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STRATEGIC MARKET PERSPECTIVE

**Client/Server Impact on
Major Project Contracting
Europe**

1993-1998

Systems Integration Programme – Europe



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CLIENT/SERVER IMPACT ON MAJOR PROJECT CONTRACTING

EUROPE, 1993-1998

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Abstract

Systems integration projects are evolving from large bespoke development projects to projects based around the assembly of standard software products and kernels. The emergence of client/server technology is also changing the nature of projects and the skills required by vendors. In particular, multivendor networking skills are becoming a key requirement. At the same time, client/server technology offers the ability to address ill-structured tasks outside the scope of conventional information systems, and to improve methods of office work.

This report analyses the impact of client/server technology on the systems integration and professional services markets. It provides market forecasts, identifies client service requirements, and analyses client attitudes towards vendors.

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Systems Integration Programme - Europe

*Client/Server Impact on Major Project Contracting
Europe, 1993-1998*

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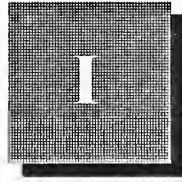
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Introduction

A

Objectives

Systems integration remains one of the fastest growing segments of the European information services market. However, the emergence of client/server technology will have a major impact on the nature of this market.

IS managers perceive that client/server technology will assist them in integrating applications, providing multivendor interoperability, and achieving rapid application development.

Departmental managers perceive that client/server technology will free them from the constraints of the IS department, provide their staff with more effective ways of working, and increase the flexibility of their information systems.

This report monitors the impact of client/server technology on the systems integration and professional services markets, including:

- Forecasting the size of the client/server-related components of these markets
- Identifying the impact of the technology on the role of the IS department
- Identifying the profile of services required by end users and IS managers
- Evaluating client attitudes towards the principal vendor categories

B

Scope and Methodology

Systems integration is a business offering that provides a complete solution to an information system, networking or automation requirement through the custom selection and implementation of a variety of information systems products and services. A systems integrator is responsible for the overall management and control of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function to the agreed schedule and price.

As listed in Exhibit I-1, the components of a systems integration project are the following:

- *Equipment* - includes information processing and communication equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- *Software products* - include prepackaged applications and systems software products.
- *Professional services* - include the value-added component that adapts the equipment and develops, assembles or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement and, if included in the contract, operate an information system, including consulting, programme/project management, design and integration, software development, education and training, documentation and systems operations and maintenance.
- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT I-1

Products/Services in Systems Integration Projects

- Equipment
 - Information systems
 - Communications
- Software Products
 - Systems software
 - Applications software
- Professional Services
 - Consulting
 - Feasibility and trade-off studies
 - Selection of equipment, network and software
 - Programme/project management
 - Design/integration
 - Systems design
 - Installation of equipment, network and software
 - Demonstration and testing
 - Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
 - Education/training and documentation
 - Systems operations/maintenance
- Other Miscellaneous Products/Services
 - Site preparation
 - Data processing supplies
 - Processing/network services
 - Data/voice communication services

The professional services market consists of three principal elements, delivered either individually or in combination, namely:

- IS consulting
- Custom development
- Education and training

The research for this study is based on thirty-eight interviews with managers. These interviews were divided equally between user department managers and IS managers.

The distribution of the interviews by country is as follows:

- United Kingdom - 14 interviews
- France - 12 interviews
- Germany - 12 interviews

For the purposes of this report:

- The term "user" is used to indicate "end user"
- The terms "manager" and "organisation" are used to denote both "end user" and "IS personnel."

C

Report Structure

Chapter II consists of the Executive Overview, which is a summary of the key conclusions of the study.

Chapter III analyses the impact of client/server technology on the systems integration and professional services markets. Market forecasts of the level of client/server-related activity are provided. Leading applications that will be implemented using client/server technology are identified.

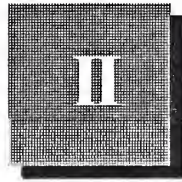
Chapter IV analyses the impact of client/server technology on users. In particular, it considers users' service requirements and their attitudes towards potential suppliers.

Chapter V analyses the impact of client/server technology on IS departments. It considers the changing role of IS departments, their service requirements, and their attitudes towards potential suppliers.

D

Related Reports

- *Impact of Downsizing on Systems Integration—Europe, 1992-1997*
- *Systems Integration Vendor Analysis—Europe, 1992*
- *Methods for Successful Systems Integration Projects—Europe, 1992*
- *Procurement Approaches to Systems Integration—Europe, 1993*
- *Systems Integration Market—Europe, 1993-1998*



Executive Overview

A

Client/Server Technology Fuels Services Growth

Client/server technology is being grasped with great enthusiasm by both users and IS departments. However, the technology is more complex than traditional architectures and its implementation requires a high level of integration skill.

Accordingly, both users and IS departments are turning to external vendors for implementation services, with users additionally requiring high levels of ongoing support. As a result, client/server technology is fuelling services growth.

Since the level of buying intention for systems based on client/server technology is high, client/server technology will have a major impact on the services market:

- Clients will become more reliant on vendors for services.
- Networking and application integration services will increase in importance.
- Client/server-based projects will result in higher levels of competition in the systems integration and professional services markets.

B

Organisations Will Become More Reliant on Vendors' Services

Overall, users and IS managers expect client/server technology to assist them in reducing their information systems expenditure by:

- Reducing equipment costs
- Increasing their level of choice of vendor for products and services
- Reducing the number of personnel within in-house IS departments

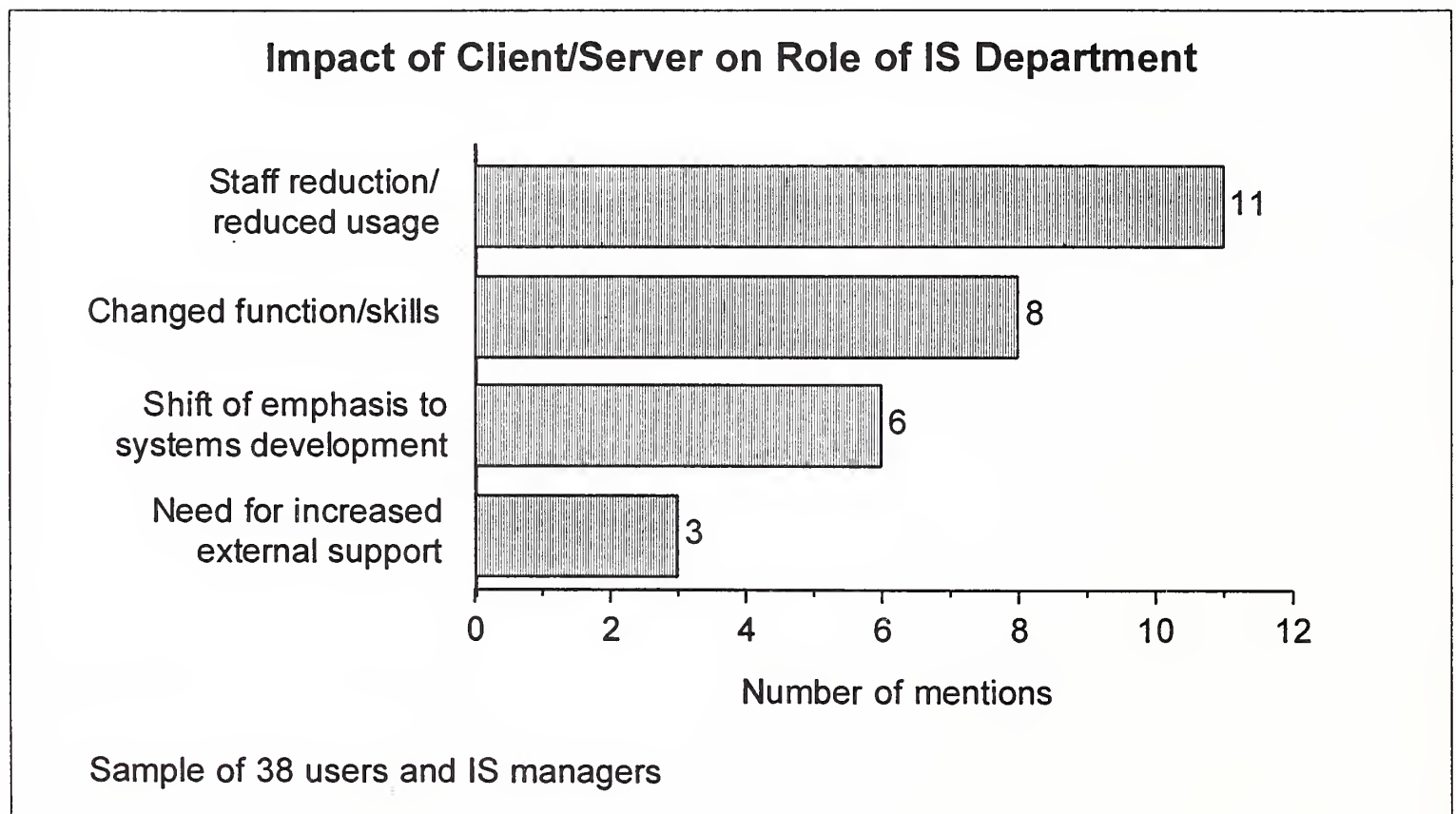
However, they also perceive that use of client/server technology will broaden the range of services they purchase from vendors and lead to their becoming more dependent on vendors for services.

The changing roles of users and in-house IS departments is a major influence on this increased demand for services.

Firstly, users are increasingly taking responsibility for the implementation of departmental applications, and will require extensive external assistance.

Secondly, the in-house IS department will need to purchase significantly higher levels of services than in the past. The expected impact of client/server technology on the role of the in-house IS department is described in Exhibit II-1.

EXHIBIT II-1

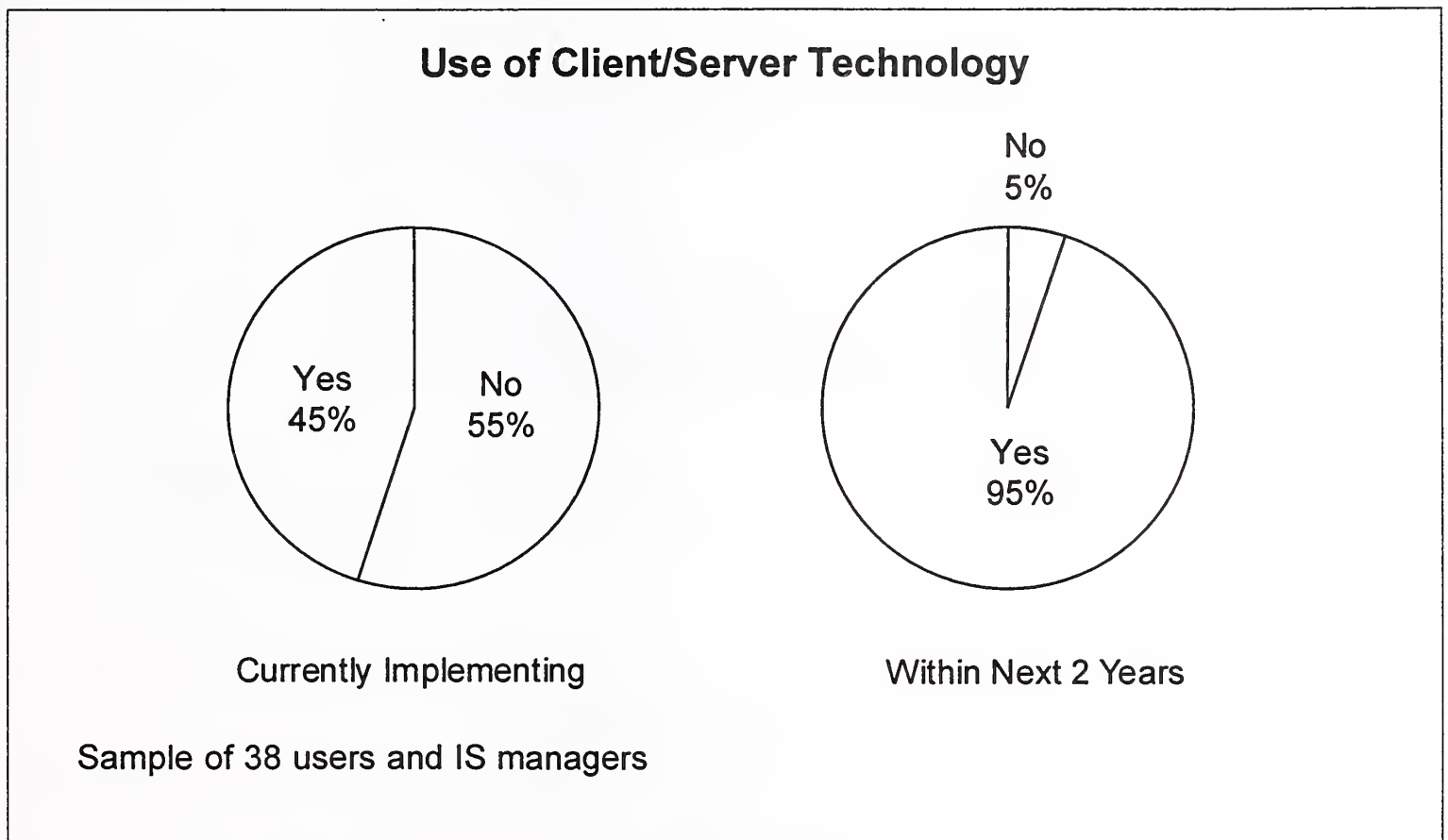


Users and IS managers expect the role of the IS department to change as data centres disappear. In many cases, IS departments will no longer take day-to-day responsibility for computer operations.

Accordingly, organisations will become more dependent on vendors for the provision and support of their IT infrastructures.

In the medium term, IS managers perceive that client/server technology will assist them in meeting their customers' needs for rapid and efficient application development. However, in the short term at least, IS departments will need considerable external support in new systems development. From the perspective of the IS department, this situation is exacerbated by the limited training budgets available to them at a time of considerable technical change.

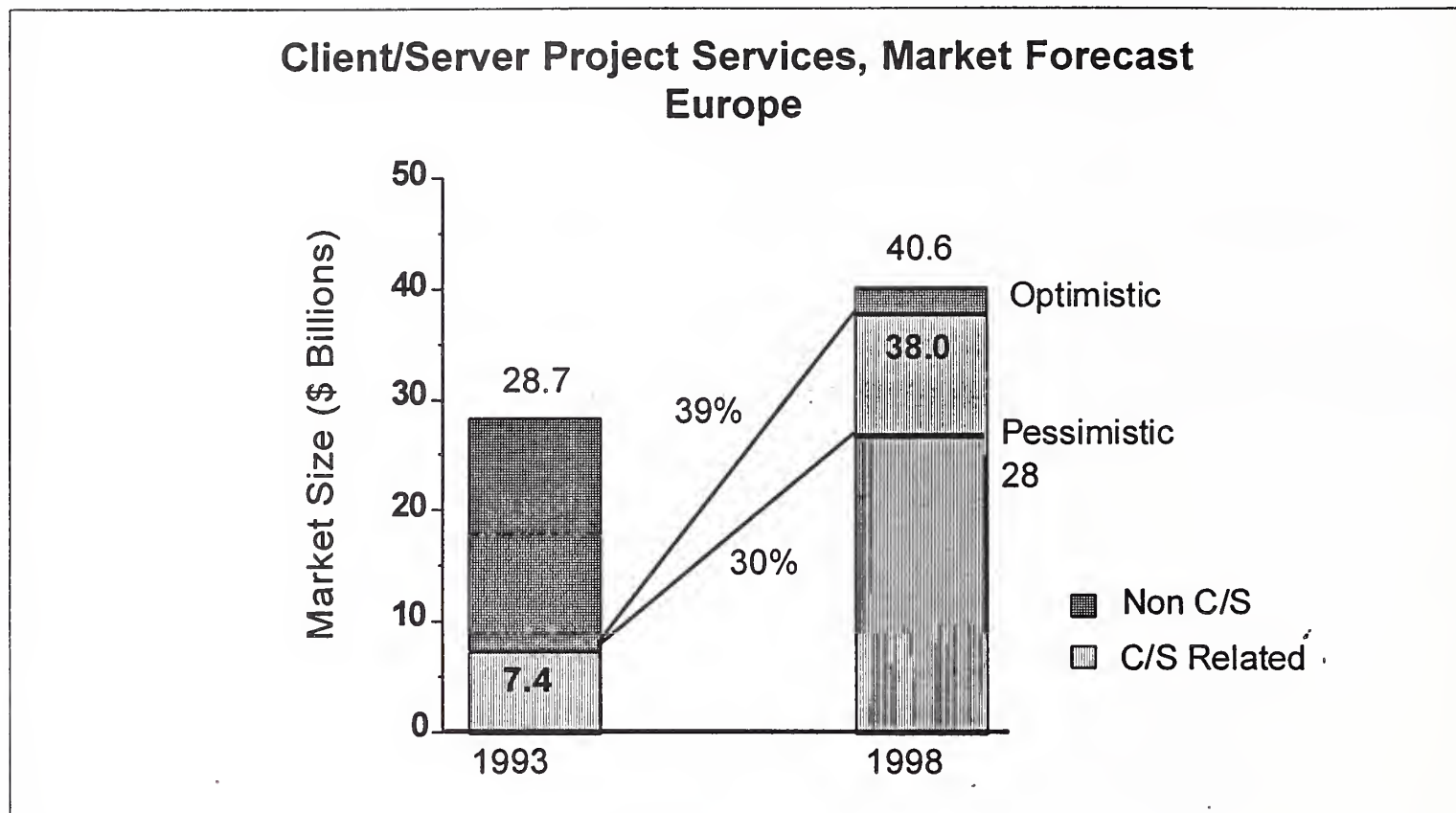
This will have a major impact on project services market growth because client/server-based systems are being adopted by the overwhelming majority of organisations (see Exhibit II-2).

EXHIBIT II-2


Organisations in Europe estimate that 25% of their external spending on information systems over the next twelve months will be incurred on client/server-related projects. INPUT forecasts that by 1998, up to 90% of their external expenditure will be related to client/server technology.

The impact of client/server technology will be even more pronounced in the systems integration and professional services markets, because these markets are primarily concerned with new system development. Pessimistic and optimistic forecasts for these markets are shown in Exhibit II-3.

EXHIBIT II-3



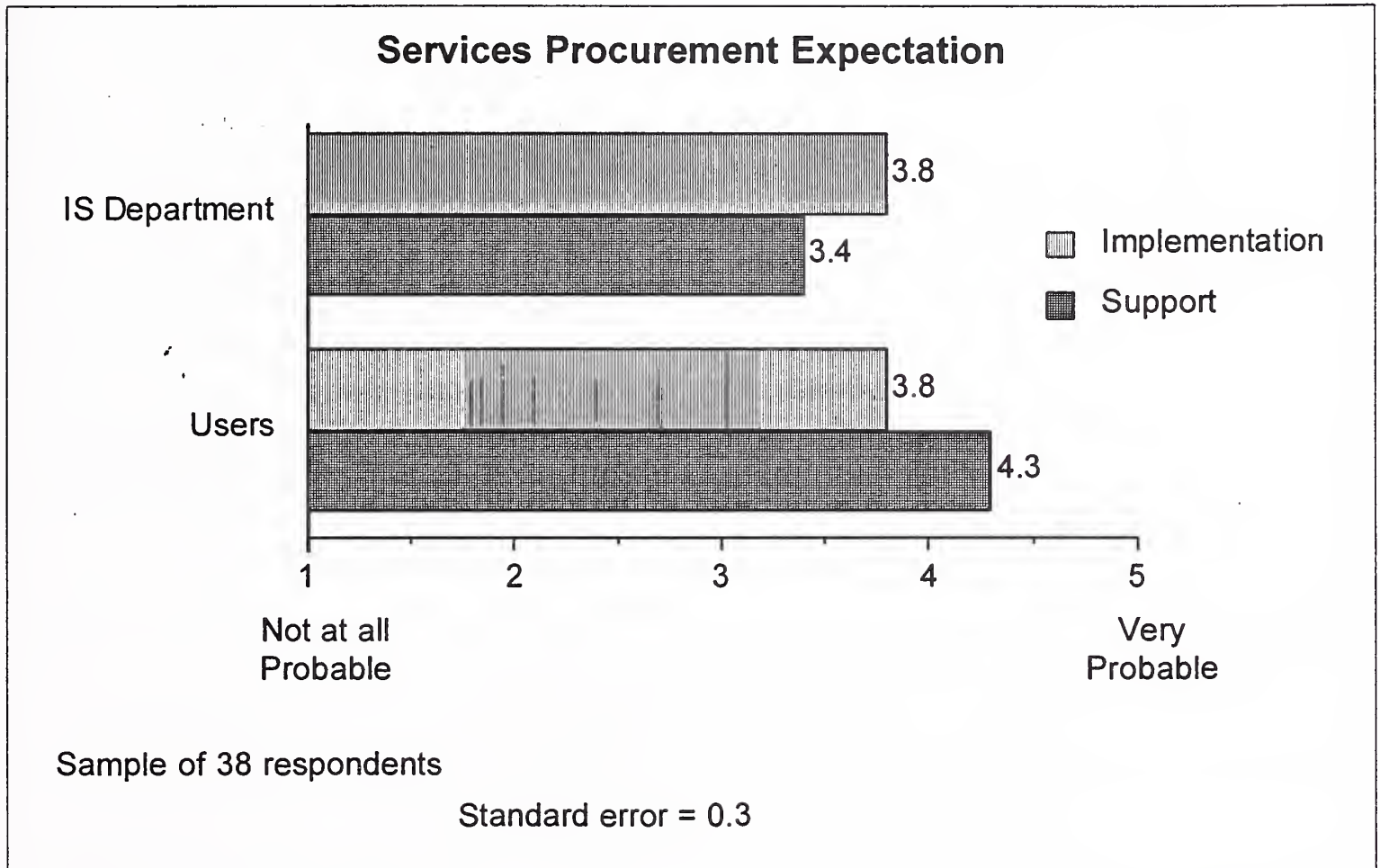
Already fifty percent of the revenues in the European systems integration market are associated with developments based around client/server technology.

C

Integration Services Are a Key Requirement

Exhibit II-4 shows users' and IS managers' expectations of using an external vendor to assist them in implementing and supporting client/server-based systems.

EXHIBIT II-4



Both IS managers and users require vendors to be active in supporting system development and implementation.

However, there are notable differences between the requirements of IS managers and those of users, and also between countries.

IS managers are essentially seeking technical assistance in network design and implementation. Multivendor capability is very important because vendors will frequently be expected to design and implement networks incorporating a wide range of heterogeneous equipment.

Users view this type of service in terms of increased integration and connectivity of systems.

One of the major recent opportunities for vendors has been to provide networks that integrate, and provide easy access to, information from a wide range of existing systems. This has been particularly prevalent in the financial services sector where organisations have been endeavouring to move away from a product-oriented approach in favour of an account-based service culture.

However, in addition to multivendor network integration, users also require consultancy and project management services. In particular, users will frequently expect vendors to provide them with a complete range of system introduction services ranging from consultancy and pilot installations to installation and training.

This trend is most pronounced in the United Kingdom. Here, managers are increasingly aware of the potential of client/server technology to improve working practices, and expect vendors to become extensively involved in business process redesign. The level of need for such services is still comparatively low in France and Germany, but INPUT expects the level of demand to increase significantly in these countries over the next few years.

As the involvement of IS departments in day-to-day operations decreases, users will turn to vendors for increased levels of support, particularly in areas such as LAN tuning and performance management. The requirement for these two services is especially high in France and Germany.

D

The Level of Competition Will Increase

Client/server technology will increase the level of competition in the systems integration and professional services markets. Managers anticipate that client/server technology will provide them with greater choice of supplier for equipment and applications software products, driving down the price of these products. The same effect can be expected with professional services pricing. Firstly, client/server architecture will assist in providing potential purchasers with a wider choice of professional services vendors, particularly as vendors find it essential to offer multivendor capability. Secondly, the price potential purchasers expect to pay will decrease under the influence of falling equipment and software product prices.

Purchasers will select vendors on the basis of their:

- Ability to provide total solutions
- Track record and financial stability
- Industry/business knowledge
- Networking and operating system expertise

At present, it is important that vendors can demonstrate in-depth knowledge of network integration. This necessitates both wide-area and local-area network capability and knowledge of all the diverse operating systems involved.

Exhibit II-5 shows managers' attitudes towards the principal operating systems that are expected to be used in client/server projects.

EXHIBIT II-5

Attitudes to Operating Systems Users and IS Managers

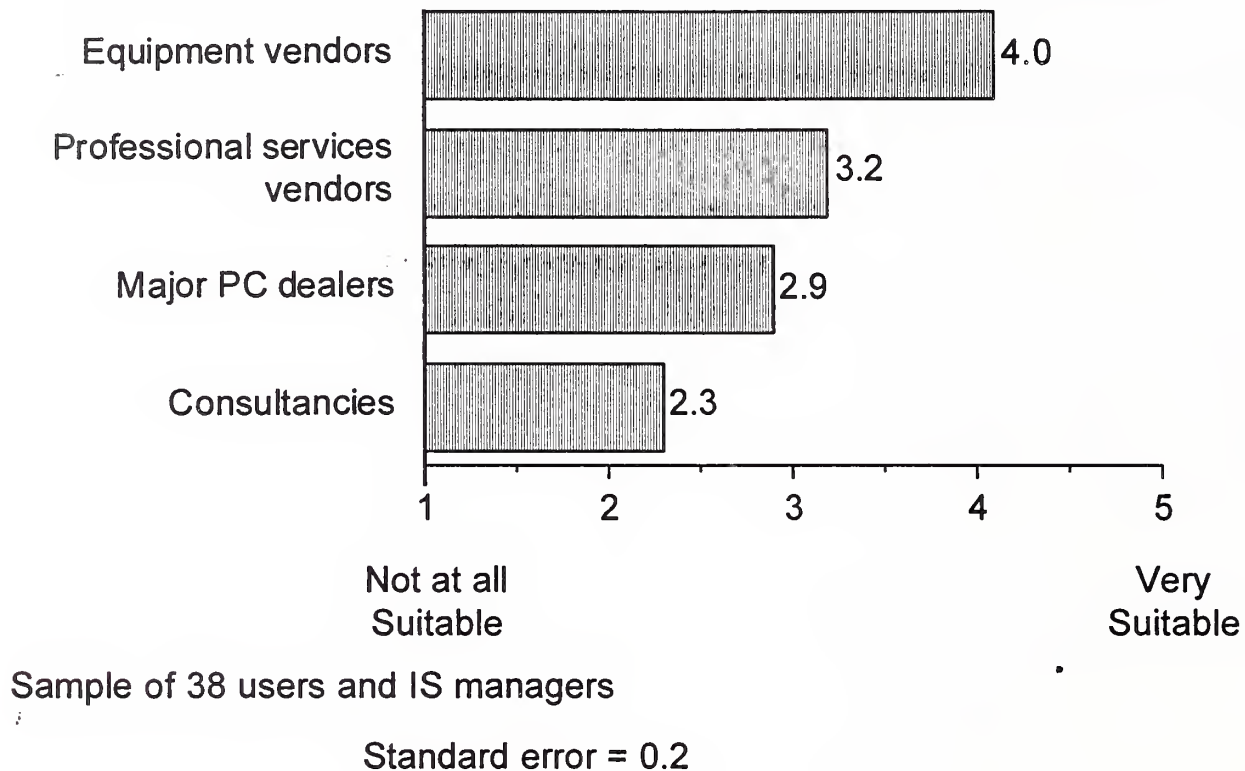
Operating System	Attitudes
UNIX	The future standard Needs to mature faster
WINDOWS/NT	Will be important Under evaluation
MS-DOS	Favoured by users, not by IS personnel
OS/2 OS/400	Unlikely to be basis of future corporate standards

However, at present all these operating systems, with the exception of Windows/NT, are widely used. Vendors need to display expertise in each.

Exhibit II-6 lists the ratings users and IS managers gave to vendors' current suitability to undertake client/server-based projects.

EXHIBIT II-6

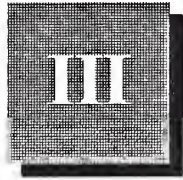
Perceived Vendor Suitability, Europe Implementation of Major Client/Server-Based Projects



The equipment vendors are at an advantage because they are perceived to possess the breadth of capability required. Professional services vendors are perceived to be an appropriate choice to meet a specialist requirement. However, they need to improve the image of their all-round technical capability. Client/server-based projects will frequently require equipment skills in addition to software and services skills. Overall, professional services vendors are regarded as having low levels of equipment-related skills.

Even major PC dealers are regarded as relatively ill-suited to major client/server projects. Many managers believe that better equipment prices can be obtained by negotiating directly with the equipment vendor. In addition, PC dealers are perceived to lack the depth of service capability required.

Consultancies are typically perceived to be only appropriate for “front-end” activities and not for system development and implementation.



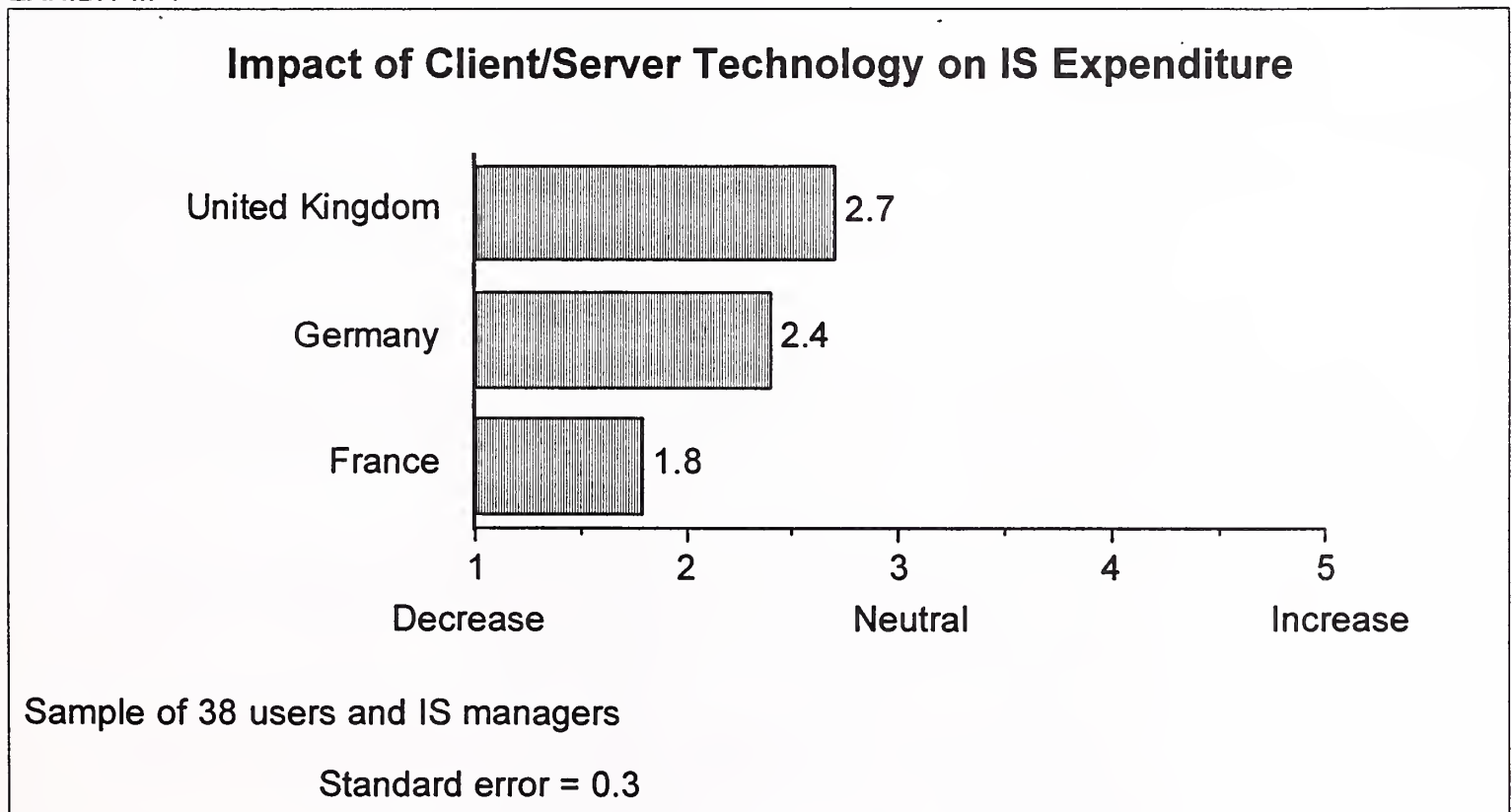
United Kingdom Requires Advanced Client/Server Services

A

Client/Server Technology Drives Systems Integration Market Growth

Overall, organisations expect client/server technology to assist them in reducing their information systems expenditure. The comparative expectations of managers by country are shown in Exhibit III-1.

EXHIBIT III-1

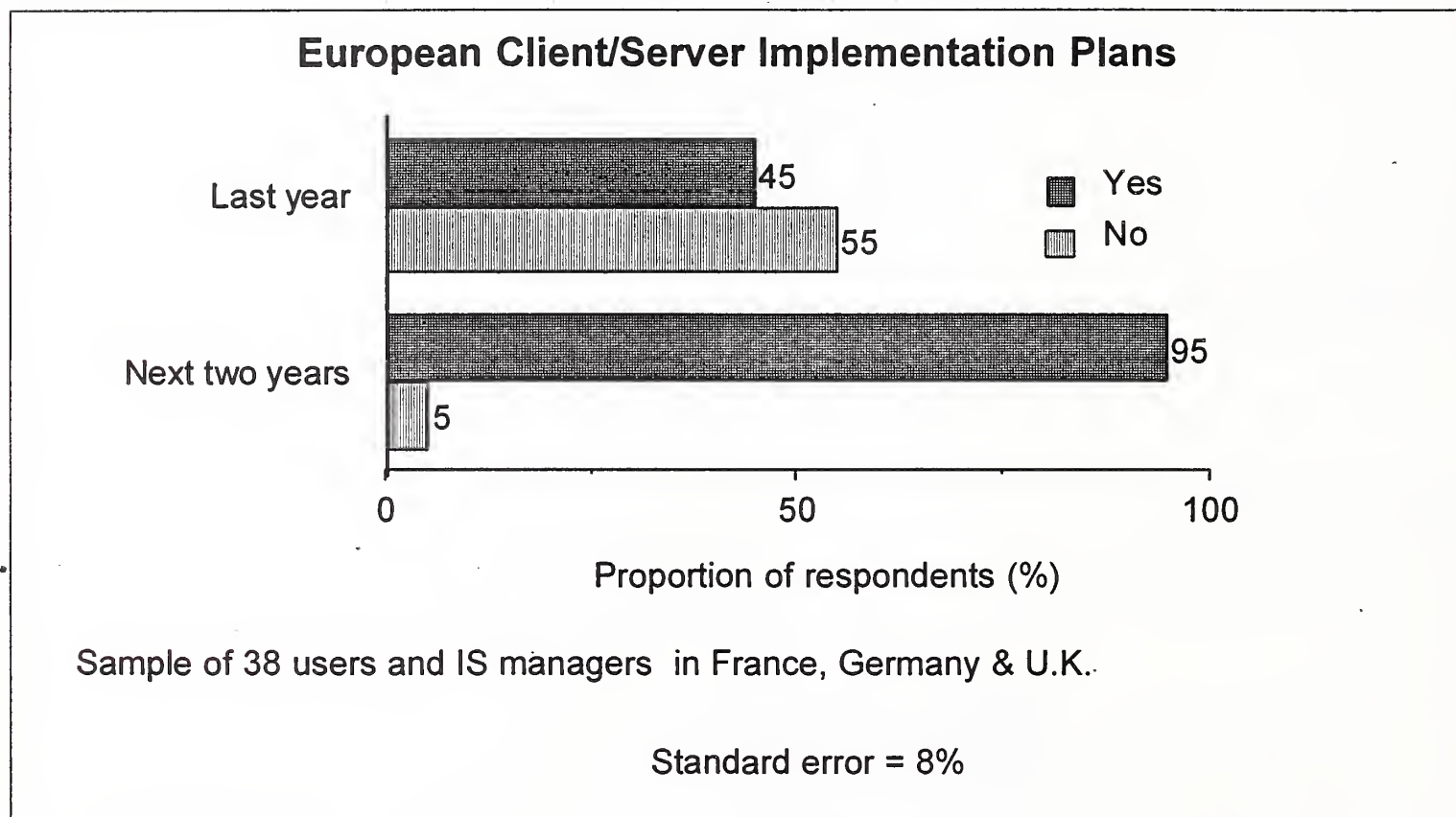


However, this chart is probably a more accurate reflection of the relative needs of managers to reduce IS expenditures than differing perspectives on the potential of client/server technology. It reflects the relative states of the three national economies at the present time, with the United Kingdom expecting an economic upturn in the near future and France suffering from the highest levels of economic downturn.

Despite organisations' reluctance to fund IS developments in this economic climate, there is considerable enthusiasm for client/server-based projects among both IS managers and users.

Exhibit III-2 shows the client/server implementation pattern in Europe.

EXHIBIT III-2



Forty-five percent of organisations implemented systems based on client/server technology in the last year, and the overwhelming majority of organisations anticipate implementing client/server-based systems over the next two years.

Accordingly, INPUT forecasts that the European systems integration and professional services markets will become dominated by projects based on client/server architecture over the next five years.

Exhibit III-3 provides forecasts of the growth of client/server-based projects within the European systems integration market, and Exhibit III-4 provides forecasts for the professional services market.

EXHIBIT III-3

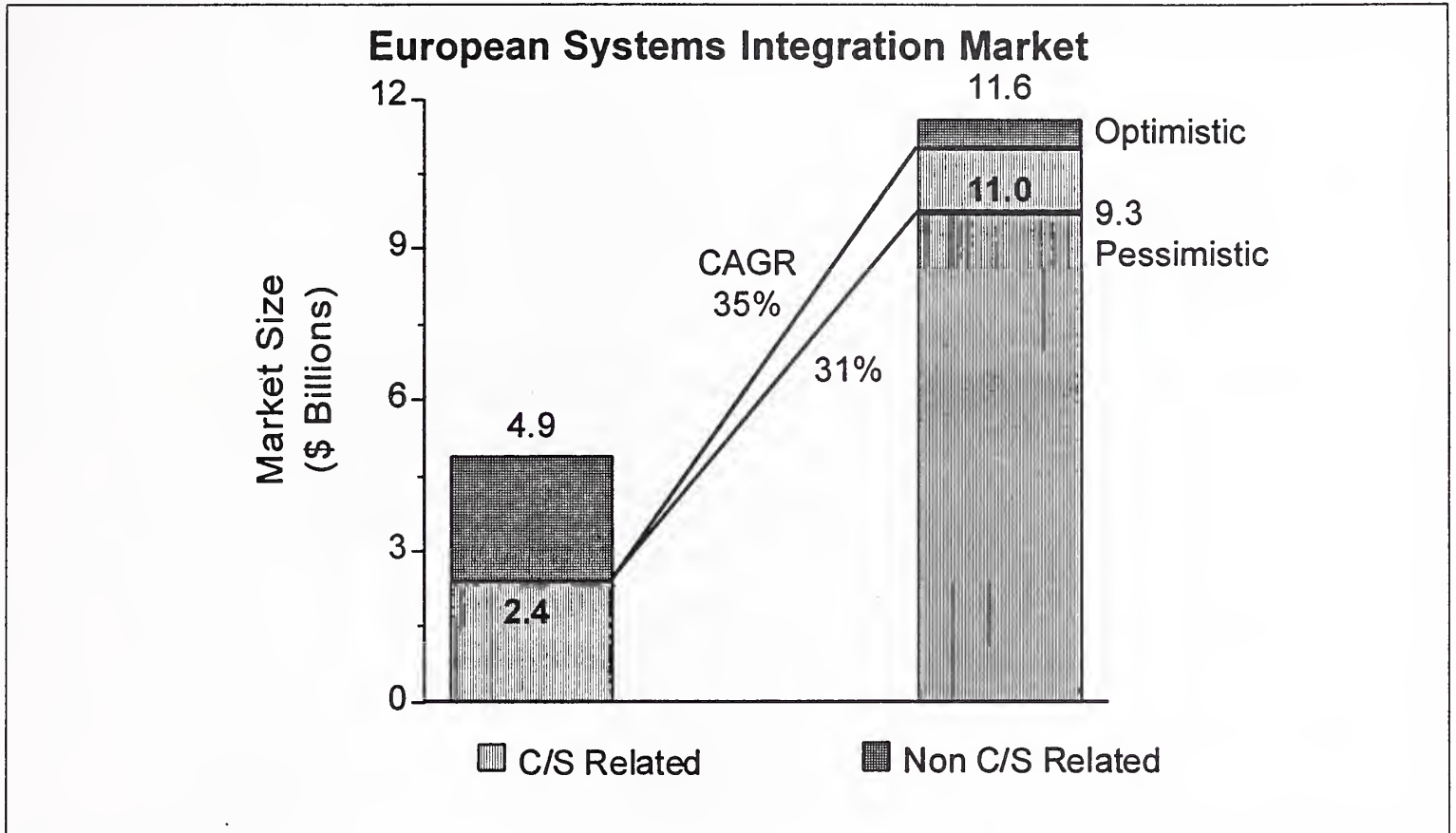
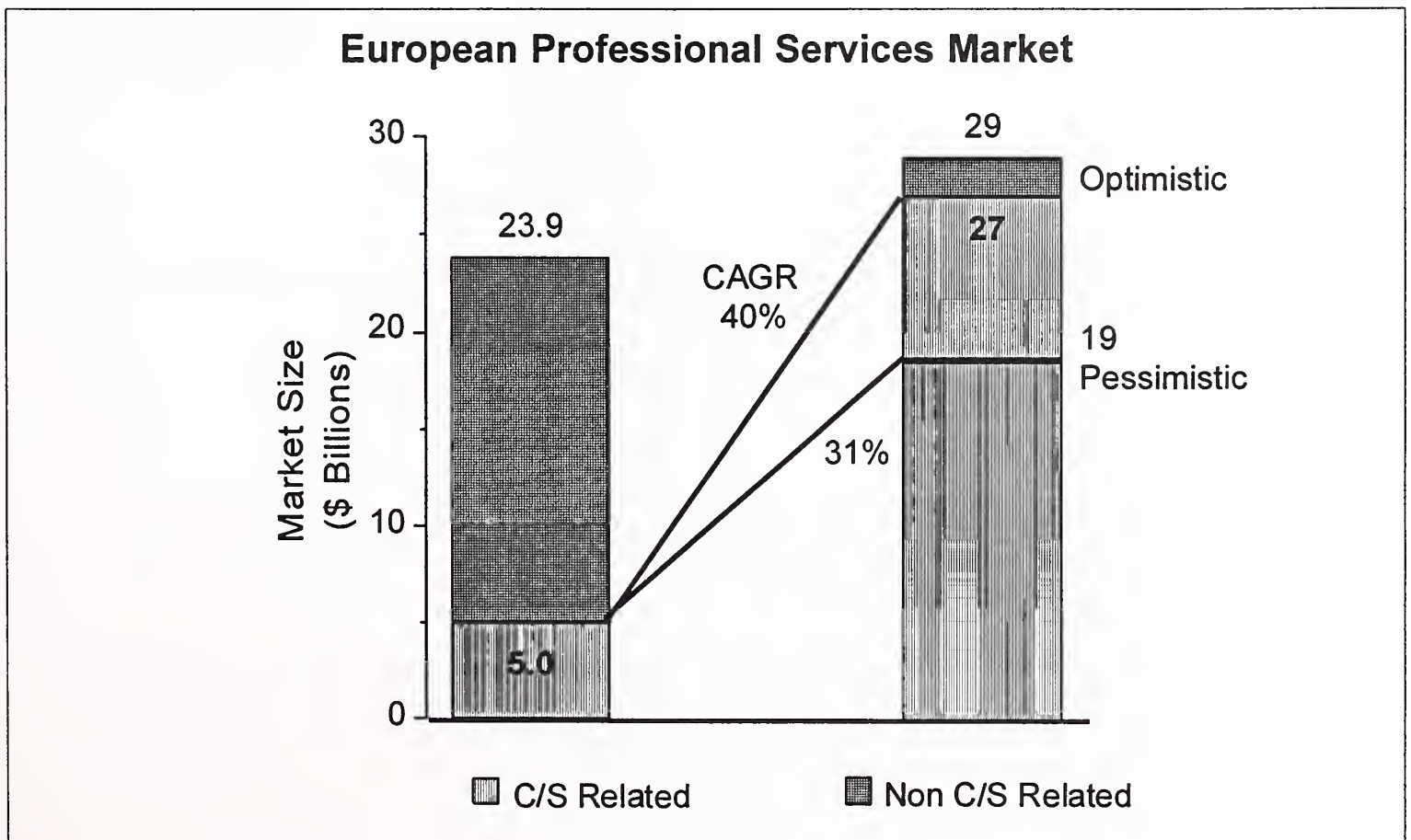


EXHIBIT III-4

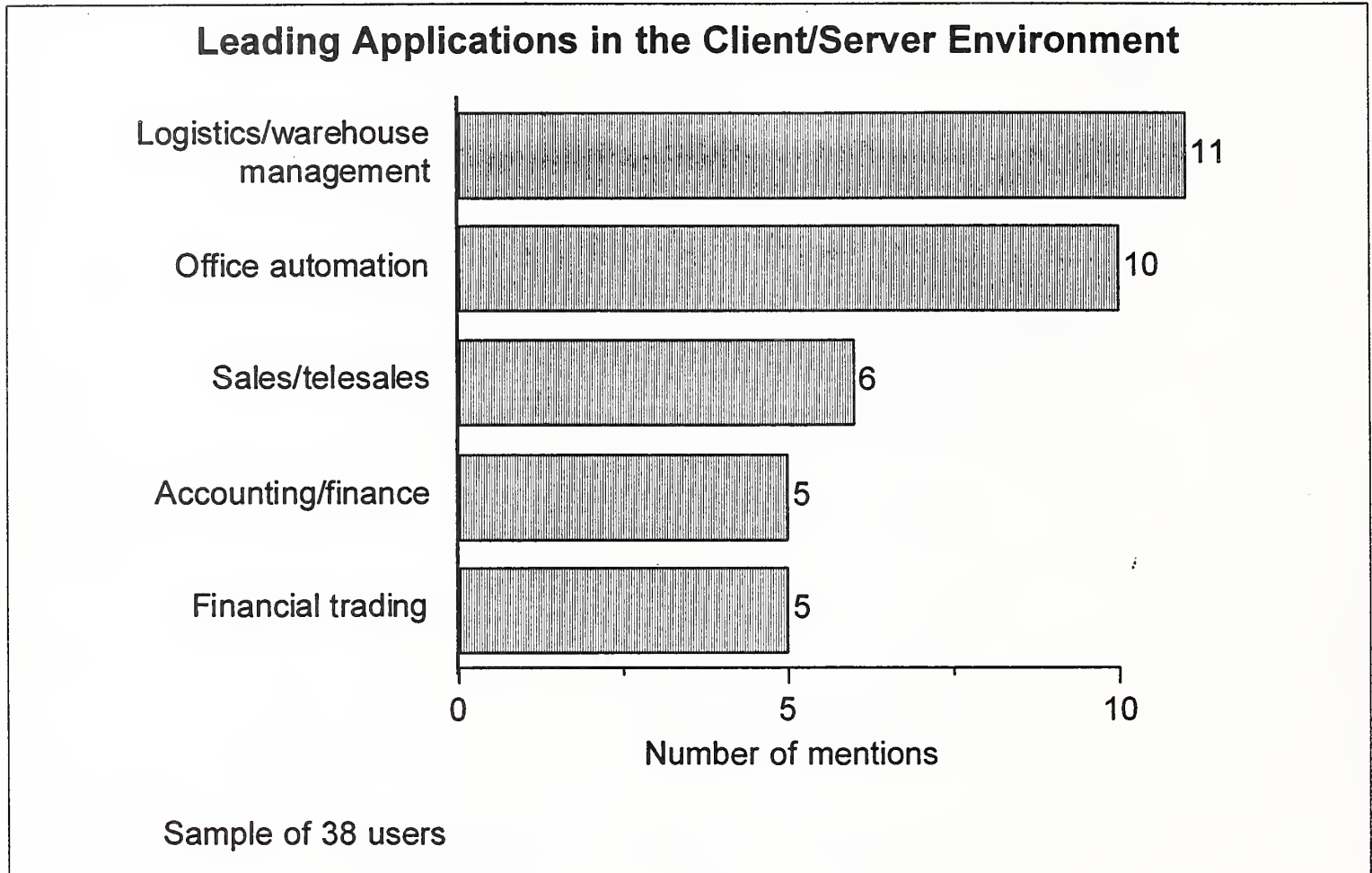


B

Logistics and Office Automation Are Key Opportunities

Exhibit III-5 lists the principal applications that managers are planning to implement using client/server technology over the next two years.

EXHIBIT III-5



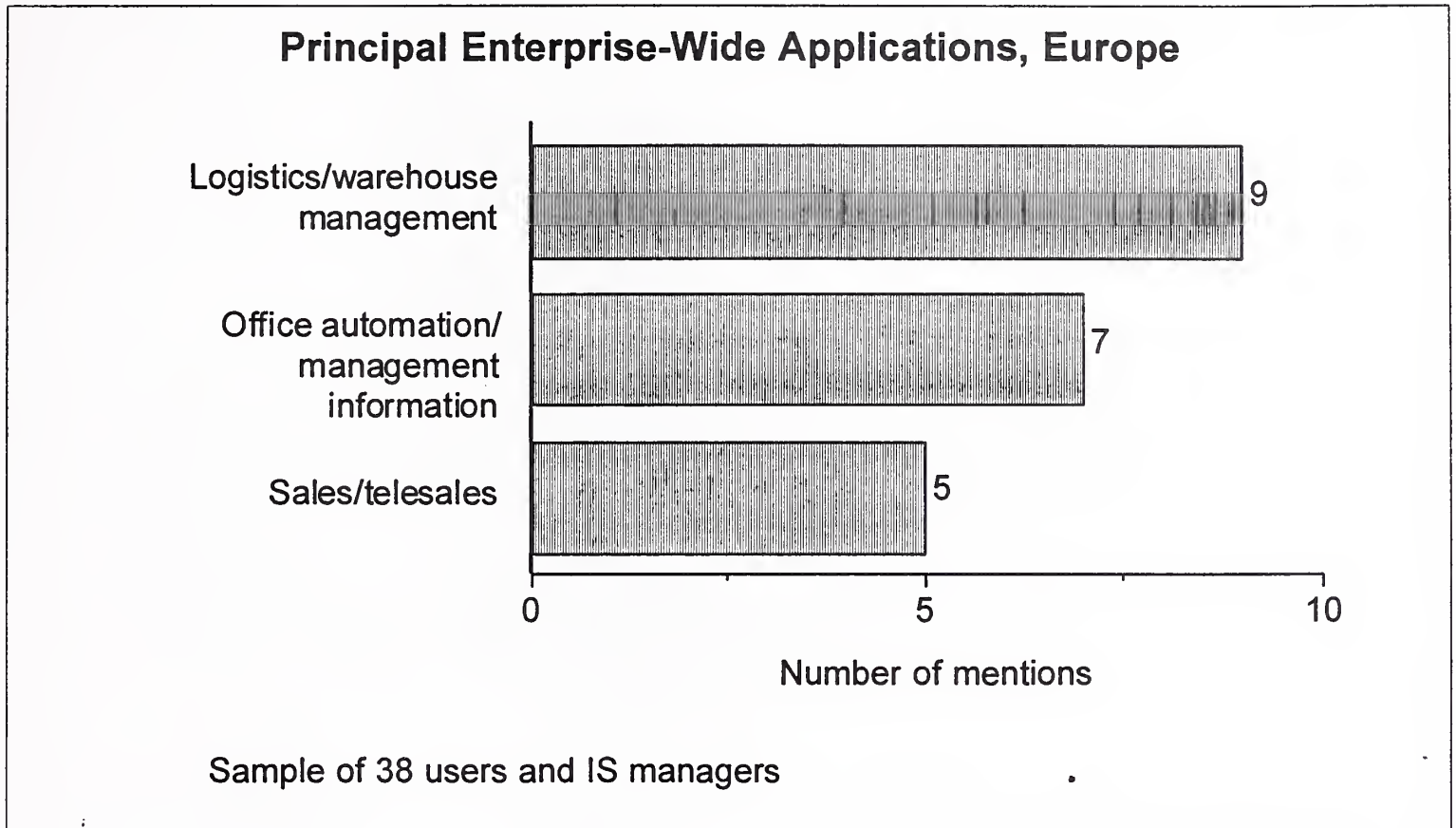
Client/server technology is widely regarded as offering two benefits not widely associated with traditional information systems, namely:

- Improved ability to handle complexity and non-structured data
- Improved interactivity and information sharing

Accordingly, one of the major uses planned by managers for client/server technology is the implementation of office automation systems, including management information systems.

Managers were asked to classify the applications they intended to implement into those for departmental use and those that were enterprise-wide. The principal enterprise-wide applications that managers intend to implement are listed in Exhibit III-6.

EXHIBIT III-6

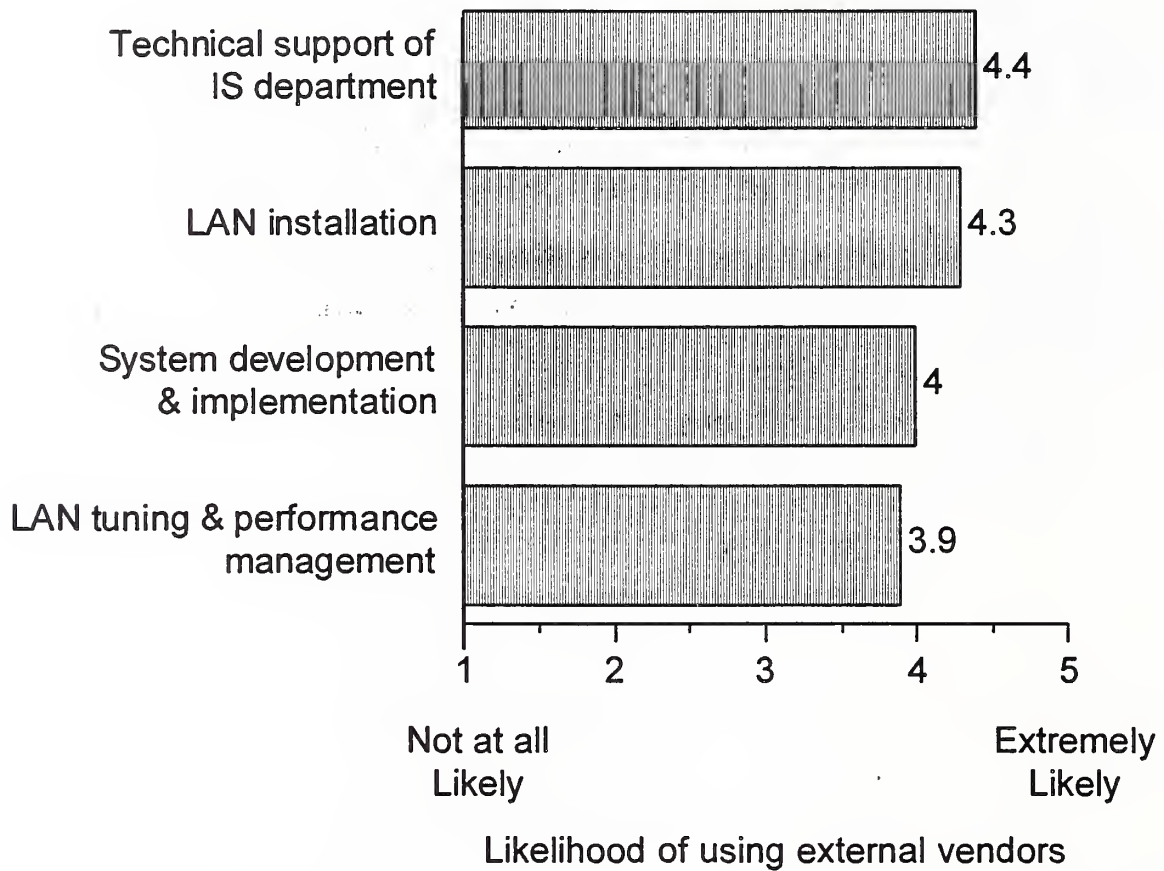
**C****Organisations in France and Germany Require LAN Installation and Support Services**

The services that managers anticipate purchasing from external vendors differ markedly between those required in France and Germany and those required in the United Kingdom.

Exhibit III-7 lists the ratings managers gave to the leading service options nominated in France. Exhibit III-8 lists the leading service options favoured by German managers.

EXHIBIT III-7

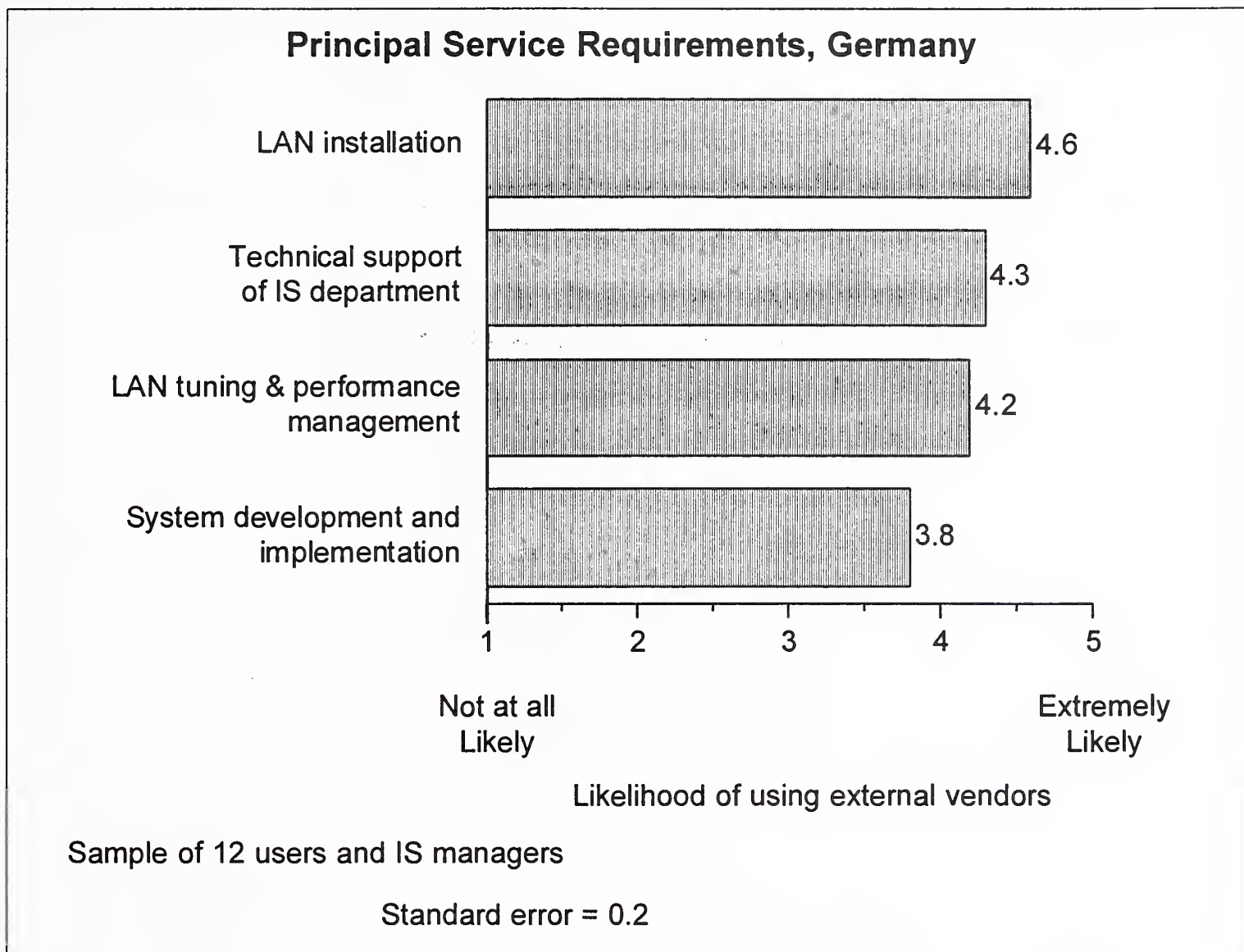
Principal Service Requirements, France



Sample of 12 users and IS managers

Standard error = 0.2

EXHIBIT III-8



Although the ranking of options differs slightly between France and Germany, there is also considerable similarity between the requirements in these two countries.

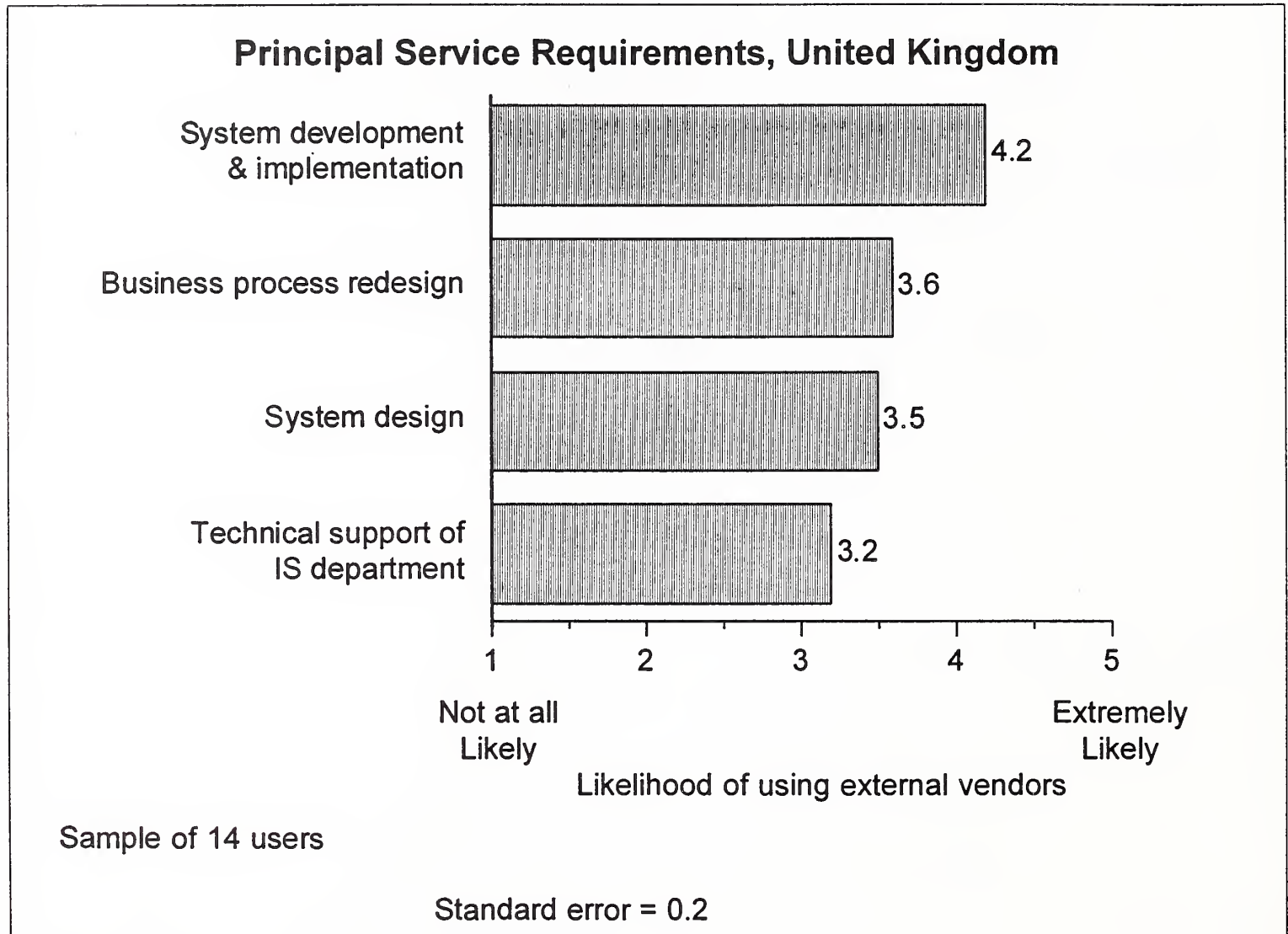
Users and IS managers in both countries exhibit a strong need for assistance in installing local-area networks and in LAN performance management. Organisations also recognise that their IS departments require extensive technical support when implementing client/server-based systems.

D

Organisations in The United Kingdom Require Business Process Redesign Services

Exhibit III-9 lists the leading service options required in the United Kingdom.

EXHIBIT III-9



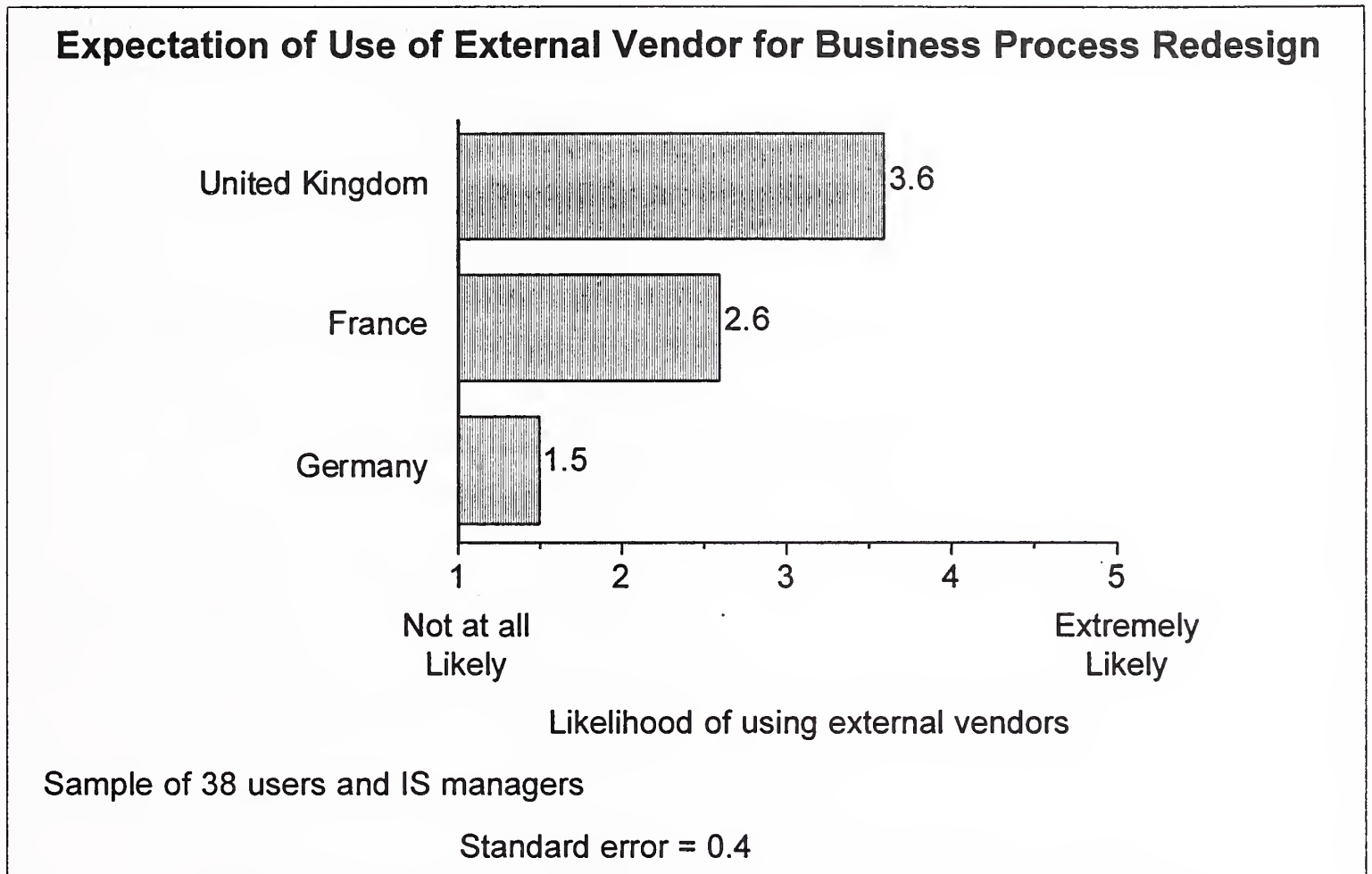
The profile of services required in the United Kingdom is markedly different from those in France and Germany. In particular, there is much more emphasis on assistance in business process redesign and system design.

This means that in addition to technical skills, vendors in the United Kingdom need to offer their clients consultants with:

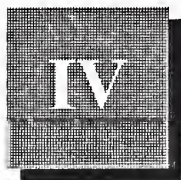
- Either in-depth industry and business knowledge specific to their sector
- Or excellent business acumen and communication skills, facilitating rapid adaption to a range of industries

To maximise the potential of client/server technology, managers should use it to improve the business processes undertaken by information workers. Managers in the United Kingdom recognise the need for vendors to assist them in this process. This need is not apparent yet in France or Germany, as shown in Exhibit III-10.

EXHIBIT III-10



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Users Exhibit High Level of Service Need

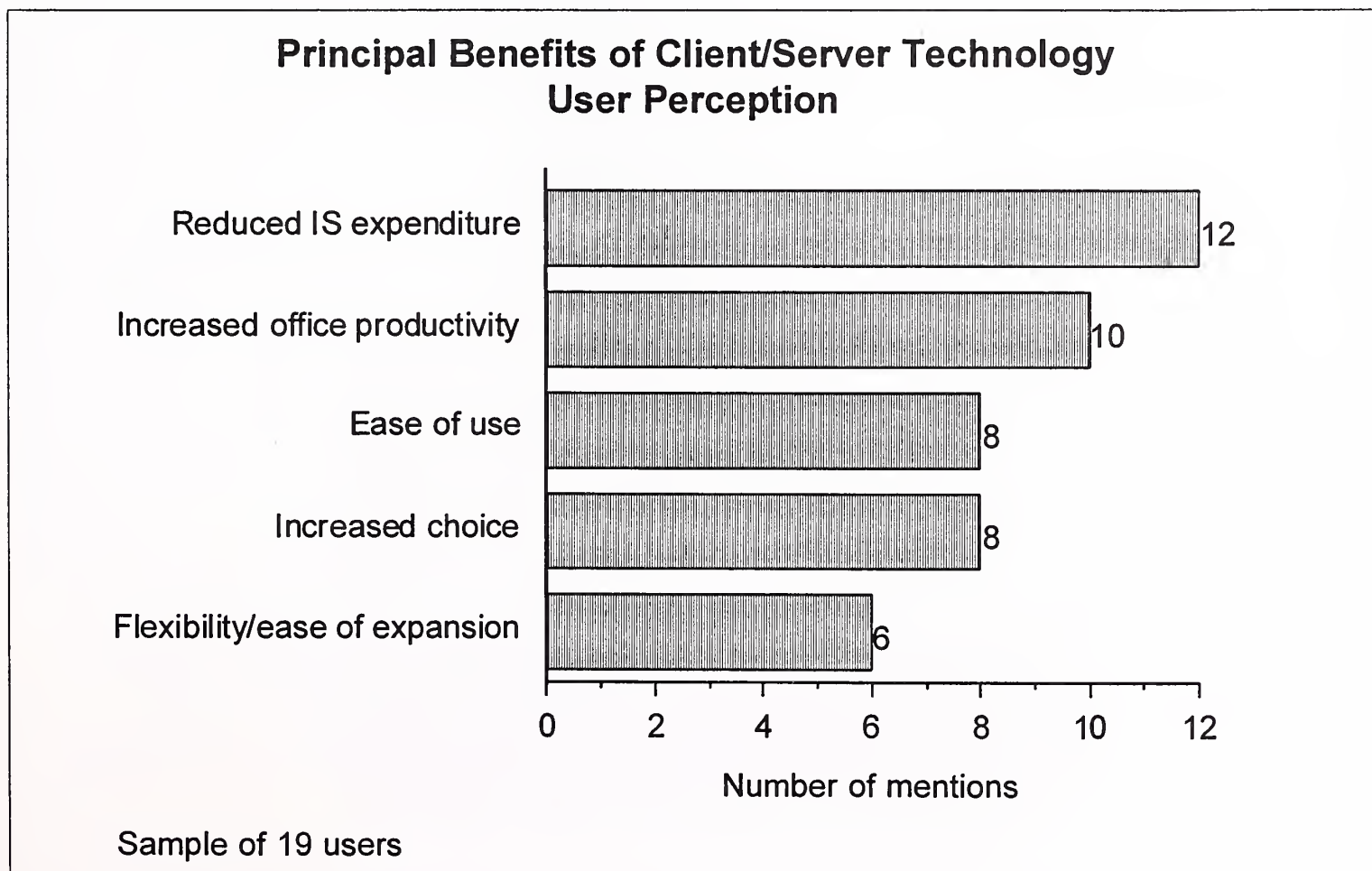
A

Users Anticipate Greater Reliance on Vendor Services

Users expect client/server technology to be a major driving force in reducing their overall information systems expenditure. However, at the same time, they expect to become more dependent on vendor services.

Exhibit IV-1 lists the user perception of the principal benefits of client/server technology.

EXHIBIT IV-1



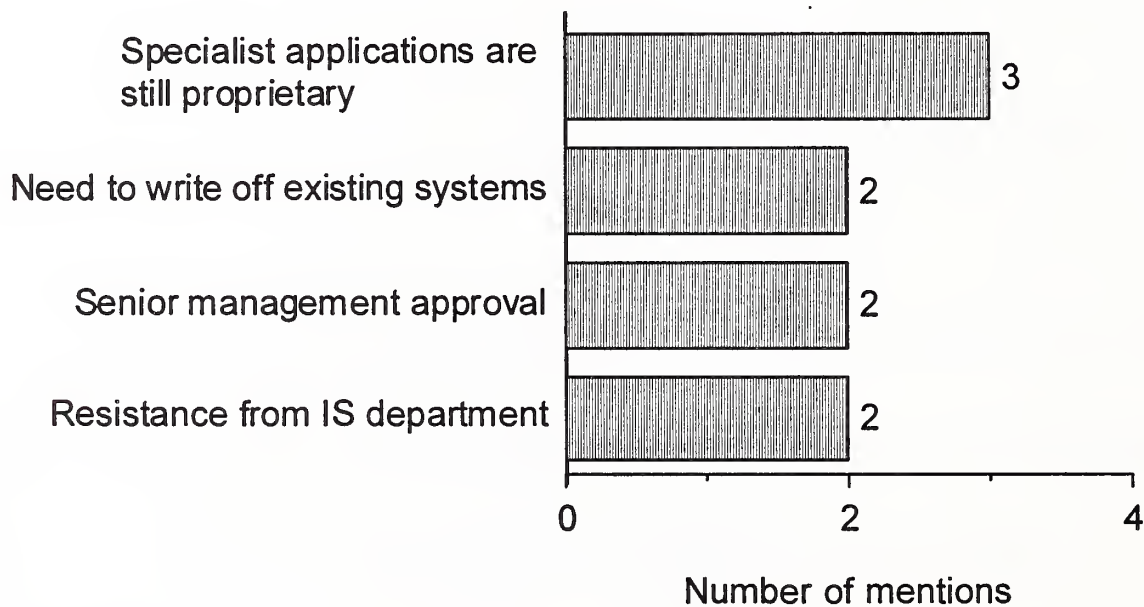
Firstly, the majority of users interviewed expect client/server technology to be a major factor in reducing their information systems expenditure. Client/server technology is expected to introduce increased choice into clients' selection of equipment and applications software products, making these markets much more price-competitive than previously.

Secondly, users perceive that the introduction of client/server technology will significantly increase office productivity. Although increased ease of use and flexibility are important factors here, users also expect client/server technology to cater for the introduction of new ways of working and the improvement of existing business processes.

Users expect client/server technology to be widely adopted in their organisations. Nonetheless, there are still some factors slowing down its rate of adoption. The user view of the principal inhibitors to the adoption of client/server technology is shown in Exhibit IV-2.

EXHIBIT IV-2

Inhibitors to Adoption of Client/Server Technology User Perception



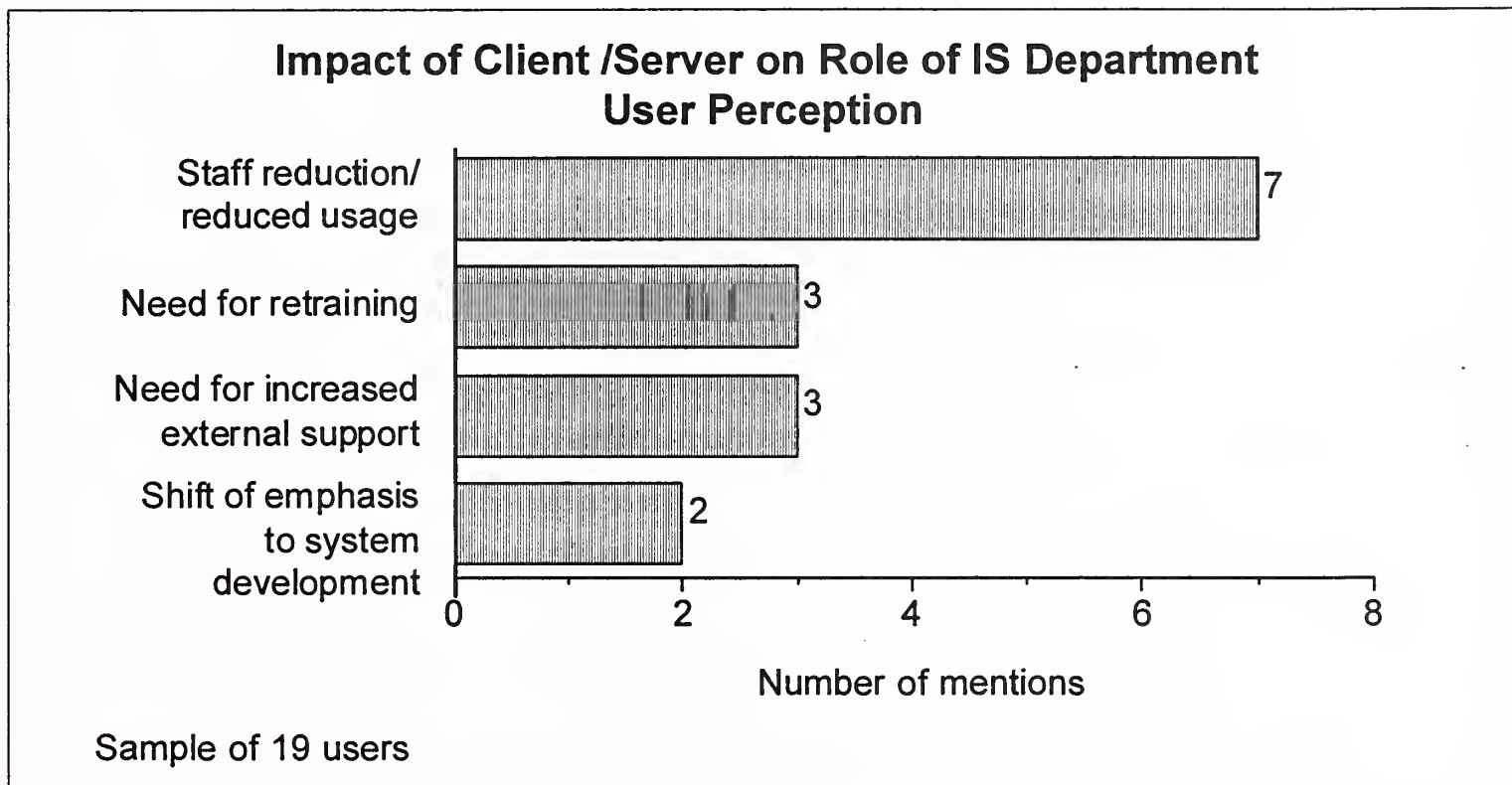
Sample of 19 users

One inhibitor is the fact that many of the major specialist applications used by organisations are still based on proprietary architectures. In many instances, it may be difficult to integrate these key business applications into a client/server network. Where these applications have been implemented recently it is difficult to justify their replacement. Replacement can often only take place once the existing investment has been fully depreciated.

There are also political factors inhibiting the adoption of client/server technology. Firstly, users are dependent on senior executives providing them with a mandate to control their own information systems expenditure. The control of the overall technical infrastructure still typically rests with the organisation's IS management. Secondly, some organisations face opposition to client/server technology from the IS department. This is not surprising, because client/server technology is widely regarded as a threat to the size and influence of internal IS departments.

The impact that client/server technology will have on the role of the IS department is shown from the user perspective in Exhibit IV-3.

EXHIBIT IV-3

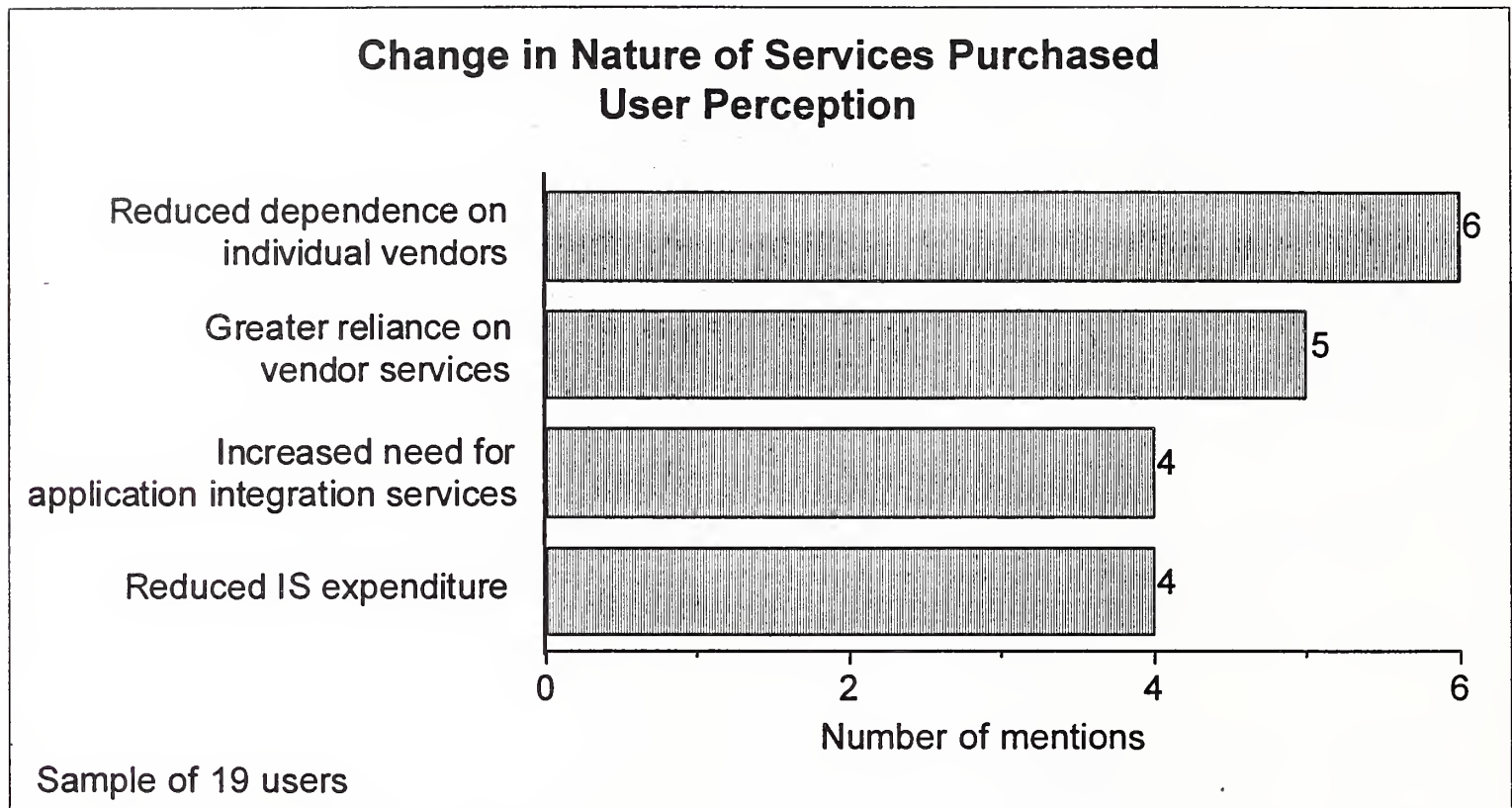


The introduction of client/server technology is widely expected to lead to reduced usage of the IS department and consequently a reduction in the number of staff employed. However, much of this reduction will occur in mainframe computer operations. Users expect the emphasis within in-house IS departments to show a major shift away from day-to-day housekeeping activities and operational support towards system development and improvement.

However, in-house IS departments are dependent on high levels of training if they are to be effective in the client/server environment. Given the present economic climate in Europe, many organisations are unwilling to provide funding to retrain their IS departments extensively. This will further increase their dependence on external support.

As shown in Exhibit IV-4, many users perceive that client/server technology will be influential in increasing their reliance on vendor services.

EXHIBIT IV-4



However, users also believe that client/server technology will finally free them from the purchasing constraints imposed by proprietary architectures, providing them with a significantly increased choice of vendors from whom to purchase goods and services. The overall impact of downsizing and the more open market leads users to expect to reduce their IS expenditure. However, INPUT forecasts that the major reductions will accrue from reduced expenditure on equipment and in-house personnel. The market for services will continue to grow.

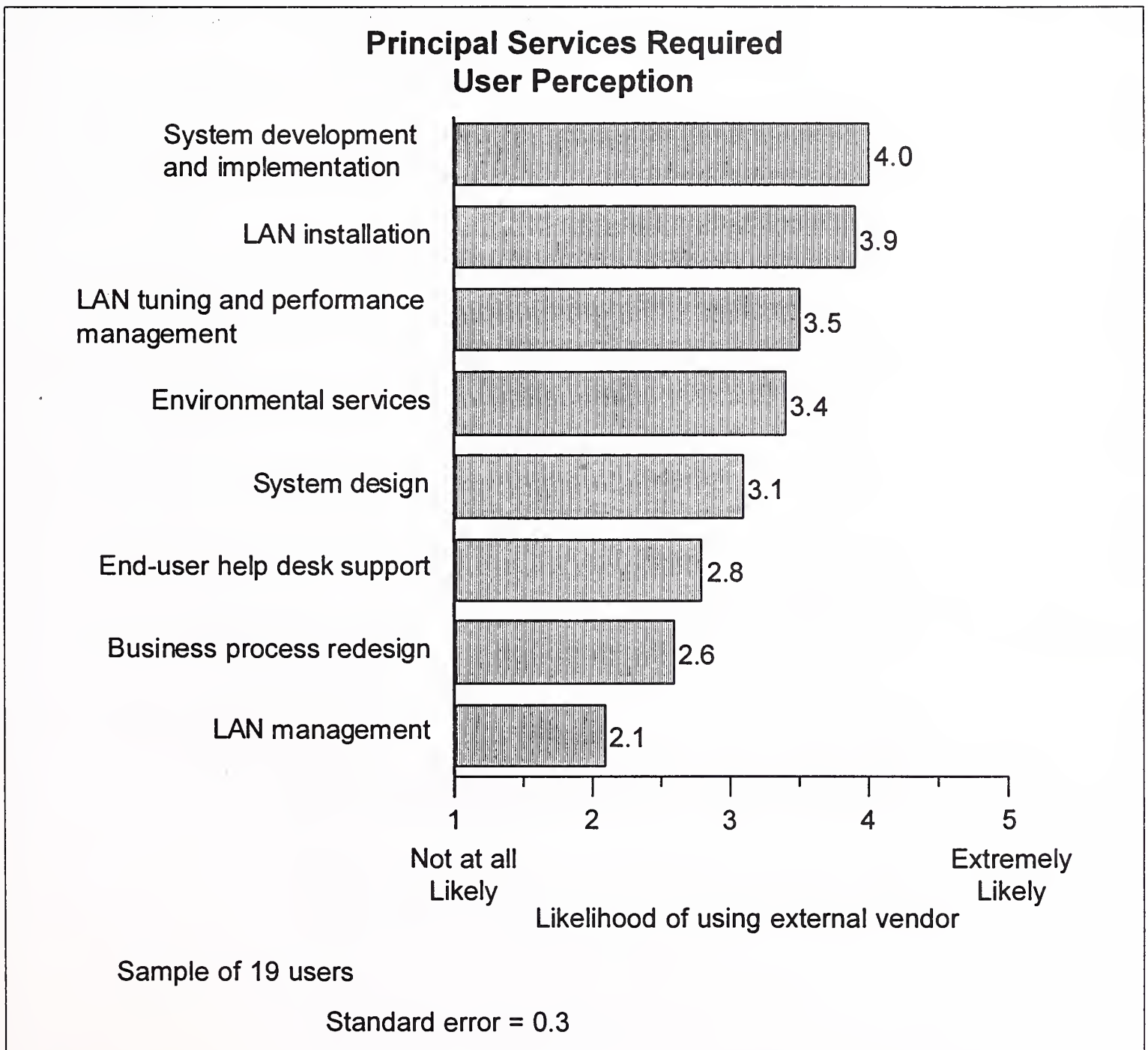
Users' growing need for application integration services and multivendor network integration will be a major factor contributing to growth in the service market. In addition, users will require increased system introduction support, such as piloting and trials, as they become more independent from in-house IS departments.

B**Users Need Ongoing Support Services**

Both users and IS managers expressed a high level of interest in implementation assistance from external vendors. However, while IS managers only exhibited a moderate level of interest in support services, users showed a very high level of interest.

Exhibit IV-5 lists the ratings users gave to a range of service options.

EXHIBIT IV-5



Users perceive a need for considerable assistance in systems development and implementation. This includes services such as:

- Consultancy
- Project management
- System design and integration
- Pilot implementations/trials

Network design and implementation are also key requirements, particularly where this involves multivendor network integration.

However, users differ from IS managers, in that they exhibit a significant level of interest in support services such as:

- LAN tuning and performance management
- Environmental services

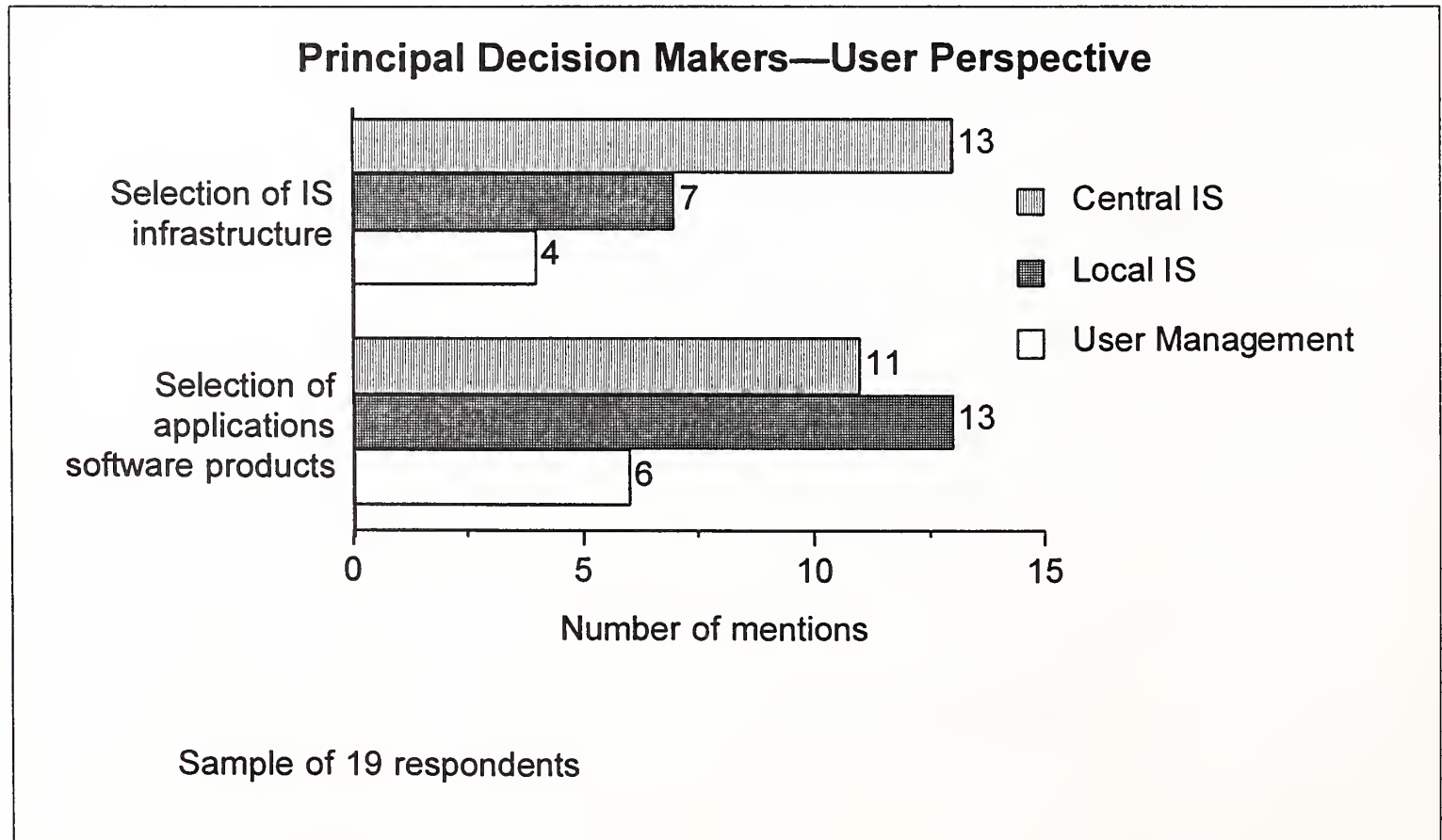
Surprisingly, users showed a low level of interest in ongoing help desk services.

C

Equipment Vendors Favoured Over Dealers

Exhibit IV-6 provides the user perspective of the purchasing processes for IS technical infrastructure and applications software products.

EXHIBIT IV-6

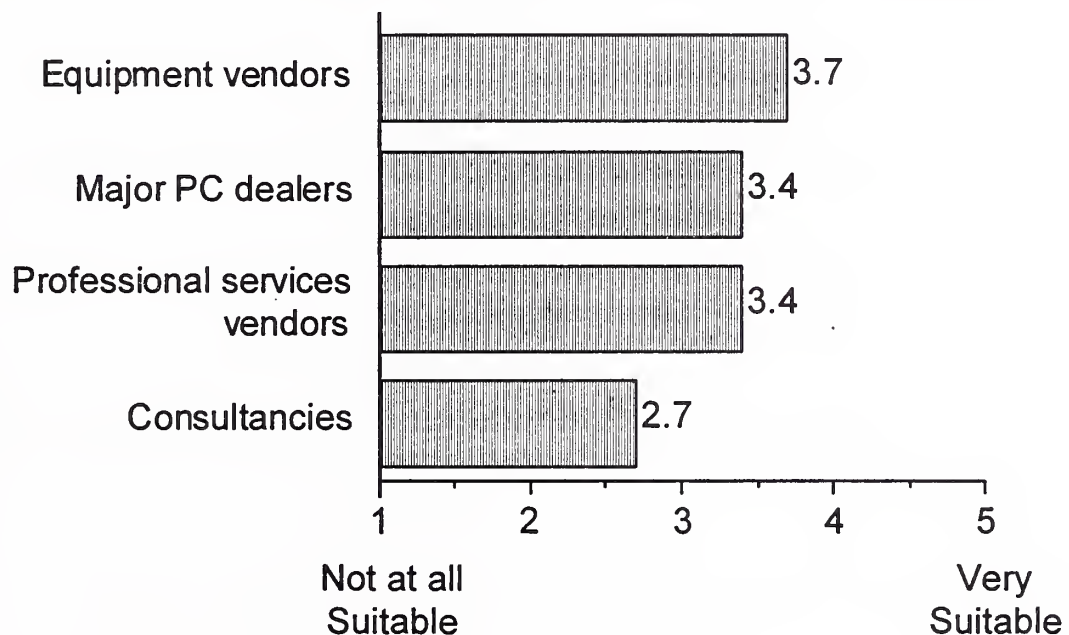


Central IS departments retain control of decision making for the overall IS technical infrastructure in the majority of cases. However, it is also apparent that users believe that they are beginning to take control of applications software product selection and purchasing. Users are especially influential when the information systems being purchased are specific to a single department or business unit.

Exhibit IV-7 shows user ratings of the perceived suitability of vendors to implement major systems development projects based around client/server technology.

EXHIBIT IV-7

Vendor Suitability, User Perception Implementation of Major Client/Server-Based Projects



Sample of 19 users

Standard error = 0.3

For many users, the choice appears to be dictated by the equipment vendors' sales channels.

Though some users perceive that the equipment vendors are "too large" to cater satisfactorily for their needs, equipment vendors received the highest rating overall. Favourable comments made by users included:

- "Equipment vendors have the depth of management"
- "Equipment vendors are able to cope with all aspects of change."

The major dealers were viewed as suitable for smaller purchases and thought to offer price-competitive entry-level systems. However, their services capabilities were regarded as unproven, with clients commenting that:

- Their support was questionable.
- They had inadequate skills.
- They had insufficient experience in implementing total systems.

Professional services vendors tend to be regarded by users as specialists only to be used if specialist applications software products or bespoke software is required. They are not perceived to have extensive equipment-related skills.

Users regard consultancies as expensive and only to be used for front-end activities such as:

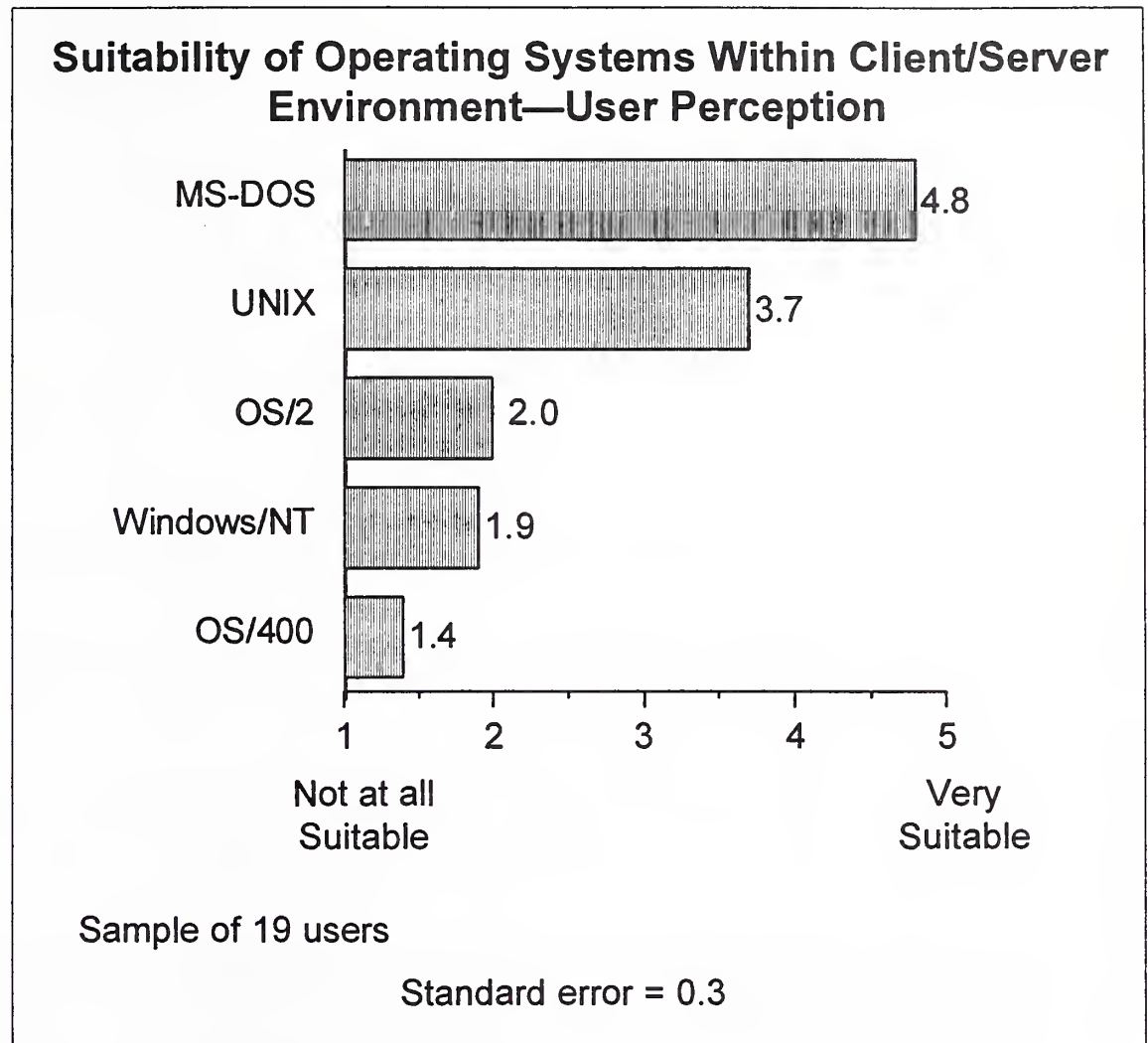
- Strategic and IS planning
- Project research
- Project design and management

The principal criteria that users use in choosing a vendor for a systems development project based on client/server architecture are:

- Proven track record
- Competitively priced industry-specific solutions
- Networking capability

User perceptions of the suitability of individual operating systems are shown in Exhibit IV-8.

EXHIBIT IV-8



Users tend to adopt a more conservative approach to operating systems than their colleagues in IS departments, showing a strong preference for the extensively used MS-DOS.

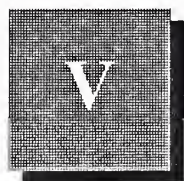
UNIX is also acceptable to users, though their recognition of UNIX tended to reflect its adoption as the standard operating system within their organisation rather than any strong personal views.

Unlike UNIX, OS/2 was not viewed as an operating system for the future. Users perceive that usage of OS/2 will decline as their organisations standardise around other operating systems.

There is some expectation among users that Windows/NT will be very important in the future. However, users typically have little knowledge of Windows/NT and prefer to continue to use Windows under MS-DOS until Windows/NT has become a proven product.

OS/400 will remain popular with a minority of users and will continue to be used as IBM AS/400s become integrated into wider client/server environments.

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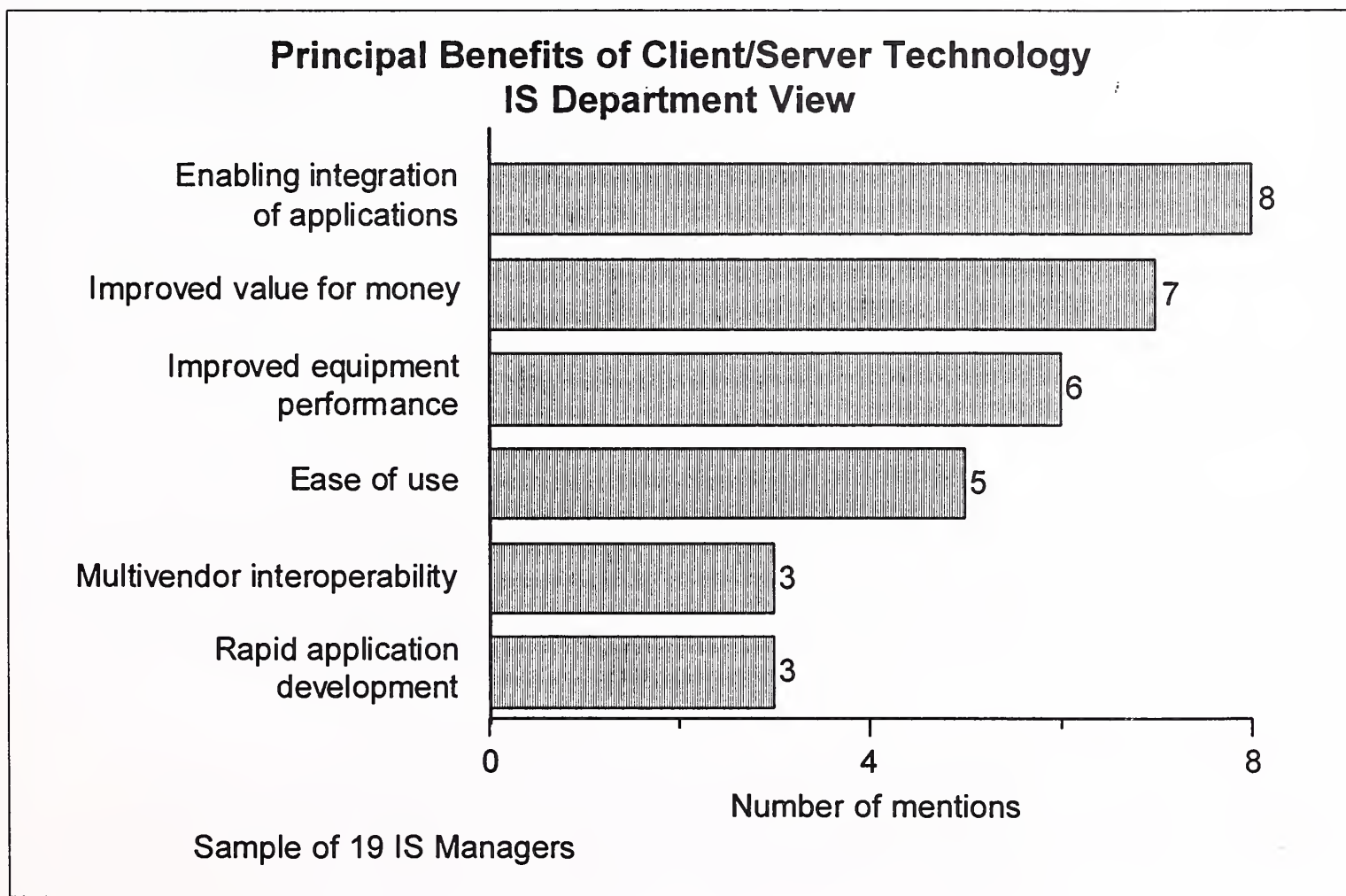
IS Departments Require Multivendor Network Integration Skills

A

IS Departments Anticipate Rapid Application Development

Exhibit V-1 shows the principal benefits of client/server technology from the IS management perspective.

EXHIBIT V-1



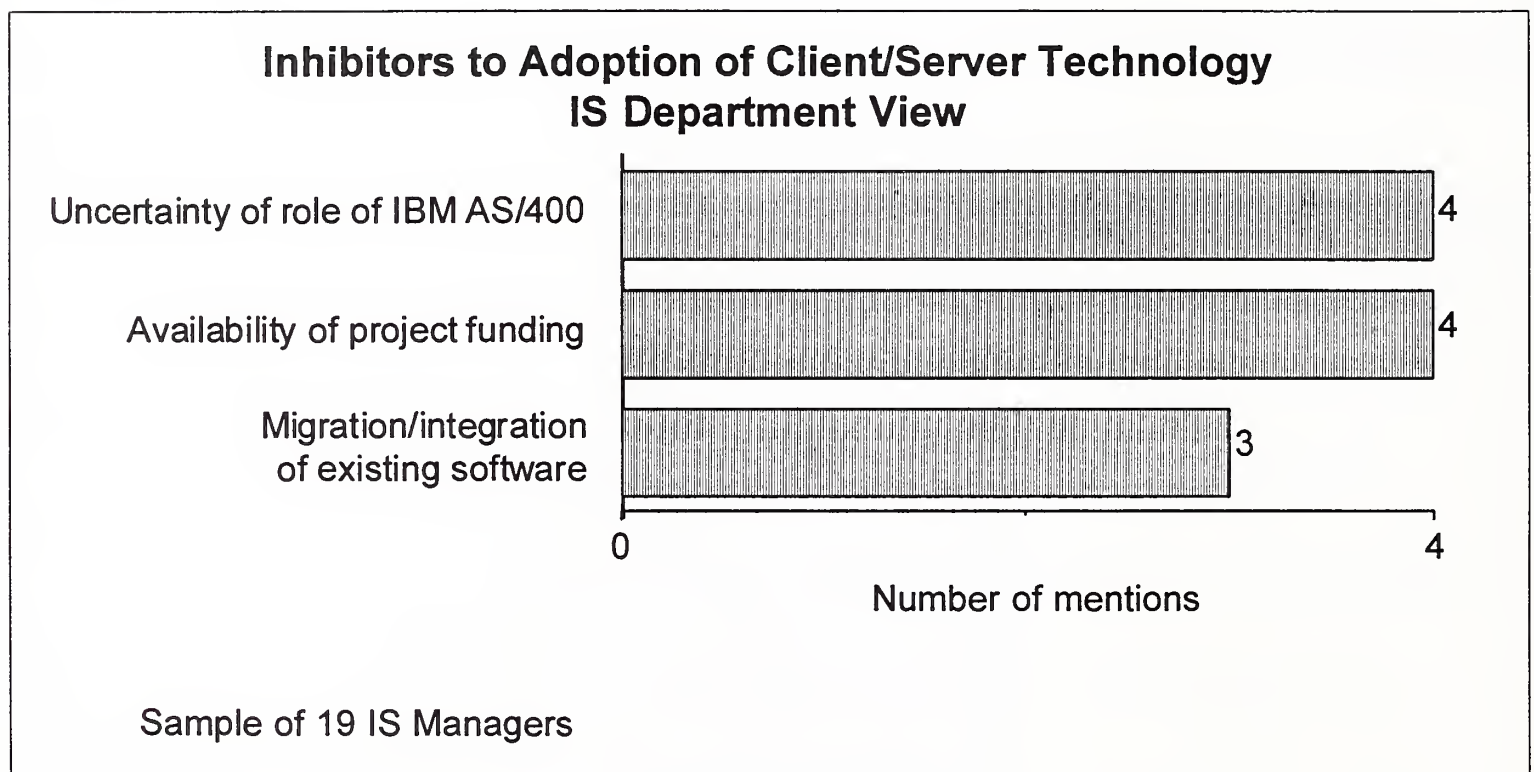
Firstly, like user management, IS managers expect client/server technology to lead to higher value for money. In particular, they expect this to be achieved through improved equipment price/performance.

Secondly, IS managers expect client/server technology to facilitate the integration of applications in a multivendor environment.

Thirdly, IS managers anticipate that their development productivity will increase, leading to comparatively rapid development of new applications.

The principal inhibitors perceived by IS managers to the adoption of client/server technology are listed in Exhibit V-2.

EXHIBIT V-2



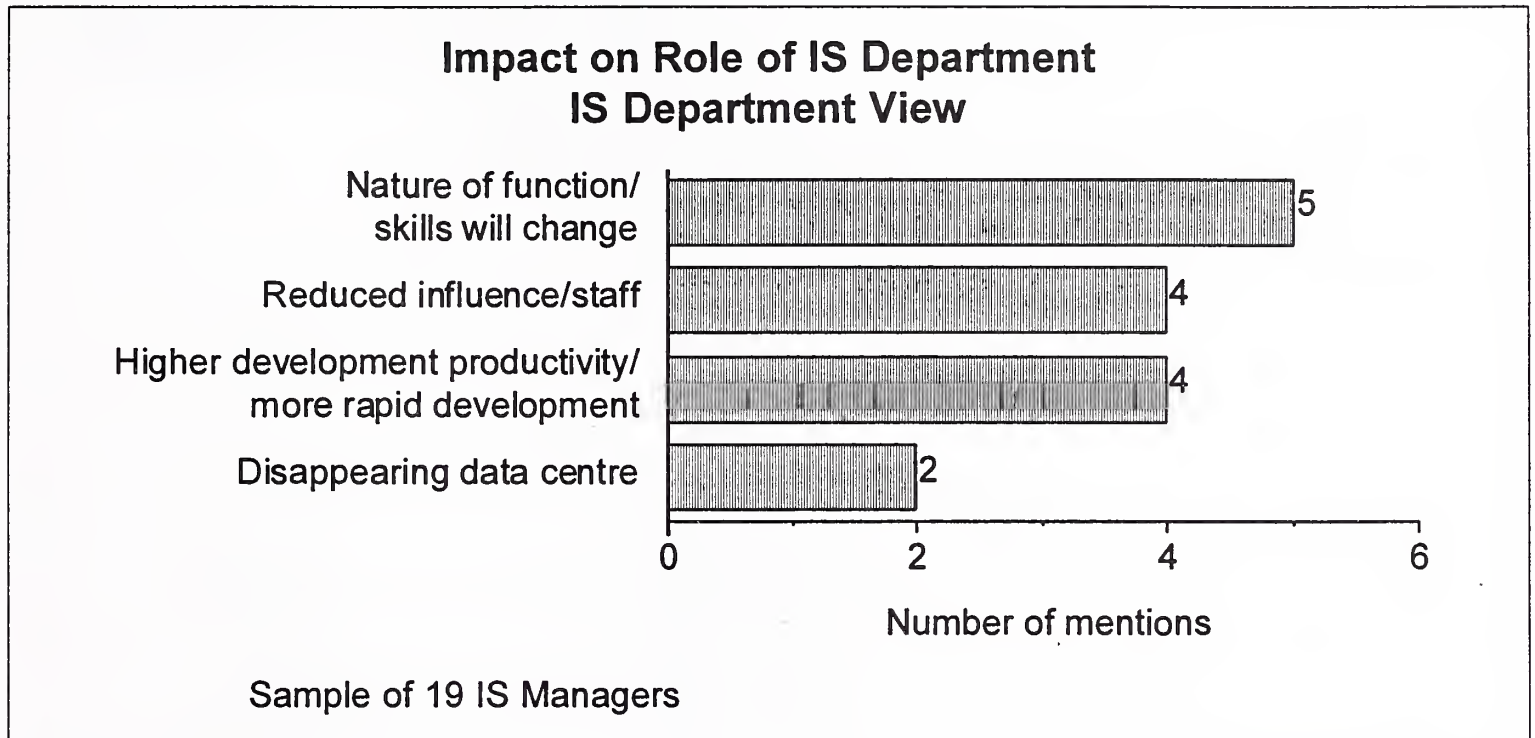
Organisations with IBM AS/400s were unclear about the role that IBM was planning for the AS/400 in a client/server environment. Accordingly, this uncertainty was delaying their adoption of the client/server model. However, IBM's announcements, made shortly after the completion of this research, may now have clarified this situation, leaving these organisations in a better position to plan their future IS infrastructures.

Currently, IS managers are facing considerable pressures to reduce costs. Although most organisations expect client/server technology to assist in reducing IS costs in the long run, considerable funding may still be required in the transitional phase in the short term. In the present economic environment in Europe, it can be difficult to obtain such funding.

Another inhibitor is the technical difficulty of integrating or migrating existing business applications—often based on proprietary standards—into an open systems environment.

The impact IS managers expect client/server technology to have on the role of their departments is shown in Exhibit V-3.

EXHIBIT V-3



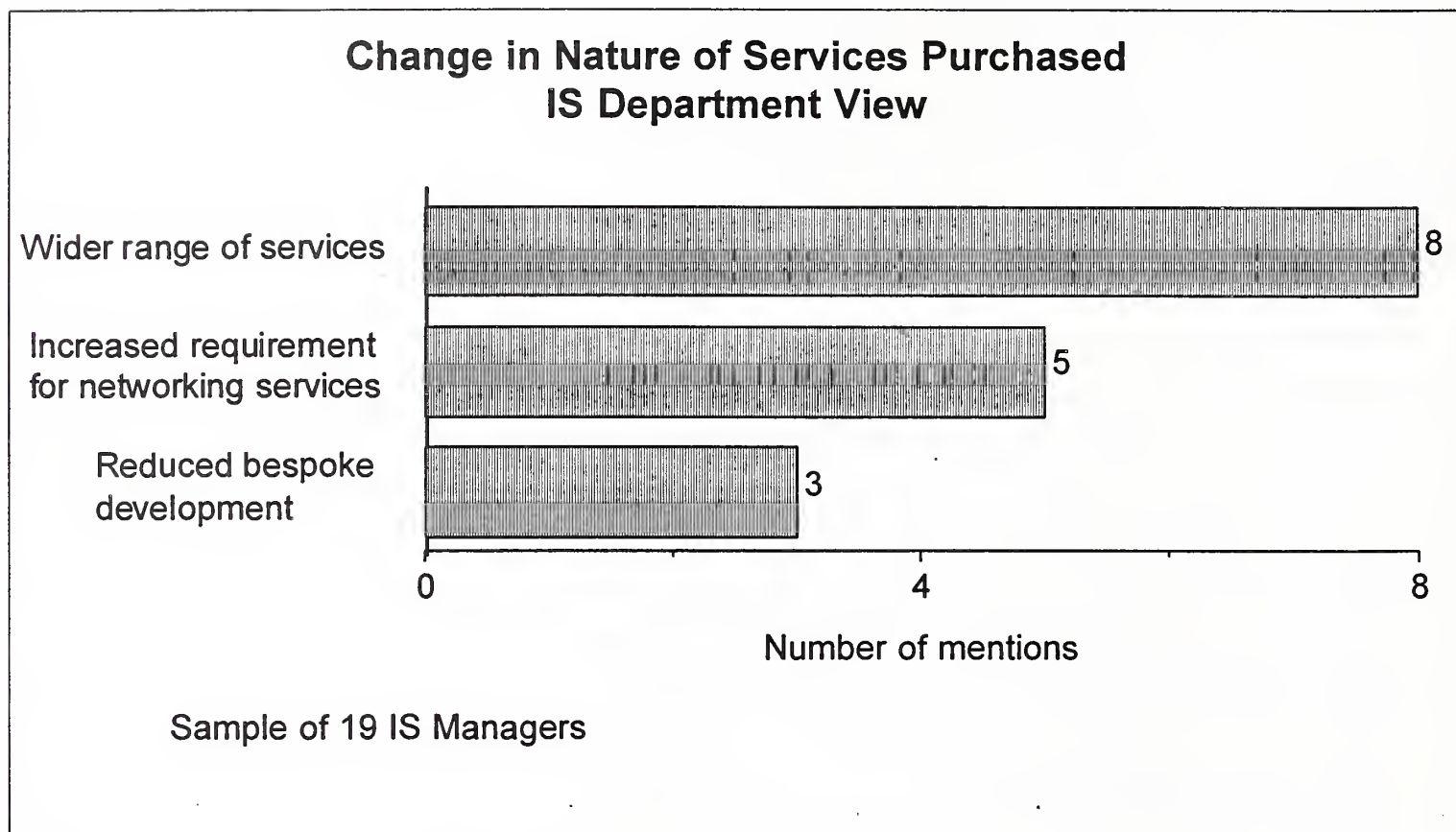
The majority of IS managers expect client/server technology to have a major impact on their departments.

The pessimistic view from the IS managers' perspective is that their role in the organisation will gradually disappear. It is widely believed by IS managers that their role will change significantly, probably leading to a reduction in the number of personnel and reduced influence.

Users are expected to take over day-to-day operations as data centres gradually disappear. However, although IS managers expect to lose much of their influence over computer operations, they believe that client/server technology will enhance their development capabilities by facilitating higher development productivity and faster project completion.

IS managers typically perceive that the adoption of client/server technology will increase their need for external services, particularly in the short term. As shown in Exhibit V-4, IS managers also perceive that it will widen the scope of services purchased, with greater emphasis being placed on services related to local-area networks and connectivity.

EXHIBIT V-4



However, as the integration and interconnection of software products increases in importance, there will be a corresponding reduction in the level of demand for bespoke development.

B**IS Managers Need Technical Support**

Exhibit V-5 lists the ratings IS managers gave to a range of service options.

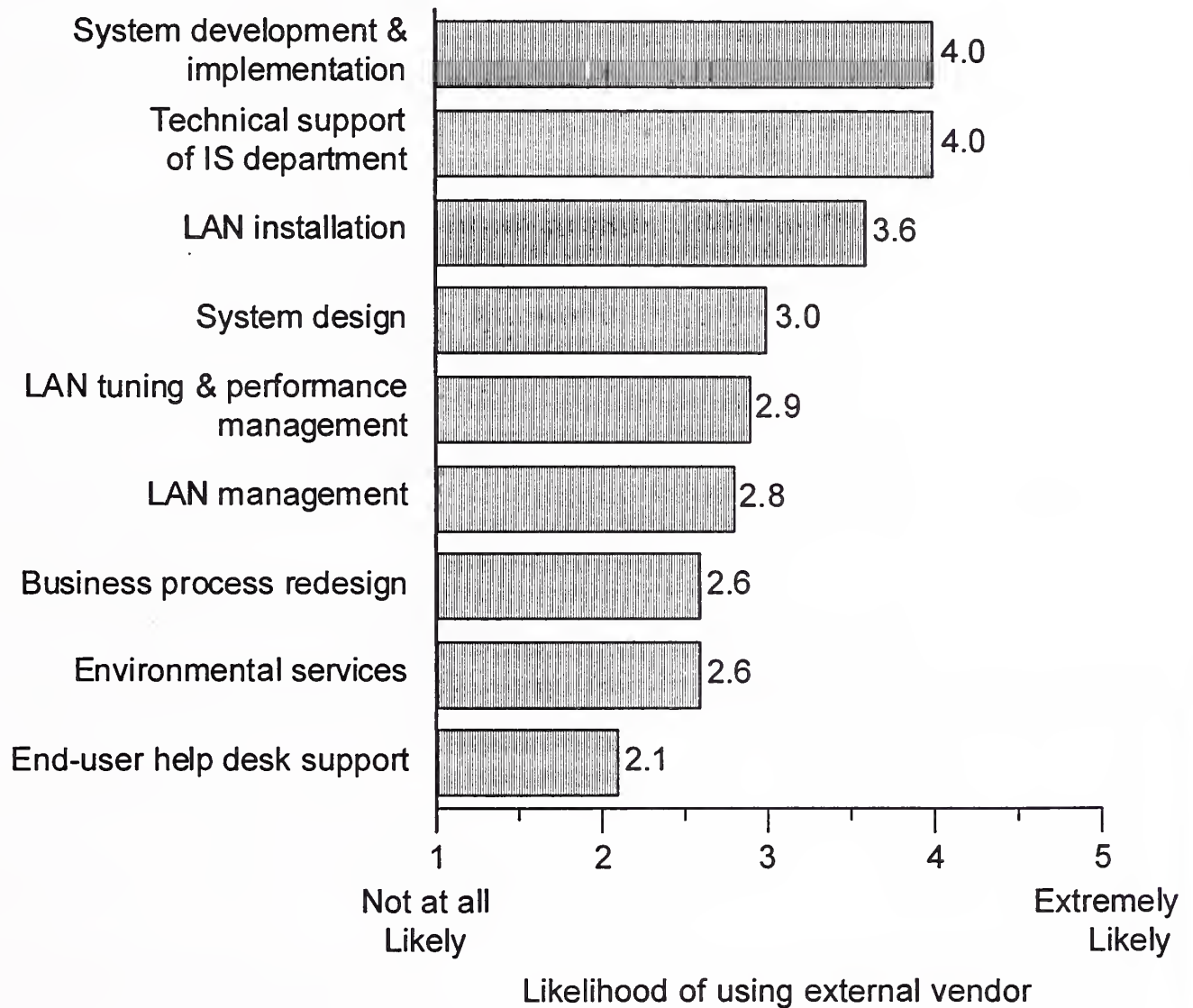
Two out of the sample of nineteen IS managers want a vendor to be the prime contractor for client/server-based systems. However, more typically, IS managers are seeking extensive technical support.

Unprompted, IS managers stated their major requirements to be:

- Wide-area and local-area network design
- Network installation
- Network integration

EXHIBIT V-5

Principal Services Required IS Management Perspective



Sample of 19 IS Managers

Standard error = 0.3

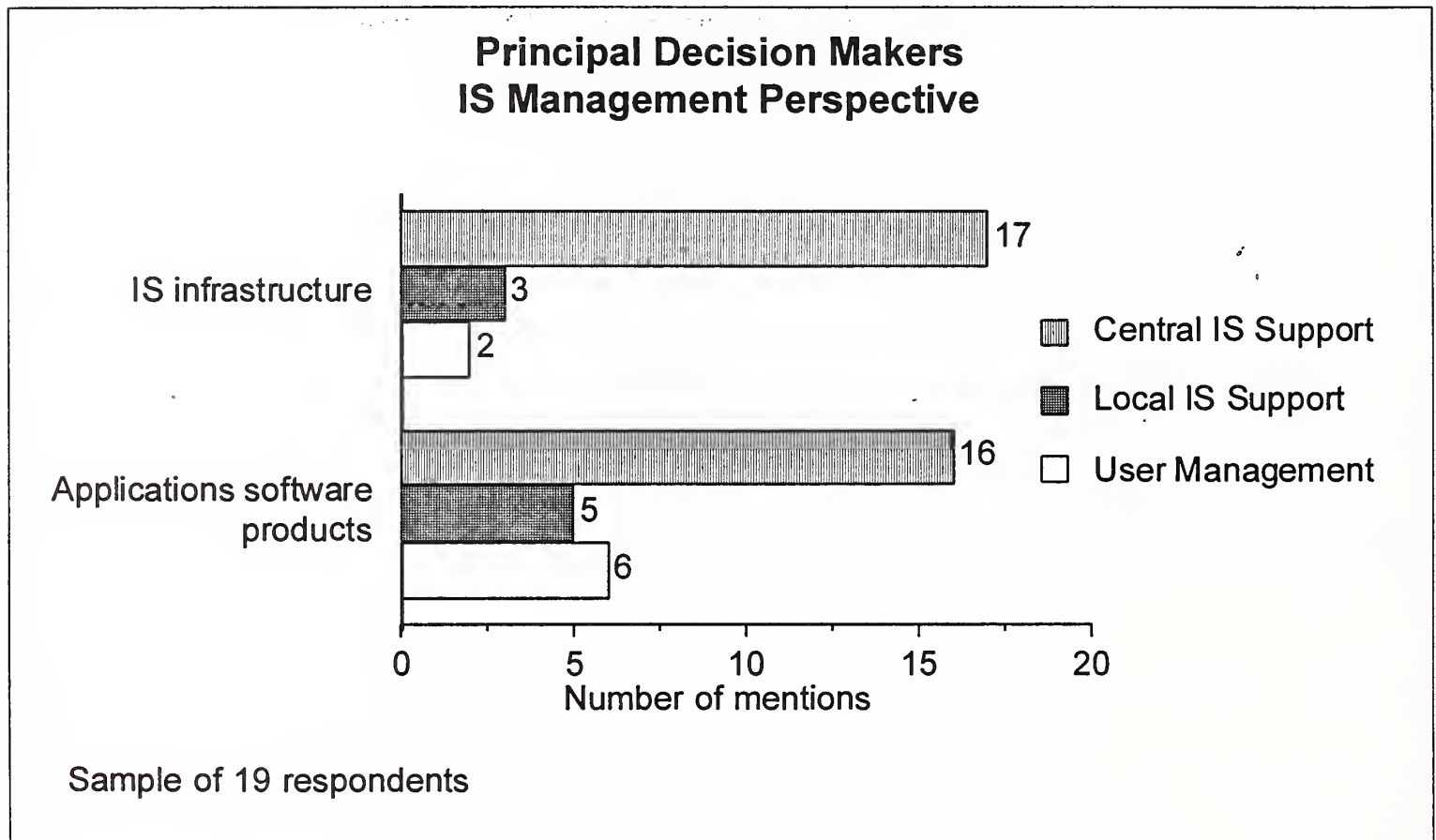
IS managers show less interest in LAN tuning, performance management and environmental services than do users.

C

Equipment Vendors Favoured Over Professional Services Vendors

Exhibit V-6 shows the IS management perspective on the purchasing processes for IS technical infrastructure projects and applications software products.

EXHIBIT V-6



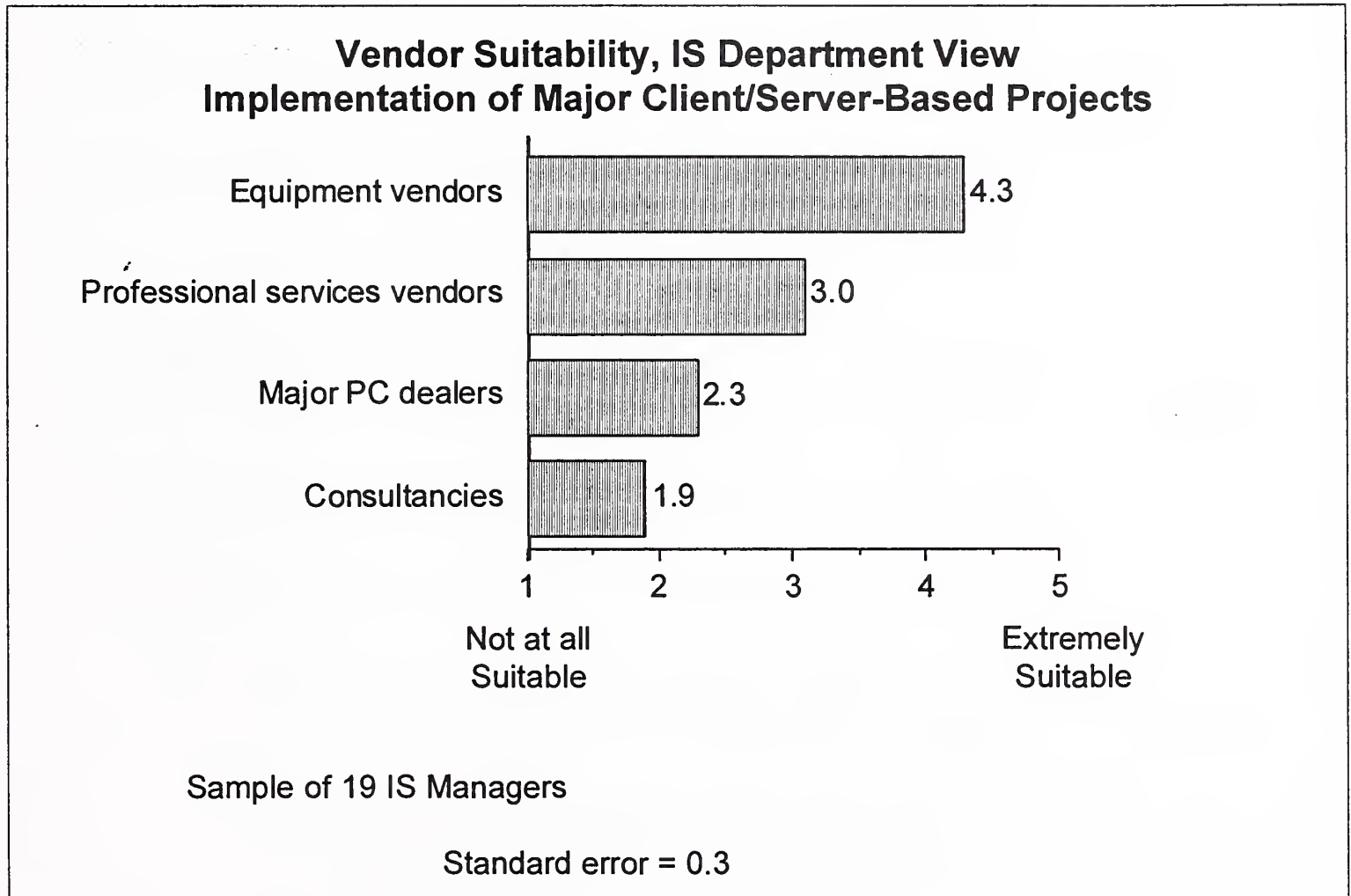
IS managers take a quite different view of their importance in the purchasing process from that held by departmental managers. Nonetheless, both parties agree that:

- IS managers are the principal decision makers in purchasing IS infrastructure projects.
- Departmental/business unit managers play a more important role in the selection of applications software products.

Overall, it appears that IS managers take precedence over departmental/business unit managers—though not necessarily over senior executives—in purchasing IS infrastructure and enterprise-wide solutions. Departmental/business unit managers are increasingly taking responsibility for purchasing systems limited to their own departments.

Exhibit V-7 shows the ratings IS managers awarded to vendors, indicating their level of suitability to implement major systems development projects based around client/server technology.

EXHIBIT V-7



Although the equipment vendors received a high rating from IS managers, this rating needs to be put into perspective. The rating owes more to these vendors' market position and the desire of IS managers to cut out the middle-man when purchasing large volumes of equipment than to vendors' service skills.

Some IS managers perceived that the equipment vendors:

- Are too large/not dedicated
- Are still learning how to deliver services
- Are not the most appropriate choice for this type of project
- Overprice their products and services

IS managers perceive professional services vendors to have good services skills, but:

- Often expect them to work in conjunction with the equipment vendor who acts as the private contractor
- Sometimes have difficulty in matching their skills and software products to the desired equipment platforms
- Perceive them as a source of specialist systems and software

IS managers tend not to perceive dealers as appropriate for major projects. Dealers are perceived to be most applicable for smaller projects and for providing client equipment and user applications.

For large projects, IS managers prefer to deal directly with equipment vendors. The services skills of PC dealers are perceived to lack depth by IS managers.

Like users, IS managers prefer to use consultancies only for front-end project activities.

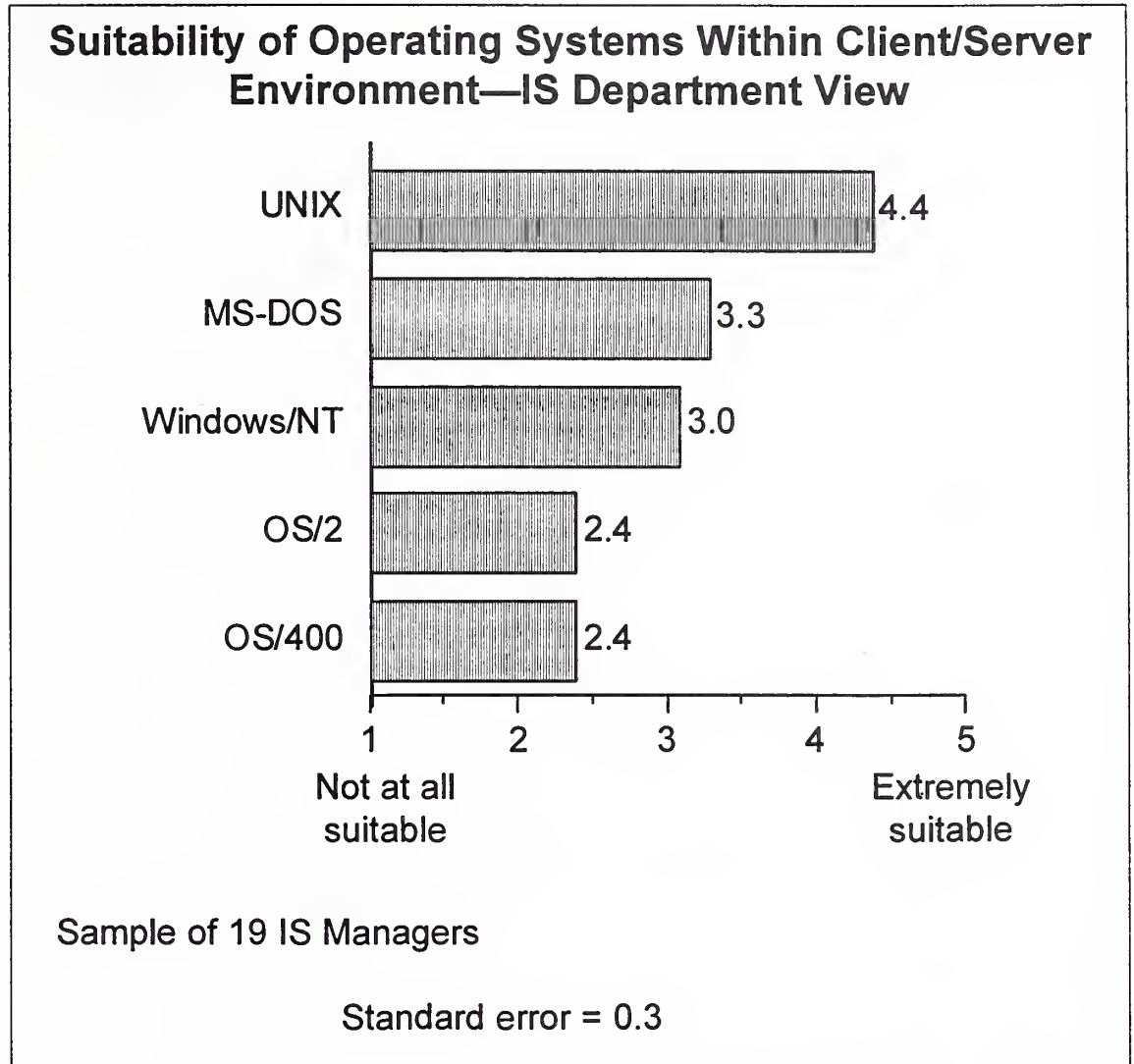
The vendor selection criteria favoured by IS managers include:

- Adherence to open systems
- Ability to cover the range of operating system skills required
- Company stability
- Multivendor network integration capability

Overall, vendors increasingly need to demonstrate a wide, multivendor integration capability, with skills in a wide range of operating systems.

The suitability of individual operating systems as perceived by IS managers is rated in Exhibit V-8.

EXHIBIT V-8

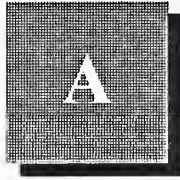


UNIX tends to be viewed as the standard operating system for the future. However, it was suggested that UNIX is not maturing at the rate required.

Usage of MS-DOS is perceived to be static or declining, under the threat from Windows/NT. IS managers typically have high expectations of Windows/NT, which they expect to use extensively in the future. However, at present, IS managers are either evaluating Windows/NT or waiting for it to become proven.

Some IS managers expect that the use of OS/2 will increase in their organisations. However, it is more likely that the use of OS/2, overall, will steadily decline. A similar scenario is expected for OS/400. If IS managers could run UNIX on the IBM AS/400, then it is probable that many would choose to do so.

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Client/Server Integration Services User Questionnaire

1. (a) Has your organisation implemented any major corporate or departmental systems based on client/server technology in the last year?

Yes

No Go to Q1c

- (b) What applications were supported by these systems? What equipment did you use?

Application

Equipment

Server

Client

- (c) Do you intend to implement any client/server based systems over the next two years?

Yes Go to Q1e

No

- (d) If not, why not?

- (e) What applications will these client/server based-systems support? Are these applications specific to an individual department or enterprise-wide? What equipment is planned?

Application

Equipment

Enterprise-/Department-Specific

Server

Client

- (f) How likely are you to use an external vendor to assist you in implementing and/or supporting these systems? Please rate on a scale of 1-5, where 1 = not at all likely and 5 = extremely likely.

	Rating
Implementing	_____
Supporting	_____

- (g) What do you believe are the main roles an external vendor should play within this type of project?

- (h) How likely are you to use an external vendor for each of the following services? Please rate on a scale of 1 - 5, where 1 = not at all likely and 5 = extremely likely.

Business process redesign	_____
System design	_____
System development and implementation	_____
Environmental services (e.g. cabling)	_____
Local-area network installation	_____
Local-area networking tuning and performance management	_____
Ongoing LAN management	_____
User help-desk support	_____
Technical support of IS department	_____

Vendor Image

- 2 (a) What are the main criteria you would use in choosing a vendor for a systems development project based on client/server architecture?

(b) Which vendors do you regard as most appropriate for this type of project? Why?

(c) How suitable do you believe each of the following types of vendor to be for conducting the implementation of major systems development projects based around client/server technology? Why? Please rate on a scale of 1-5, where 1 = not at all suitable and 5 = very suitable.

	Rating	Comments
Equipment vendors	_____	
Major PC dealers	_____	
System houses	_____	
Consultancies	_____	
Other (please specify)	_____	

(d) Who will decide the technical infrastructure used?

- Central IS unit
- User management
- Local IS support

(e) Who will choose the applications software products to be used?

- Central IS unit
- User management
- Local IS support

(f) Which products and services will be purchased through a central IS unit and which through departmental user management?

Central IS unit Departmental Users

Technology Preferences

3 (a) Which technologies do you favour as the basis of a client/server architecture?

(b) How appropriate do you perceive each of the following operating systems to be? Please rate on a scale of 1-5, where 1 = not at all appropriate and 5 = very appropriate. Why?

	Rating	Comments
UNIX	_____	
Windows/NT	_____	
OS/2	_____	
OS/400	_____	
Other (please specify)	_____	

(c) Which version of UNIX do you favour?

General Trends

4 (a) As a consequence of the introduction of client/server-based systems, to what extent do you believe that:

[Please rate the following statements from 1 - 5, where 1 signifies strong disagreement and 5 signifies strong agreement.]

Development projects will become smaller	_____
Projects will become more frequent	_____
IS expenditure will increase	_____
Lower levels of implementation assistance will be required from external vendors	_____
End users will play a greater role in development projects	_____

