications	1	1	_____
c) Network monitoring	1	1	_____
d) Network operation	1	1	_____
e) Network evaluation			
- Communications	1	1	_____
- Applications	1	1	_____
f) Network customising	1	1	_____
g) Network planning	1	1	_____
h) Facilities management of your network	1	1	_____

B

In-Depth Interviews

6. What do you feel are the major issues relating to network service, both current and potential?

   i) Current

   _____

   _____

   _____

   _____

   ii) Potential

   _____

   _____

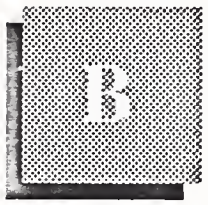
   _____

   _____

7. How do you envisage future trends in network services developing, and what would you anticipate future user requirements to be?

8. Is there, in your opinion, a single key factor that will influence future LAN service development?

9. Are there any other factors of key importance related to LAN service?



Appendix: Vendor Questionnaire

1. What do you feel are the major issues relating to network service, both current and potential?

   i) Current

   ii) Potential

2. How do you envisage future trends in network services developing, and what would you anticipate future user requirements to be?

3. Is there, in your opinion, a single key factor that will influence future LAN service development?

4. Are there any other factors of key importance related to LAN service?

Report Quality Evaluation

To our clients:
To ensure that the highest standards of report quality are maintained, INPUT would appreciate your assessment of this report. Please take a moment to provide your evaluation of the usefulness and quality of this study. When complete, simply fold, staple, and drop in the post.

Thank You.

1. Report title: ***The Challenge of Network Service In Customer Service*** (CESIN)

2. Please indicate your reason for reading this report:
   - ☐ Required reading
   - ☐ Area of high interest
   - ☐ Area of general interest
   - ☐ New product development
   - ☐ Business/market planning
   - ☐ Product planning
   - ☐ Future purchase decision
   - ☐ Systems planning
   - ☐ Other _____

3. Please indicate extent report used and overall usefulness:

	Extent		Usefulness (1=Low, 5=High)				
	Read	Skimmed	1	2	3	4	5
Executive Overview	☐	☐	☐	☐	☐	☐	☐
Complete report	☐	☐	☐	☐	☐	☐	☐
Part of report (_____ %)	☐	☐	☐	☐	☐	☐	☐

4. How useful were:

Data presented	☐	☐	☐	☐	☐
Analyses	☐	☐	☐	☐	☐
Recommendations	☐	☐	☐	☐	☐

5. How useful was the report in these areas:

Alert you to new opportunities or approaches	☐	☐	☐	☐	☐
Cover new areas not covered elsewhere	☐	☐	☐	☐	☐
Confirm existing ideas	☐	☐	☐	☐	☐
Meet expectations	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

6. Which topics in the report were the most useful? Why? _____

_____

7. In what ways could the report have been improved? _____

_____

8. Other comments or suggestions: _____

_____

Name _____ Title _____

Department _____

Company _____

Address _____

Country _____

Telephone _____ Date completed _____

Thank you for your time and cooperation.

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