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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.

Continuous-information advisory services, proprietary research/consulting, merger/acquisition assistance, and multiclient studies are provided to users and vendors of information systems and services (software, processing services, turnkey systems, systems integration, professional services, communications, and systems/software maintenance and support).

Many of INPUT's professional staff members have more than 20 years' experience in their areas of specialisation. 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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A Publication from INPUT's Customer Service Programme—Europe

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 *Network Support—A Customer Services Opportunity* 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.

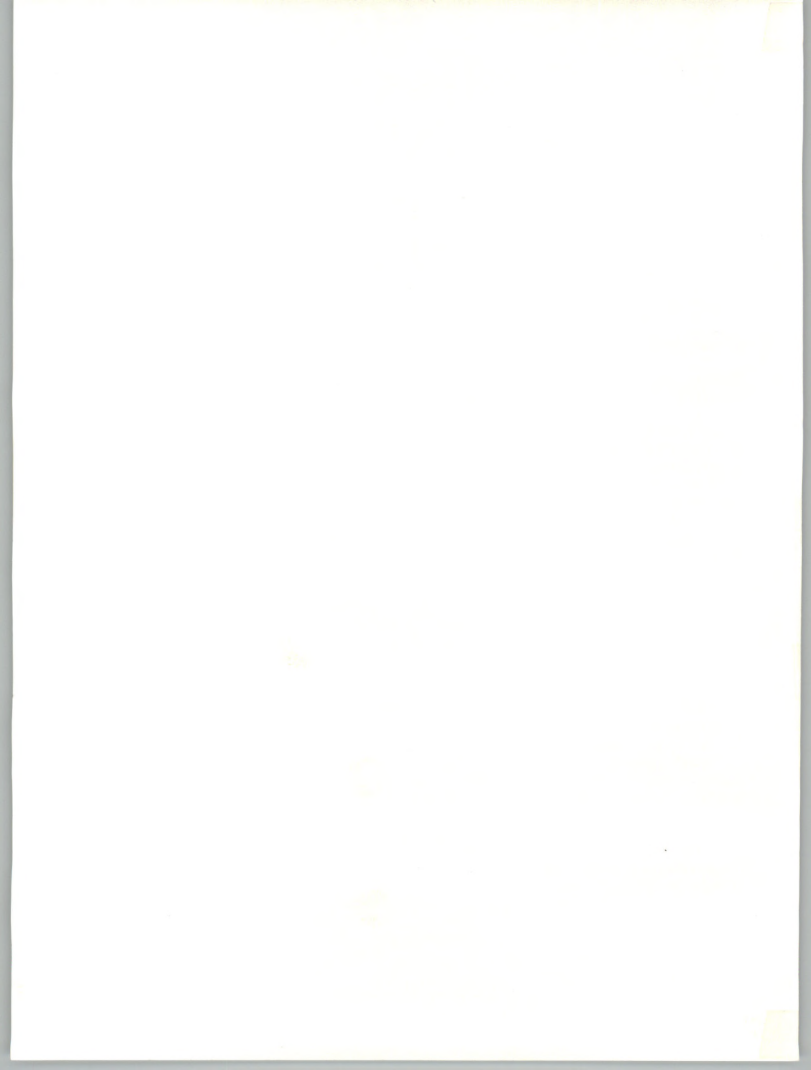
A high proportion of vendors have made little progress in addressing the key issues and the full scope of network services

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.



Full Support—The Key to Network Customer Services

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

The full network support opportunities for customer services are summarised in Exhibit 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.

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.



Network Services Market Growth, 1990-1995

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

Exhibit 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.

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.

the first part of the paper, the authors discuss the importance of the study of the history of the region.

The second part of the paper is devoted to a detailed description of the geographical features of the region.

In the third part, the authors analyze the economic and social conditions of the region.

The fourth part of the paper discusses the political and administrative organization of the region.

In the fifth part, the authors discuss the cultural and historical heritage of the region.

The sixth part of the paper discusses the current situation of the region and the challenges it faces.

In the seventh part, the authors discuss the future prospects of the region.

The eighth part of the paper discusses the role of the region in the national development.

In the ninth part, the authors discuss the role of the region in the regional development.

The tenth part of the paper discusses the role of the region in the global development.

In the eleventh part, the authors discuss the role of the region in the world development.

The twelfth part of the paper discusses the role of the region in the human development.

In the thirteenth part, the authors discuss the role of the region in the sustainable development.

The fourteenth part of the paper discusses the role of the region in the economic development.

In the fifteenth part, the authors discuss the role of the region in the social development.

The sixteenth part of the paper discusses the role of the region in the cultural development.

In the seventeenth part, the authors discuss the role of the region in the political development.

The eighteenth part of the paper discusses the role of the region in the administrative development.

In the nineteenth part, the authors discuss the role of the region in the historical development.

The twentieth part of the paper discusses the role of the region in the geographical development.

In the twenty-first part, the authors discuss the role of the region in the economic development.

The twenty-second part of the paper discusses the role of the region in the social development.

In the twenty-third part, the authors discuss the role of the region in the cultural development.

The twenty-fourth part of the paper discusses the role of the region in the political development.

Network Services Market Growth Factors

- Market drivers
 - Increasing service base
 - New applications
 - User service needs
- Market inhibitors
 - >25% of users opt for self-service
 - User acceptance of service need
 - Limited opportunities for traditional customer services

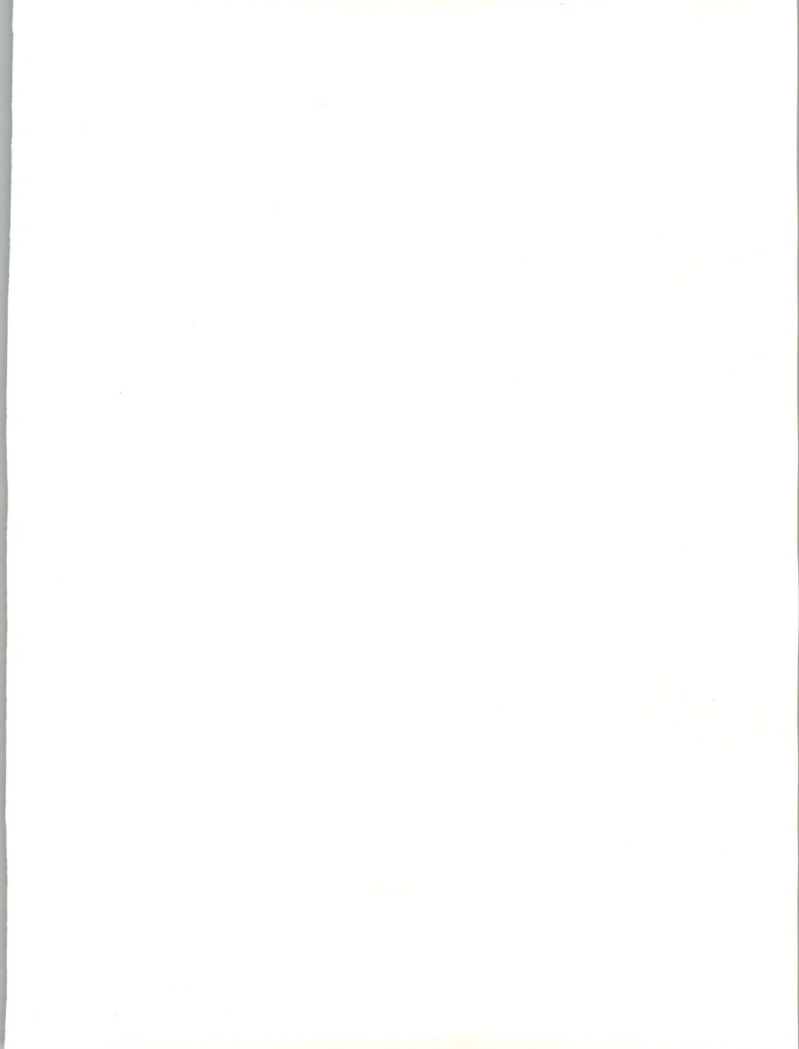
Factors that influence the growth of network services are listed in Exhibit 3.

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.

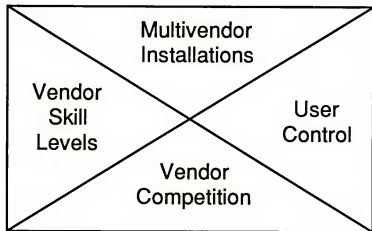
Part of the growth in the installed base of networks is driven by new user applications; the result is an influence on the growth of user service needs.

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.



Network Services Environment



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

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 5 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.



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

Servicing of computer systems and networks requires a different mix of skills. Exhibit 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.

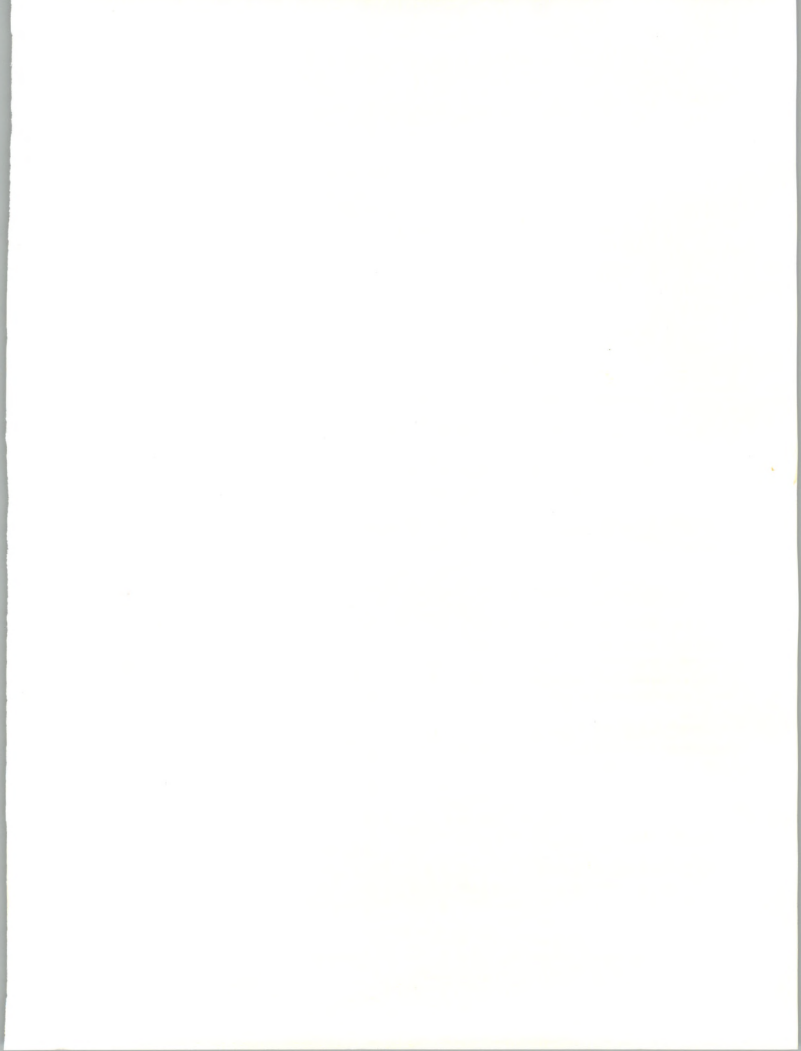
- Equipment maintenance plays a less-significant role because of the relative high reliability of network equipment.
- More emphasis is placed on the need for software orientation and consultancy skills. The reason for this emphasis is the need to support users who implement networks, particularly less experienced users, and to provide the

specific type of support required by networks.

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.



Network Services Users Have a Wider View

- Users:
 - Do not discriminate between types of network and computer centres
 - Consider terminals as access to computing power
- Vendors:
 - 50% of vendors retain a product orientation
 - Tend to exclude devices as part of the network

As indicated by Exhibit 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.

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.

the 1990s, the number of people with a mental health problem has increased in the UK (Mental Health Act 1983, 1990).

There is a growing awareness of the need to improve the lives of people with mental health problems. This has led to a number of initiatives, including the development of self-help materials (e.g. *Living with a Mental Health Problem*, 1997).

The purpose of this paper is to describe the development of a self-help manual for people with a mental health problem. The manual is designed to help people understand their condition, and to provide them with information on how to manage their condition.

The manual is divided into two main sections. The first section is entitled 'Understanding your condition' and the second section is entitled 'Managing your condition'.

The first section is designed to help people understand their condition. It covers a range of topics, including the symptoms of mental health problems, the causes of mental health problems, and the different types of mental health problems.

The second section is designed to help people manage their condition. It covers a range of topics, including how to cope with symptoms, how to seek help, and how to live with a mental health problem.

The manual is written in a simple, easy-to-understand style. It is designed to be accessible to people with a range of literacy skills.

The manual is available in both print and electronic formats. It is available free of charge to people who are registered with a mental health service.

The manual is a valuable resource for people with a mental health problem. It provides them with the information they need to understand their condition and to manage their condition.

The manual is a result of a collaborative effort between a number of organizations, including the Department of Health, the Mental Health Act Commission, and a number of mental health service providers.

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Key User Network Services Needs

- Network access
- Improved dealer expertise
- Flexible service offerings
- Single point of contact

Exhibit 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.

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.

Network Services Systems Operations

- 30% of users provide in-house service
- <20% of users require vendor service
- Users are reluctant to relinquish responsibility

Exhibit 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.

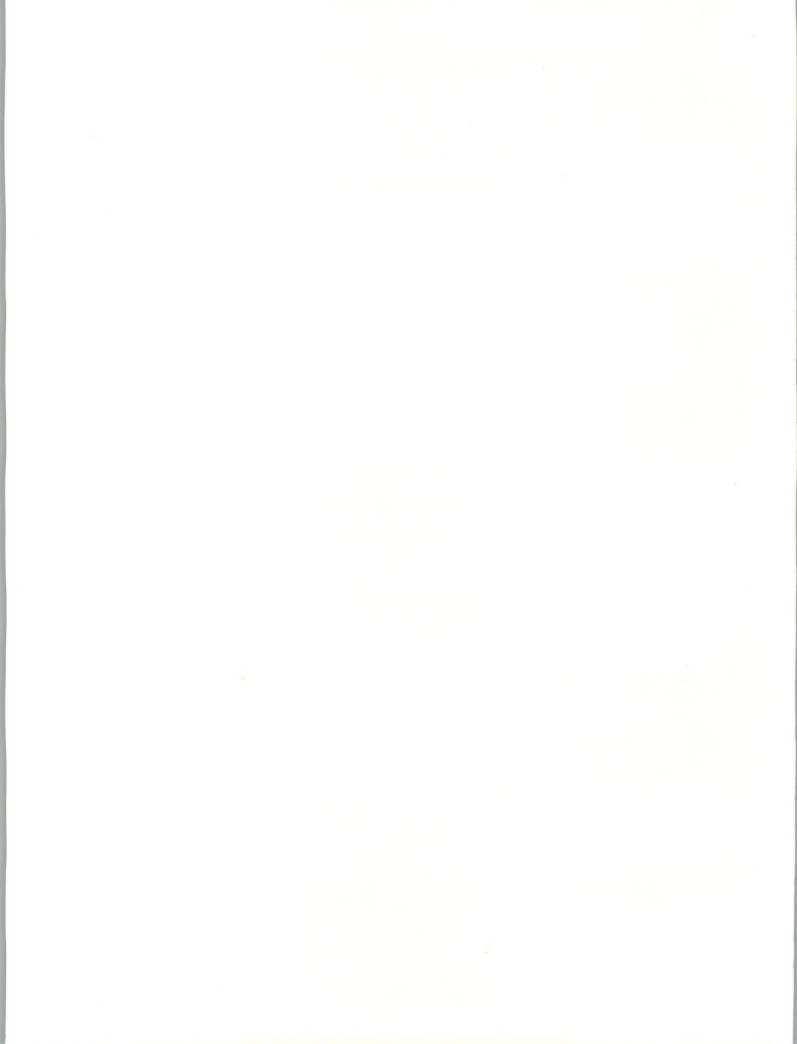
User attitudes to vendor-provided systems operation are mixed:

- 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.



User Source of Network Services

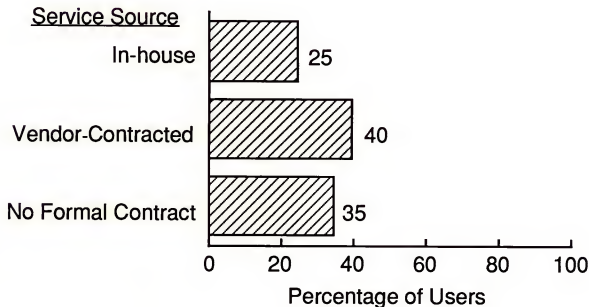


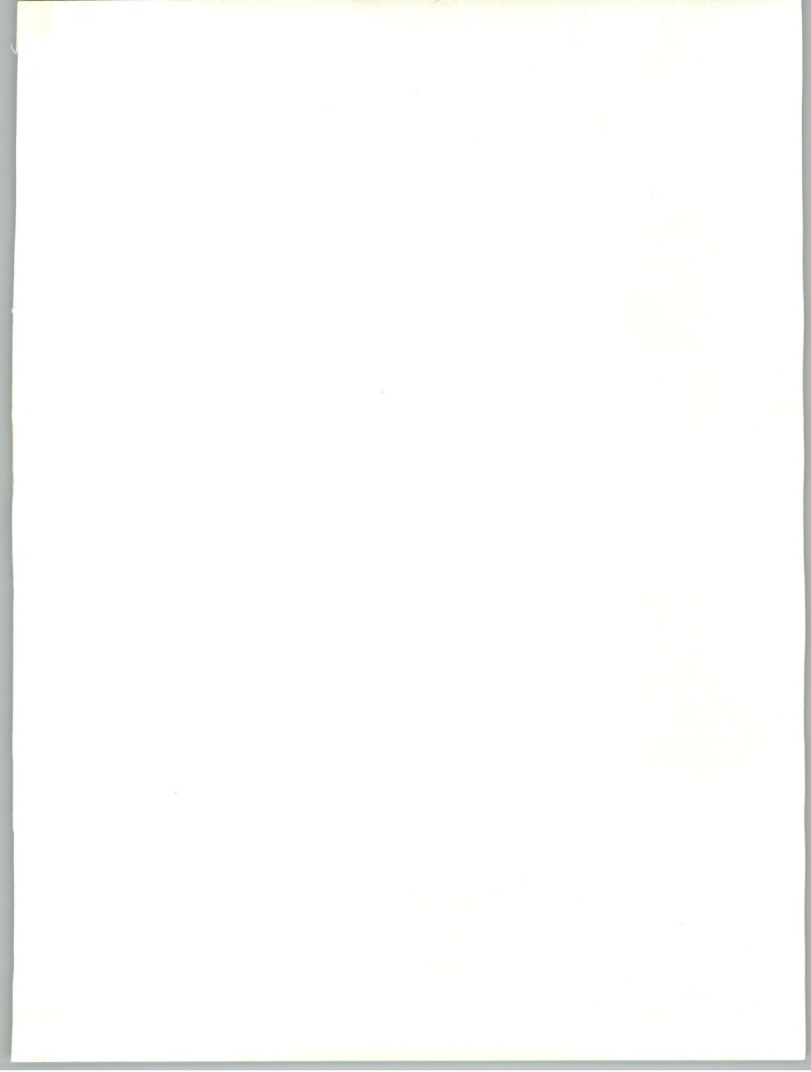
Exhibit 9 illustrates the source of network services reported by the sample of users. This exhibit indicates that 65% of network services are provided by either in-house resources or vendor-contracted services. These figures have been averaged from a range of services.

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.



Key Vendor Issues

- Working in a multivendor environment
 - Equipment compatibility
 - Equipment connectivity
 - Definition of responsibilities

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 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.

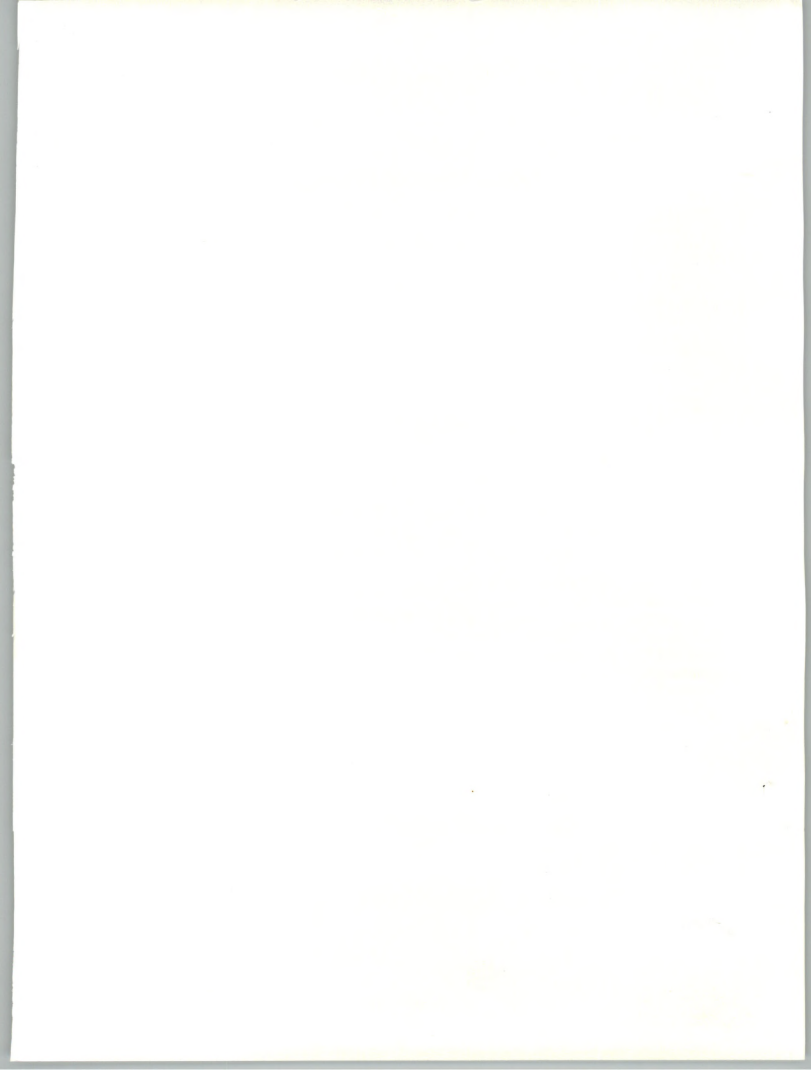


Key Vendor Issues

- Compatibility of software
 - Revision levels
 - Old versus new
 - Multivendor software

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



Key Vendor Issues

- Wider range of skills
 - Multivendor systems
 - Increased software orientation
 - Skill shortages

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

Network Services Wider Opportunities

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

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

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

the 1990s, the number of people in the world who are undernourished has increased from 600 million to 800 million. The number of people who are malnourished has increased from 1.2 billion to 1.5 billion. The number of people who are obese has increased from 100 million to 300 million.

There are a number of reasons for this. One is that the world population has increased from 5 billion to 6 billion. Another is that the world population is becoming more urban. A third is that the world population is becoming more affluent. A fourth is that the world population is becoming more educated. A fifth is that the world population is becoming more mobile.

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Vendor Opportunity Network Disaster Recovery

- Continuation of user business activities
- Radical changes in business procedures—no backup
- Need for insurance expertise
- Market not yet defined

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

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.

An opportunity exists for vendors to provide disaster recovery services to protect users against major network failures.

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.



Computer Equipment Disaster Recovery Market

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

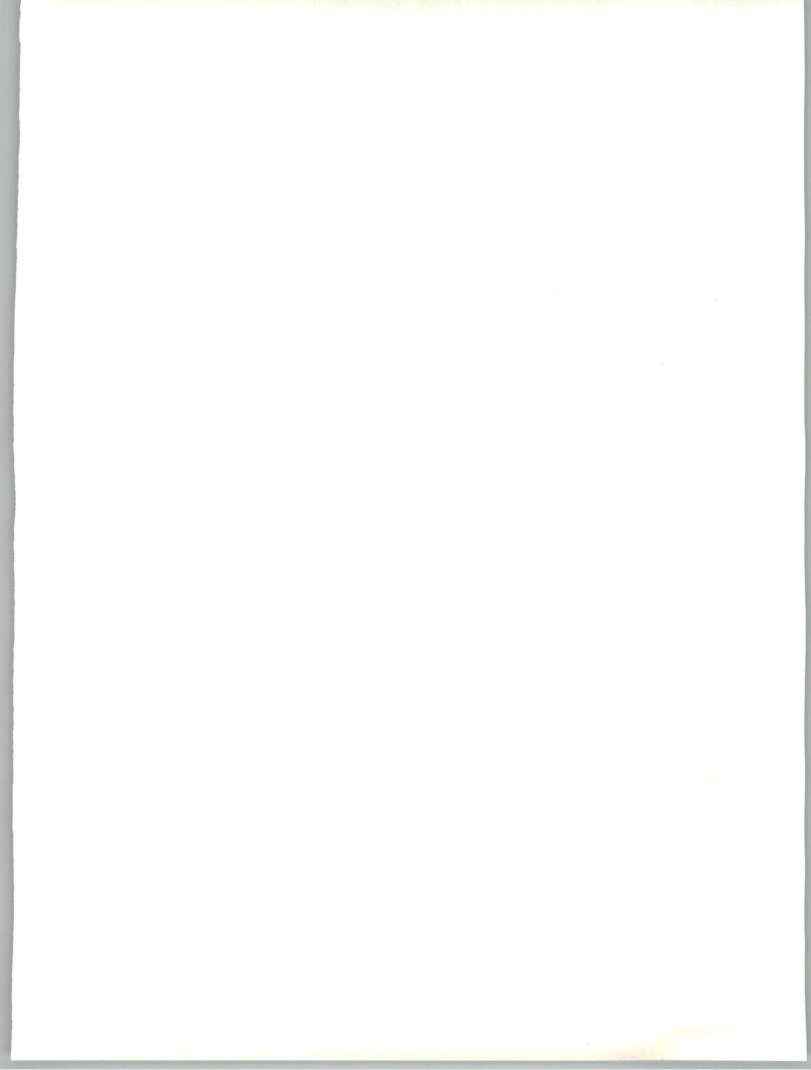
As the network disaster recovery market has yet to be defined, an opportunity exists for vendors to play a leading role in its definition and implementation. Exhibit 15 provides an example of the revenue and growth opportunities presented by disaster recovery. These forecasts are related to computer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

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.



Network Implementation Challenges

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

The implementation of a network can pose special challenges for users; these challenges are listed in Exhibit 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.

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.

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Network Implementation Opportunities

- Consultancy
- Project management
- Integration
- Environmental services

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

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.



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

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

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.

This Research Bulletin is an excerpt from a full research report issued as part of INPUT's Customer Service Programme—Europe. If you have questions or comments on this bulletin or wish to purchase the report, please contact Peter Lines at INPUT, Piccadilly House, 33/37 Regent Street, London SW1Y 4NF, England. Tel. (071) 493 9335, Fax (071) 629 0179

