

INPUT

RESEARCH REPORT

Evaluation of Internet Access
Services for Business

Evaluation of Internet Access Services for Business

INPUT[®]

Frankfurt • London • New York • Paris • San Francisco • Tokyo • Washington D.C.

INPUT®

Clients make informed decisions more quickly and economically by using INPUTs services. Since 1974, information technology (IT) users and vendors throughout the world have relied on INPUT for data, research, objective analysis and insightful opinions to prepare their plans, market assessments and business directions, particularly in computer software and services.

Contact us today to learn how your company can use INPUT's knowledge and experience to grow and profit in the revolutionary IT world of the 1990s.

SUBSCRIPTION SERVICES

- Information Services Markets
 - Worldwide and country data
 - Vertical industry analysis
- Business Integration Markets
- Systems Integration and Professional Services Markets
- Client/Server Software Platforms
- Outsourcing Markets
- Information Services Vendor Profiles and Analysis
- Electronic Commerce/Internet
- U.S. Federal Government IT Markets
- IT Customer Services Directions (Europe)

SERVICE FEATURES

- Research-based reports on trends, etc. (Over 100 in-depth reports per year)
- Frequent bulletins on events, issues, etc.
- 5-year market forecasts
- Competitive analysis
- Access to experienced consultants
- Immediate answers to questions
- On-site presentations

DATABASES

- Software and Services Market Forecasts
- Software and Services Vendors
- U.S. Federal Government
 - Procurement Plans (PAR)
 - Forecasts
 - Awards (FAIT)
 - Agency Procurement Requests (APR)

CUSTOM PROJECTS

For Vendors—analyze:

- Market strategies and tactics
- Product/service opportunities
- Customer satisfaction levels
- Competitive positioning
- Acquisition targets

For Buyers—evaluate:

- Specific vendor capabilities
- Outsourcing options
- Systems plans
- Peer position

OTHER SERVICES

Acquisitions/partnerships searches

INPUT Worldwide

Frankfurt

Perchstätten 16
D-35428 Langgöns
Germany
Tel: +49 (0) 6403 911420
Fax: +49 (0) 6403 911413

London

Cornwall House
55-77 High Street
Slough, Berkshire
SL1 1DZ UK
Tel: +44 (0) 1753 530444
Fax: +44 (0) 1753 577311

New York

300 Frank W. Burr Blvd.
Teaneck, NJ 07666
U.S.A.
Tel: +1 (201) 801-0050
Fax: +1 (201) 801-0441

Paris

24, avenue du Recteur
Poincaré
75016 Paris
France
Tel: +33 (1) 46 47 65 65
Fax: +33 (1) 46 47 69 50

San Francisco

1881 Landings Drive
Mountain View
CA 94043-0848
U.S.A.
Tel: +1 (650) 961-3300
Fax: +1 (650) 961-3966

Tokyo

6 F #B, Mitoshiro Building,
1-12-12 Uchikanda
Chiyoda-ku, Tokyo 101
Japan
Tel: +81 3 3219-5441
Fax: +81 3 3219-5443

Washington, D.C.

1921 Gallows Road
Suite 250
Vienna, VA 22182 3900
U.S.A.
Tel: +1 (703) 847-6870
Fax: +1 (703) 847-6872

Abstract

This report analyzes use of ISP services in the US and Europe.

ISPs (Internet service providers) face considerable challenges in meeting the changing requirements of customers, maintaining market share, and winning new business. Providers can no longer rely on basic Internet access for business. They must provide higher-value services, and at the same time commit themselves to service level agreements.

As buyers increase the scale and complexity of their Internet operations and applications, they need ISPs who can keep pace. To date, ISPs have performed reasonably well, but some aspects of ISP services (notably capacity-related issues) are beginning to lag behind user expectations.

This report identifies the current and planned use of access, hosting, and Extranet services, and measures buyer satisfaction, benefit expectations, and concerns. It covers the US, UK, France, and Germany, and the finance, manufacturing, and retail industries.

Published by
INPUT
Cornwall House, 55-77 High Street
Slough, Berkshire, SL1 1DZ
United Kingdom

***Internet/Intranet Technologies &
Solutions Program***

***Evaluation of Internet Access Services
for Business***

Copyright © 1998 by INPUT. All rights reserved.
Printed in the United Kingdom. No part of the
publication may be reproduced or distributed in any
form, or by any means, or stored in a database or
retrieval system, without the prior written permission
of the publisher.

The information provided in this report shall be used
only by the employees of and within the current
corporate structure of INPUT's clients, and will not be
disclosed to any other organisation or person
including parent, subsidiary, or affiliated organisation
without prior written consent of INPUT.

INPUT exercises its best efforts in preparation of the
information provided in this report and believes the
information contained herein to be accurate.
However, INPUT shall have no liability for any loss or
expense that may result from incompleteness or
inaccuracy of the information provided.

Table of Contents

I	Introduction	1
	A. Objectives and Scope	1
	B. Research Methodology	1
	C. Report Structure	3
	D. Related Reports	4
II	Executive Summary	5
	A. Internet Access is a Highly-Rated Commodity, But Higher Value Services Are Keys to Future Growth	5
	B. Web Hosting	15
	C. Application Hosting	17
	D. Extranet Services	19
	E. The Future of the ISP Market	22
III	Internet Access Usage and Plans	27
	A. Current and Future Usage	27
	B. Scope of Access Within Organizations	31
	C. Internal and External Traffic	33
	D. ISPs Used	34
	E. Expected Change in ISP Use	37
	F. Bandwidth Usage	40
	G. Service Guarantees	42
	H. Payment Schemes	44
IV	Internet Access Satisfaction and Criteria	47
	A. Overall Satisfaction With Internet Access	47
	B. Importance Of and Satisfaction With Internet Access Characteristics	50

V	Web Hosting Usage and Plans	59
	A. Current and Future Usage	59
	B. Server Ownership	62
	C. Management Responsibility	64
	D. ISP Consistency	69
VI	Web Hosting Benefits, Satisfaction, and Criteria	71
	A. Benefits	71
	B. Satisfaction	73
	C. Purchasing Criteria	83
VII	Application Hosting Usage and Plans	85
	A. Server Ownership	85
	B. Management Responsibility	87
	C. ISP Consistency	92
VIII	Application Hosting Benefits, Satisfaction, and Criteria	93
	A. Benefits	93
	B. Satisfaction	96
	C. Purchasing Criteria	106
IX	Extranet Service Usage and Plans	109
	A. Current and Future Usage	109
	B. Best VPN Implementation Methods	111
	C. Scope of Extranet Deployment	114
	D. ISP Consistency	116

X	Extranet Benefits, Satisfaction, and Criteria	117
	A. Benefits	117
	B. Satisfaction	119
	C. Purchasing Criteria	125
	D. Cost Savings	126

Appendices

- A. Vendor Awareness
- B. Buyer Questionnaire

List of Exhibits

I

-1	Sample Breakdown by Country	2
-2	Sample Breakdown by Industry	2
-3	Sample Breakdown by Country and Industry	3

II

-1	Satisfaction With Internet Access	6
-2	Performance of Most Important Internet Access Characteristics	8
-3	Extent of Internet Access Among Employees	9
-4	Minimum ISP Services	10
-5	Current and Expected Use of ISP Services	11
-6	Satisfaction With ISP Services, Worldwide	12
-7	Vendor Awareness	13
-8	Internet Access Expenditure, Worldwide, 1998-2003	14
-9	Performance of Most Important Web Hosting Characteristics	16
-10	Hosting Expenditure, Worldwide, 1998-2003	17
-11	Performance of Most Important Application Hosting Characteristics	19
-12	Change in Importance of Most Significant Extranet Characteristics	21
-13	Extranet Service Expenditure, Worldwide, 1998-2003	22

III

-1	Current and Expected Use of ISP Services, 1998-2000, Worldwide	28
-2	Current and Expected Use of ISP Services, 1998-2000, US	28
-3	Current and Expected Use of ISP Services, 1998-2000, Europe	29
-4	Current and Expected Use of ISP Services, 1998-2000, Finance	29
-5	Current and Expected Use of ISP Services, 1998-2000, Manufacturing	30
-6	Current and Expected Use of ISP Services, 1998-2000, Retail	30
-7	Scope of Email and Web Access Within Organizations, by Region	31
-8	Scope of Email and Web Access Within Organizations, by Country	32
-9	Scope of Email and Web Access Within Organizations, by Industry	32
-10	Internal and External Traffic Volumes, Worldwide	33
-11	External Traffic Carried Over Internet, Worldwide	34
-12	ISPs Used, US	35
-13	ISPs Used, UK	36
-14	ISPs Used, France	36
-15	ISPs Used, Germany	37

-16	Change of ISP Expected Within 12 Months, Worldwide	39
-17	Change of ISP Expected Within 12 Months, US	39
-18	Change of ISP Expected Within 12 Months, Europe	40
-19	Bandwidth Usage, US	41
-20	Current and Expected Service Levels, Worldwide	42
-21	Current and Expected Service Levels, US	43
-22	Current and Expected Service Levels, Europe	43
-23	Service Levels Typically Achieved, Worldwide	44
-24	Current and Preferred Payment Schemes, Worldwide	45
-25	Current and Preferred Payment Schemes, US	45
-26	Current and Preferred Payment Schemes, Europe	46

IV

-1	Overall Satisfaction With Internet Access, by Country	47
-2	Overall Satisfaction With Internet Access, by Industry	48
-3	Overall Satisfaction With Internet Access, US	48
-4	Overall Satisfaction With Internet Access, Europe	49
-5	Overall Satisfaction With Internet Access by Industry, US	49
-6	Overall Satisfaction With Internet Access by Industry, Europe	50
-7	Current Importance of Internet Access Characteristics, Worldwide	51
-8	Current Importance of Internet Access Characteristics, US	52
-9	Current Importance of Internet Access Characteristics, Europe	52
-10	Expected Importance of Internet Access Characteristics, 2000, Worldwide	53
-11	Expected Importance of Internet Access Characteristics, 2000, US	54
-12	Expected Importance of Internet Access Characteristics, 2000, Europe	54
-13	Expected Change in Importance of Internet Access Characteristics, Worldwide	55
-14	Satisfaction With Internet Access Characteristics, Worldwide	56
-15	Satisfaction With Internet Access Characteristics, US	56
-16	Satisfaction With Internet Access Characteristics, Europe	57
-17	Difference Between Importance of and Satisfaction With Internet Access Characteristics, Worldwide	57

V

-1	Current and Expected Use of Hosting Services, Worldwide	60
-2	Current and Expected Use of Hosting Services, US	61
-3	Current and Expected Use of Hosting Services, Europe	61
-4	Current and Expected Web Server Ownership, Worldwide	63
-5	Current and Expected Web Server Ownership, US	63
-6	Current and Expected Web Server Ownership, Europe	64
-7	Hosted Web Server Management Responsibilities, Worldwide	65
-8	Hosted Web Server Management Responsibilities, US	66
-9	Hosted Web Server Management Responsibilities, Europe	66

-10	Preferred Web Hosting Management Responsibilities, Worldwide	67
-11	Preferred Web Hosting Management Responsibilities, US	67
-12	Preferred Web Hosting Management Responsibilities, Europe	68
-13	Difference Between Current and Preferred Web Hosting Management Responsibilities, Worldwide	68
-14	Use of Same ISP for Internet Access and Web Hosting	69

VI

-1	Web Hosting Benefits, Worldwide	72
-2	Web Hosting Benefits, US	72
-3	Web Hosting Benefits, Europe	73
-4	Overall Satisfaction With Web Hosting Services, by Country	74
-5	Overall Satisfaction With Web Hosting Services, by Industry	74
-6	Current Importance of Web Hosting Characteristics, Worldwide	75
-7	Current Importance of Web Hosting Characteristics, US	76
-8	Current Importance of Web Hosting Characteristics, Europe	76
-9	Expected Importance of Web Hosting Characteristics, 2000, Worldwide	77
-10	Expected Importance of Web Hosting Characteristics, 2000, US	78
-11	Expected Importance of Web Hosting Characteristics, 2000, Europe	78
-12	Expected Change in Importance of Web Hosting Characteristics, Worldwide	79
-13	Satisfaction With Web Hosting Characteristics, Worldwide	80
-14	Satisfaction With Web Hosting Characteristics, US	81
-15	Satisfaction With Web Hosting Characteristics, Europe	81
-16	Difference Between Importance of and Satisfaction With Web Hosting Characteristics, Worldwide	82
-17	Criteria Used for Purchasing Web Hosting Services, Worldwide	83

VII

-1	Current and Expected Hosted Application Server Ownership, Worldwide	86
-2	Current and Expected Hosted Application Server Ownership, US	86
-3	Current and Expected Hosted Application Server Ownership, Europe	87
-4	Hosted Application Server Management Responsibilities, Worldwide	88
-5	Hosted Application Server Management Responsibilities, US	89
-6	Hosted Application Server Management Responsibilities, Europe	89
-7	Preferred Application Hosting Management Responsibilities, Worldwide	90

-8	Preferred Application Hosting Management Responsibilities, US	90
-9	Preferred Application Hosting Management Responsibilities, Europe	91
-10	Difference Between Current and Preferred Application Hosting Management Responsibilities, Worldwide	91
-11	Use of Same ISP for Internet Access and Application Hosting	92

VIII

-1	Application Hosting Benefits, Worldwide	94
-2	Application Hosting Benefits, US	95
-3	Application Hosting Benefits, Europe	96
-4	Overall Satisfaction With Application Hosting Services, by Region	97
-5	Overall Satisfaction With Application Hosting Services, by Industry	97
-6	Overall Satisfaction With Application Hosting Services, US	98
-7	Overall Satisfaction With Application Hosting Services, Europe	98
-8	Current Importance of Application Hosting Characteristics, Worldwide	99
-9	Current Importance of Application Hosting Characteristics, US	100
-10	Current Importance of Application Hosting Characteristics, Europe	100
-11	Expected Importance of Application Hosting Characteristics, 2000, Worldwide	102
-12	Expected Importance of Application Hosting Characteristics, 2000, US	102
-13	Expected Importance of Application Hosting Characteristics, 2000, Europe	103
-14	Expected Change in Importance of Application Hosting Characteristics, Worldwide	103
-15	Satisfaction With Application Hosting Characteristics, Worldwide	104
-16	Satisfaction With Application Hosting Characteristics, US	105
-17	Satisfaction With Application Hosting Characteristics, Europe	105
-18	Difference Between Importance of and Satisfaction With Application Hosting Characteristics, Worldwide	106
-19	Criteria Used for Purchasing Application Hosting Services, Worldwide	107

IX

-1	Current and Expected Use of Extranet Services, Worldwide	110
-2	Current and Expected Use of Extranet Services, US	110
-3	Current and Expected Use of Extranet Services, Europe	111
-4	Most Appropriate VPN Implementation Method, Worldwide	112

-5	Most Appropriate VPN Implementation Method, US	113
-6	Most Appropriate VPN Implementation Method, Europe	113
-7	Current and Expected Scope of Extranet Deployment, Worldwide	114
-8	Current and Expected Scope of Extranet Deployment, US	115
-9	Current and Expected Scope of Extranet Deployment, Europe	115
-10	Use of Same ISP for Internet Access and Extranet Services	116

X

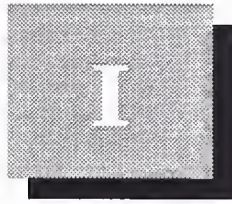
-1	Extranet Service Benefits, Worldwide	118
-2	Extranet Service Benefits, US	118
-3	Extranet Service Benefits, Europe	119
-4	Overall Satisfaction With Extranet Services	120
-5	Current Importance of Extranet Service Characteristics, Worldwide	121
-6	Expected Importance of Extranet Service Characteristics, 2000, Worldwide	121
-7	Expected Importance of Extranet Service Characteristics, 2000, US	122
-8	Expected Importance of Extranet Service Characteristics, 2000, Europe	122
-9	Expected Change in Importance of Extranet Service Characteristics, Worldwide	123
-10	Satisfaction With Extranet Service Characteristics, Worldwide	124
-11	Difference Between Importance of and Satisfaction With Extranet Service Characteristics, Worldwide	124
-12	Criteria Used for Purchasing Extranet Services, Worldwide	125
-13	Expected Extranet Cost Savings, Worldwide	127

Appendices

A Vendor Awareness

A-1	Vendor Awareness, US
A-2	Vendor Awareness, UK
A-3	Vendor Awareness, France
A-4	Vendor Awareness, Germany

B Buyer Questionnaire



Introduction

A

Objectives and Scope

Most large US and European organizations (revenues of \$100 million and above) have Internet access via an ISP; 90% in the US, 75% in Europe. The worldwide market for ISP services—Internet access, Web hosting, application hosting, and Extranet services—will grow at around 50% CAGR between 1997 and 2002.

These ISP services form a hierarchical chronology. In order, ISPs have, and will, include the following services into their standard offerings: Internet access, Web hosting, application hosting, Extranet services, and full commerce services. By 2002, ISPs serving the corporate market will be provide, and integrate, all these services as a minimum requirement.

This report identifies the current and planned use of access, hosting, and Extranet services. It measures buyer satisfaction, benefit expectations, and concerns.

B

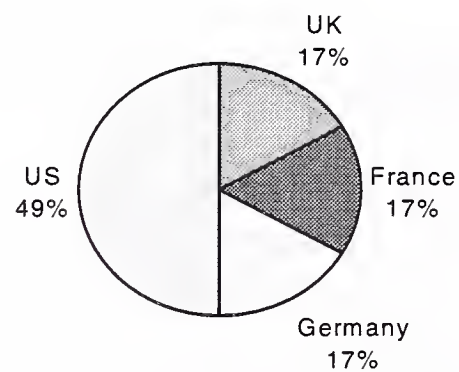
Research Methodology

INPUT interviewed 150 large US and European companies (revenues of \$100 million or higher) during March 1998. Countries included were the US, UK, France, and Germany. Industry sectors covered were finance, manufacturing, and retail.

Exhibit I-1 shows the sample breakdown by country; Exhibit II-2 shows sample breakdown by industry sector. Exhibit I-3 shows industry sector splits within each country.

Exhibit I-1

Sample Breakdown by Country

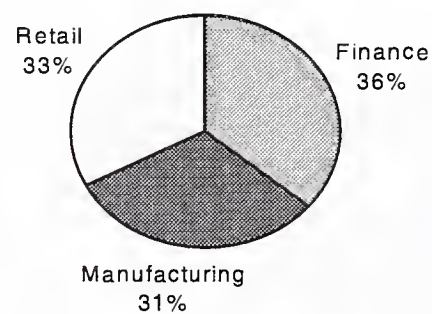


Sample: 150

Source: INPUT

Exhibit I-2

Sample Breakdown by Industry



Sample: 150

Source: INPUT

Exhibit I-3

Sample Breakdown by Country and Industry

Country	Industry	Sample
US	Finance	26
	Manufacturing	26
	Retail	23
UK	Finance	9
	Manufacturing	7
	Retail	9
France	Finance	10
	Manufacturing	6
	Retail	9
Germany	Finance	9
	Manufacturing	8
	Retail	8

*Source: INPUT***C****Report Structure**

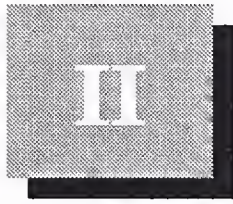
- Chapter II—Executive Summary—presents a summary of the key findings of this report, plus market forecasts.
- Chapter III—Internet Access Usage and Plans—show details of buyers' current use of access and other services, the extent of access within organizations, ISPs currently used, and service levels.
- Chapter IV—Internet Access Satisfaction and Criteria—presents a breakdown of Internet access service characteristics: their importance to buyers, and satisfaction levels

- Chapter V—Web Hosting Usage and Plans—shows current and planned use of all hosting services, server ownership options, management responsibilities, and ISP consistency
- Chapter VI—Web Hosting Benefits, Satisfaction, and Criteria—presents a breakdown of Web hosting service characteristics, their importance to buyers, and satisfaction levels, and purchasing criteria
- Chapter VII—Application Hosting Usage and Plans—shows server ownership options, management responsibilities, and ISP consistency
- Chapter VIII—Application Hosting Benefits, Satisfaction, and Criteria—presents a breakdown of Internet access service characteristics, their importance to buyers, and satisfaction levels, and purchasing criteria
- Chapter IX—Extranet Service Usage and Plans—shows current and planned use of Extranets, best VPN implementation methods, scope of deployment, and ISP consistency
- Chapter X—Extranet Benefits, Satisfaction, and Criteria—presents a breakdown of Extranet service characteristics, their importance to buyers, and satisfaction levels, purchasing criteria, and cost savings
- Appendix A shows buyers' awareness of ISPs per country
- Appendix B shows the buyer questionnaire used for this report

D

Related Reports

- *Internet and Intranet Market Analysis, Worldwide 1997-2002*



Executive Summary

A

Internet Access is a Highly-Rated Commodity, But Higher Value Services Are Keys to Future Growth

INPUT's survey reveals that Internet access is a low-margin commodity service, with buyers expressing high levels of satisfaction. However, Internet services providers, primarily ISPs and telcos, must focus on higher-value services to:

- Maintain new business growth
- Position themselves as full-service providers
- Meet the increasingly diverse needs of existing customers

The higher-value services discussed in this report which ISPs must work to integrate into their core offerings are:

- Web hosting
- Application/database hosting
- Extranet services

These are discussed separately in the following sections.

Web commerce services is the fourth category that will become a minimum requirement of ISPs, but is beyond the scope of this report.

Internet access is a commodity service. INPUT estimates that 90% of large enterprises (revenues of \$100 million and above) in the US currently have a connection to the Internet via an ISP. The figure in Europe is a little lower, at 75%. A small proportion (approximately 5%) of large

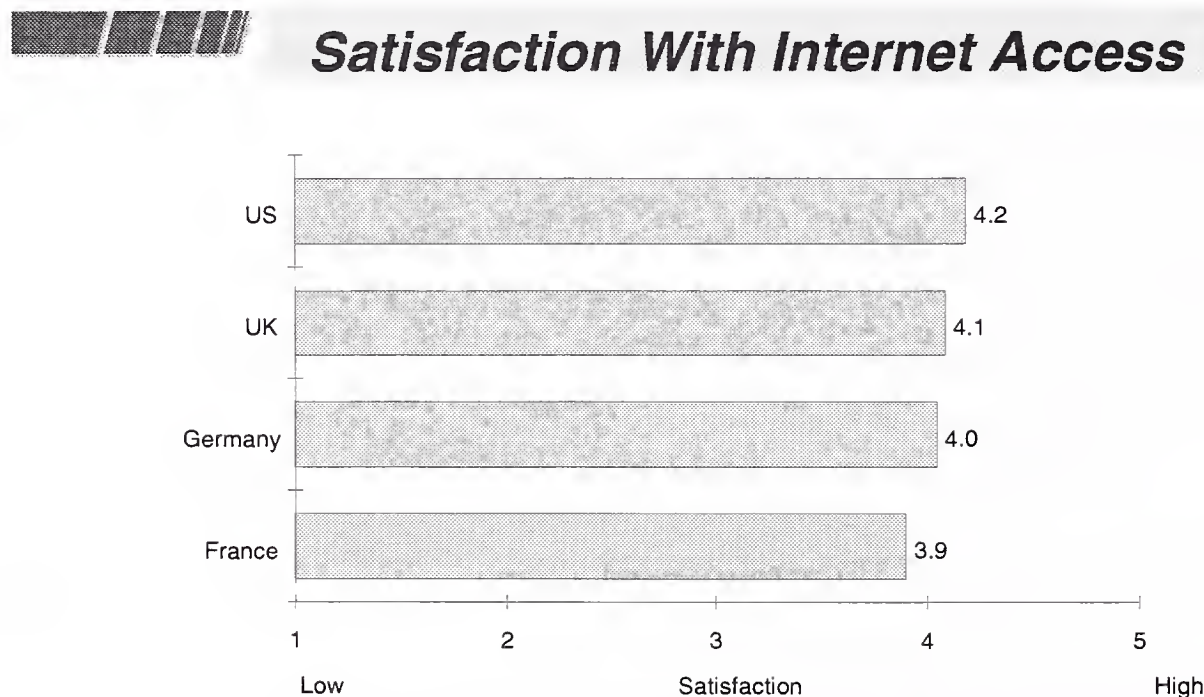
companies are themselves ISP, telcos or other Internet-based network services providers, and connect direct to the Internet backbone.

INPUT's survey sample comprised large companies with an existing Internet connection, and is therefore representative of 75-90% of large US and European organizations.

As is typical for high-volume, commodity services, satisfaction levels are high. On an ascending scale of 1 to 5, organizations rate their satisfaction with their Internet access service at 4.1. There is very little difference between the countries or industry sectors covered in the survey, indicating that ISPs are providing uniformly good Internet access. Exhibit II-1 shows the ratings given by country.

Exhibit II-1

Satisfaction With Internet Access



2 - 3/5/98

Proprietary & Confidential - INPUT

INPUT®

Sample: 131

Source: INPUT

Exhibit II-2 shows satisfaction plotted against importance of several characteristics of Internet access services. The black circle shows current importance; the white circle shows expected importance in two years'

time. Characteristics towards the top-right corner are important *and* meet with buyers' satisfaction. National coverage and reliability, therefore, are both important aspects of Internet access that ISPs are providing to a high level currently.

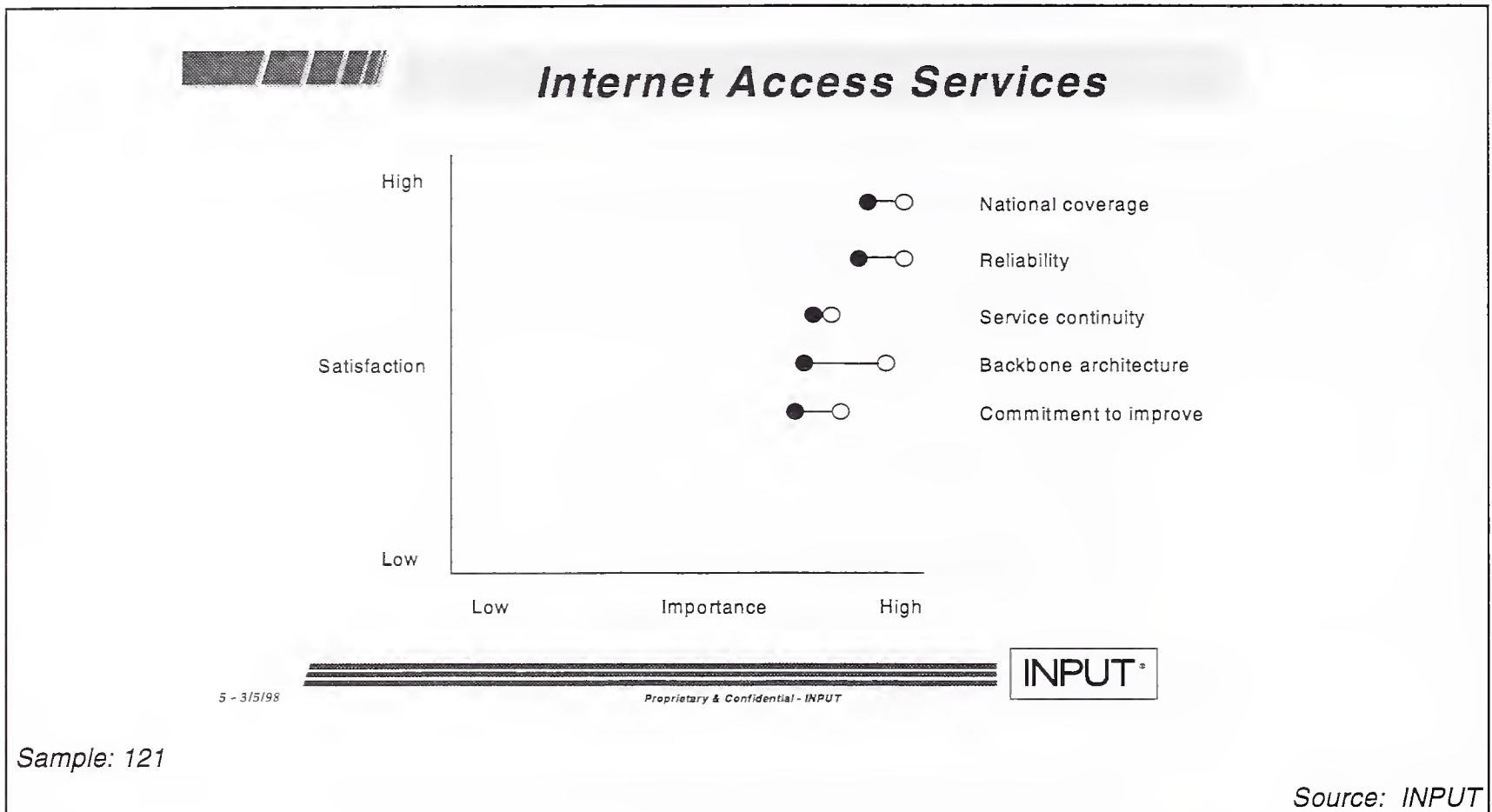
Characteristics towards the bottom-right corner are important, but *not* provided to a high standard currently. For example, buyers are relatively dissatisfied with their ISP's apparent commitment to upgrade and improve service. At current satisfaction levels, quality of backbone architecture is a problem area; its importance to users will rise significantly over the next two years, and it is only considered adequate by users currently.

As corporate buyers seek to connect an increasing proportion of their worldwide operations to the Internet, and to each other, the solidity and performance of the underlying backbone become critical. Many companies, even large enterprises, connect to the Internet through sub-capacity connections. Low-bandwidth dialup connections are not uncommon even in large organizations, particularly those fragmented geographically such as retailers.

The quality of every service an ISP offers depends on that ISP's connections to the rest of the Internet. High bandwidth backbone connections are not adequate to provide a robust service. Peering arrangements with other ISPs, redundancy of equipment, lines, and power at PoPs (points of presence) and NAPs (network access points), and high-quality management are critical to ensure good service.

Exhibit II-2

Performance of Most Important Internet Access Characteristics



The Exhibit shows the most important characteristics. Other aspects, while of lower importance, will experience a similarly significant relative rise. For example, currently, European organizations place more importance on international coverage than do US companies. US organizations are extending their Internet operations overseas rapidly, and they account for most of the increase in importance of international coverage over the next two years. This is the most significant difference between US and European buyers; European respondents rated the importance of international coverage at 3.3 out of 5, US respondents at only 2.2.

But growth in the large company Internet access market does not depend only on identifying changing buyer requirements. There is considerable room for growth supplying basic access to employees that currently have no access. Exhibit II-3 shows the proportions of employees that currently have email and Web access among companies surveyed. The opportunities for ISPs are in providing higher capacity connections, extensive implementation services to serve an increasing user base within

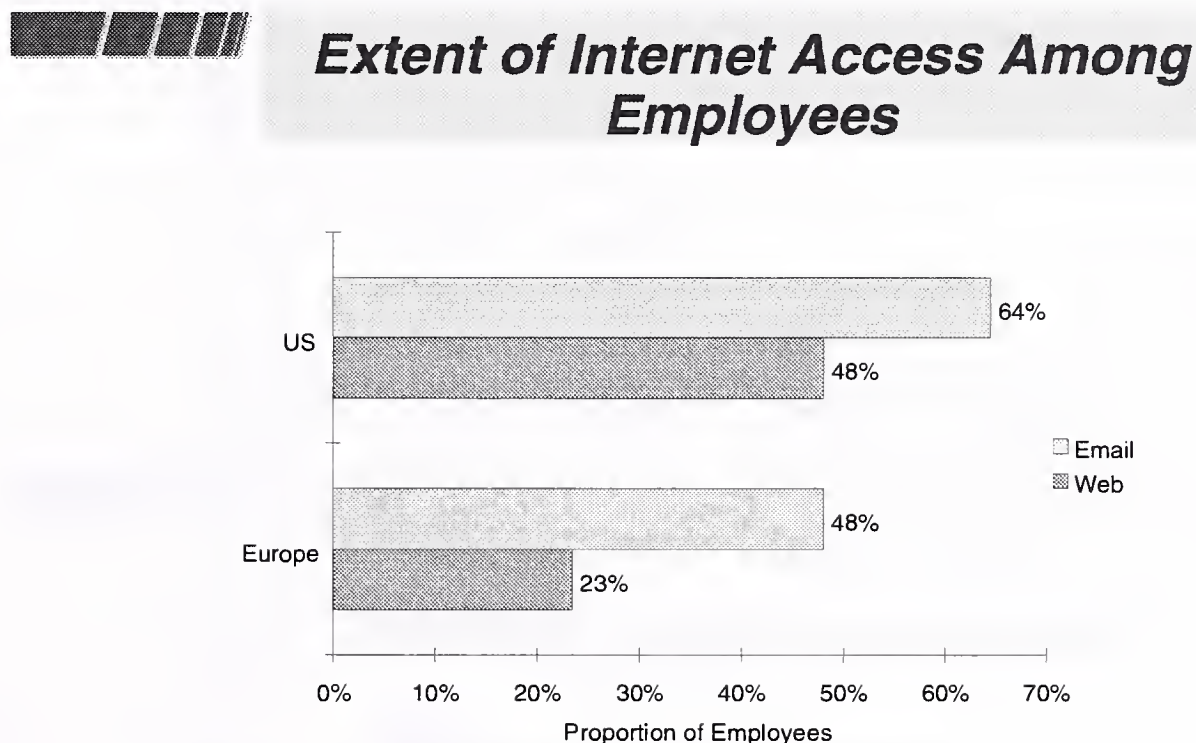
individual companies, and increasing revenue through traffic volume-based pricing models.

In a typical US organization interviewed, half the employees have Web access; in Europe, a quarter. In France, the figure drops to just 17%.

Among US respondents, one third gave email access to 100% of staff; in Europe one quarter did. Company-wide Web access was seen in only 10% of US and European companies.

Exhibit II-3

Extent of Internet Access Among Employees



5 - 3/5/98

Proprietary & Confidential - INPUT

INPUT®

Sample: 145

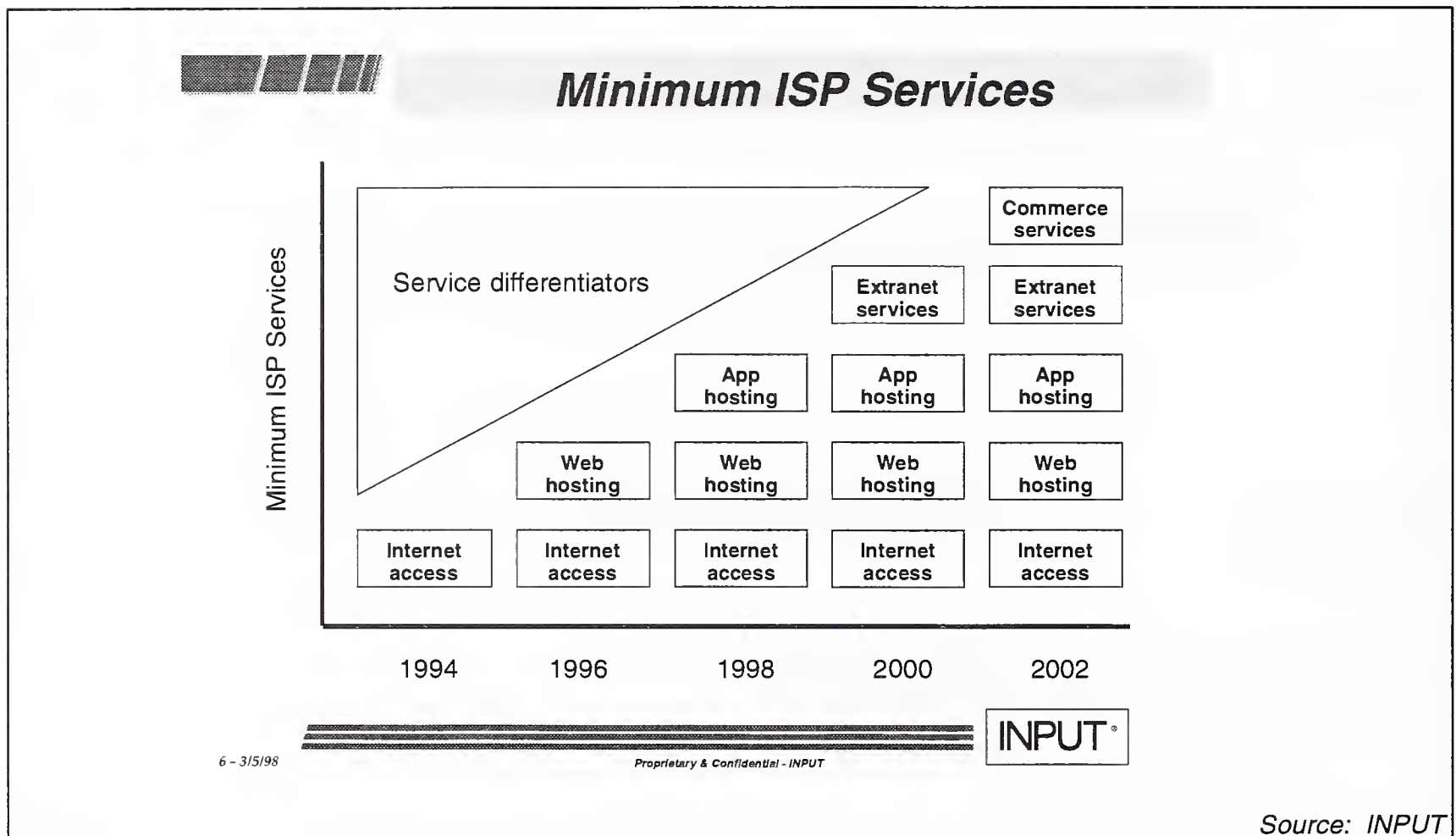
Source: INPUT

While the need for ISPs to offer the highest quality access services and continually perfect the underlying network architecture is paramount, strategic focus must be put on higher value services. ISPs cannot compete on access alone, and buyers are requiring an increasingly broad range of additional services. Exhibit II-4 shows the minimum services that a corporate ISP must offer to be able to bid for business. Many ISPs offer these services ahead of time as marked in the Exhibit—buyers can expect

to conduct Internet commerce with many ISPs today, for example, but the ISP may be restricted to the provision of a secure server and rudimentary credit card handling. Full, integrated commerce services that support all major payment mechanisms and provide service guarantees are rarer, and not yet an absolute requirement for an ISP to succeed in the market.

Exhibit II-4

Minimum ISP Services



Internet access is decreasing as a proportion of ISP revenues. Service offerings required of ISPs are increasing in number and variety and include Web hosting, private application, Intranet and database hosting, Extranet provision, and Internet commerce. Further, buyers are looking to shift greater management responsibility to their ISP, and an increasing number are seeking fully-managed services.

The requirements within service offerings are growing. Web hosting services must include not only the operation and management of a Web server, but also content duplication and mirroring, load balancing, site advertising management, credit card processing, and visitor tracking and profiling, alongside being responsive to short-term changes in customer

needs. Auxiliary services such as Web site planning and design and Web marketing consultancy are become increasingly important in the SME sector.

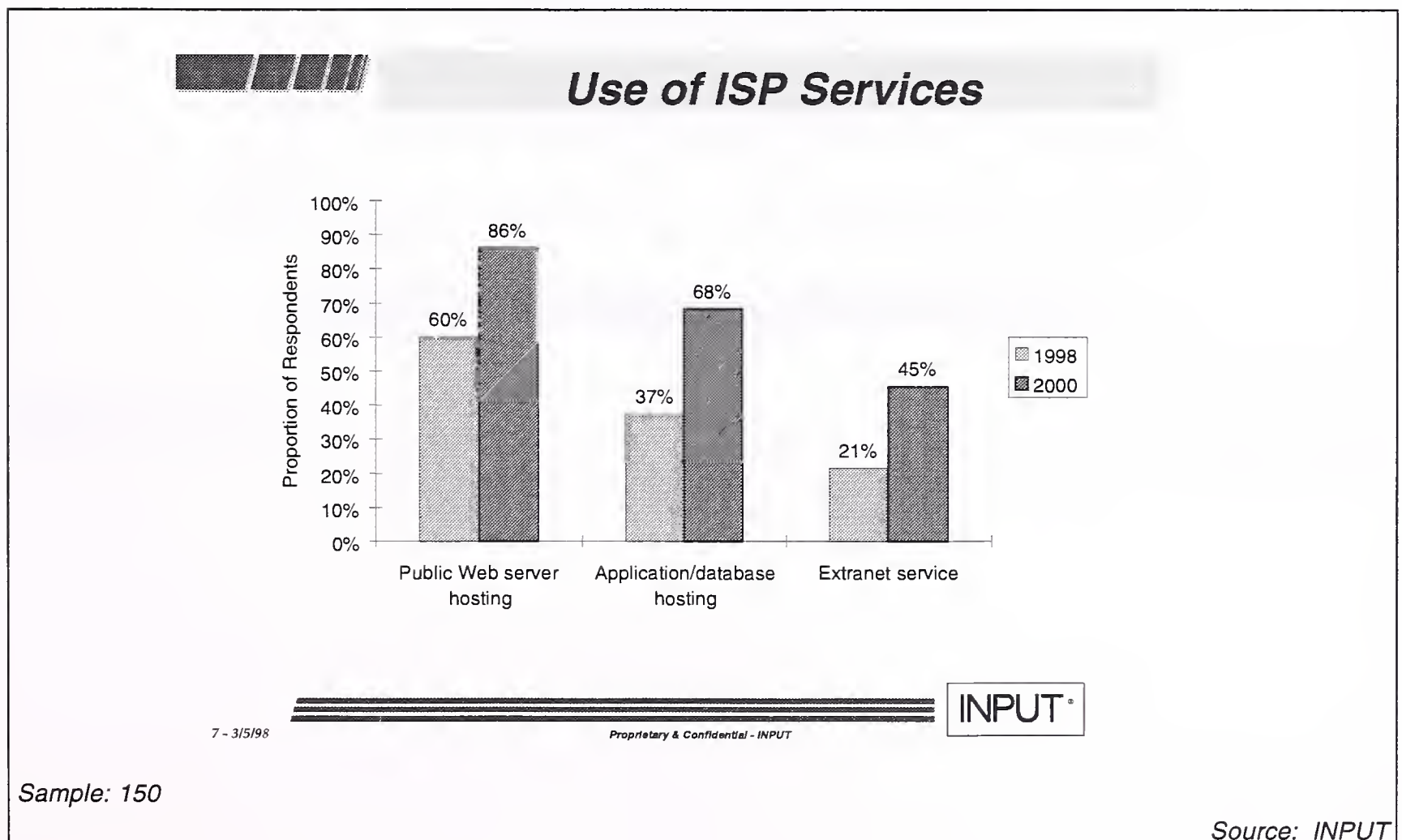
Exhibit II-5 shows the current and expected usage of ISP services.

US and European organizations expect to make similar use of Web server hosting, application hosting, and Extranet services by 2000. However, European respondents exhibited only half the level of usage of application hosting and Extranet services as US respondents, indicating particularly strong growth in Europe in these areas.

Among the industry sectors covered in this report, finance and manufacturing exhibited similar current and future service usage levels, but the retail industry lagged behind significantly in use of application hosting and Extranet services. By 2000, the retail industry expects to make comparatively very high use of Web hosting, but still low use of ISPs' Extranet offerings.

Exhibit II-5

Current and Expected Use of ISP Services



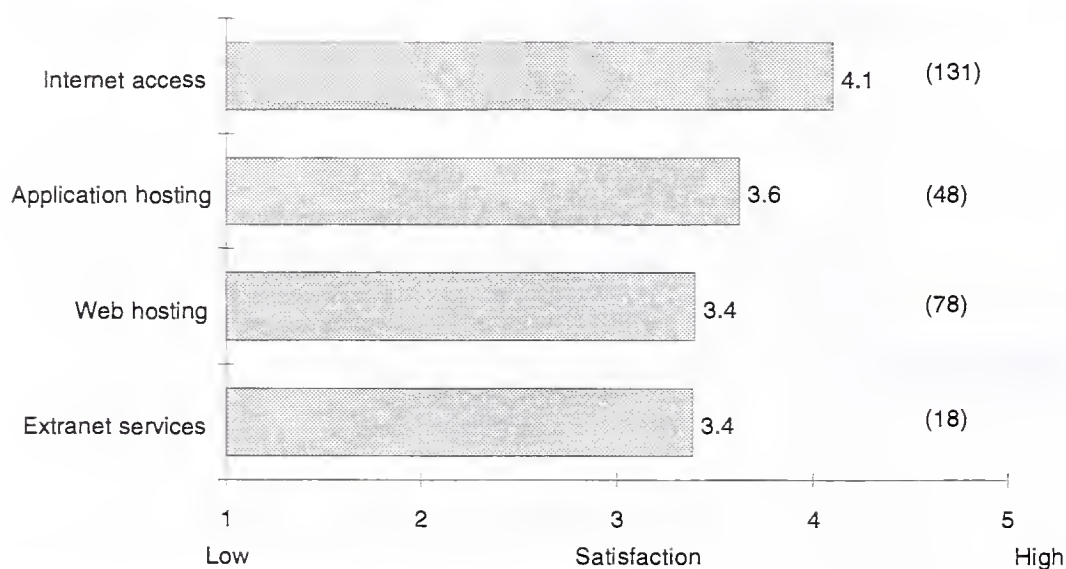
Although buyers are satisfied with their Internet access service, higher value services are not performing equally well. Exhibit II-6 shows the overall satisfaction rating given to each service. Due to the speed of growth in the Internet services market and the increasing range of buyer requirements, ISPs positioning themselves in the enterprise market must provide high-quality service in all these areas.

Exhibit II-6

Satisfaction With ISP Services, Worldwide



Satisfaction With ISP Services, Worldwide



1 - 3/5/98

Proprietary & Confidential - INPUT

INPUT®

Sample: shown individually

Source: INPUT

Exhibit II-7 shows which ISPs in each country have highest visibility in the market for corporate Internet services. Respondents were asked to indicate which ISPs they considered credible suppliers of high-quality Internet access and related services (hosting and Extranet services). In all countries but the UK, one or more telcos were most often perceived as credible providers. IBM, AT&T, and Compuserve had high visibility across all countries (Compuserve only narrowly missed inclusion among the top vendors in the US), indicating their strong international presence.

Exhibit II-7

Vendor Awareness



Vendor Awareness

US	
AT&T	85%
IBM	72%
GT-BBN, ANS	65%

UK	
IBM	88%
Compuserve	80%
BT, AT&T	68%

France	
France Telecom	96%
IBM	84%
CS, Cegetel, AT&T	68%

Germany	
Deutsche Telekom	84%
AT&T	80%
CS, IBM, UUNET	72%

13 - 3/5/98

Proprietary & Confidential - INPUT

INPUT®

Sample: US: 75; others: 25
Note: CS = Compuserve

Source: INPUT

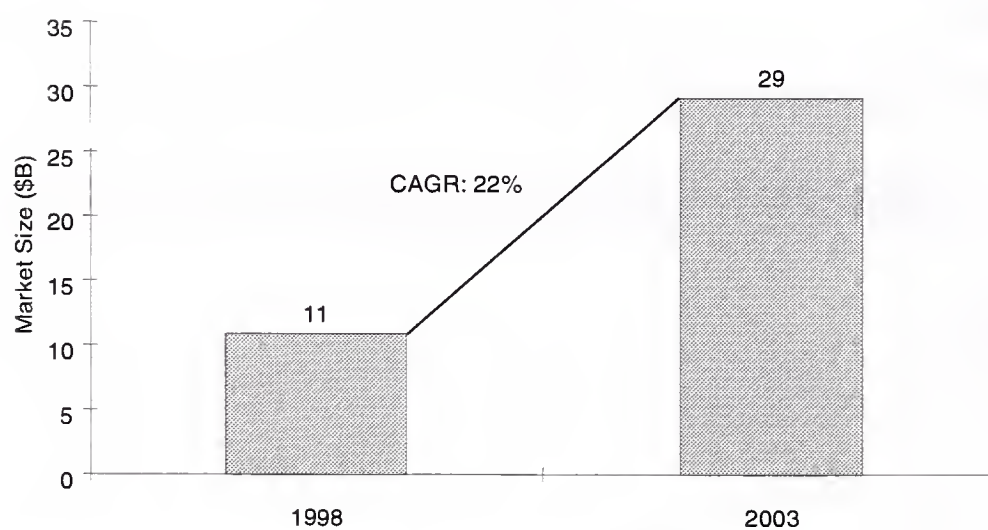
Exhibit II-8 shows current and future expenditure on Internet access, worldwide. Growth rates over the next five years are lower for Internet access than for most other sectors of the Internet/Intranet market. This is due to:

- Comparatively high starting base compared with newer services such as hosting and Extranet services
- Subsequent greater proximity to market saturation
- Falling prices due to the commoditization of Internet access
- More limited opportunities to generate additional business from existing customers; hosting services can be sold several times to a company, Internet access cannot to the same level

Exhibit II-8

Internet Access Expenditure, Worldwide, 1998-2003

Internet Access Expenditure, 1998-2003



6 - 3/5/98

Proprietary & Confidential - INPUT

INPUT

Source: INPUT

B

Web Hosting

The Web hosting market is well established, yet is in constant change. As publicly available Web sites become more sophisticated, they require a greater degree of server intelligence. As a result, Web hosting and application hosting services are providing increasingly similar capabilities.

Quality of service is becoming a prime differentiator of Web hosting services during 1998, with several leading hosting vendors committing to published service levels. Examples include Exodus, ANS, and PSI.net, which have all set guarantees at 99.5% or higher. From 1998, service levels will be a requirement of all corporate ISP services, from access to hosting and Extranet services. ISPs that do not respond to this trend will find it increasingly difficult to compete, yet providing service guarantees of 99.5% and above is a considerable challenge. Providers that own the largest infrastructures will find it easiest to guarantee service, leaving small independent and reseller ISPs at a disadvantage.

Unlike Internet access, buyers are only moderately satisfied with the Web hosting services they receive, rating them at 3.4 out of 5 overall. Exhibit II-9 shows importance of and satisfaction with the elements of Web hosting services considered most important.

The highest performing characteristic among both US and European organizations is reliability/uptime, but security issues are currently the most important to buyers. Physical security is rated only moderately, however.

Two issues of very high future importance are scalability and server bandwidth, reflecting the increasingly ambitious and demanding nature of corporate Web sites. Currently, however, buyers are relatively dissatisfied with these aspect of Web hosting services, and ISPs are encouraged to address these and related capacity issues.

Exhibit II-9

Performance of Most Important Web Hosting Characteristics

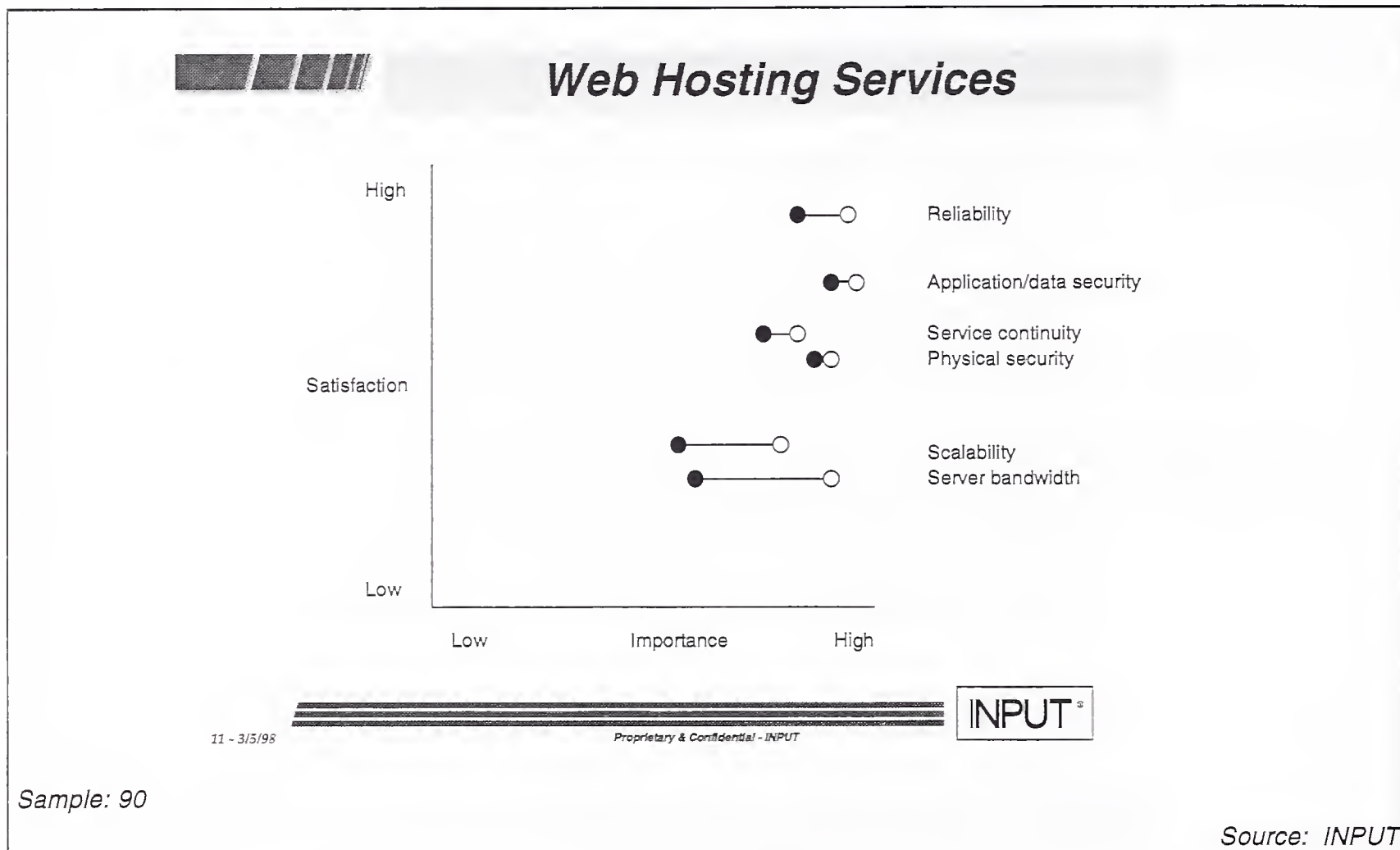
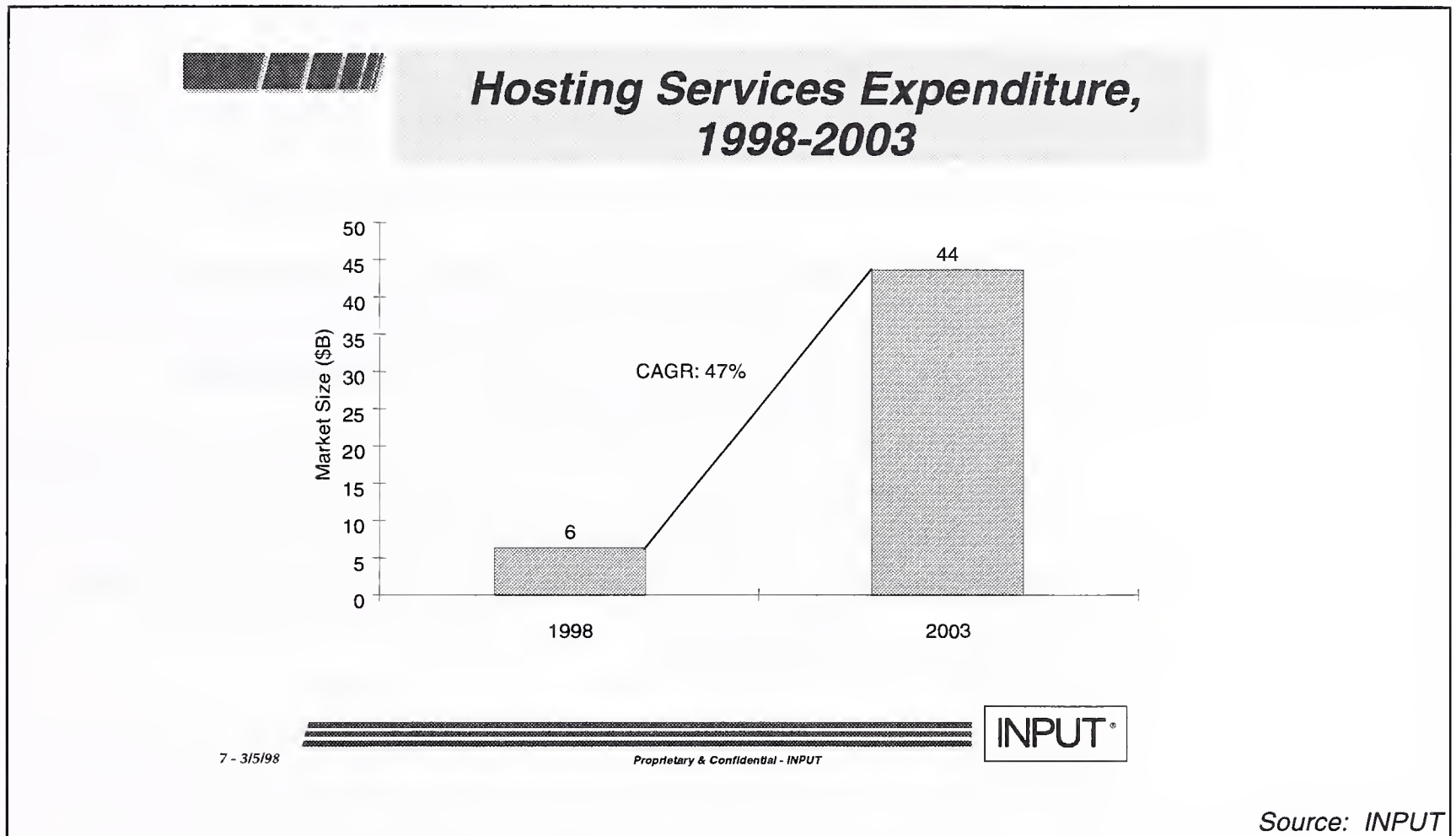


Exhibit II-10 shows expenditure on hosting services (both Web and application hosting) worldwide.

Exhibit II-10

Hosting Expenditure, Worldwide, 1998-2003**C****Application Hosting**

Application hosting is defined as the remote siting and operation of a dedicated process-based application. INPUT considers server-side CGI applications as a standard component of a Web hosting service, and they are not included here.

Early examples of remotely ISP-hosted applications are groupware, remotely shared workspaces, and low-end database applications. However, the greatest opportunity for ISPs is the hosting of enterprise and otherwise mission-critical applications.

Application hosting providers comprise a diverse range of providers including major ISPs, telcos, and specialist hosting companies not competing in the crowded Internet access market. They include:

- NaviSite provides remote access to enterprise applications such as SAP, Baan, and Oracle. Navisite acquired the application integrator Servercast, and in doing so gained access to its customers who previously used Exodus and Frontier GlobalCenter for application hosting.
- PSInet and Hewlett-Packard have partnered to promote PSInet's hosting services, based on HP systems. Hewlett-Packard is marketing the hosting service through its extensive reseller channel.
- USinternetworking is integrating enterprise applications including Oracle, PeopleSoft, and Baan into its Web hosting service and is developing a monthly application rental scheme.
- Sage Networks' Enterprise Solutions Group is building its US hosting business through an aggressive acquisition policy (including Tri Star Web Creations, Clever Internet Services, DirectNet, and an IBM hosting site). Sage is offering Lotus Notes/Domino-based knowledge management application hosting through a partnership with KnowledgeLink Interactive.

Exhibit II-11 shows the importance given to characteristics of application hosting services, expected future importance, and buyers' satisfaction levels. Buyers are very highly satisfied with the reliability of their application hosting service, particularly when satisfaction is compared with importance.

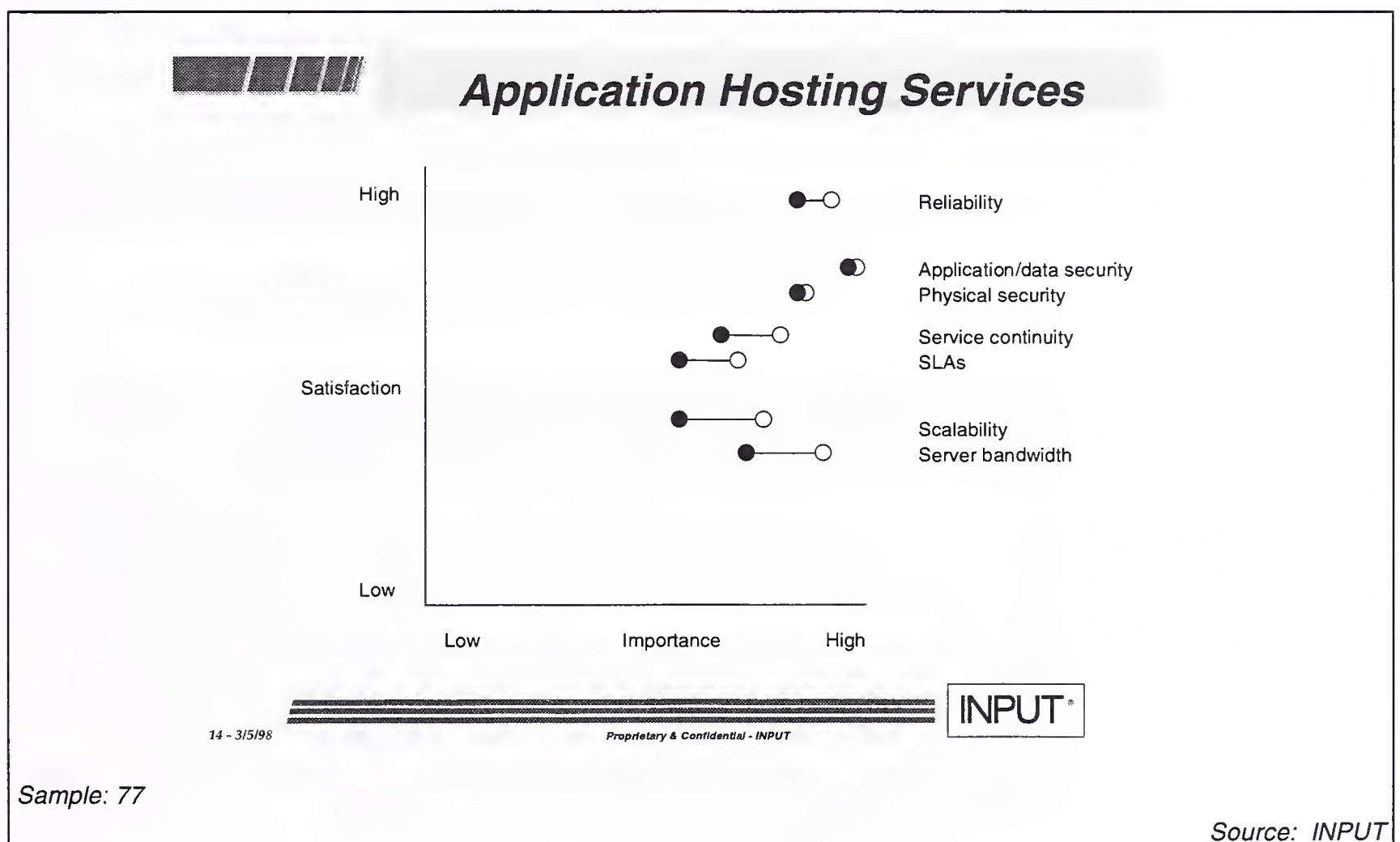
As with Web hosting, security is the most important issue overall, and is rated reasonably highly. Also as seen with Web hosting services, server bandwidth and scalability are issues expected to increase considerably in importance over the next two years, yet are currently rated only medium for satisfaction. The sharply increasing importance put on server bandwidth suggests that ISPs should offer dedicated, reserved bandwidth quotas on a per-server basis as a standard component of a hosting service. Buyers expect predictable performance levels from application servers, and currently this is not being provided adequately.

The bandwidth available to the server is directly related to the traffic demands of the application being run and the number of concurrent users. As both increase, scalability of the server becomes critical, and this is the second area that will rise in importance significantly over the next two years.

Buyers expect the applications they run on hosted servers to increase in size, complexity, and user population. As organizations progress through the cycle of trial and small-scale projects, their needs increase until they move one or more mission-critical applications onto a hosting site. At that point, reliability, availability, scalability, and security are non-negotiable factors.

Exhibit II-11

Performance of Most Important Application Hosting Characteristics



See Exhibit II-10 for a forecast of the hosting market.

D

Extranet Services

Unlike the other ISP services discussed in this report—Internet access, Web hosting, and application hosting—an Extranet can be achieved by an organization without the use of a dedicated ISP service. To connect two or

more organizations' Intranets, a basic Extranet can be implemented using only an ISP's Internet access service.

In-house, product-based Extranets can be developed using technology from a diverse range of companies, including Cisco, Secure Computing, Netscape, IBM, and Bay Networks. For example, Ford Motor Company's Extranet was developed using Netscape servers, notably Directory Server, to connect to its suppliers worldwide; its Extranet directory contains 200,000 employees and resources.

As with all Internet services, Extranet quality guarantees are rapidly becoming a critical competitive tool. UUNET has set an end-to-end service guarantee on its Extralink Extranet service of 99.9%, with substantial discounts for failures to meet service levels. Providers entering the Extranet market from a background of VPN and VAN services must apply the same standards to Internet services as they do to proprietary services.

The elements of ISP-provided Extranet services considered most important, now and in two years, are shown in Exhibit II-12.

Two characteristics not shown in the Exhibit are expected to grow in importance particularly rapidly: international coverage and directory services. International coverage is currently considered the least important aspect by US respondents, but as US organizations extend their core Internet and Intranet operations to Europe and Asia Pacific, they expect ISPs to keep pace. As mentioned above, Ford Motor Company based its wide-ranging Extranet largely on Netscape's Directory Server. Ford has a history of pioneering Internet-based technology—it provided one of the first widely publicized cases of a large-scale corporate Intranet—and its Extranet implementation shows the future importance of directory services.

Most of the future important characteristics are already considered important. Unlike most issues, Internet tunneling (the process of creating a secured route through the Internet for private, encrypted traffic) will change in status, from 'reasonably important' to 'very important', as organizations demand higher levels of security due to the increasingly mission-critical nature of their Internet usage.

Exhibit II-12

Change in Importance of Most Significant Extranet Characteristics

Most Important Extranet Characteristics

<i>Characteristic</i>	<i>Importance</i>	
	<i>1998</i>	<i>2000</i>
1. National coverage	4.8	4.9
2. Reliability	4.7	4.8
Biggest change 3. Internet tunneling	3.8	4.2
4. Remote Intranet access	4.2	4.2

16 - 3/5/98

Proprietary & Confidential - INPUT

INPUT®

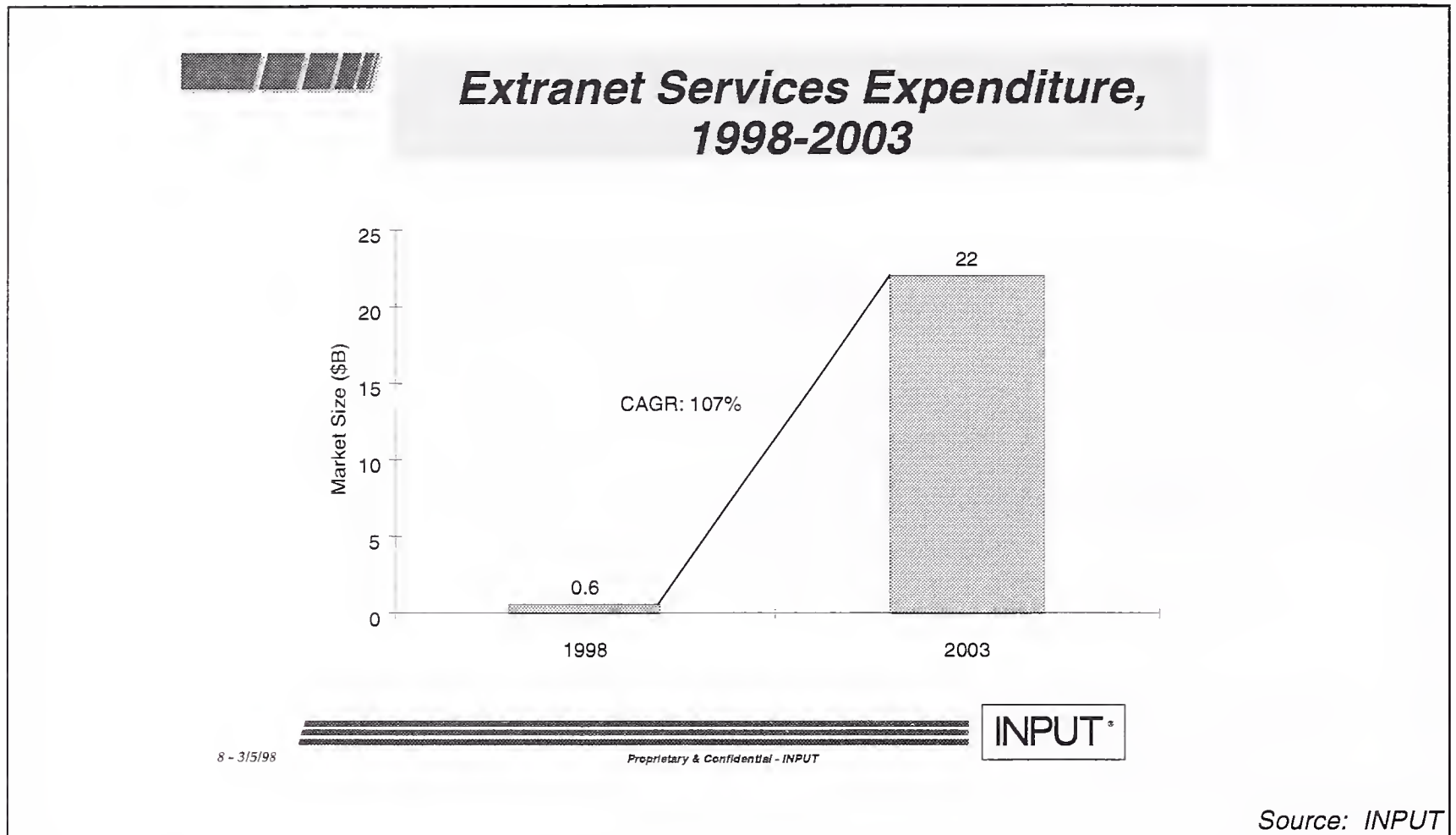
Sample: 48

Source: INPUT

Exhibit II-13 shows current and future expenditure on ISP Extranet services. Of all the sectors covered in this report, Extranet services will show the highest growth by value over the next five years. This is due partly to the lower starting base compared with Internet access and hosting services, and potentially high pricing.

Growth in the Extranet market will also be driven by Metcalfe's Law, which states that the value of a network is proportional to the square of the nodes connected to it. This value-based growth in networks and network-based devices is exponential. Each new adopter increases the value of the whole network, thus making the network more attractive to the next adopter, thus speeding growth. Very high growth rates are common in such a model; historic examples include the Internet itself, telephones, and fax machines.

Exhibit II-13

Extranet Service Expenditure, Worldwide, 1998-2003**E****The Future of the ISP Market**

The ISP market is volatile and is changing rapidly from a carrier market to an applications and services market. Many aspects of the market will take part in shaping it over the next few years, including increasingly demanding enterprise needs, emerging technologies, and an increase in commerce activity. This section discusses two such aspects: application rental and market consolidation.

1. Application Rental

Application rental is one step beyond application hosting. It requires the supplier to take a proactive, sales-driven approach as opposed to the more passive technology-based approach of an infrastructure provider.

Opportunities will become more numerous in the rental than in the hosting market, although unit sales will be lower. Buyers will use rental services to:

- Trial an application before purchase of the product and/or related hosting service
- Gain access to applications previously out of reach due to lack of budget or required infrastructure
- Provide access to non-critical applications for specialist staff otherwise too few in number to justify in-house implementation
- Cut costs, paying only for the functions they use and only for the time they use them
- Retain the option to change application without complex internal upgrades

As mentioned above under “Application Hosting”, several hosting companies are looking to rental both as a revenue generator and as a service differentiator. Groupware and enterprise applications are early examples of rentable applications, and the variety will increase.

Beyond rental, several major ISPs, network services vendors, telcos, and outsourcers are working towards full utility services. The analogy of power utilities providing service via a national grid is a common one, and is becoming a more suitable model for the provision of IT as technology management increases in sophistication, remote hardware and software management becomes a commonplace, and the Internet continues to pervade as the common medium for electronic services. The full utility market is beyond the scope of this report, however, and will be analyzed in depth in a future INPUT project.

Several application and application-enabling technology vendors are aligning their products with the emerging rental market. For example, Lotus released Domino Instant Host in March 1998. Domino Instant Host

resides between a Domino application and the underlying system; it tracks Domino application usage and enables users to be billed accordingly. ISPs can use it to provide limited or full access to Domino-based applications in a flexible service offering.

The target is SMEs that do not have a Notes/Domino infrastructure or the in-house IT capability to support such an infrastructure. Large companies building Extranets are also targeted that want to keep external users away from their corporate network but still retain Extranet functionality.

At the time of the Domino Instant Host released, several ISPs announced their intention to provide an application rental service based on it. These included BT, France Telecom, Netcom, and America Online.

Another company developing application rental technology is Changepoint. Changepoint's Involv Team Intranet product provides a remotely-hosted Intranet for users who set up and manage the environment via the Internet. Groupware applications such as project management, discussion forums and calendaring are provided within the service. Per-user are low—on a par with an individual ISP dialup account.

Rented applications are particularly well suited to contract and freelance workers, grouped temporarily, who need to organize projects with disparate co-workers and who do not necessarily have permanent access to a corporate IT infrastructure.

Other companies providing rental services and not discussed so far include:

- Throw—has developed a “private space” rental service for consumers
- Epicon—provides a Windows application rental service
- Intermark—rents applications by time, down to the minute

2. Market Consolidation

Much has been reported of the consolidation of the ISP market. Similar to many Internet-related predictions such as ubiquitous commerce mechanisms, it has yet to happen. The number of small, independent ISPs continues to rise, not shrink, both in the US and Europe.

INPUT believes that ISP consolidation will happen and that in fact it is happening now. INPUT's report *Internet / Intranet Market Forecast, 1997-*

2002 predicted that the leading suppliers of Extranet services by 2002 will be:

- “Telcos currently engaged in mergers and acquisitions in preparation for the future Internet-based voice/data services market, such as Worldcom and AT&T.
- Consortia and joint ventures between existing network services providers and telcos, such as Global One and Concert.
- Major ISPs and network services providers who position themselves to offer voice and data services over the Internet differentiated from other ISPs by quality of service guarantees, global coverage, and breadth of wireless and fixed access, such as Infonet and Equant.”

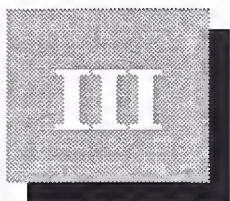
The report also concluded that “the Internet access market will consolidate between 1997 and 2002, with telcos taking the majority share through competitive offerings, integrated phone/Internet services and billing, and acquisition”.

Merger and acquisition activity in the ISP market has continued at a high level since that report was published, and in this report we have seen that service guarantees and global coverage are of high importance. The list of suppliers above can also be applied to ISPs providing other corporate services.

Evidence of ISP market consolidation comes from the many acquisitions made over the past two years. Worldcom has proved the highest-profile acquirer, counting among its acquisitions MFS Communications (thereby also UUNET), MCI, CompuServe, AOL ANS, and Dutch ISP NLnet. A by-product of this activity is Cable & Wireless’ increased standing in the ISP market through its acquisition of MCI’s Internet business, a result of US and European concerns over Worldcom’s potential monopoly status.

INPUT believes that Internet access will become a commonplace on a par with the telephone and postal systems. The best-placed companies to provide such ubiquitous service are de facto utilities. Despite the ongoing fragmentation of national telephone and postal services whereby state providers are opened to competition to private suppliers, on a global level this fragmentation is encouraging consolidation—multinational organizations are controlling a greater number of national providers.

The same will happen in the Internet access market, particularly in the residential sector. Customers will connect to, and be billed by a regional or national company which will be part of a larger, multinational group.



Internet Access Usage and Plans

A

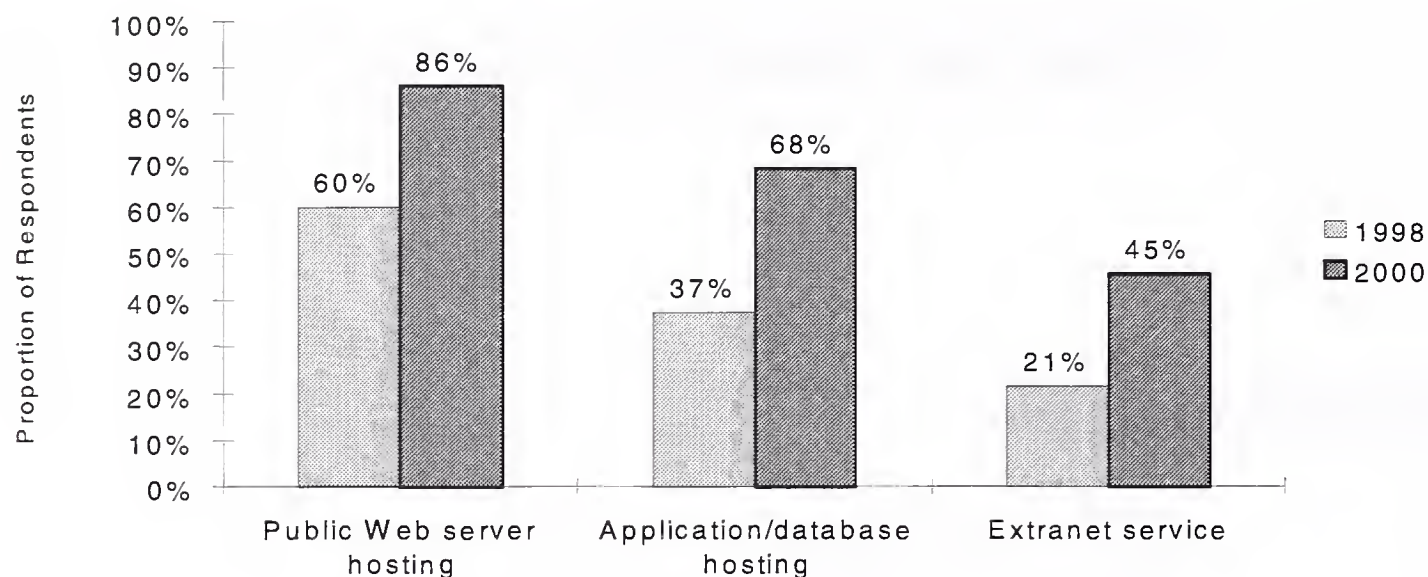
Current and Future Usage

Exhibit III-1 shows the current and expected use of ISP services—Web server hosting, application hosting, and Extranet services.

Planned service usage is similar across the US and Europe (Exhibits III-2 and III-3), but levels of application hosting and Extranet service usage in Europe are currently around half the US level. Growth rates for these services will be strongest in Europe, therefore.

Exhibits III-4 to III-6 show usage by industry sector. Finance and manufacturing show similar current and future usage levels, but the retail industry lags behind significantly in use of application hosting and Extranet services. By 2000, the retail industry expects to make comparatively very high use of Web hosting, but still low use of ISPs' Extranet offerings.

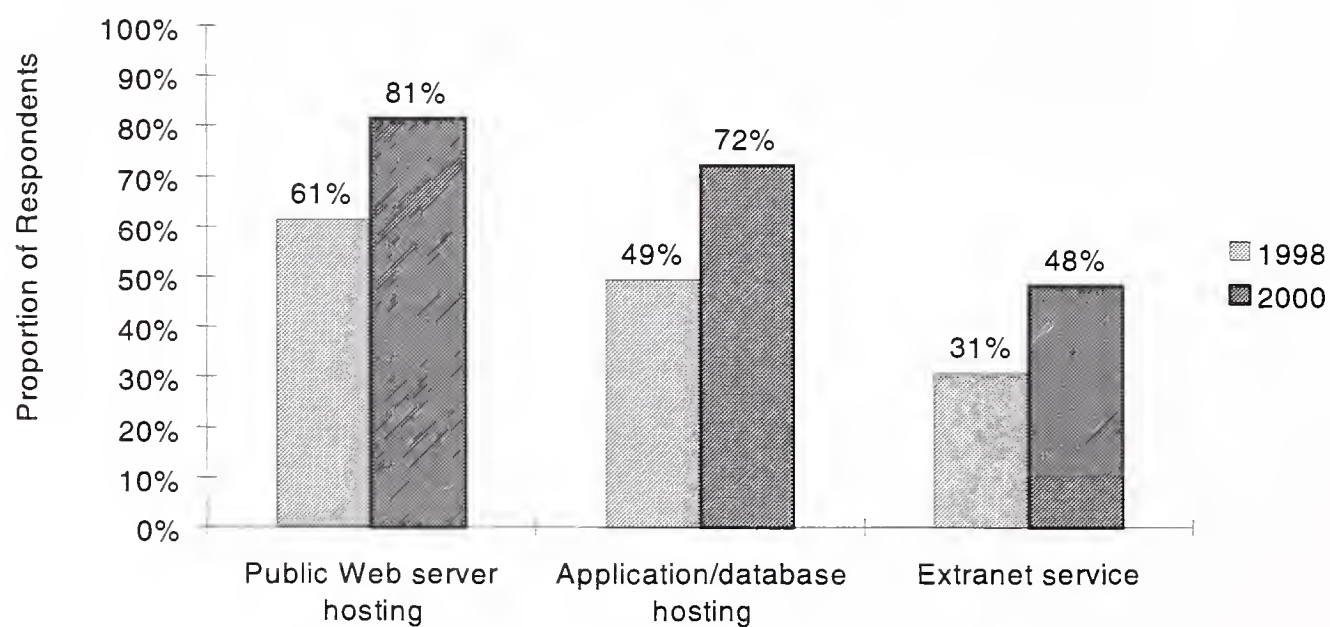
Exhibit III-1

Current and Expected Use of ISP Services, 1998-2000, Worldwide

Sample: 150

Source: INPUT

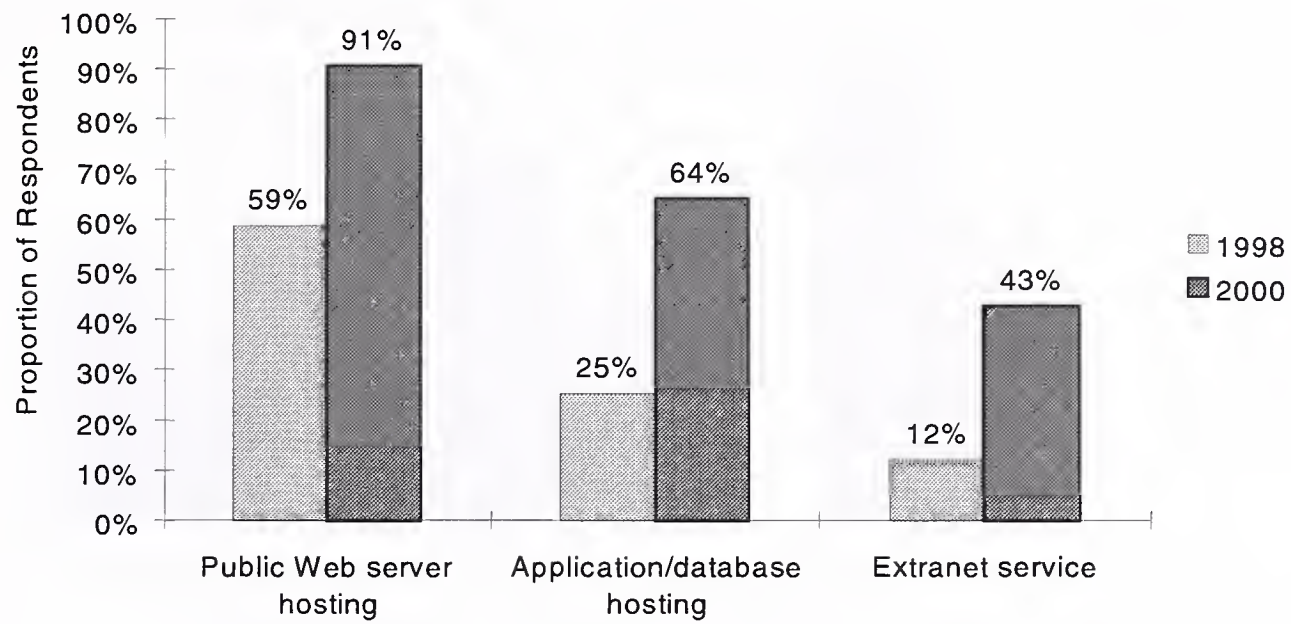
Exhibit III-2

Current and Expected Use of ISP Services, 1998-2000, US

Sample: 75

Source: INPUT

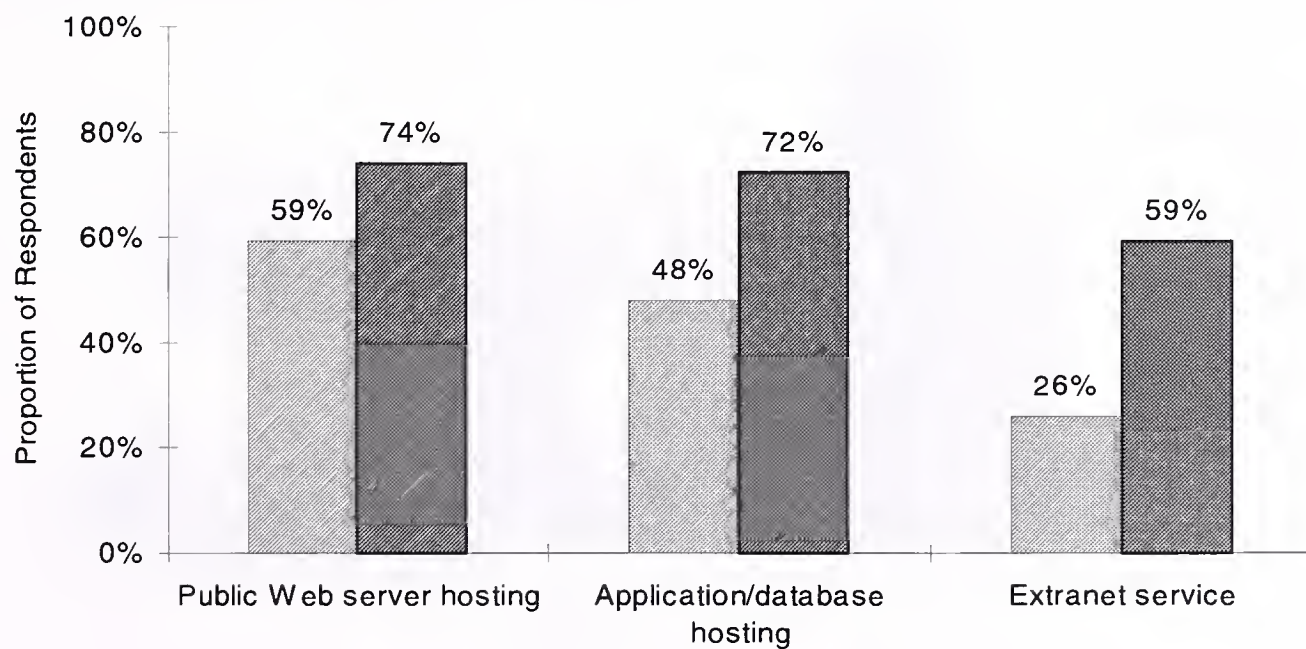
Exhibit III-3

Current and Expected Use of ISP Services, 1998-2000, Europe

Sample: 75

Source: INPUT

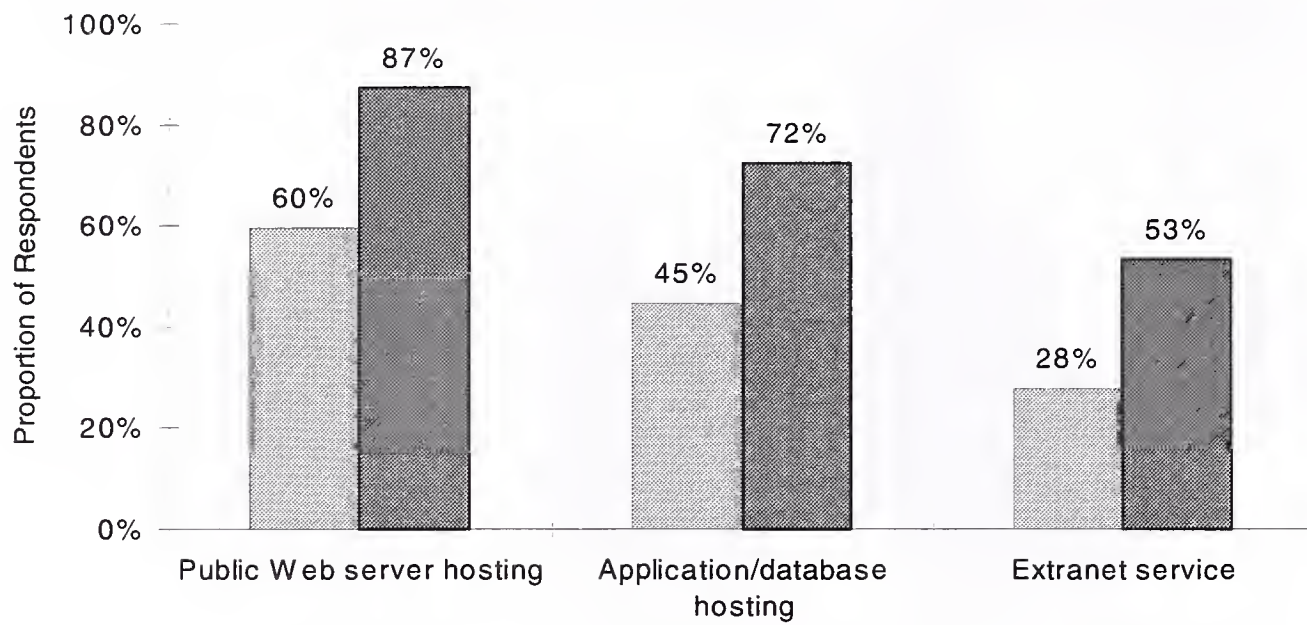
Exhibit III-4

Current and Expected Use of ISP Services, 1998-2000, Finance

Sample: 54

Source: INPUT

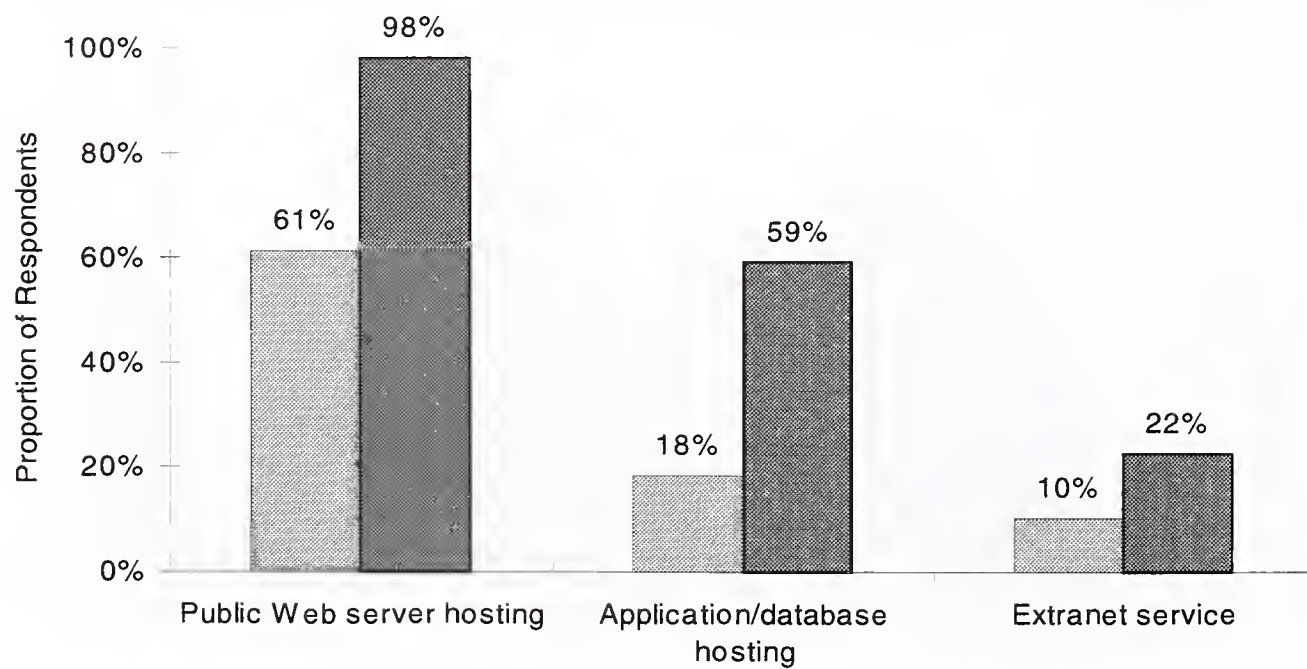
Exhibit III-5

Current and Expected Use of ISP Services, 1998-2000, Manufacturing

Sample: 47

Source: INPUT

Exhibit III-6

Current and Expected Use of ISP Services, 1998-2000, Retail

Sample: 49

Source: INPUT

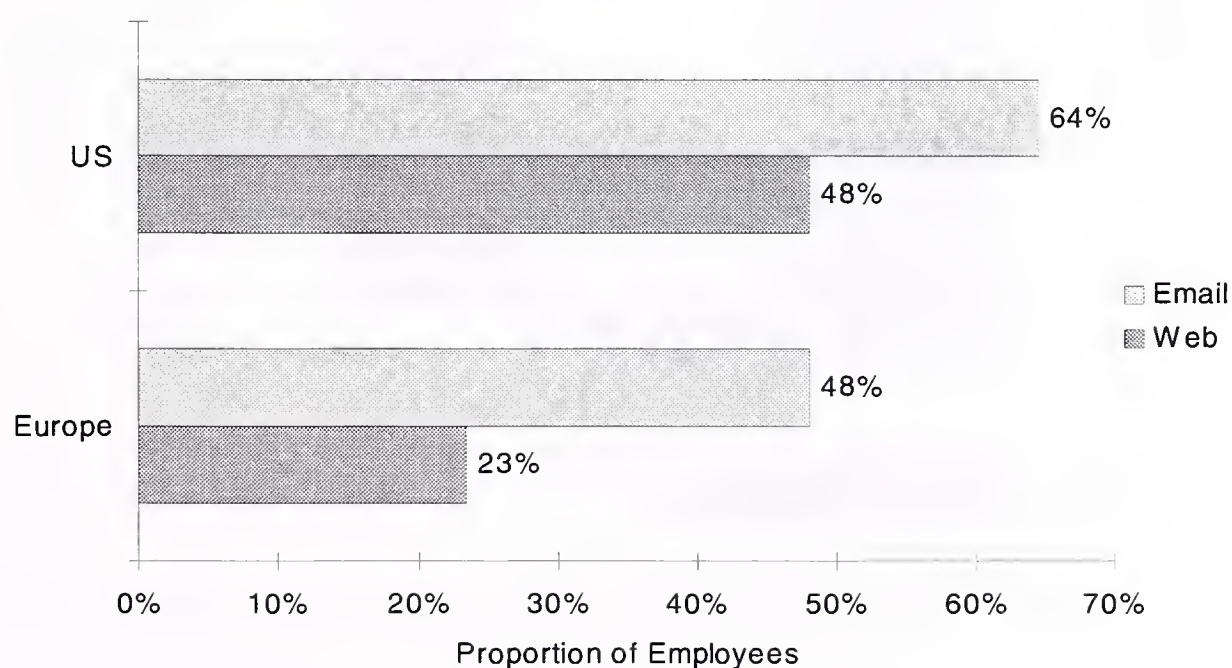
B**Scope of Access Within Organizations**

In the US, 90% of large organizations (revenues over \$100 million), and 75% in Europe, have Internet access. The market for Internet access does not stop there, however. There is room for growth supplying basic access to employees that currently have no access. Exhibits III-7 to III-9 show the proportions of employees that currently have email and Web access among companies surveyed, by region, country, and industry. The opportunities for ISPs are in providing higher capacity connections, extensive implementation services to serve an increasing user base within individual companies, and increasing revenue through traffic volume-based pricing models.

In a typical US organization interviewed, half the employees have Web access; in Europe, a quarter. In France, the figure drops to just 17%.

Among US respondents, one third gave email access to 100% of staff; in Europe one quarter did. Company-wide Web access was seen in only 10% of US and European companies.

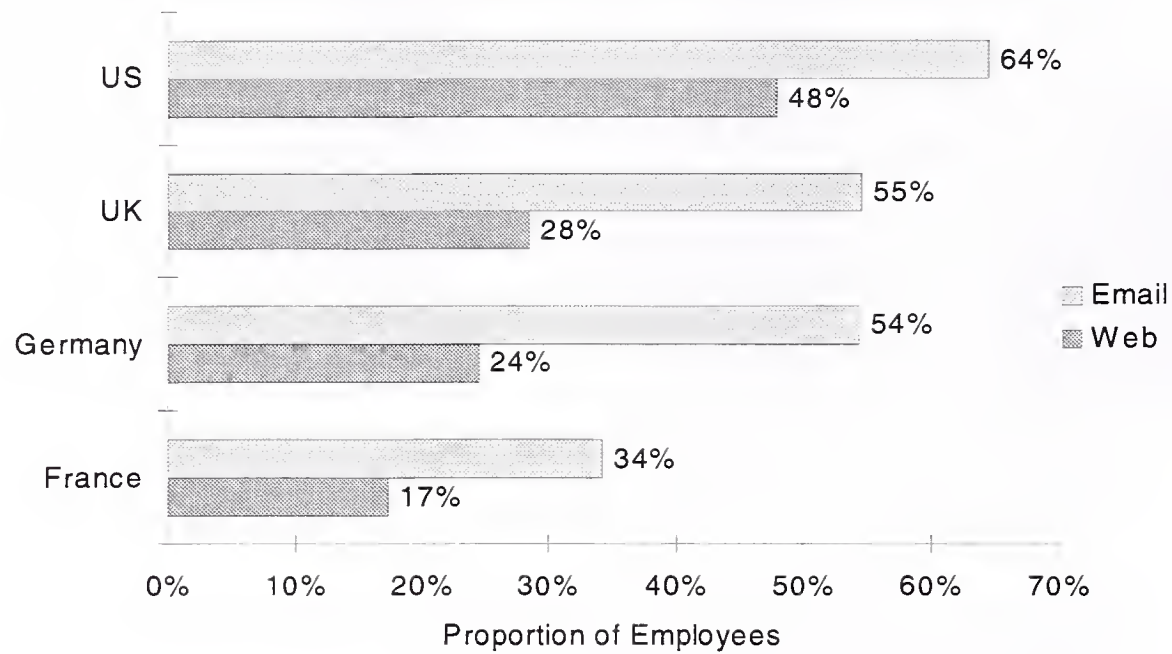
Exhibit III-7

Scope of Email and Web Access Within Organizations, by Region

Sample: 145

Source: INPUT

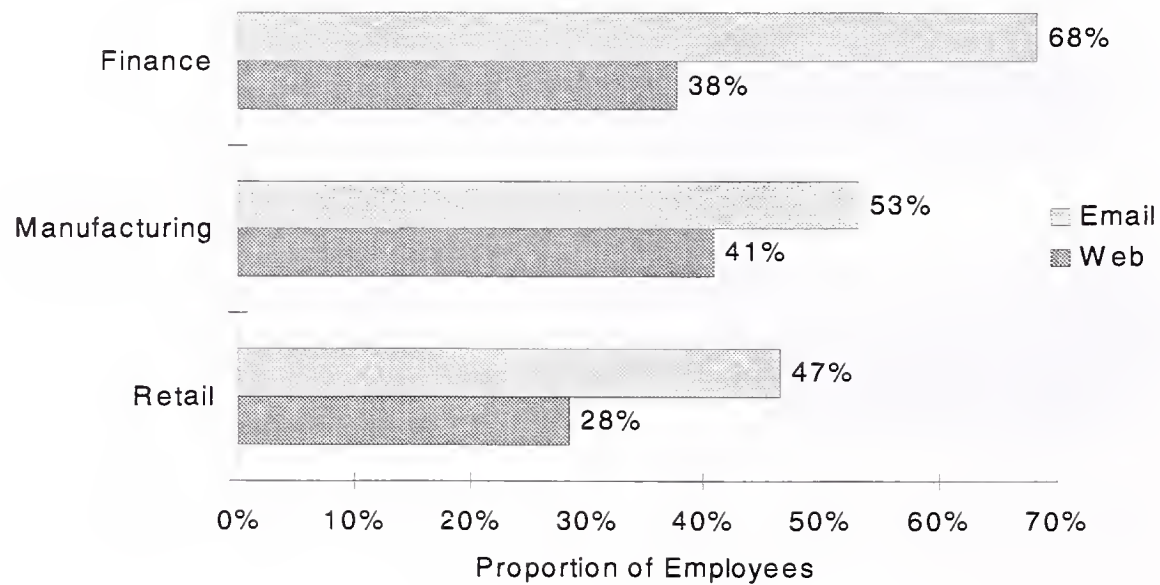
Exhibit III-8

Scope of Email and Web Access Within Organizations, by Country

Sample: 145

Source: INPUT

Exhibit III-9

Scope of Email and Web Access Within Organizations, by Industry

Sample: 145

Source: INPUT

C

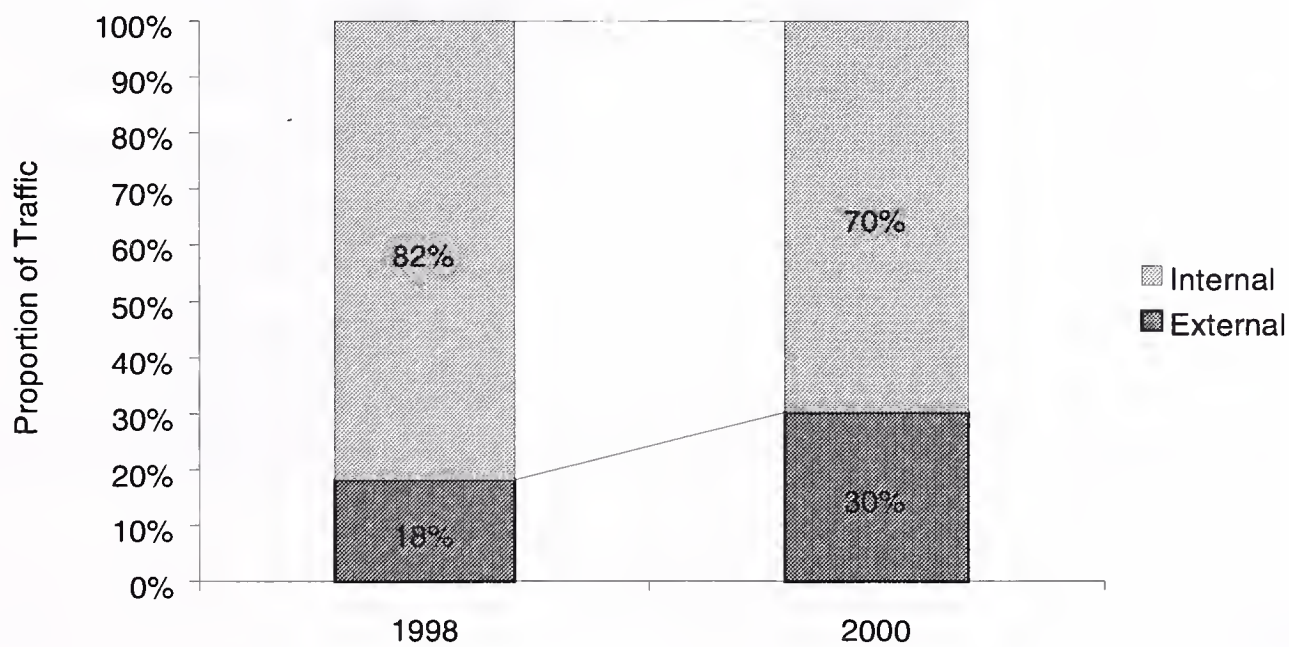
Internal and External Traffic

A measure of expected ISP traffic growth can be made by comparing the proportion of corporate network traffic that remains internal to an organization and that which goes beyond the corporate boundary. Network traffic is becoming increasingly external, as a proportion of total traffic, as shown in Exhibit III-10. The ratios shown here will continue to change in favor of external traffic beyond 2000—by 2002, 45% of traffic is expected to be routed outside the corporate network as companies conduct electronic business (personal communication, information sharing, and commerce) with customers and partners.

US and European respondents reported very similar proportions for 1998 and 2000.

Exhibit III-10

Internal and External Traffic Volumes, Worldwide



Sample: 130

Source: INPUT

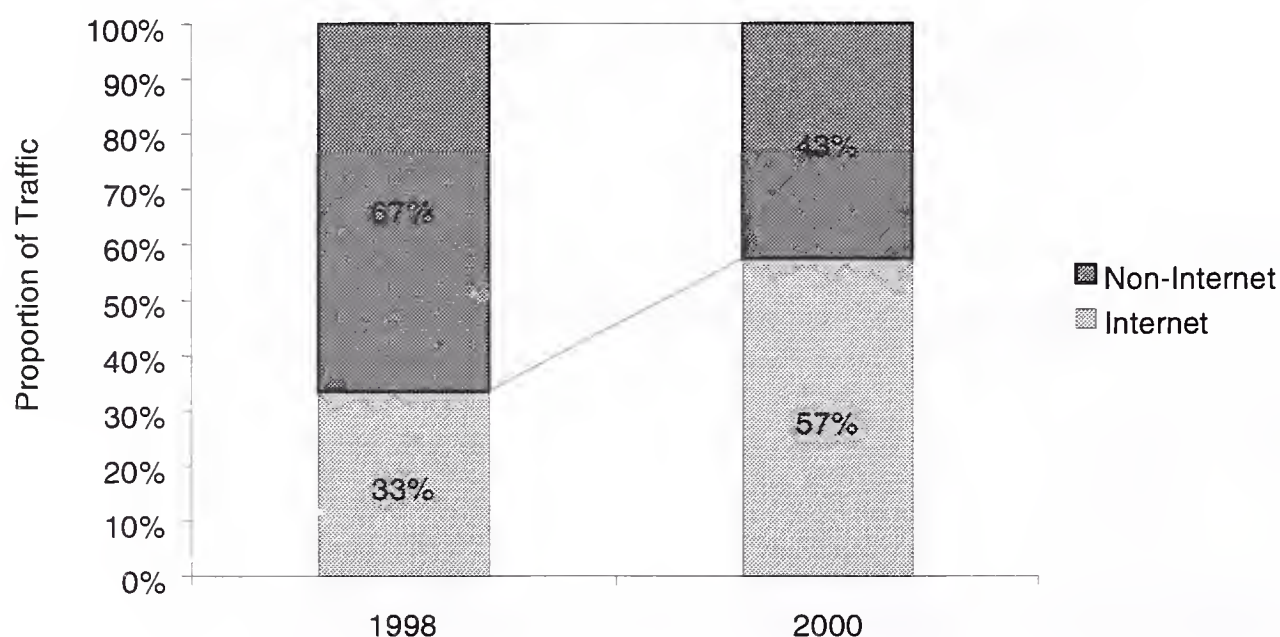
Of a company's external traffic, one third is currently carried via the Internet as shown in Exhibit III-11. Within two years, this proportion will nearly double. The Internet is accounting for a rapidly increasing

proportion of external traffic at the expense of private WANs and proprietary VAN services.

US organizations make more use of the Internet for external traffic than European companies. Among US respondents, 40% of external traffic goes over the Internet, rising to 62% by 2000. In Europe, the figures were 27% rising to 53%.

Exhibit III-11

External Traffic Carried Over Internet, Worldwide



Sample: 113

Source: INPUT

D

ISPs Used

Major telcos are the most commonly used type of ISP for Internet access. Exhibits III-12 to III-15 show ISPs used by respondents in each country covered. Unlike the US, France and Germany, there was a low telco presence in the UK, where dedicated ISP organizations account for most usage.

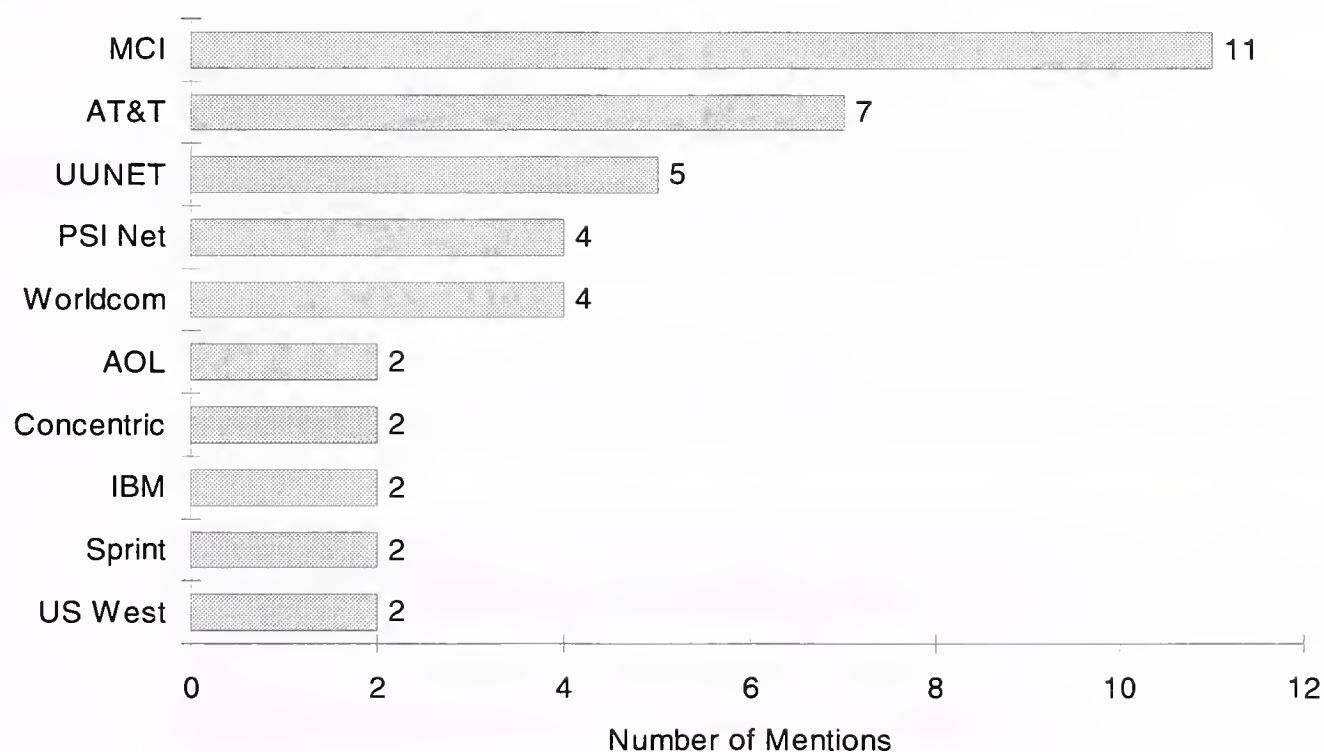
Across the US and Europe, UUNET, Compuserve and telcos such as MCI, AT&T, France Telecom and Deutsche Telekom have high credibility as

corporate Internet access providers. Most of the ISPs represented in these Exhibits (used by two or more respondents) are telcos, large providers, or members of consortia, and therefore are well placed for competing in the future consolidated market.

Within the sample, Compuserve is used for business access more in Europe than in the US. This is due partly to Compuserve's strong European presence and that fact that it is more advanced than many US competitors in establishing a European presence. Additionally, Compuserve has a long history of supplying the SME business sector, more than the large corporate market. European organizations are typically at an earlier stage in their Internet development than equivalent US companies, and may be more likely to subscribe to easy-to-use online services such as Compuserve at this earlier stage of development.

Exhibit III-12

ISPs Used, US



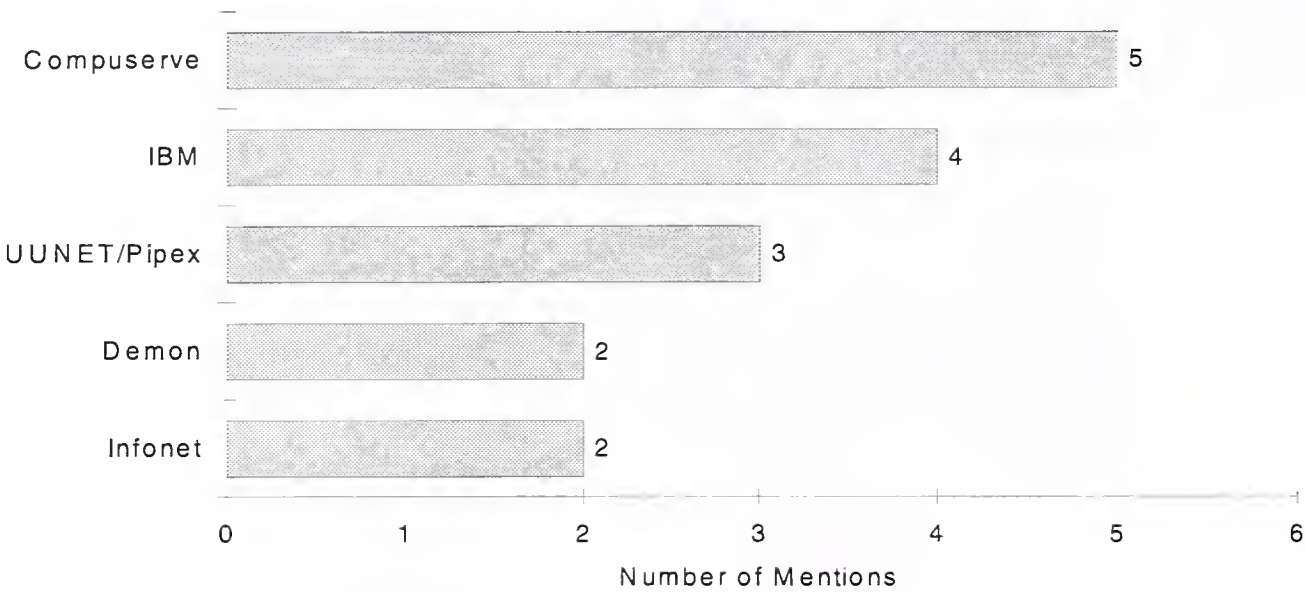
Sample: 55

Source: INPUT

ISPs mentioned by one US respondent each were: BBN, Bell Pacific, Brooks Fiber, BSP, Cloud Nine, Colorado Supernet, Compuserve, Concert, Cyburban Link, Extex, GEIS, Global VIP, GTE, IBS, Infinet, MFS, Millenium, MR Net, MVP-Net, Net Asset, Net Direct, Netcom, Nynex, On-Ramp, Raex (formerly Imperium), and TCGCS.

Exhibit III-13

ISPs Used, UK



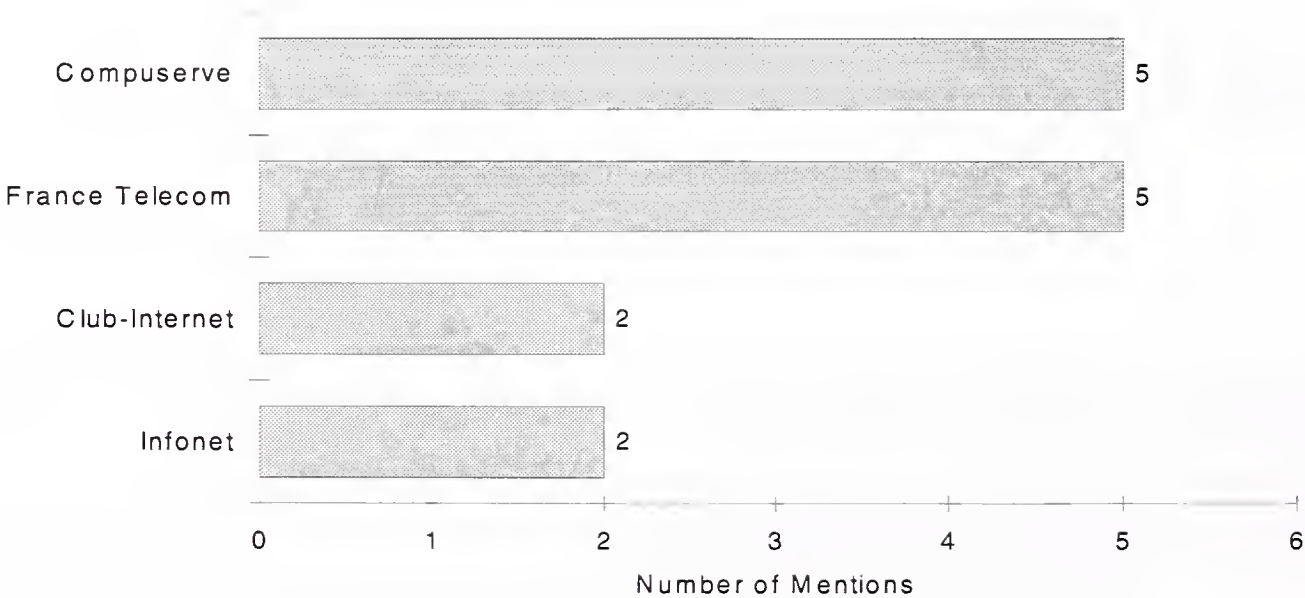
Sample: 21

Source: INPUT

ISPs mentioned by one UK respondent each were: Anglia Net, AOL, BT, ClaraNET, Internet Discovery, IT Net, Limnet, Scotland Online, Star, Supernet, and Virtual Business (formerly Netscope).

Exhibit III-14

ISPs Used, France



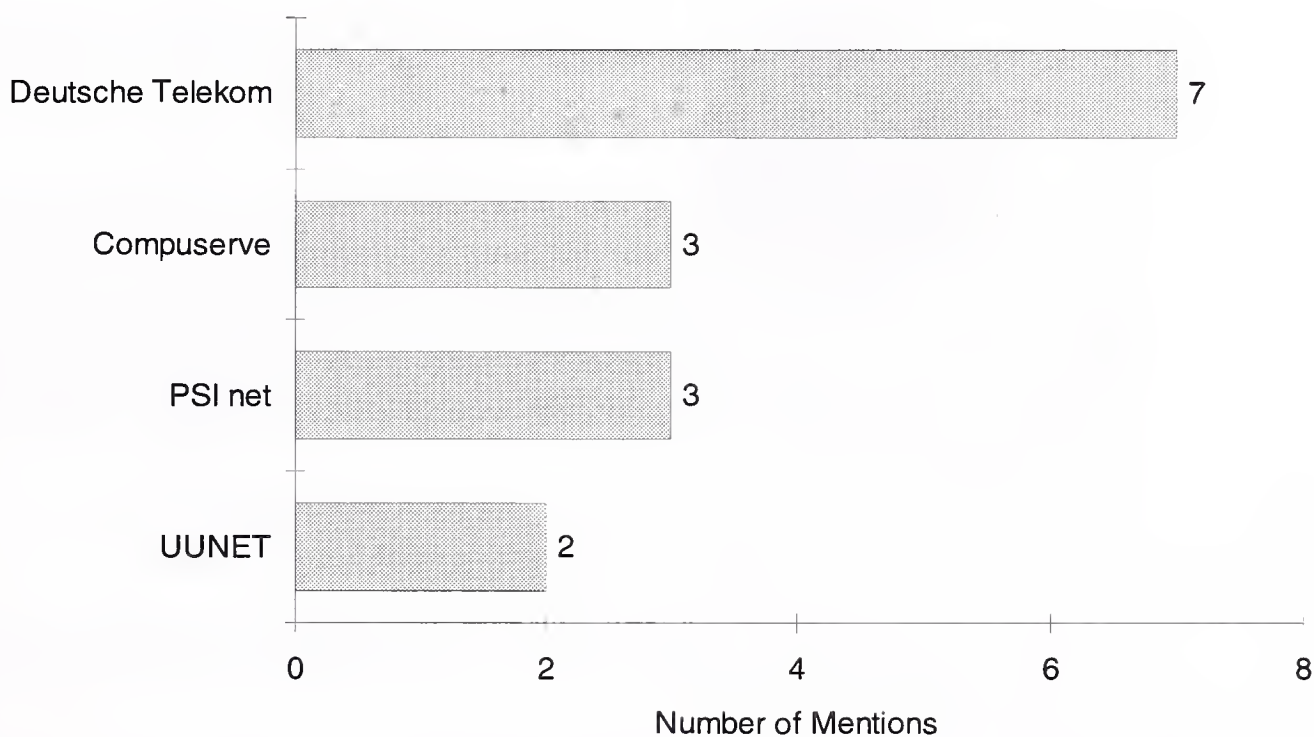
Sample: 19

Source: INPUT

ISPs mentioned by one French respondent each were: Axone, Belgecom, BT, EUnet, HOL, Magic Online, UUNET, and X-link.

Exhibit III-15

ISPs Used, Germany



Sample: 19

Source: INPUT

ISPs mentioned by one German respondent each were: AT&T, ECRC, EUnet, Germany.net, IBM, Nacamar, Netcom, Sprint, and Worldcom.

E

Expected Change in ISP Use

Around one in five respondents expected to change their ISP over the period 1998-1999 (Exhibits III-16 to III-18). The figure is slightly higher in Europe than in the US.

The reasons given by respondents for seeking an alternative ISP were as follows:

- Need to consolidate multiple ISP connections into one corporate connection (four respondents)
- Performance issues with current ISP (four respondents)
- Poor quality service (three respondents)
- Current ISP does not provide dedicated server hosting (two respondents)
- ISP is good at Internet access but all other services are lacking (one respondent)

The most commonly named ISP that users expect to drop in favor of an alternative was Compuserve. Although Compuserve was the most popular single-brand provider overall, used by 14 respondents who named their ISP, that alone is not sufficient to explain the expected high turnover. For example, MCI was used by 11 US respondents, yet none of them expected to change provider.

The expected high loss of Compuserve customers is due to:

- The long period of uncertainty over Compuserve's future before its acquisition by AOL
- The more prevalent use of Compuserve as a business-class ISP by European organizations than by US organizations. Companies in Europe are less well connected than in the US, and they may be using Compuserve still as a testbed ISP before moving to a corporate-wide, higher-value service.

Exhibit III-16

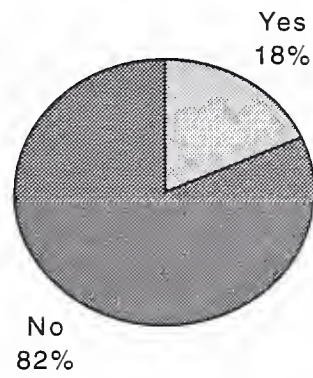
Change of ISP Expected Within 12 Months, Worldwide*Sample: 142**Source: INPUT*

Exhibit III-17

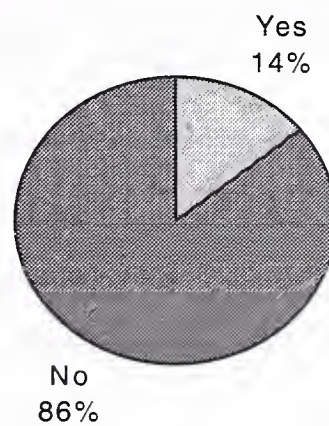
Change of ISP Expected Within 12 Months, US*Sample: 71**Source: INPUT*

Exhibit III-18

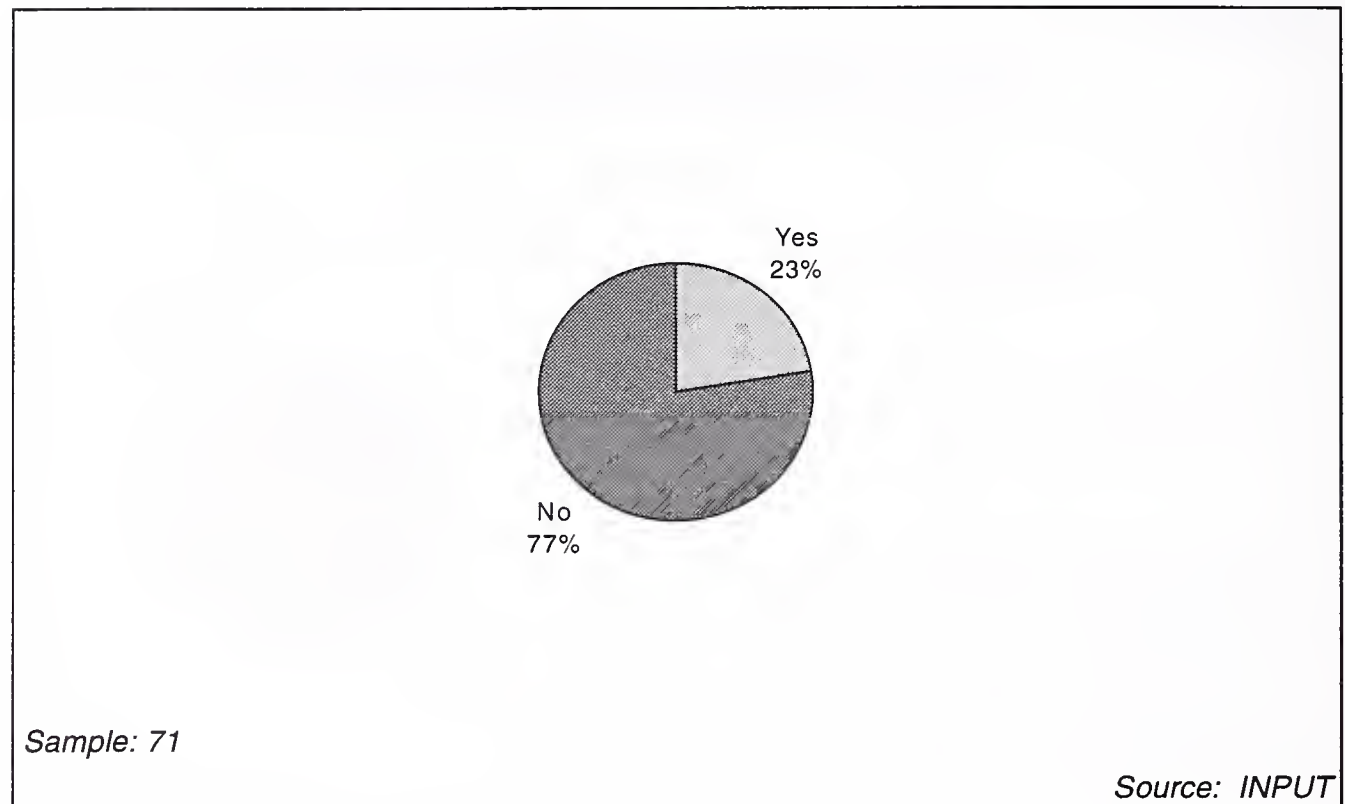
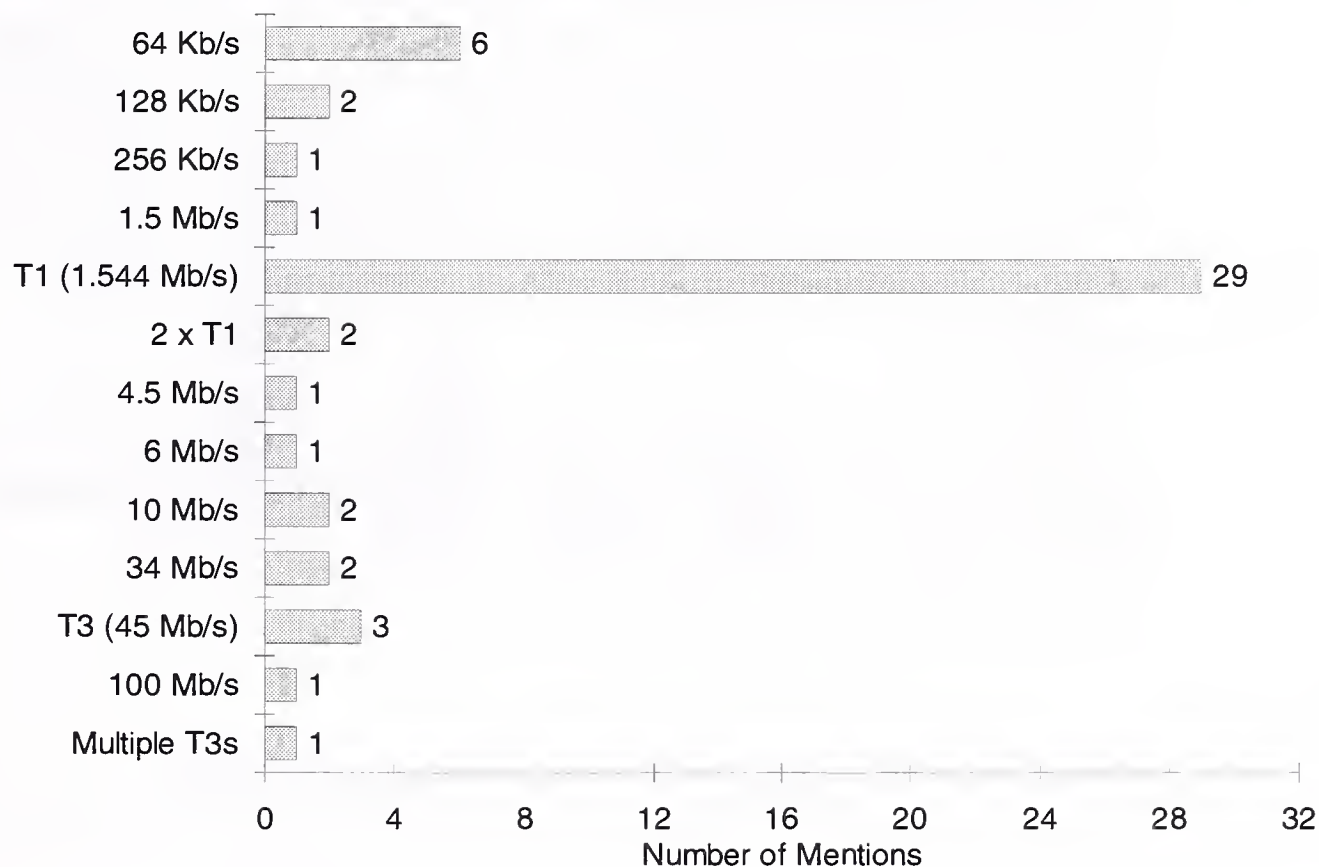
Change of ISP Expected Within 12 Months, Europe**F****Bandwidth Usage**

Exhibit III-19 shows the use of bandwidth stated by US respondents, starting at 64Kb/s. A small proportion of respondents provided Internet access to employees via dialup connections (modem and ISDN), not dedicated lines, and are not shown in the Exhibit. Too few European organizations gave details of their bandwidth to represent.

Exhibit III-19

Bandwidth Usage, US

Sample: 52

Source: INPUT

Clearly the most common method of connecting to an ISP is via a single T1 line, providing 1.544Mb/s. Bandwidth is purchased in various ways: for example, connections between 64Kb/s and 256Kb/s include fractional T1s and multiple separate 64Kb/s lines.

There is a high variance of bandwidth usage among the sample, with manufacturing companies the most common at the high end. The US company that claimed use of multiple T3 (45Mb/s) connections was an aerospace manufacturer; the 100Mb/s user was a manufacturing company; the three single-T3 customers were (one) manufacturing and (two) retail organizations.

Fewer European organizations gave details of their bandwidth. Of those that did, most were between 64Kb/s and 256Kb/s. The highest was a German manufacturing organization with a 34Mb/s connection to PSI Net.

G

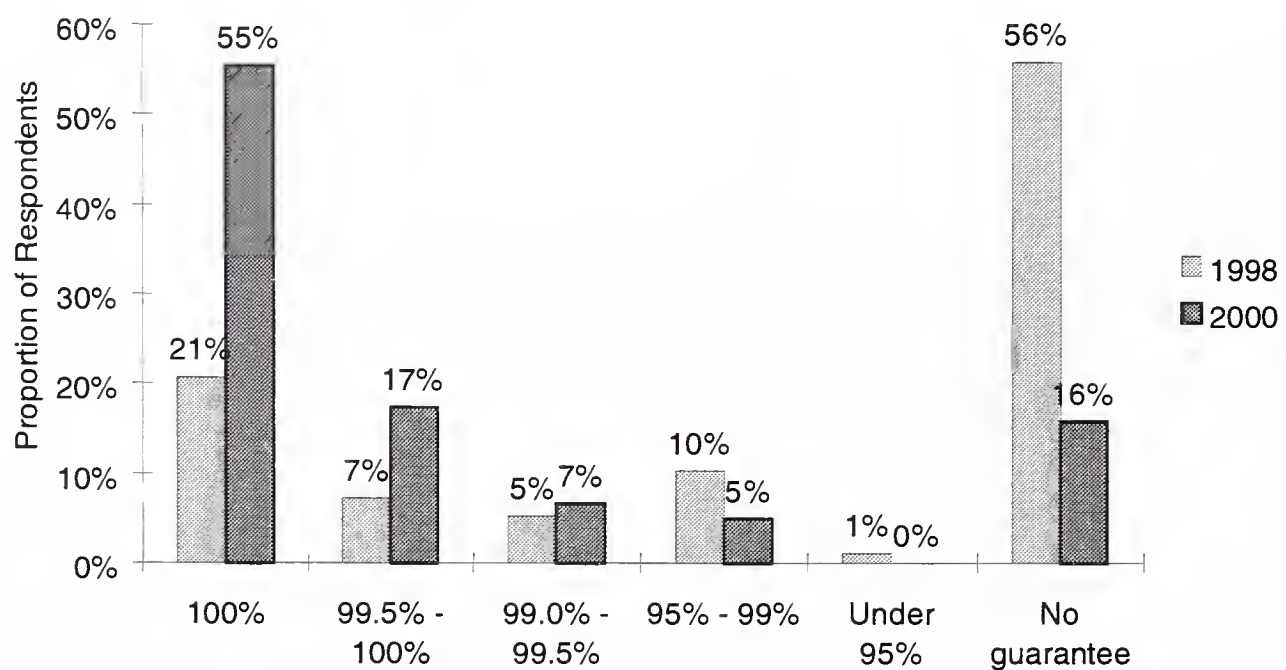
Service Guarantees

Service guarantees are set to become a critical requirement of ISPs. Exhibits III-20 to III-22 show the uptime guarantees that buyers currently receive and the guarantees that they expect to receive by 2000. The change required organizations is clear: half currently receive no guarantee, yet the same proportion expect to achieve very high levels within two years. This change is most evident across Europe, where service guarantees of any sort are received by only a third of organizations.

Exhibit III-23 shows uptime currently attained. Around 40% achieve less than 99% uptime, which is unacceptable in an electronic business environment.

Exhibit III-20

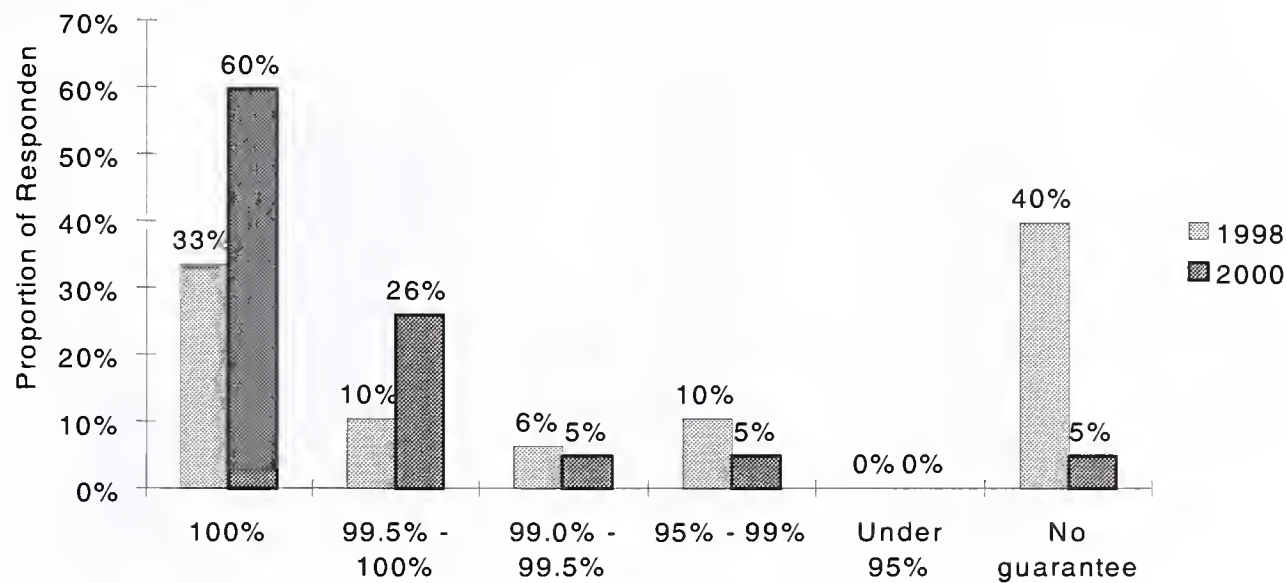
Current and Expected Service Levels, Worldwide



Sample: 121

Source: INPUT

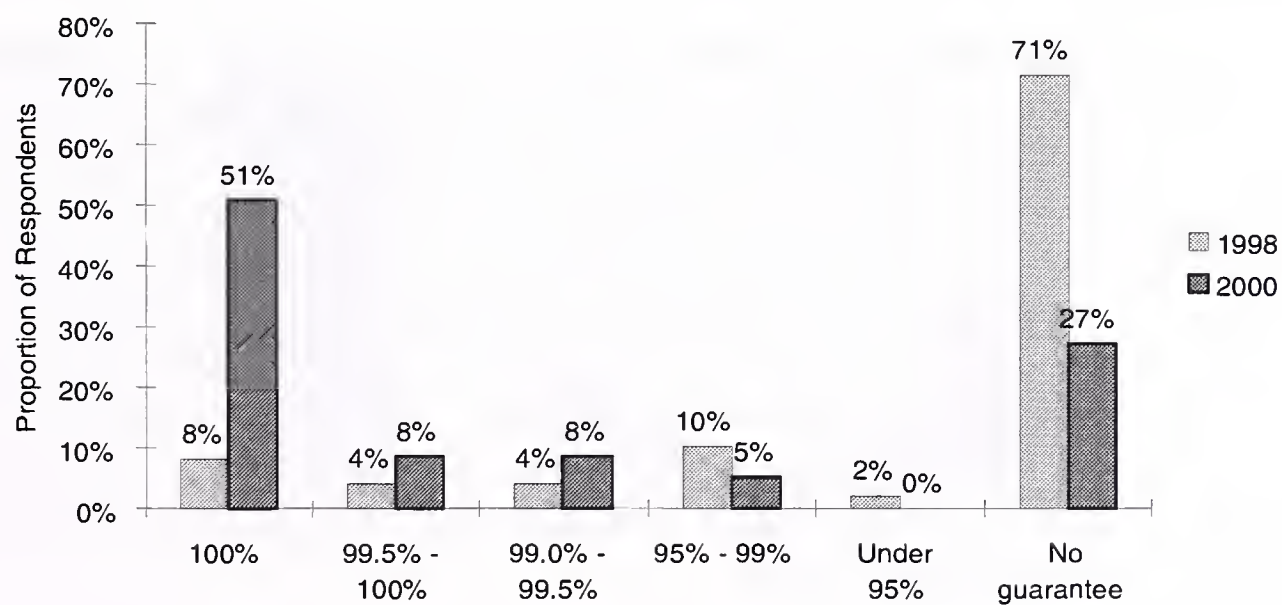
Exhibit III-21

Current and Expected Service Levels, US

Sample: 62

Source: INPUT

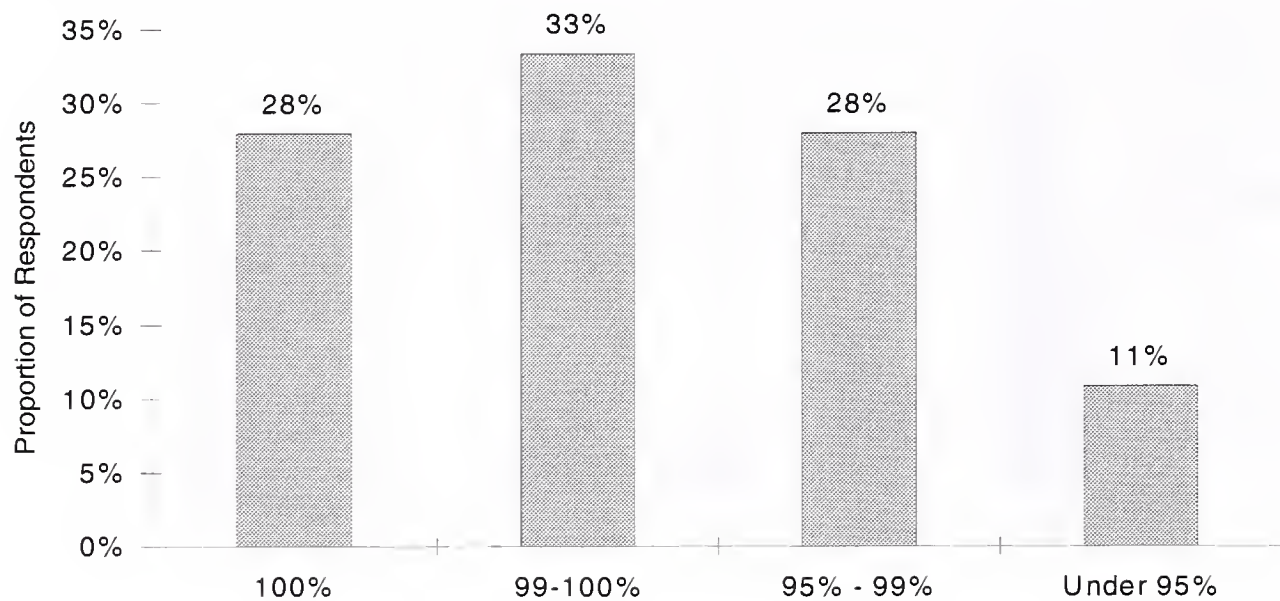
Exhibit III-22

Current and Expected Service Levels, Europe

Sample: 59

Source: INPUT

Exhibit III-23

Service Levels Typically Achieved, Worldwide

Sample: 111

Source: INPUT

H**Payment Schemes**

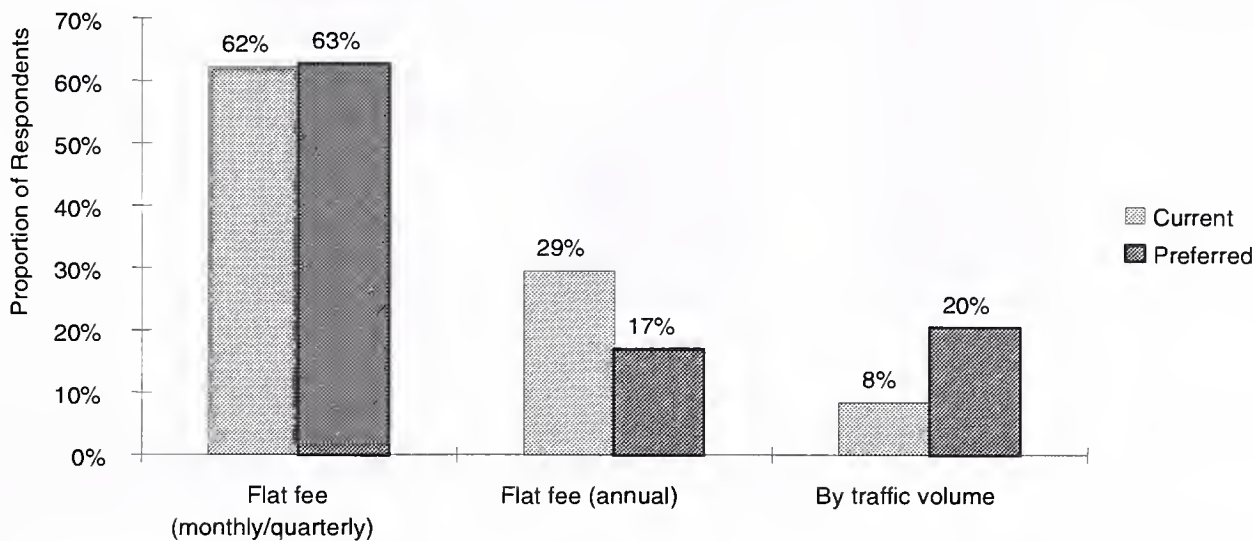
For permanent corporate Internet connections, the most common ISP billing mechanisms are fixed fee (monthly, quarterly, and annual) and traffic-volume-based pricing. Fixed monthly or quarterly billing is the default method for most ISPs and, overall, users are satisfied with such schemes. There is growing demand for volume-based pricing, however, notably in the US. European organizations are more likely to be billed by their telco for connection time where dialup and ISDN connections are used and do not see the same benefit in additional per-usage charging. In the US and Europe, many users with longer-term annual charges want to move to a more flexible scheme, giving them the option to change provider at reasonable notice.

Currently, compared with the European average, monthly/quarterly billing is particularly popular in Germany and annual billing is more common in France. The overall European preference for volume-based pricing is dampened by the results seen in the UK, where no organization

stated a preference for this scheme. Around 20% of French and German organizations preferred such a mechanism.

Exhibit III-24

Current and Preferred Payment Schemes, Worldwide

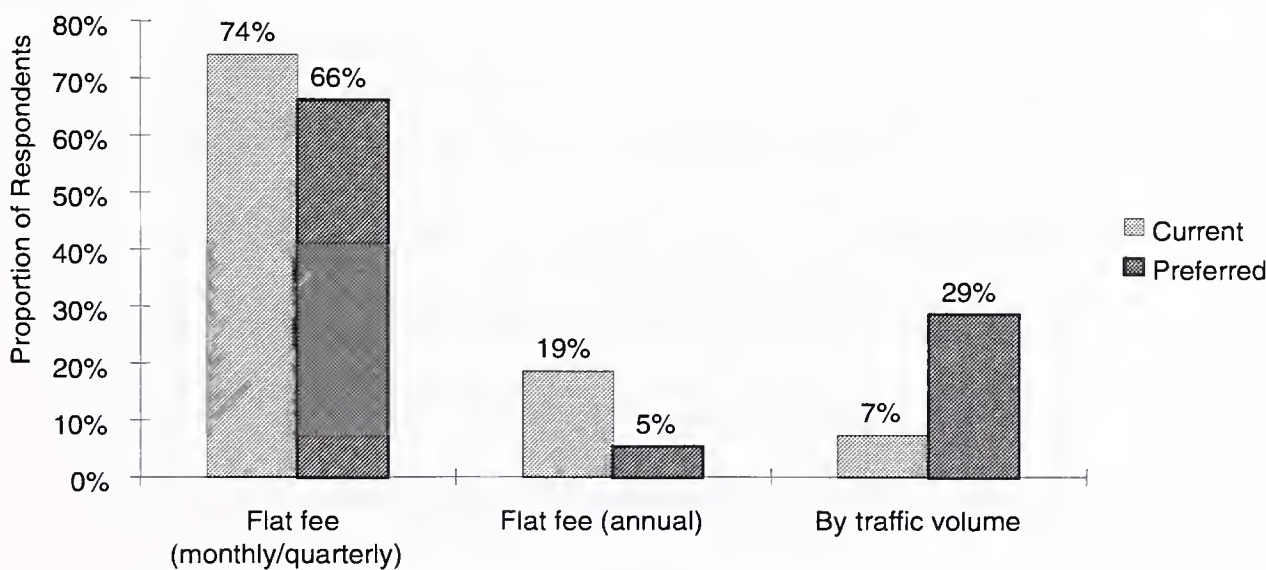


Sample: 119

Source: INPUT

Exhibit III-25

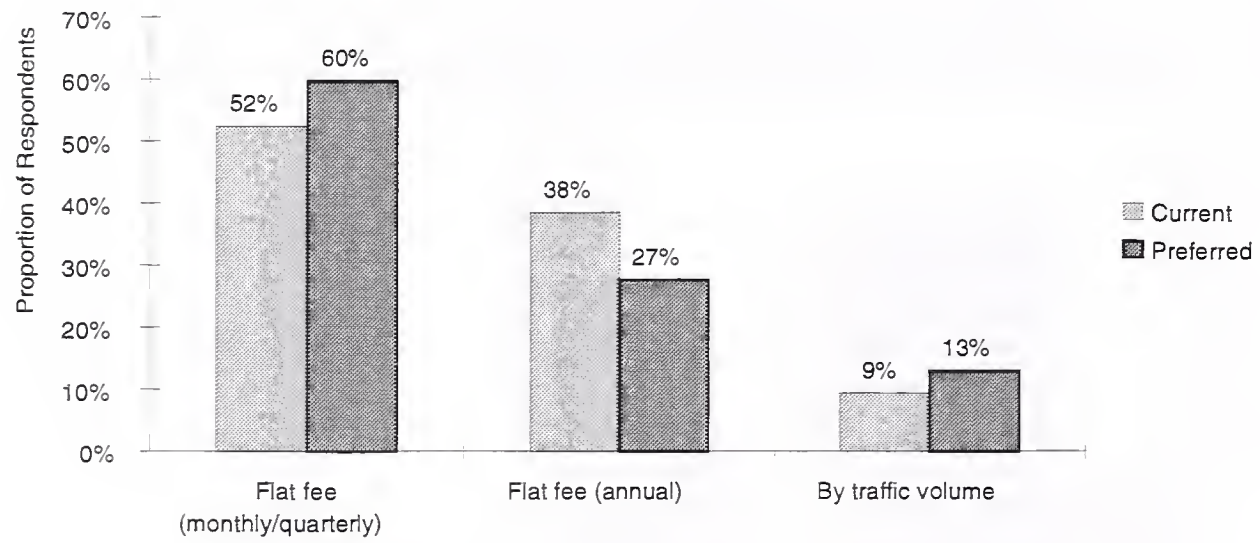
Current and Preferred Payment Schemes, US



Sample: 54

Source: INPUT

Exhibit III-26

Current and Preferred Payment Schemes, Europe

Sample: 65

Source: INPUT

IV

Internet Access Satisfaction and Criteria

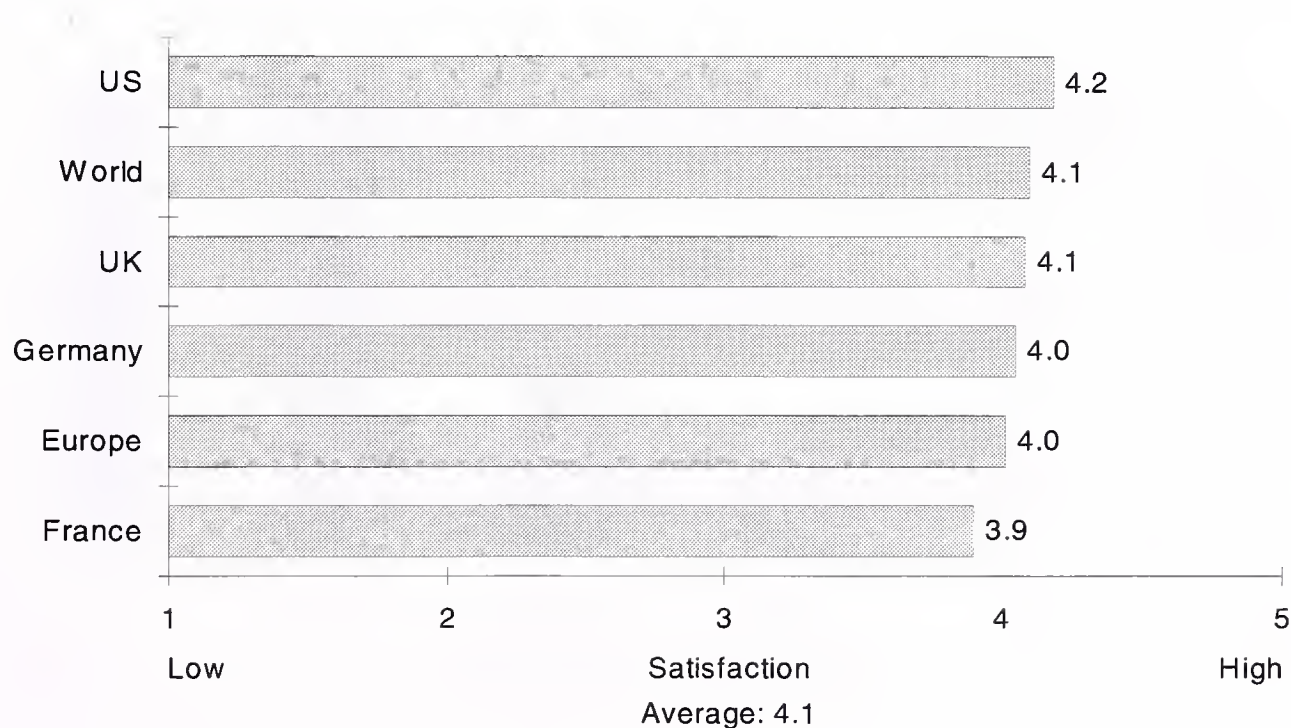
A

Overall Satisfaction With Internet Access

Exhibits IV-1 to IV-6 show the overall satisfaction ratings given by respondents to their Internet access service. Levels are consistently high, the only sample segments giving an overall rating of less than 4 out of 5 being French respondents and European respondents in the retail industry.

Exhibit IV-1

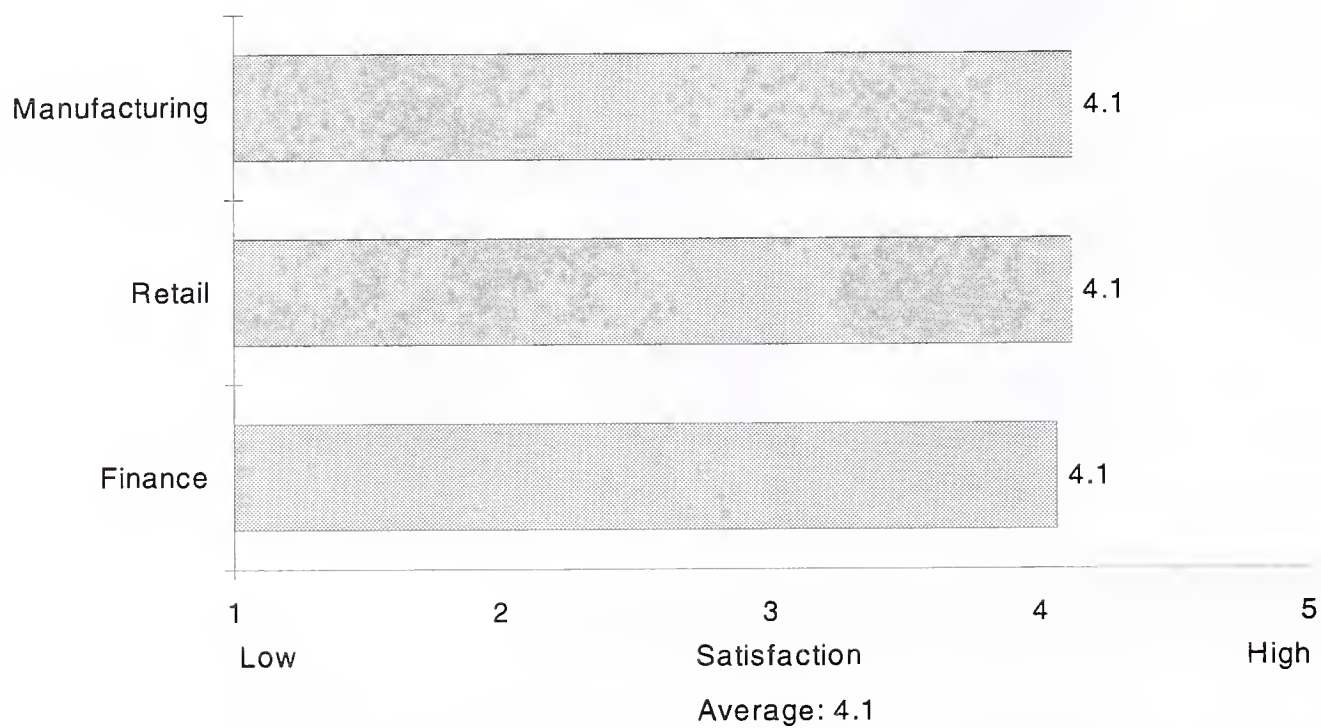
Overall Satisfaction With Internet Access, by Country



Sample: 131

Source: INPUT

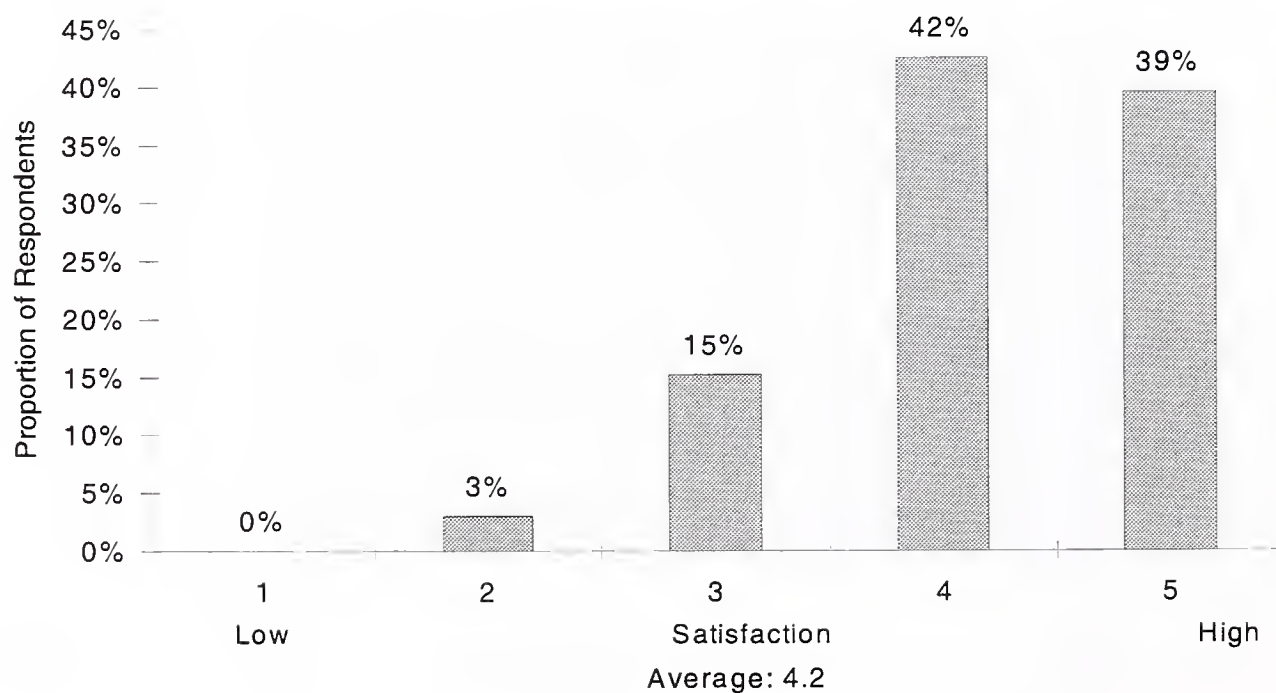
Exhibit IV-2

Overall Satisfaction With Internet Access, by Industry

Sample: 131

Source: INPUT

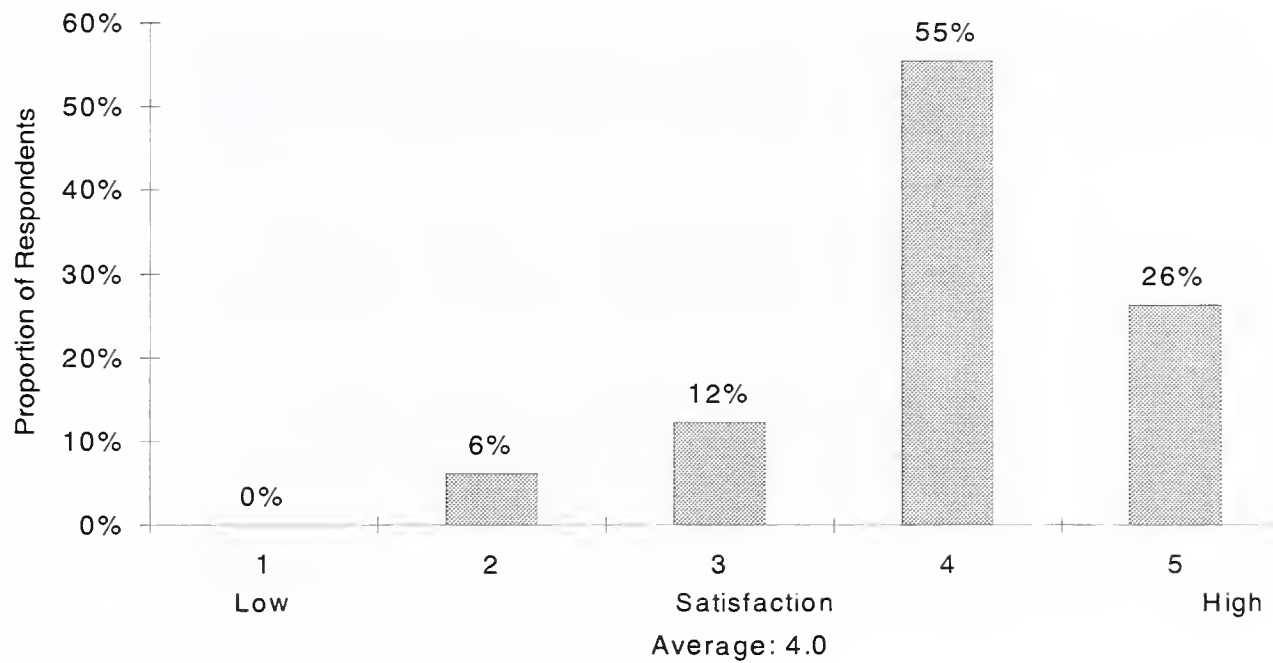
Exhibit IV-3

Overall Satisfaction With Internet Access, US

Sample: 66

Source: INPUT

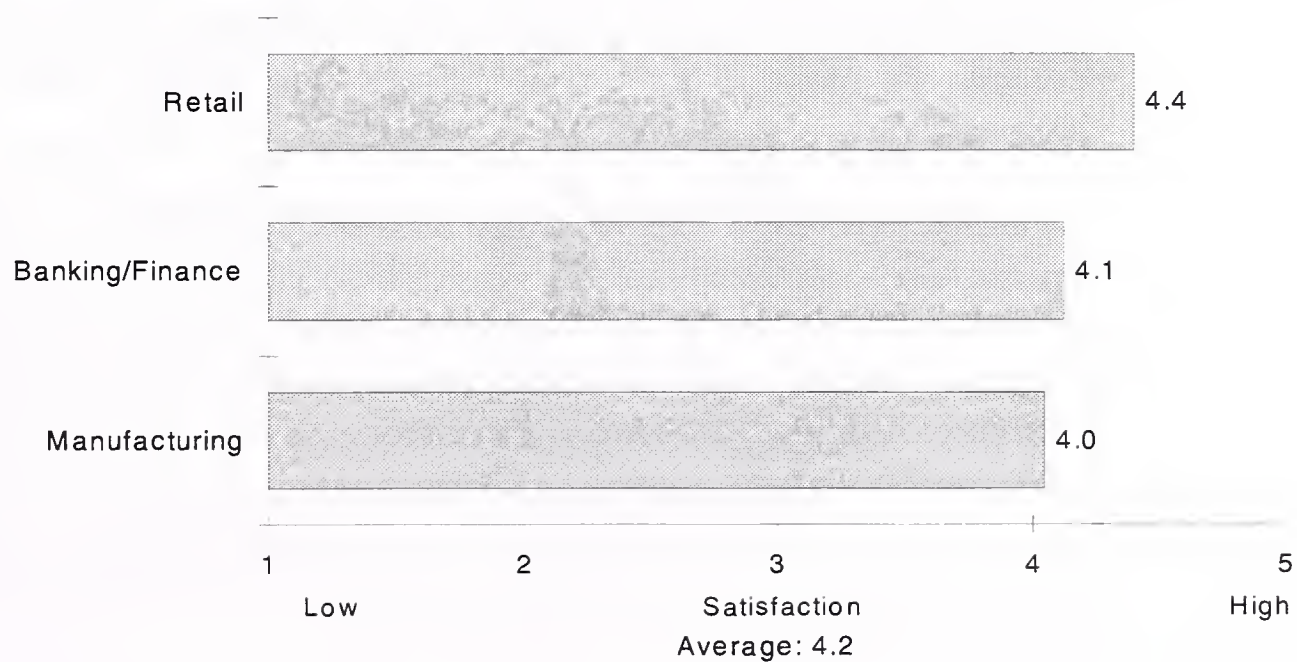
Exhibit IV-4

Overall Satisfaction With Internet Access, Europe

Sample: 65

Source: INPUT

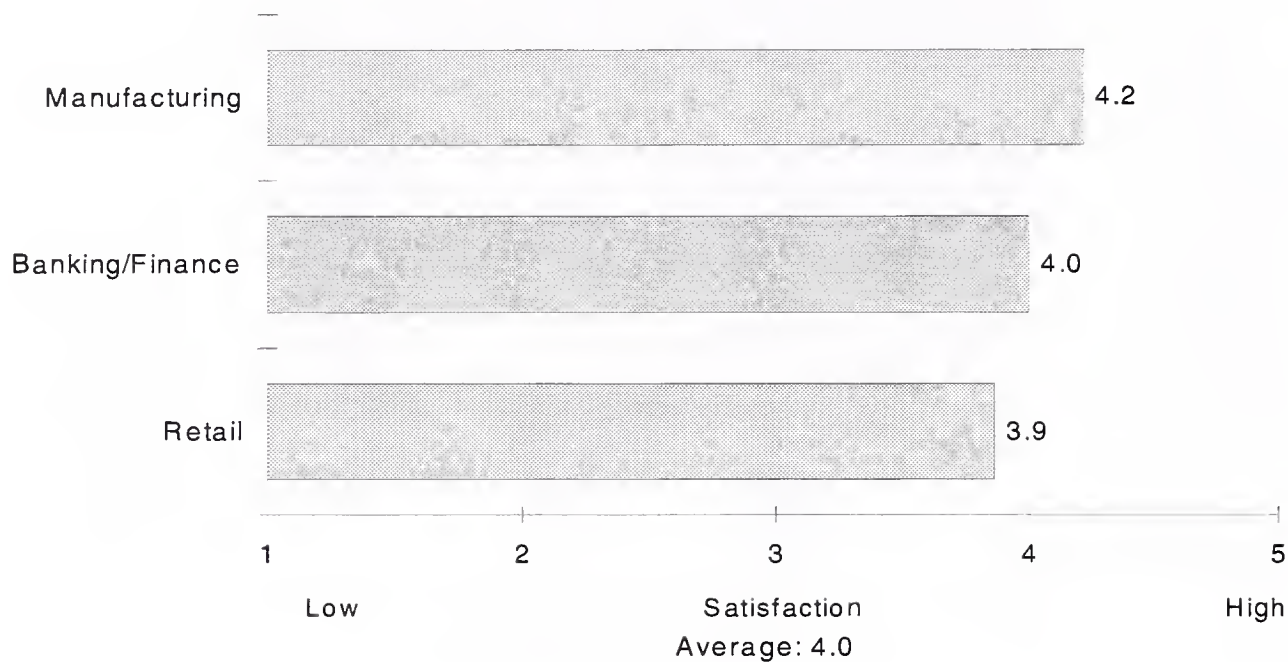
Exhibit IV-5

Overall Satisfaction With Internet Access by Industry, US

Sample: 66

Source: INPUT

Exhibit IV-6

Overall Satisfaction With Internet Access by Industry, Europe

Sample: 65

Source: INPUT

B**Importance Of And Satisfaction With Internet Access Characteristics**

Internet access was broken down into 12 components; Exhibits IV-7 to IV-9 show how important respondents currently consider each characteristic.

The aspect of an access service that most enshrines robust, stable connectivity—reliability/uptime—is considered extremely important by all respondents. Related issues—service continuity, backbone architecture, and commitment to improve and upgrade service—are rated the third, fourth and fifth most important characteristics respectively by both US and European organizations. As Internet connectivity (and related services such as Web and application server hosting) move into the domain of mission-critical services, it will become essential for ISPs to compete on reliability and availability issues.

The most important issue overall is not related to service reliability, however. Respondents placed the highest importance on national coverage. Geographically wide accessibility from a single provider is clearly critical for organizations with disperse offices and branches

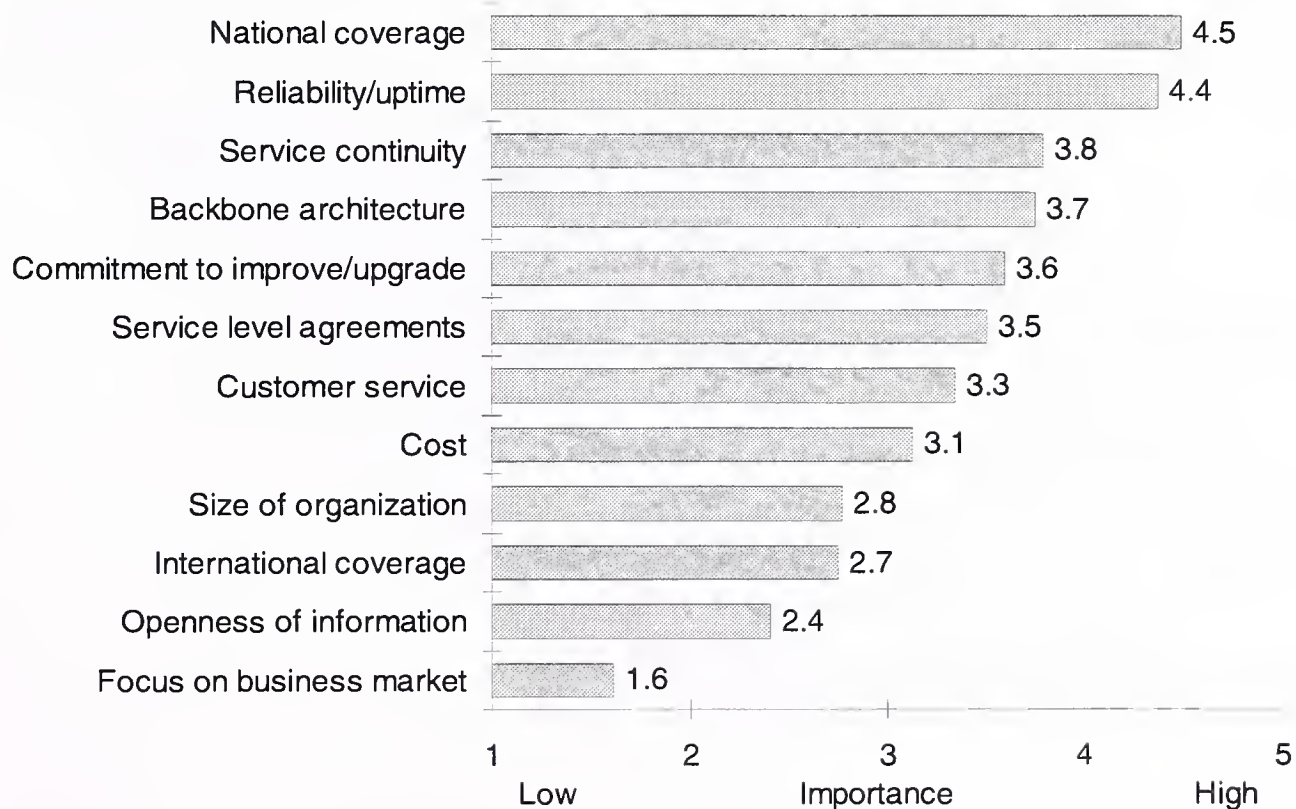
operating a corporate access policy. Considered alongside the low importance given to international coverage (dampened by lack of concern among US respondents for overseas connectivity), these are encouraging results for mid-tier ISPs focused primarily at the national level.

The danger for such ISPs is the expected increase in importance of international coverage. This aspect is in the lowest-rated group of characteristics currently, but by 2000 will be, if not of utmost importance, grouped in the band of medium-importance issues.

Overall, US buyers place greater levels of importance on Internet access characteristics than do European buyers. This reflects partly the tendency of US respondents to rate issues slightly higher than European respondents but also the greater degree to which US organizations have already embedded the Internet into their business. The order in which characteristics are ranked in terms of importance, however, are, with the exception of international coverage, very similar for US and European organizations.

Exhibit IV-7

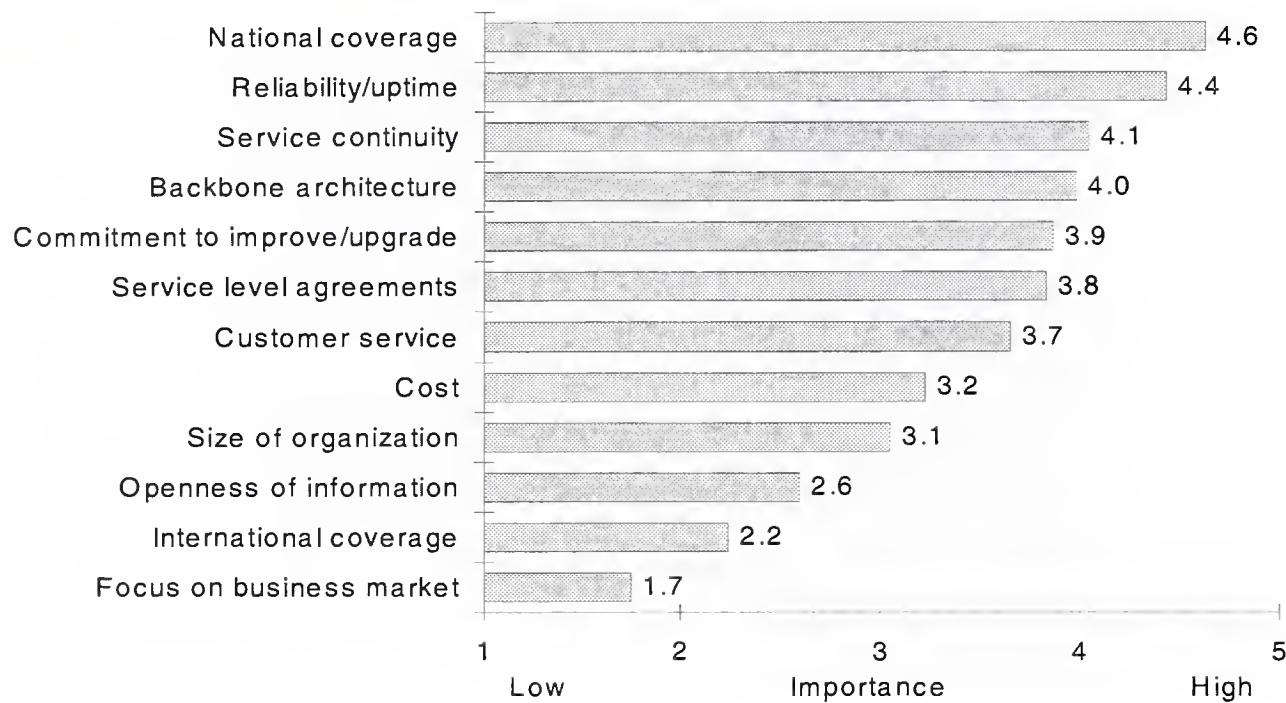
Current Importance of Internet Access Characteristics, Worldwide



Sample: 121

Source: INPUT

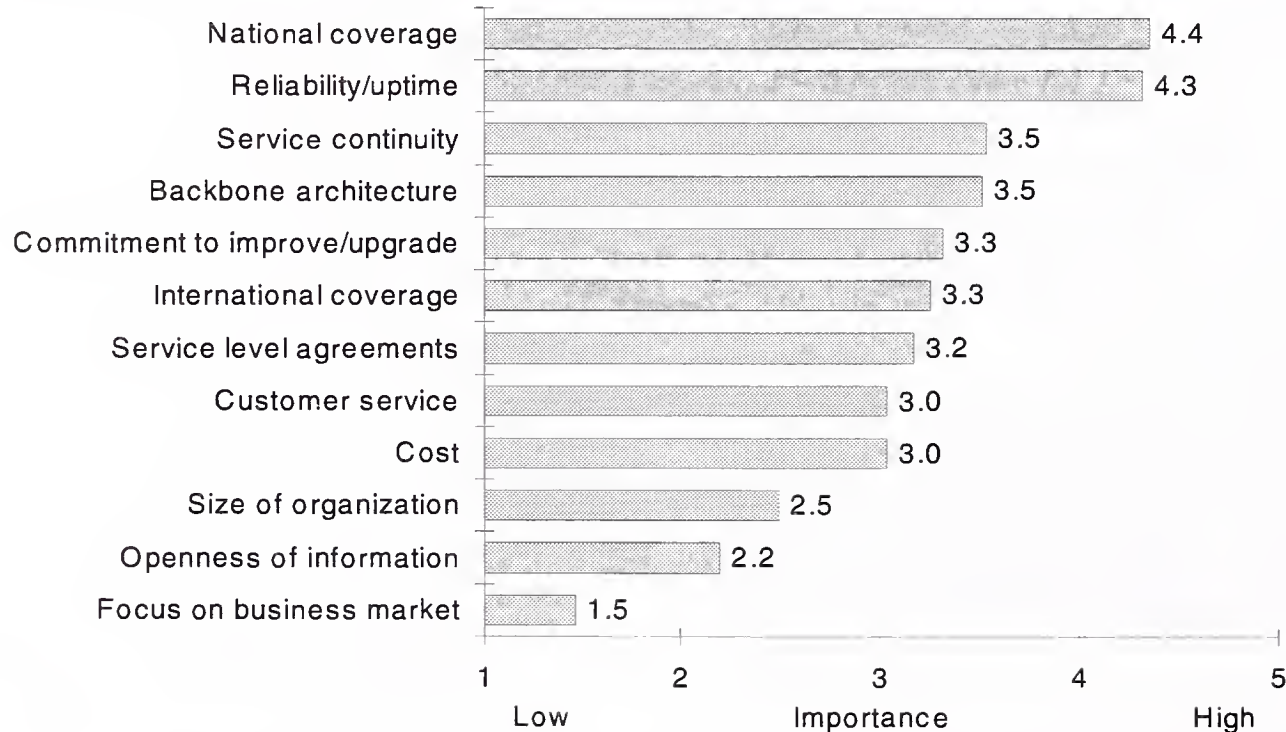
Exhibit IV-8

Current Importance of Internet Access Characteristics, US

Sample: 60

Source: INPUT

Exhibit IV-9

Current Importance of Internet Access Characteristics, Europe

Sample: 61

Source: INPUT

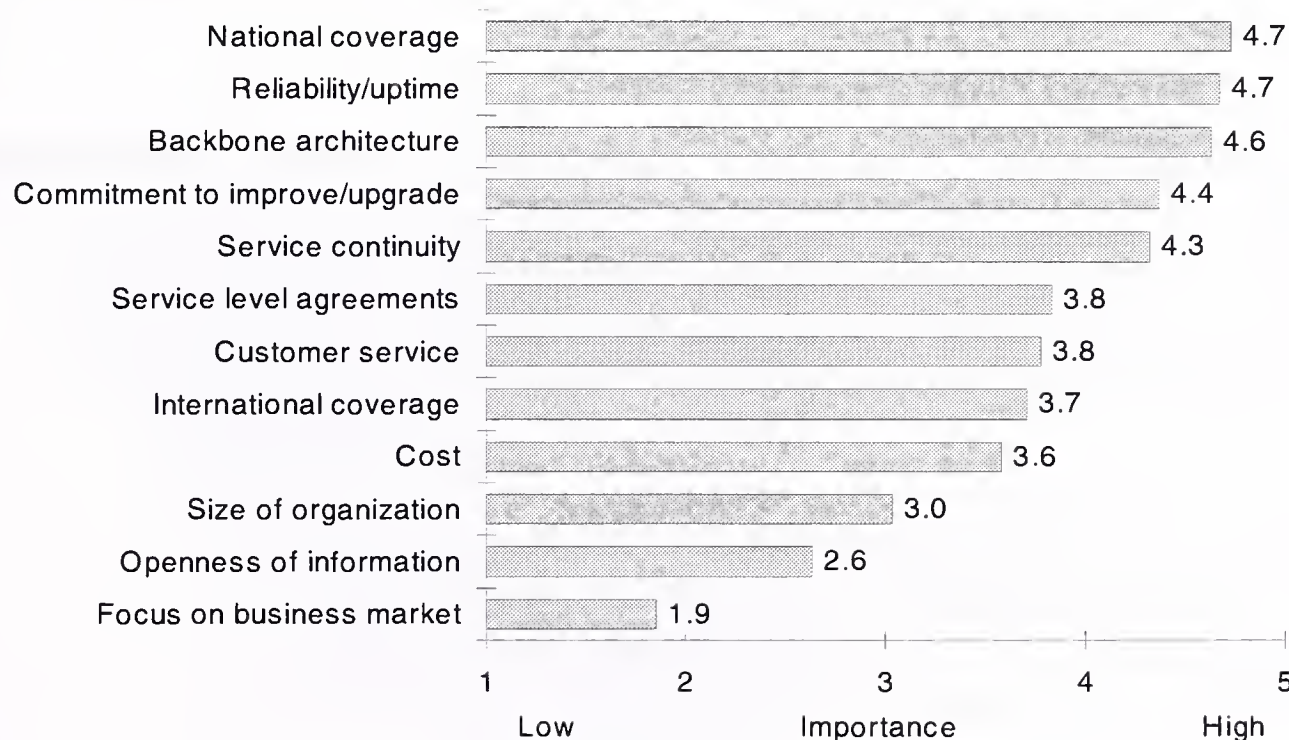
Exhibits IV-10 to IV-12 show how important respondents expected each component to become over the next two years. Exhibit IV-13 show the difference in importance for each characteristic.

As mentioned above, international coverage will increase in importance significantly, due primarily to the relative indifference of US respondents towards the issue currently. The two other components anticipated to change significantly, backbone architecture and commitment to improve and upgrade, are already important issues, however. By 2000, they will rank among the top issues of concern to buyers. Service continuity, a related issue, will also increase in importance to a very high level.

Reliability issues and national coverage form the core aspects of an access service that ISPs must ensure to a high level. Users consider other issues as secondary by comparison, although mostly still important.

Exhibit IV-10

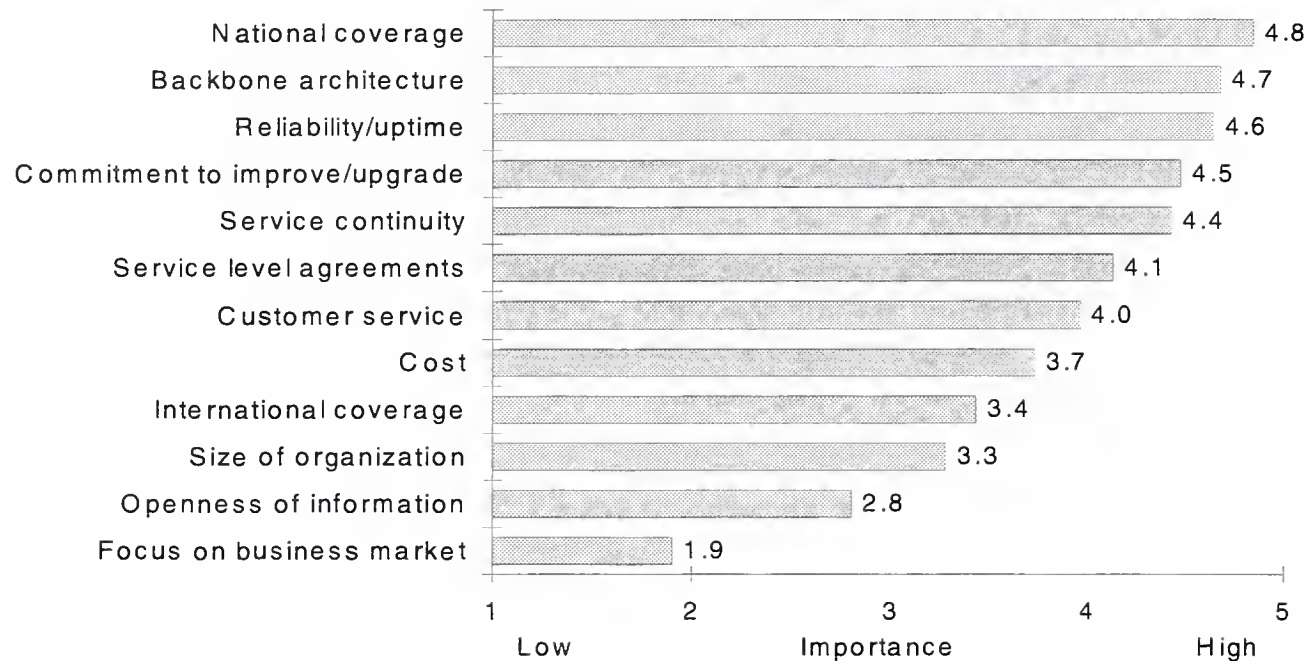
Expected Importance of Internet Access Characteristics, 2000, Worldwide



Sample: 118

Source: INPUT

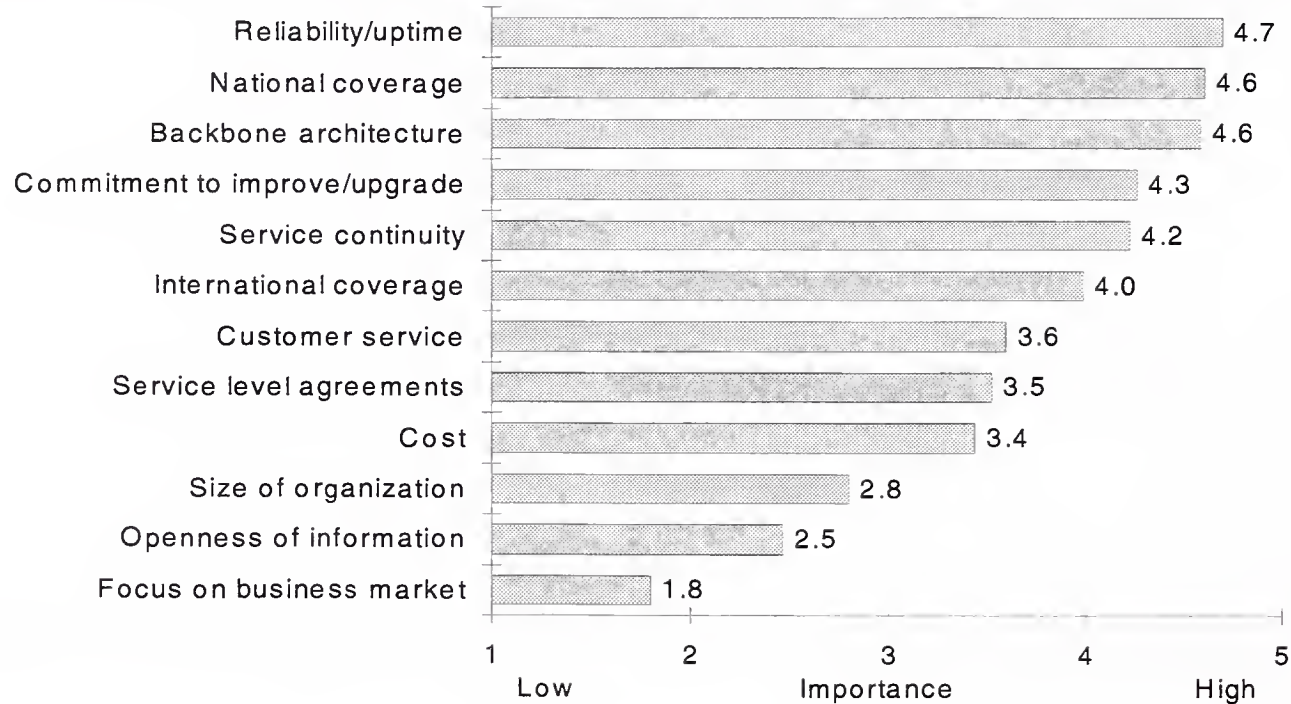
Exhibit IV-11

Expected Importance of Internet Access Characteristics, 2000, US

Sample: 59

Source: INPUT

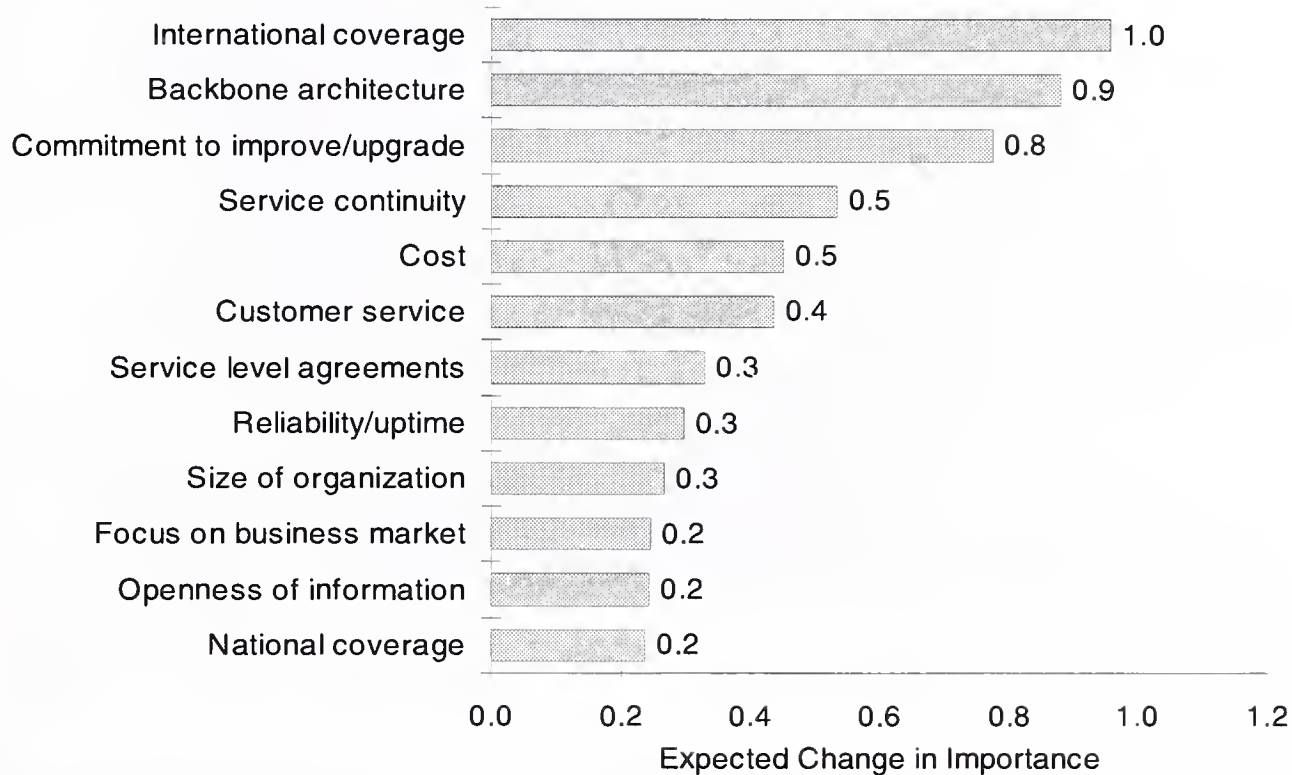
Exhibit IV-12

Expected Importance of Internet Access Characteristics, 2000, Europe

Sample: 59

Source: INPUT

Exhibit IV-13

Expected Change in Importance of Internet Access Characteristics, Worldwide

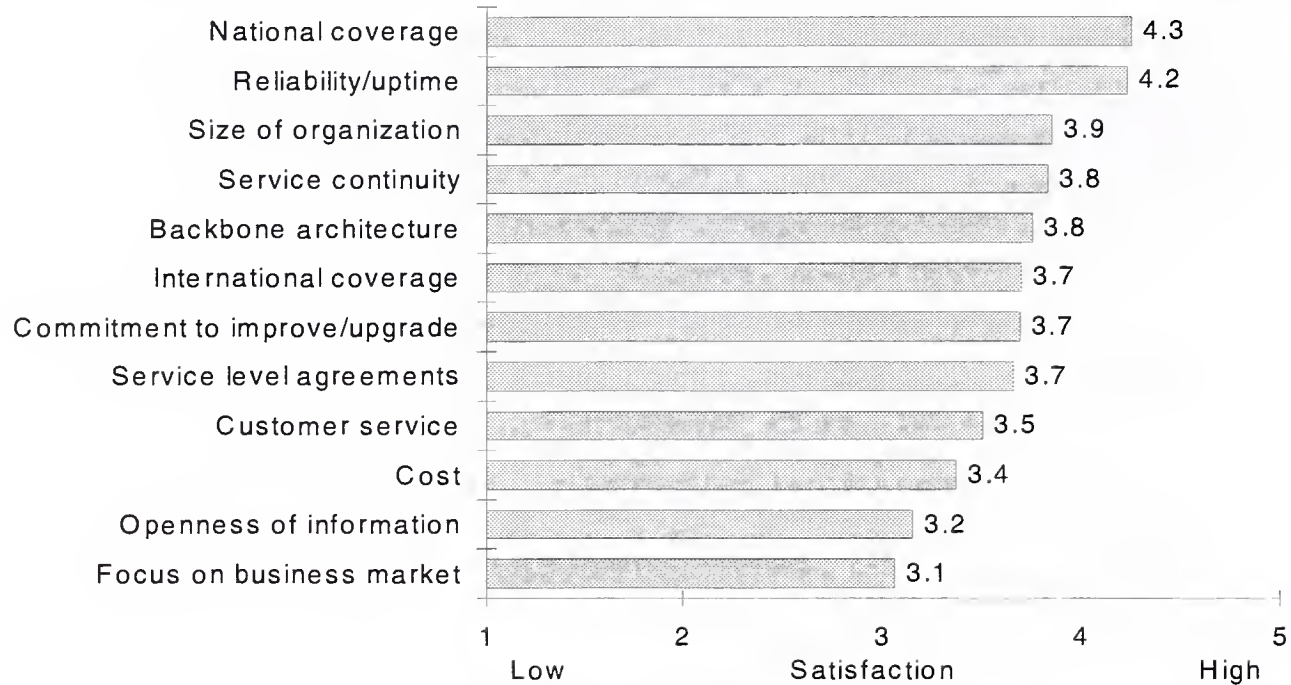
Sample: 121

Source: INPUT

Buyers are reasonably satisfied with most aspects of their access services. The most critical components highlighted above all receive ratings of 3.7 or higher across the US and Europe, with US respondents again giving higher ratings overall. For both sets of respondents, the lowest-rated characteristics are also the least important.

Exhibits IV-14 to IV-16 show the satisfaction ratings given; Exhibit IV-17 shows the difference between the importance currently given to each characteristic and the satisfaction rating received. No service component performs badly compared with its importance, and most important issues are well balanced.

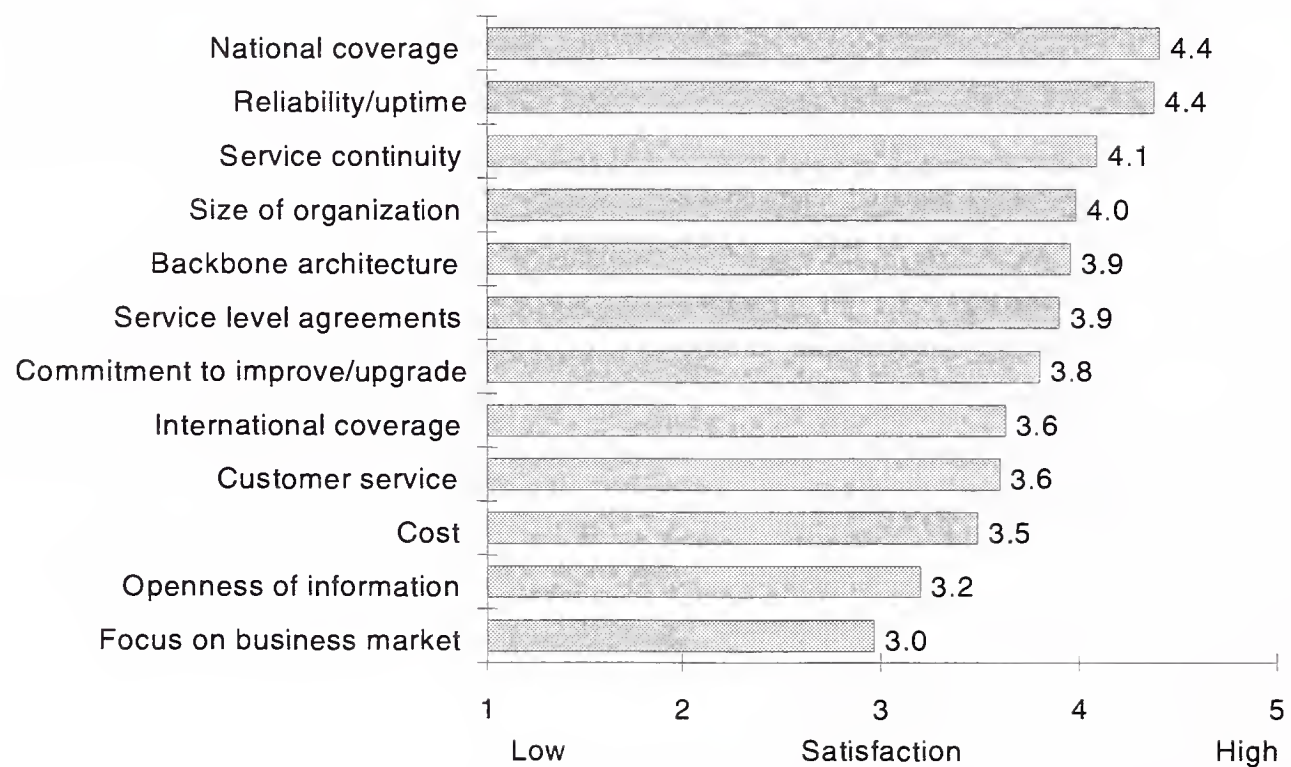
Exhibit IV-14

Satisfaction With Internet Access Characteristics, Worldwide

Sample: 118

Source: INPUT

Exhibit IV-15

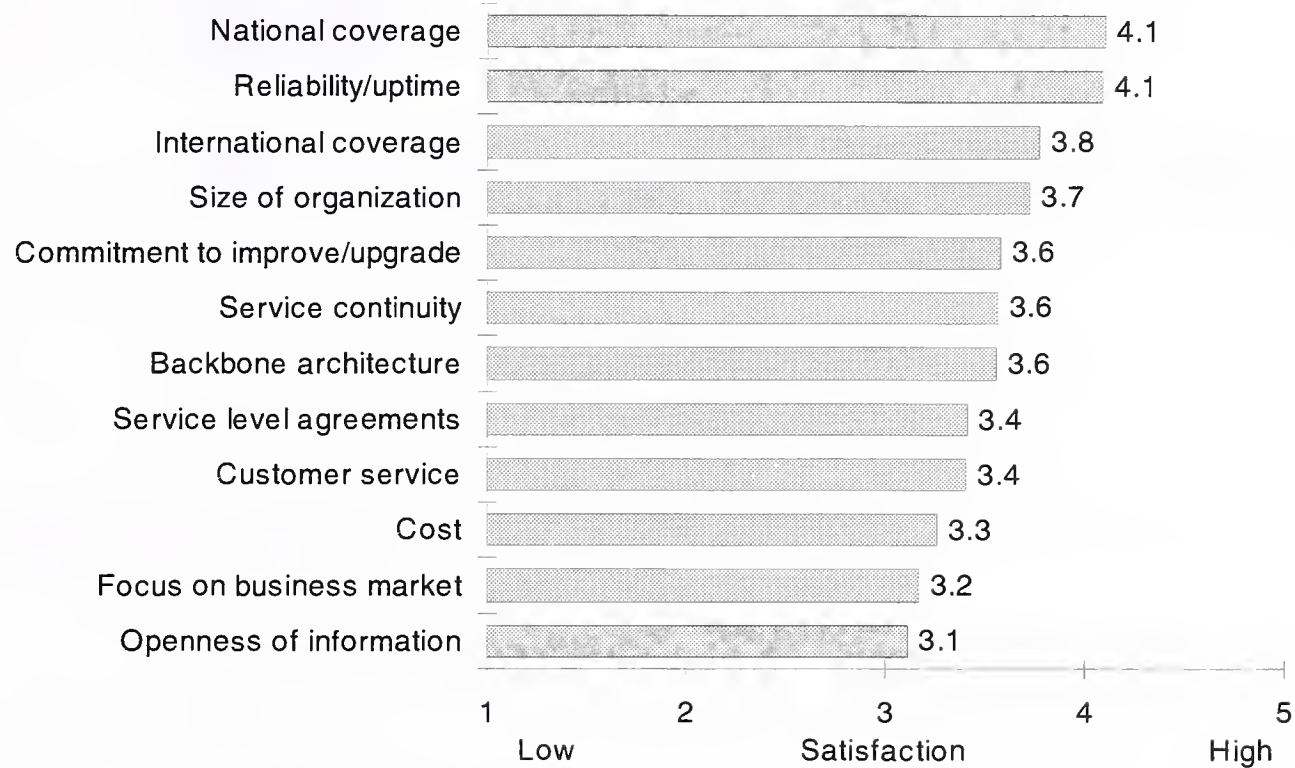
Satisfaction With Internet Access Characteristics, US

Sample: 59

Source: INPUT

Exhibit IV-16

Satisfaction With Internet Access Characteristics, Europe

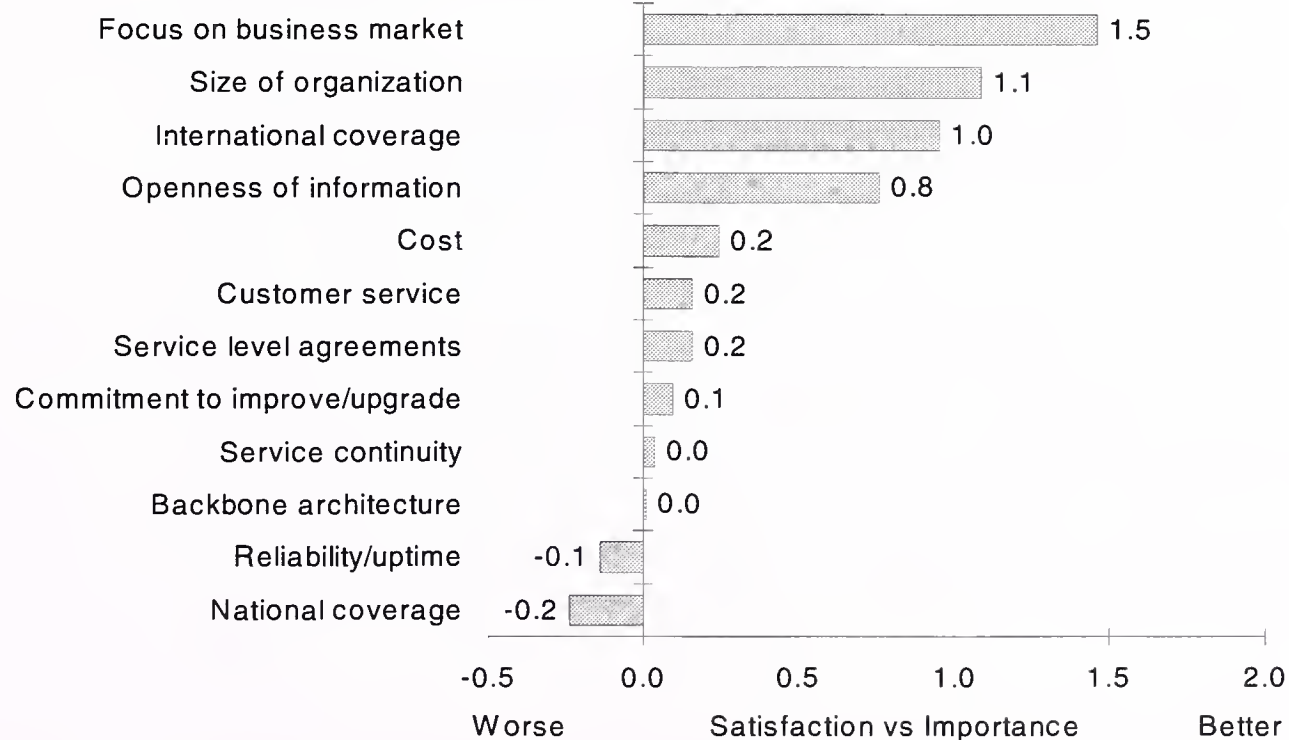


Sample: 59

Source: INPUT

Exhibit IV-17

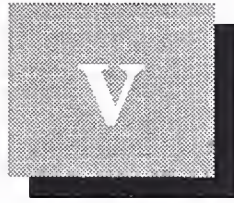
Difference Between Importance of and Satisfaction With Internet Access Characteristics, Worldwide



Sample: 121

Source: INPUT

(Blank Page)



Web Hosting Usage and Plans

A

Current and Future Usage

As shown earlier in this report, use of ISP services both currently and expected by 2000 is, in descending order of penetration:

- Web server hosting
- Application server hosting
- Extranet services

Within the hosting categories, Exhibits V-1 to V-3 break down the individual hosting services offered by ISPs and show current and future usage levels.

Expected usage by 2000 is similar across the US and Europe, but current levels are comparatively higher in the US, reflecting the higher growth rates in the European ISP market compared with the US.

Buyers do not see a substantial difference between application/database server hosting and private Intranet server hosting. In practice, the two categories overlap. All software applications, from groupware and office suite packages to enterprise applications are becoming Web-enabled. In doing so, they become inherently Intranet-enabled. The difference between an in-house Intranet server and application server is decreasing and for marketing purposes will not remain a useful difference beyond 2000.

The same convergence is happening with network and application server operating systems. For example, where Novell Netware was once used as a network (primarily file and print) server, it is now both an application

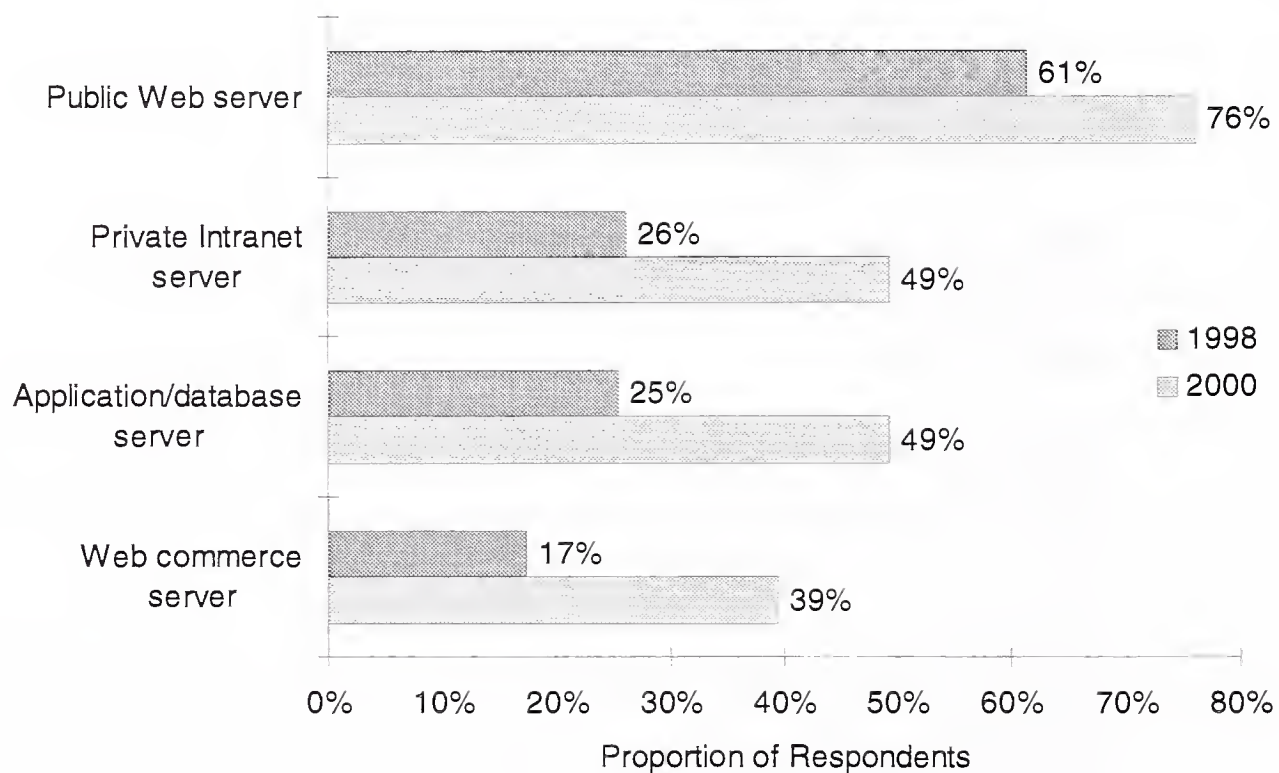
(including Intranet) and a network server. Windows NT is, similarly, both a network and application server operating system.

As a result, many users mean the same thing by Intranet and application server, and so very similar usage levels are reported.

Relative use of application/Intranet hosting services and commerce hosting services is expected to remain similar over the next two years. INPUT expects growth in commerce services to overtake growth in application hosting services from 2000 onwards, as Internet commerce itself increases sharply, due to resolution of payment mechanisms, greater acceptance of online commerce, and increased business and consumer Internet population.

Exhibit V-1

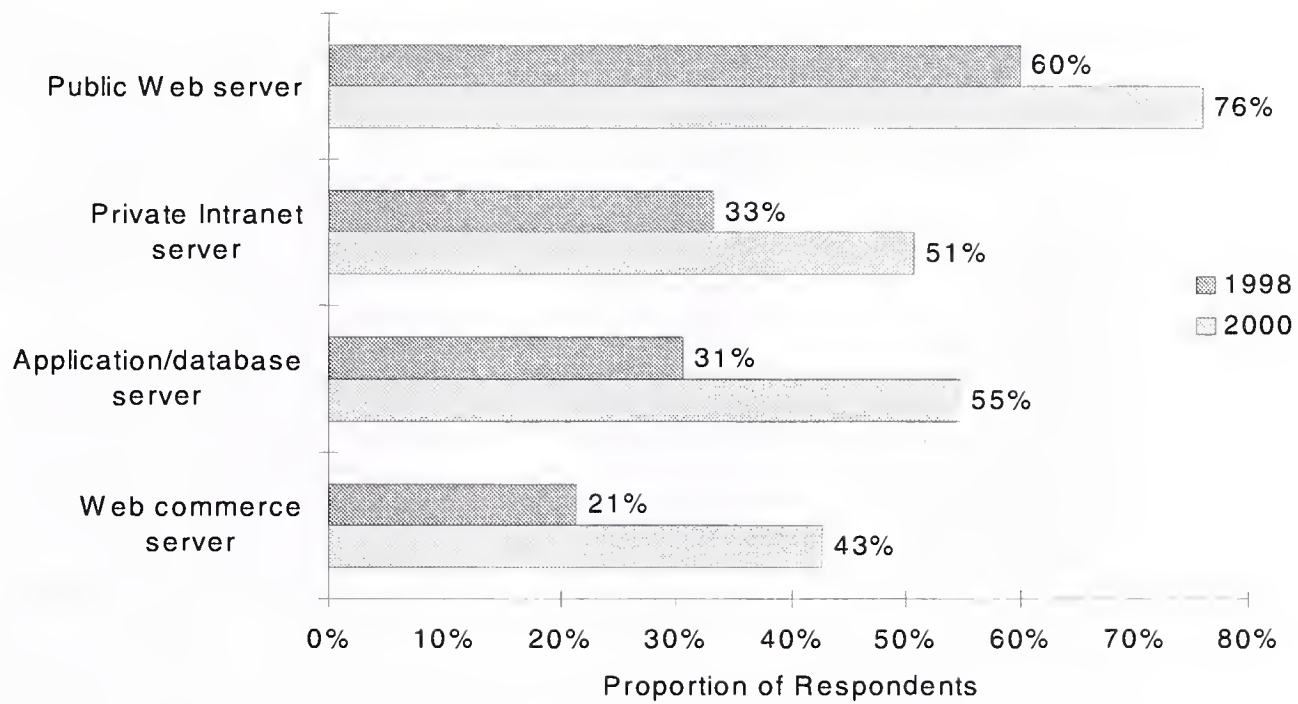
Current and Expected Use of Hosting Services, Worldwide



Sample: 150

Source: INPUT

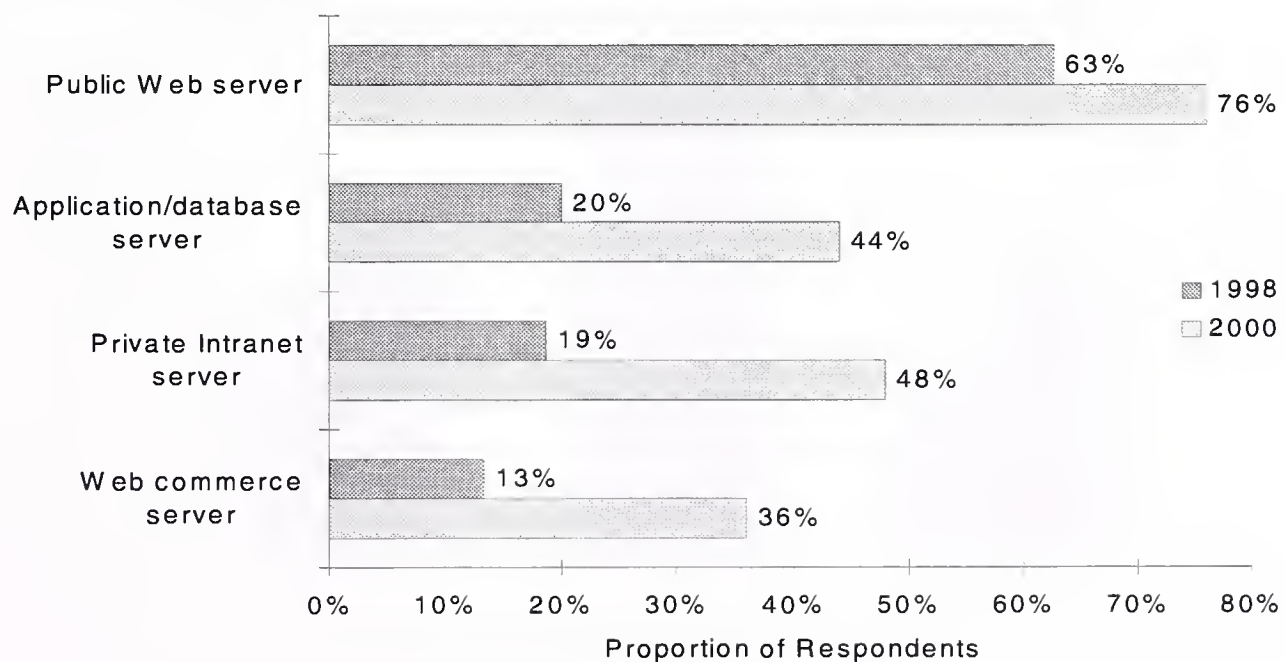
Exhibit V-2

Current and Expected Use of Hosting Services, US

Sample: 75

Source: INPUT

Exhibit V-3

Current and Expected Use of Hosting Services, Europe

Sample: 75

Source: INPUT

B

Server Ownership

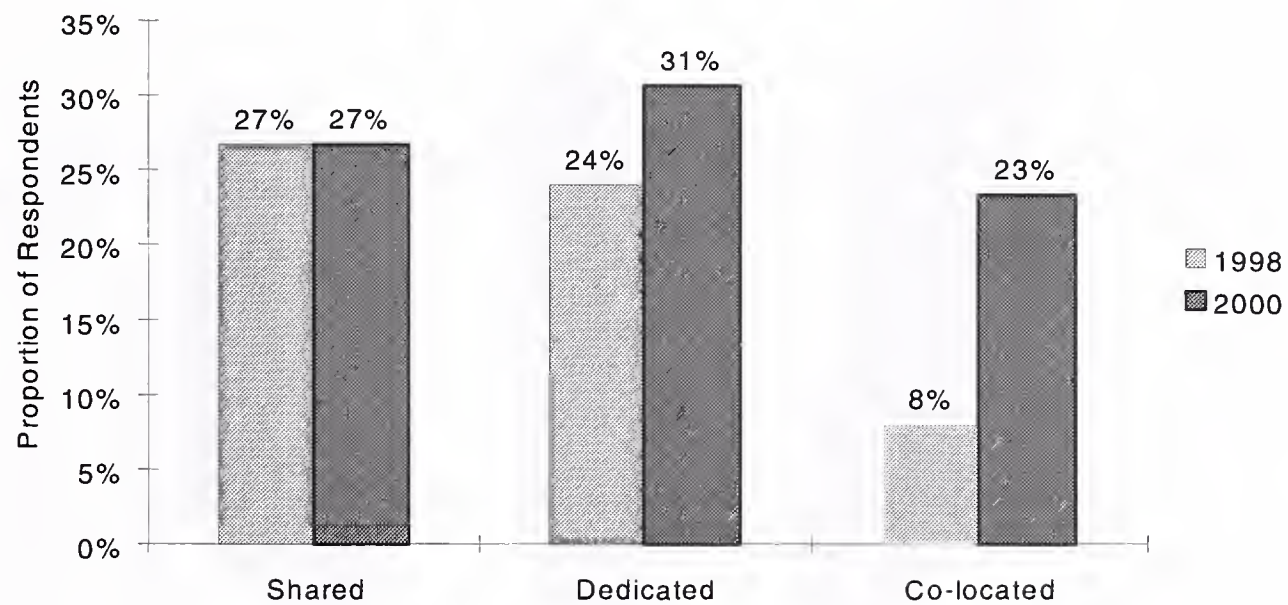
Servers are hosted in three ways:

- Shared—a customer shares a machine with other customers
- Dedicated—a customer has exclusive use of a machine
- Co-located—a customer owns a machine and sites it on an ISP's network

Exhibits V-4 to V-6 show the changing expectations of buyers regarding their use of these three options. Of respondents currently with a Web hosting service, 85% use a shared or dedicated server. The use of co-located servers will rise considerably between 1998 and 2000, as organizations rely increasingly on the Internet for advertising and marketing purposes, and for taking orders online—service guarantees, security, predictable bandwidth, scalability, and, most notably, a high level of user control are best provided by a co-location service.

Changes in server ownership are most pronounced in Europe; users expect to reduce their use of shared servers in favor of dedicated and co-located servers to meet the needs of increasingly critical and demanding Web presences. This higher growth in dedicated and co-located servers is again due to the lower current usage levels compared with the US. Expected usage by 2000 is similar across both regions.

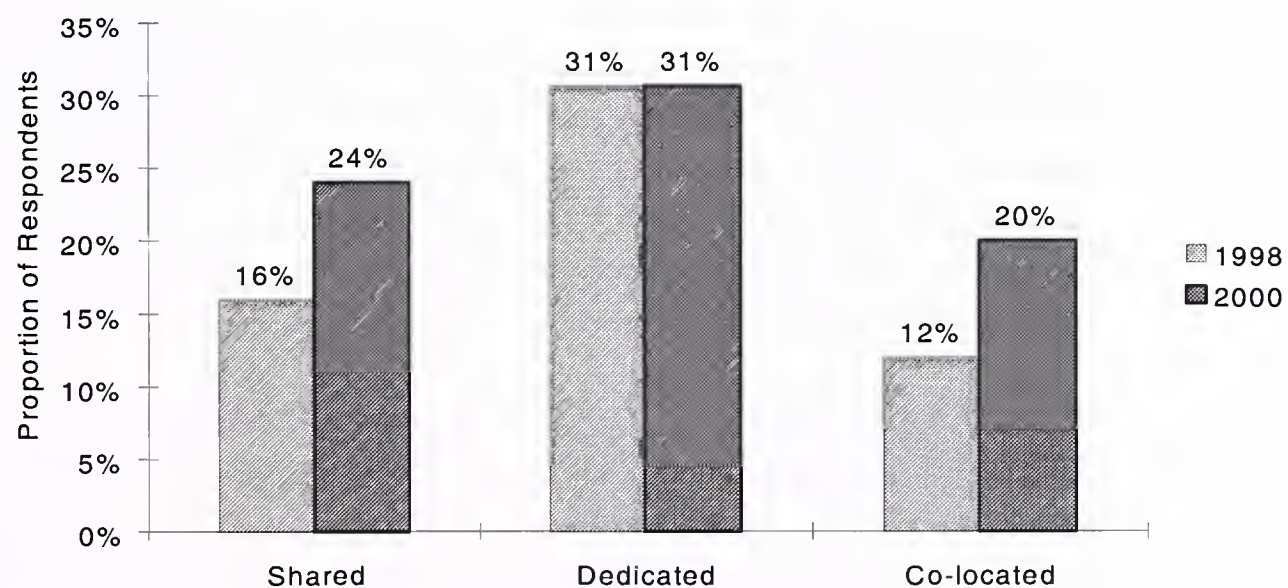
Exhibit V-4

Current and Expected Web Server Ownership, Worldwide

Sample: 150

Source: INPUT

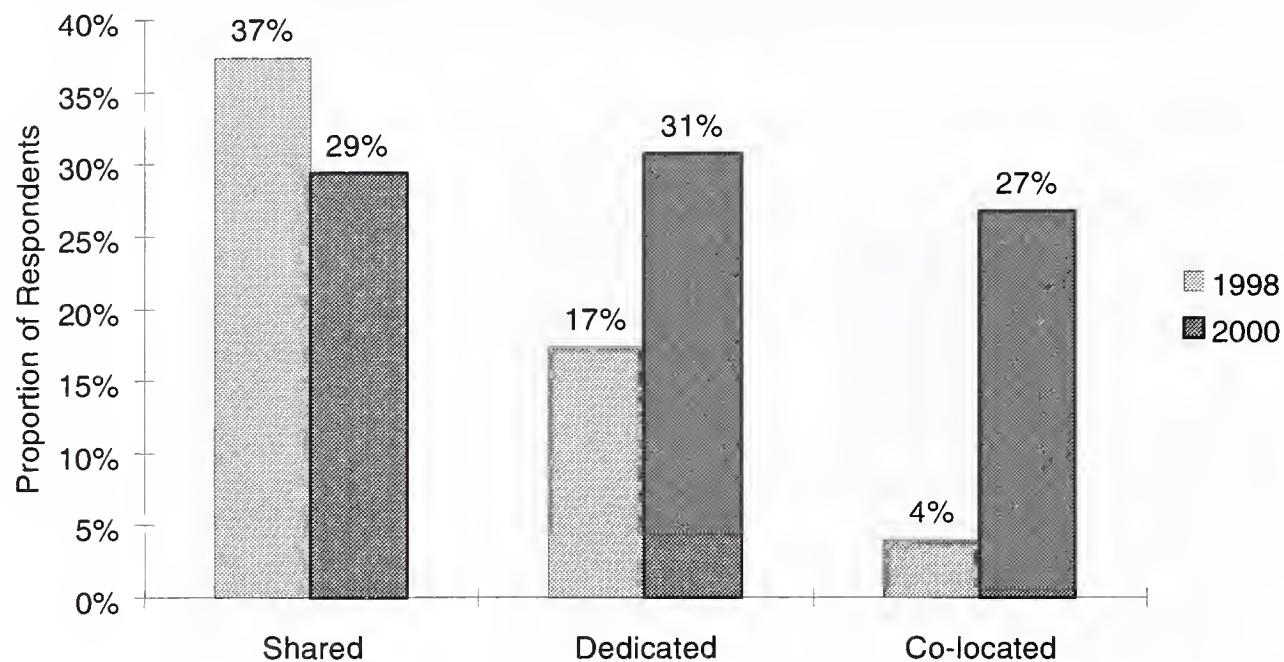
Exhibit V-5

Current and Expected Web Server Ownership, US

Sample: 75

Source: INPUT

Exhibit V-6

Current and Expected Web Server Ownership, Europe

Sample: 75

Source: INPUT

C

Management Responsibility

ISPs should prepare to accept a greater degree of management responsibility for hosted servers. Currently, as Exhibits V-7 to V-9 show, most management (system, application and content) is performed by users themselves, accessing the server remotely. ISPs are most commonly responsible for system management of hosted servers, although a small proportion of organizations let the ISP manage content as well as systems through full Web development and implementation services.

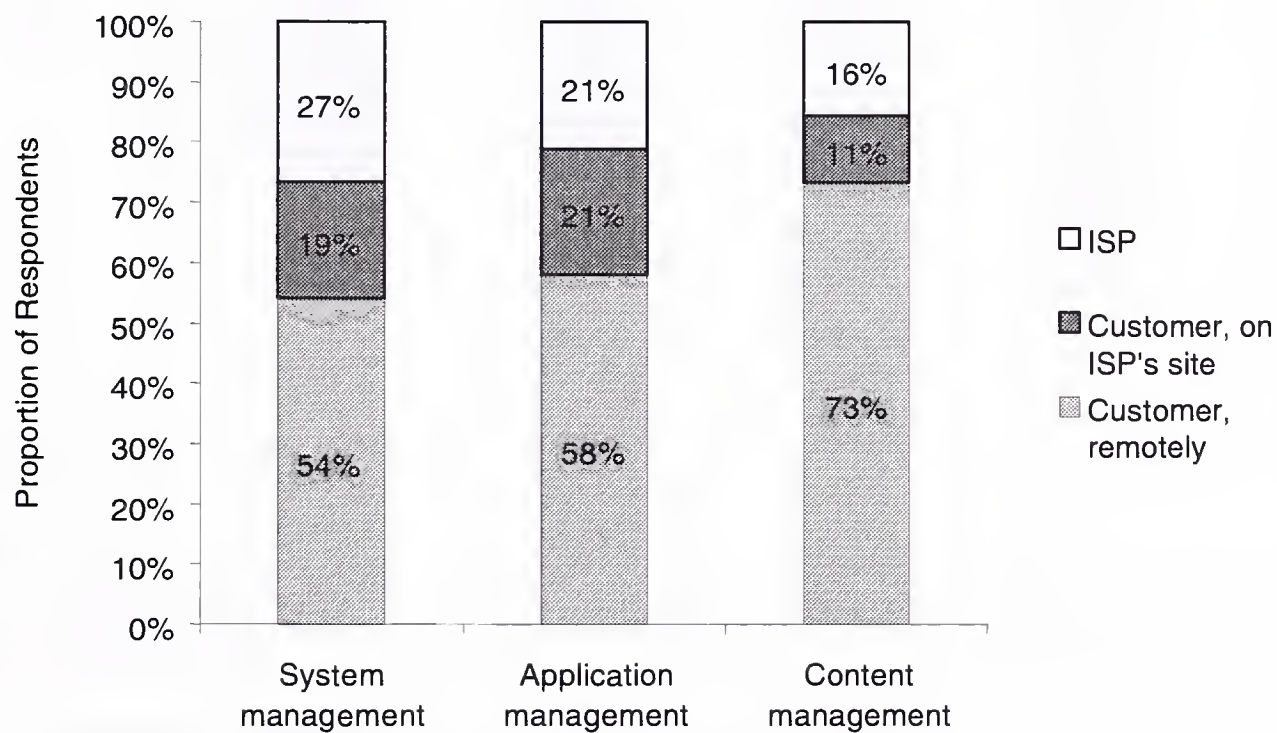
It is clear from Exhibits V-10 to V-12 that buyers want ISPs to take over more of the management role, particularly system management. This is seen as a benefit of a hosting service that currently is not being delivered according to customers' preferences. Exhibit V-13 shows the difference between current and preferred management roles, and highlights these preferences.

The market for complete managed Internet solutions will grow rapidly over the next three years and beyond, particularly within the SME sector.

The benefits of hosting services are currently largely enhancements over in-house provision, such as increased security and greater resilience, although INPUT expects unique, positive benefits to emerge that focus on the ability to conduct electronic business in new and cost-effective ways.

Exhibit V-7

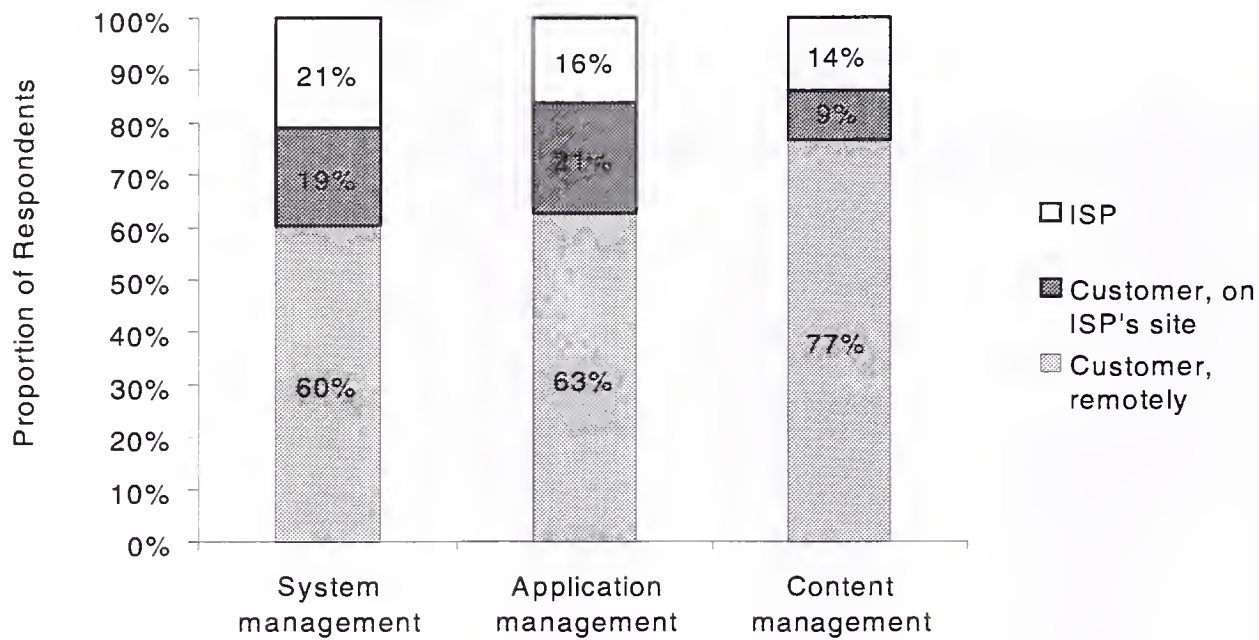
Hosted Web Server Management Responsibilities, Worldwide



Sample: 83

Source: INPUT

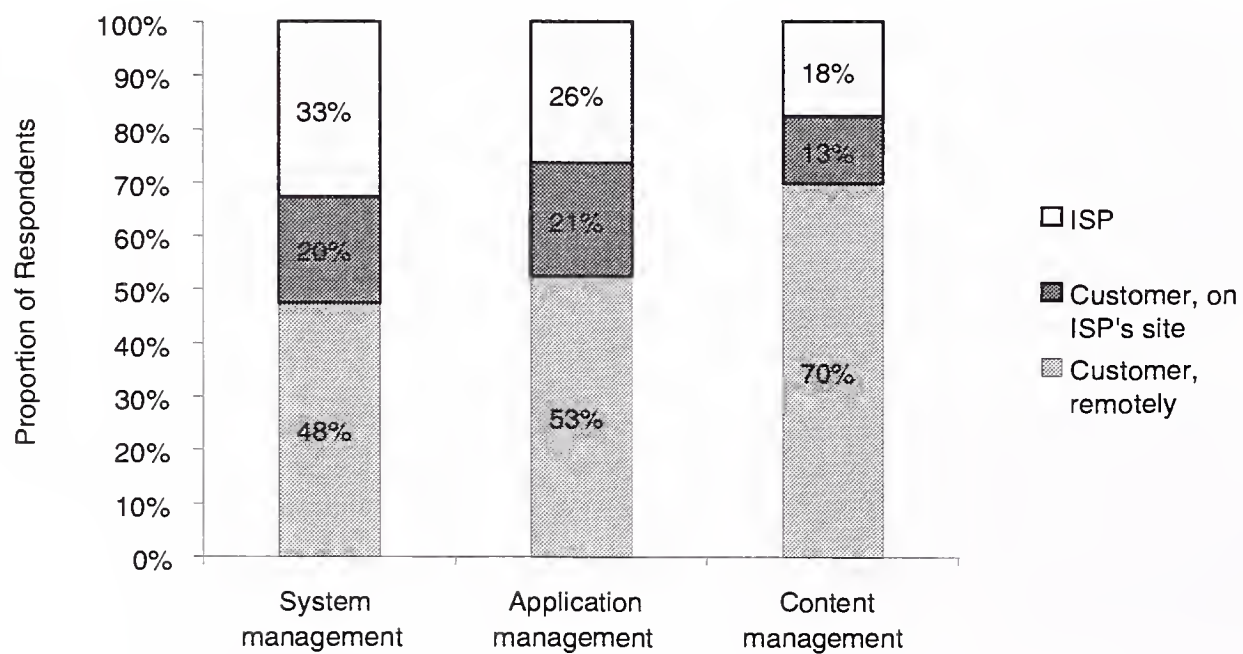
Exhibit V-8

Hosted Web Server Management Responsibilities, US

Sample: 43

Source: INPUT

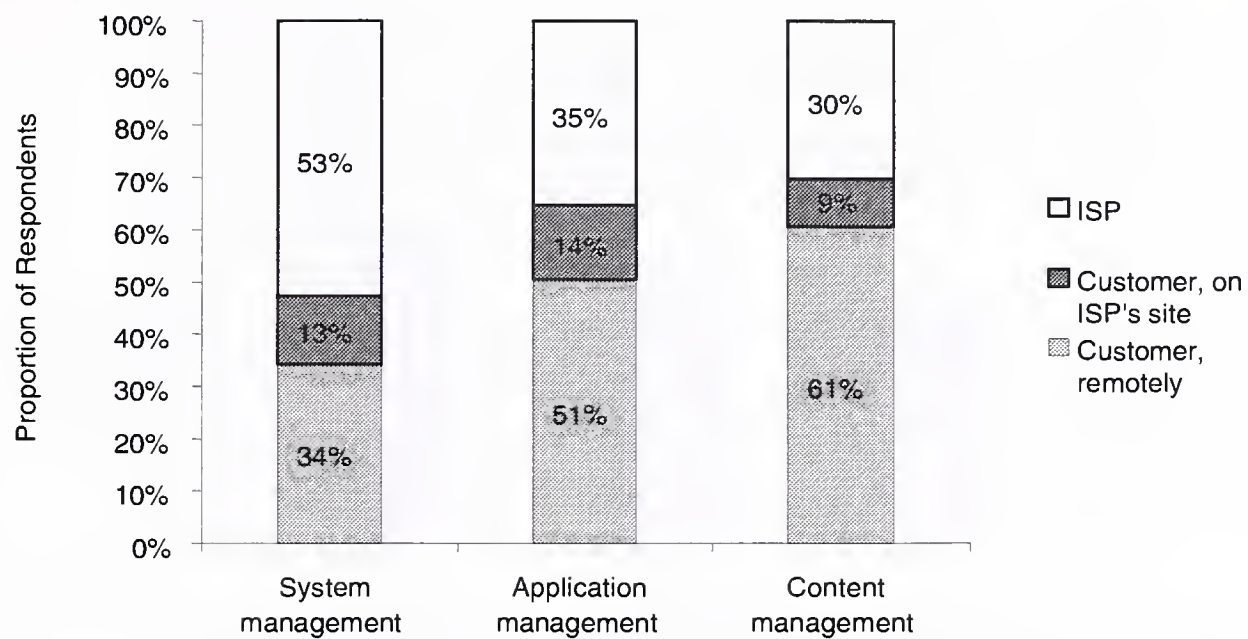
Exhibit V-9

Hosted Web Server Management Responsibilities, Europe

Sample: 40

Source: INPUT

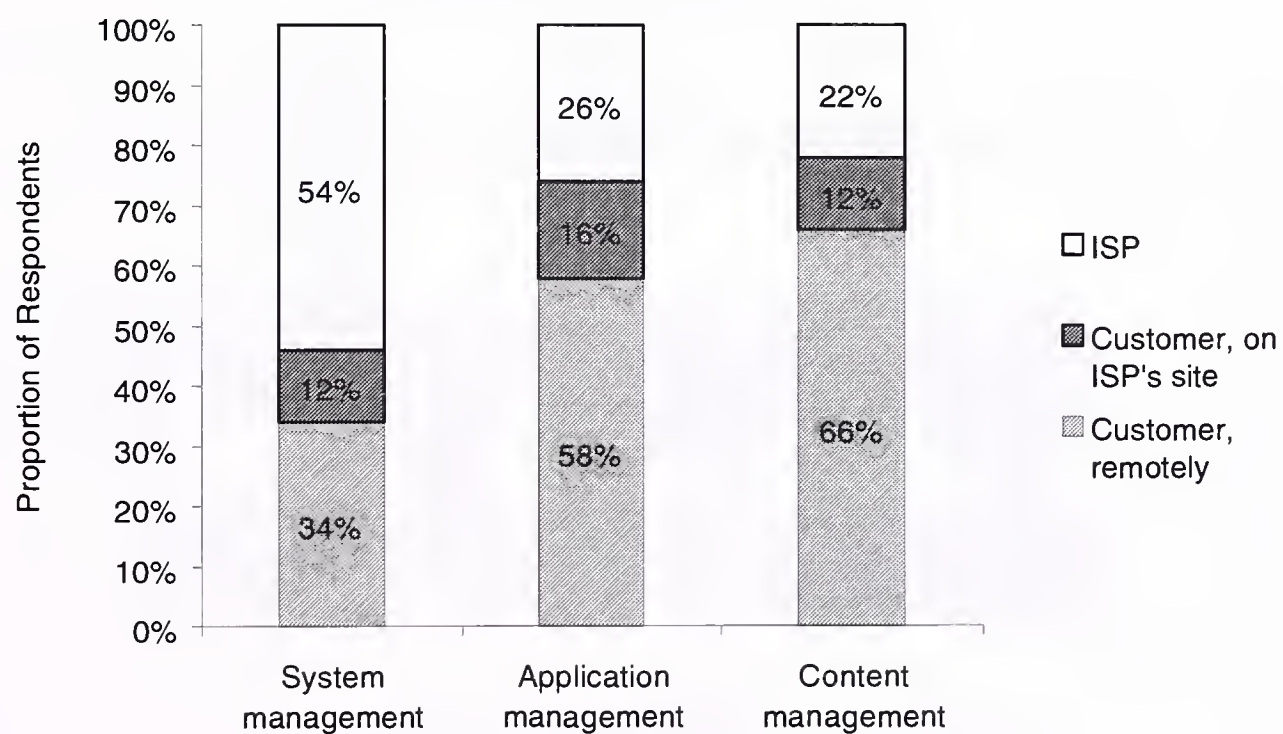
Exhibit V-10

Preferred Web Hosting Management Responsibilities, Worldwide

Sample: 99

Source: INPUT

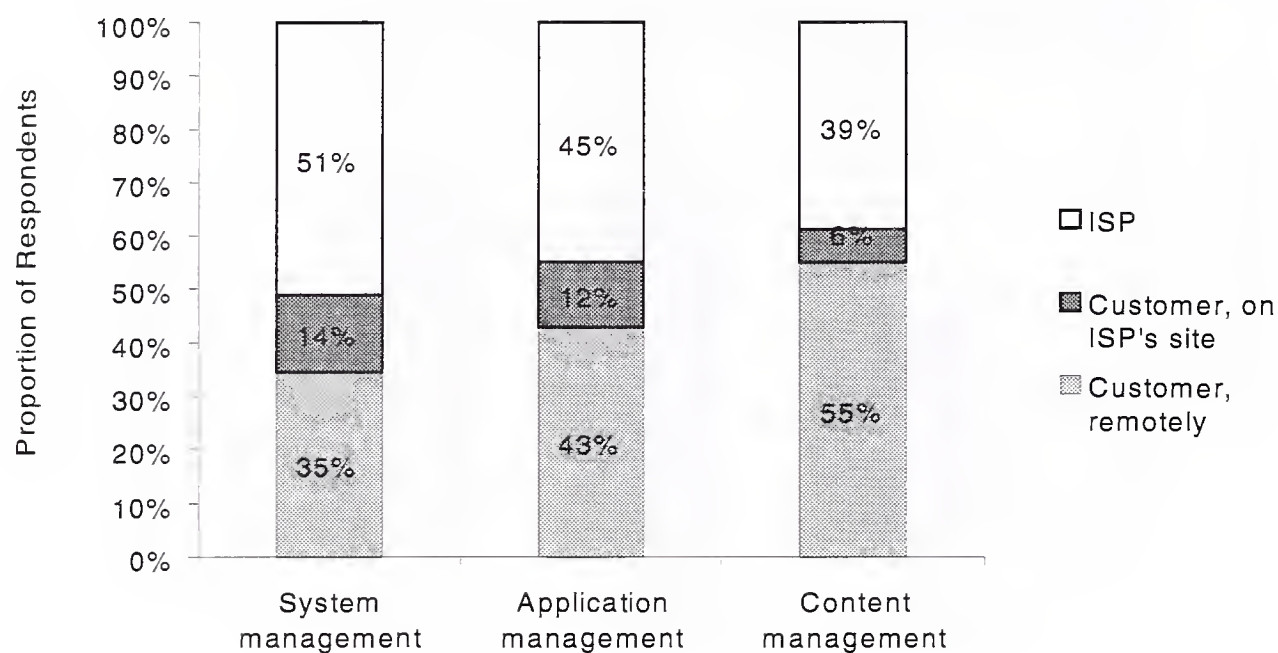
Exhibit V-11

Preferred Web Hosting Management Responsibilities, US

Sample: 50

Source: INPUT

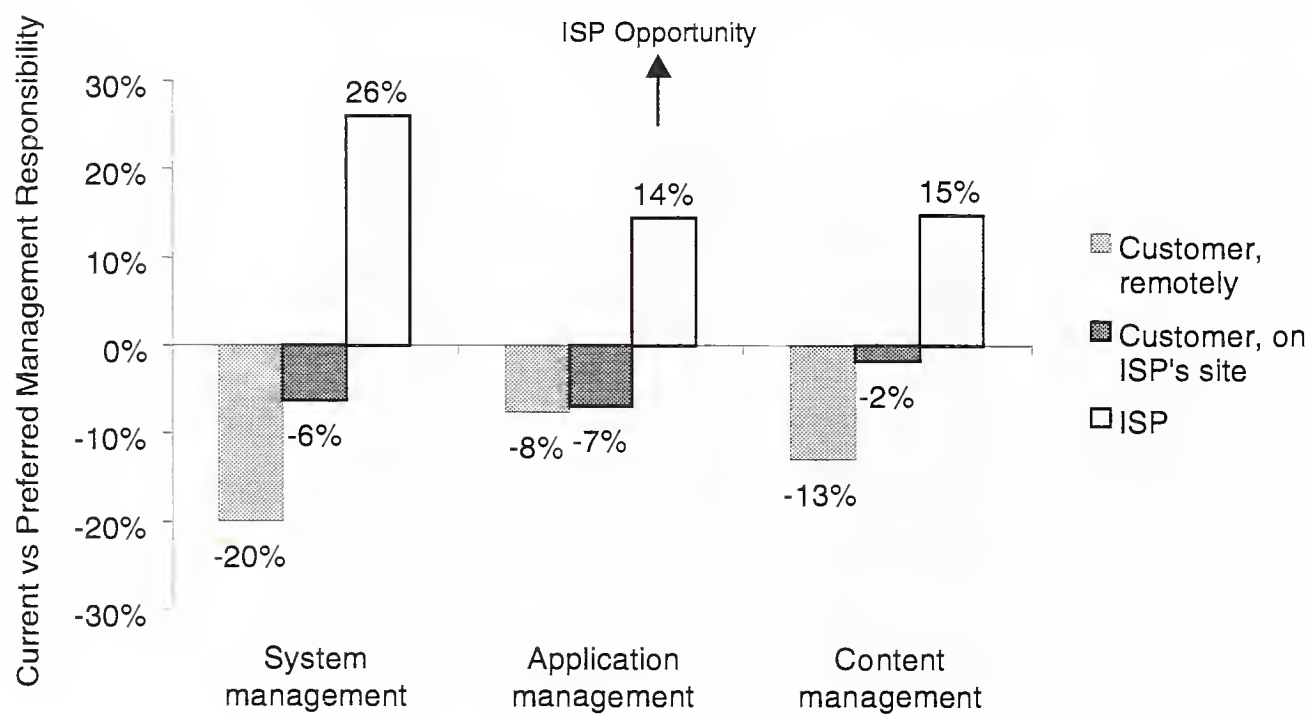
Exhibit V-12

Preferred Web Hosting Management Responsibilities, Europe

Sample: 49

Source: INPUT

Exhibit V-13

Difference Between Current and Preferred Web Hosting Management Responsibilities, Worldwide

Sample: 99

Source: INPUT

D**ISP Consistency**

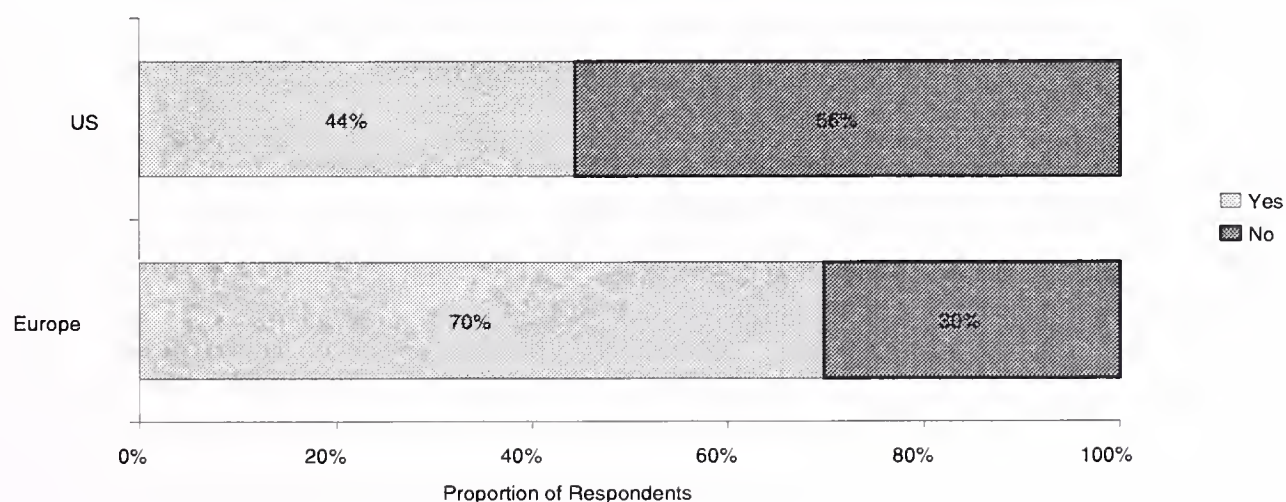
Once an ISP has negotiated a contract to supply a customer with Internet access, it must press further to supply additional services and not expect the customer to operate a one-stop-shop policy. Exhibit V-14 shows that many organizations seek alternative suppliers of Web hosting services, particularly in the US.

Customer turnover in the ISP market is high, due largely to the relative ease with which users can change suppliers. The same factor enables users to mix and match providers for individual services, in many cases obtaining better deals through such an approach than by purchasing an integrated service from a single ISP.

The two reasons given by respondents for using separate ISPs for Internet access and Web hosting, given in equal measure, were:

- The organization's current ISP did not provide a Web hosting service, or was limited in its offering
- The organization operated a 'best of breed' policy and sought suppliers for individual services

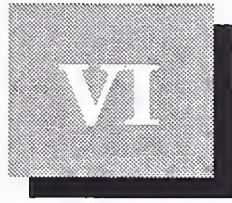
Exhibit V-14

Use of Same ISP for Internet Access and Web Hosting

Sample: 88

Source: INPUT

(Blank Page)



Web Hosting Benefits, Satisfaction, and Criteria

A

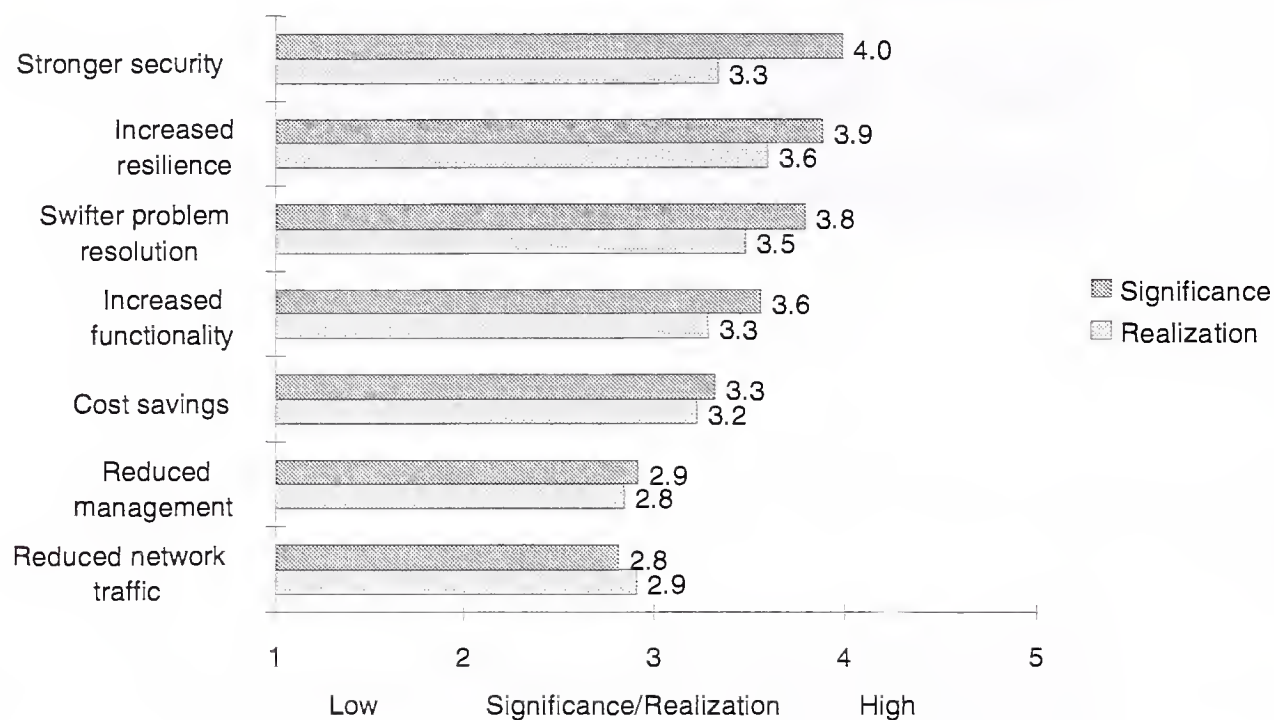
Benefits

Web hosting services enable organizations to enhance the robustness of their Web presence, and stronger security and resilience are perceived as the greatest benefits of Web hosting, well above the reduction in internal administration and network load that in-house Web servers incur.

These most significant benefits have been realized to a moderate degree, but with security in particular, in both the US and Europe, buyers seek improvements. Security of public Web sites is a contentious issue, with several (well publicized) cases of high-profile site breaches such as the US CIA site and the UK Labour Party site. Such highly-visible break-ins raise concerns among many users over the current viability of the Web as a secure environment for business, notably for commerce. Users do not feel assured that they will achieve greater levels of security by using a hosting service compared to in-house provision.

ISPs should look to all of the areas shown for improvement and publicize their improvements, particularly in security. Inevitably, buyers will be more attracted to a service that can demonstrate long-term resilience to break-in attempts than to one that has suffered high-profile breaches.

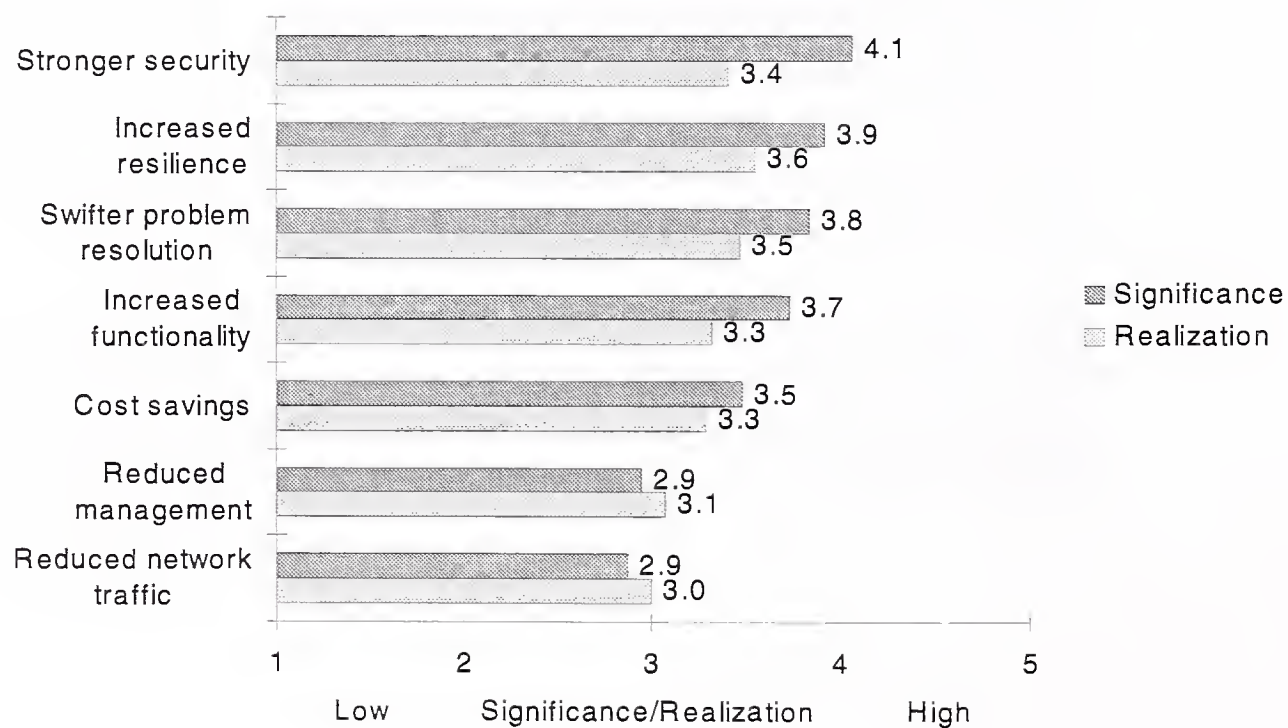
Exhibit VI-1

Web Hosting Benefits, Worldwide

Sample: 123

Source: INPUT

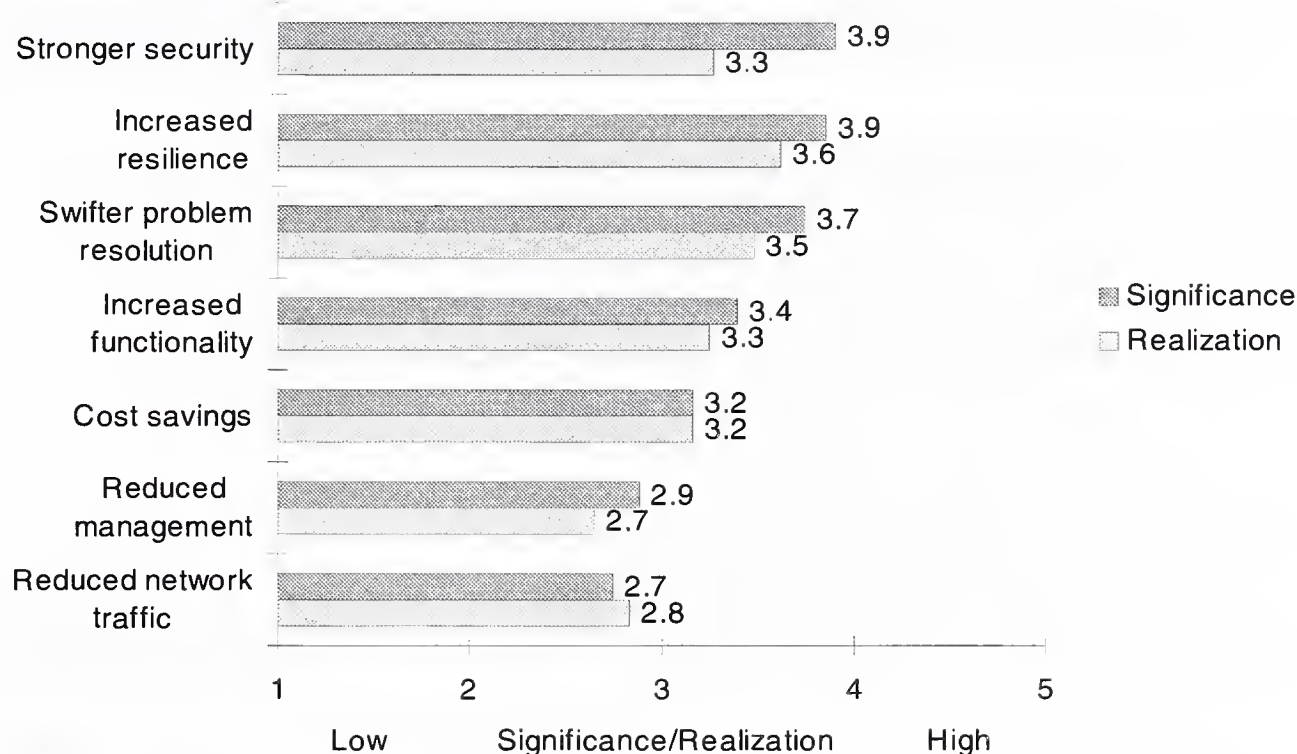
Exhibit VI-2

Web Hosting Benefits, US

Sample: 60

Source: INPUT

Exhibit VI-3

Web Hosting Benefits , Europe

Sample: 63

Source: INPUT

B**Satisfaction**

Exhibits VI-4 and VI-5 show the overall satisfaction ratings given by respondents to their Web hosting service by country and by industry sector. Unlike ratings for Internet access, buyers are not highly satisfied with their services—ratings pivot around the average of 3.4 in each sample segment.

Exhibit VI-4

Overall Satisfaction With Web Hosting Services, by Country

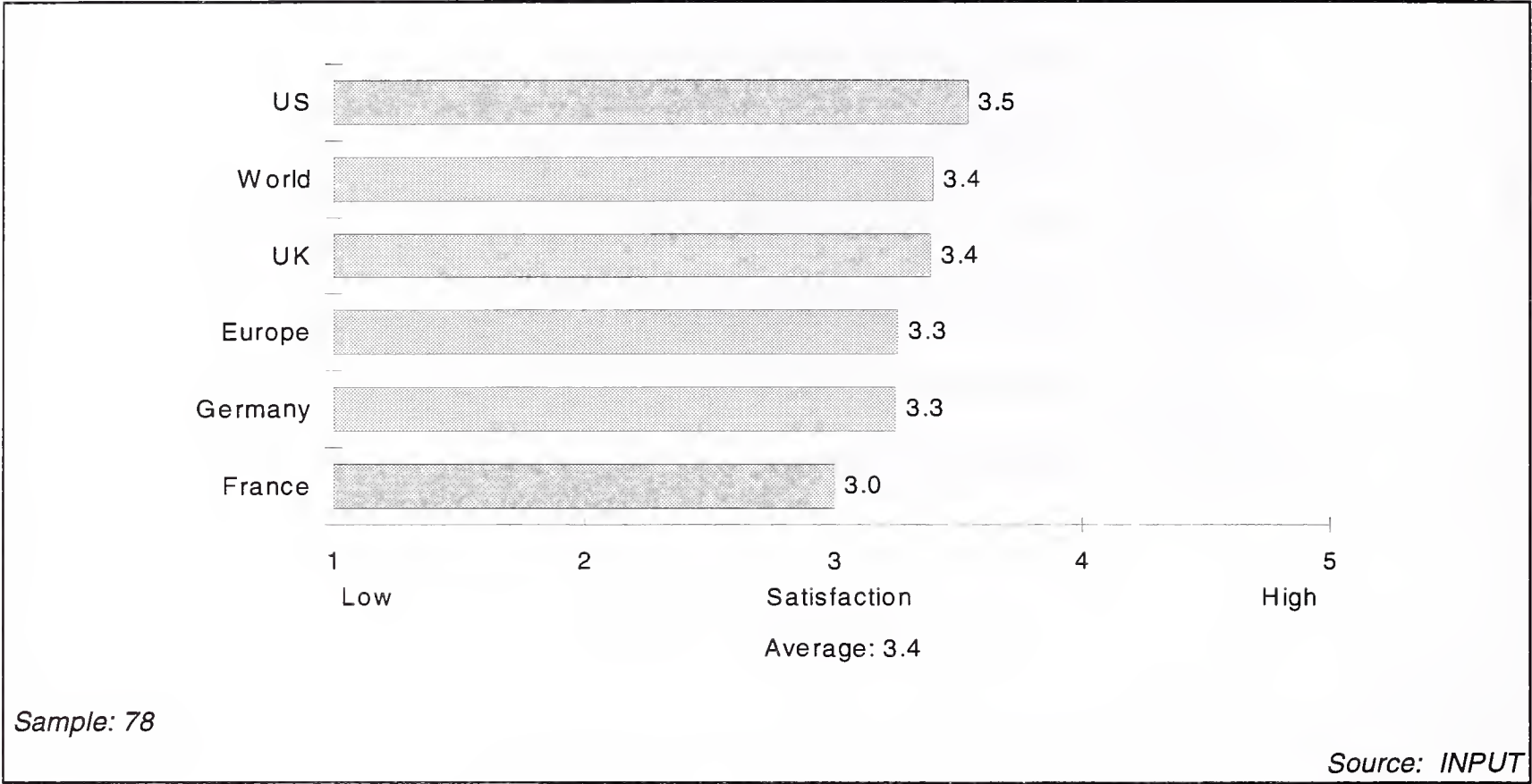
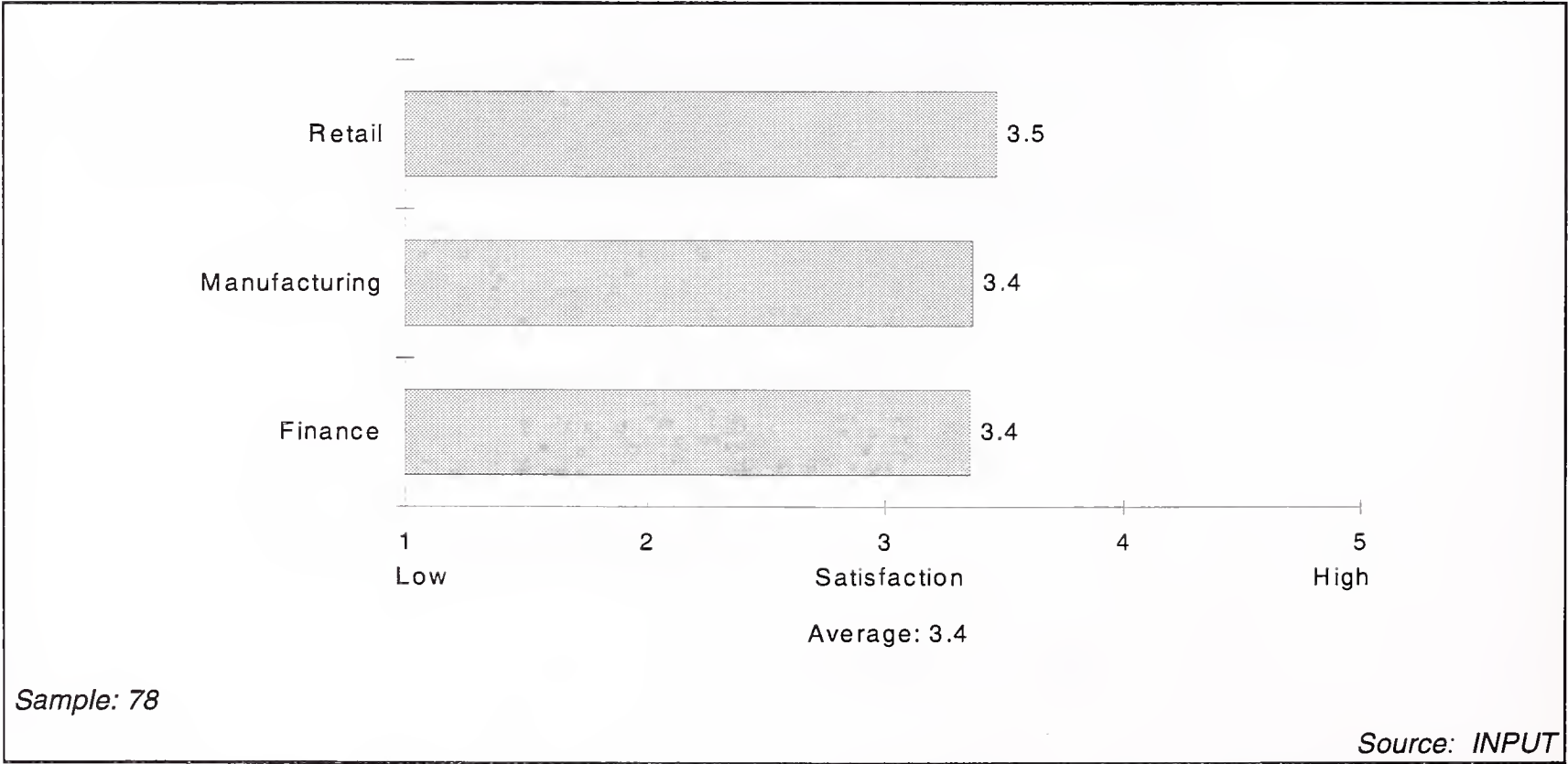


Exhibit VI-5

Overall Satisfaction With Web Hosting Services, by Industry

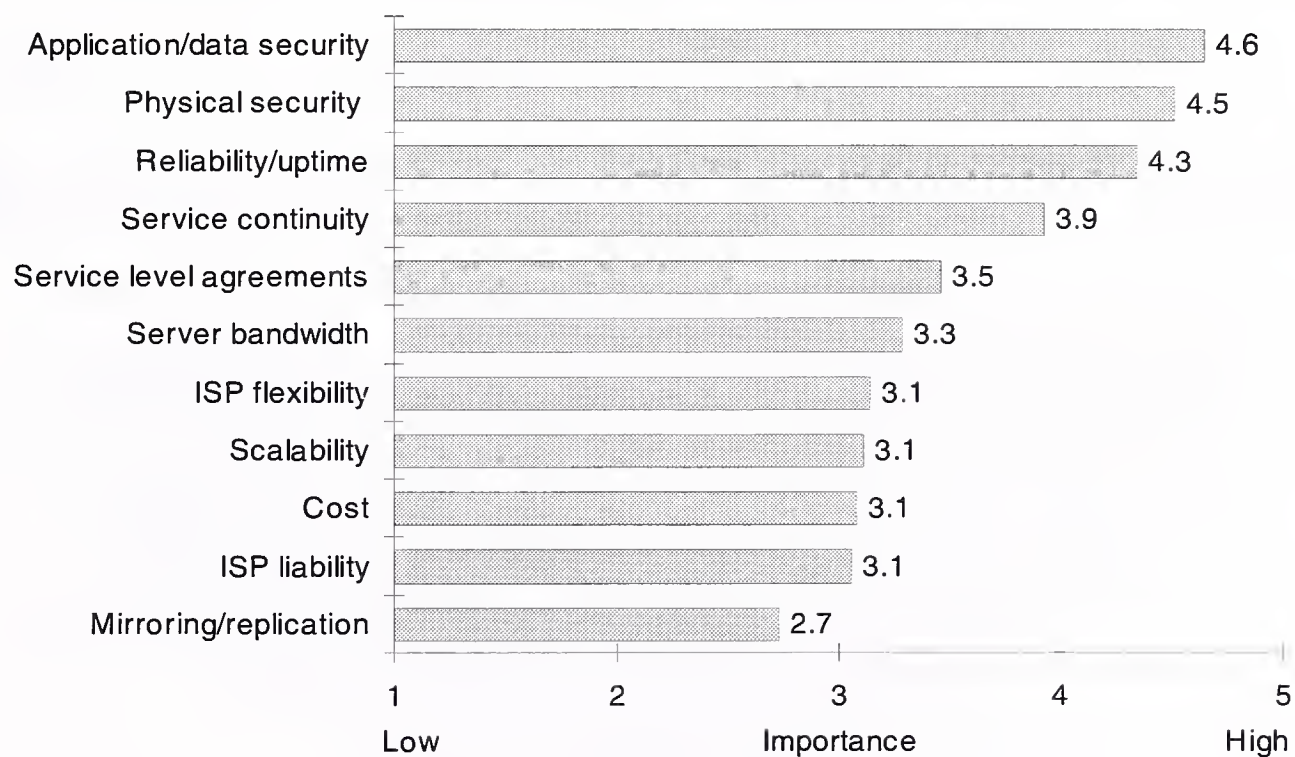


Exhibits VI-6 to VI-8 show how important respondents currently consider characteristics of Web hosting services. Reflecting the concerns discussed above, both security issues covered (application/data and physical security) are of near-maximum importance.

As with access services, buyers place great importance on a robust, stable service. Reliability, service continuity, and service level agreements are, in order, the three most important issues after security for both US and European companies. To meet the requirements of Web sites increasingly critical to organizations' business, ISPs must compete firstly on security, reliability, and availability issues.

Exhibit VI-6

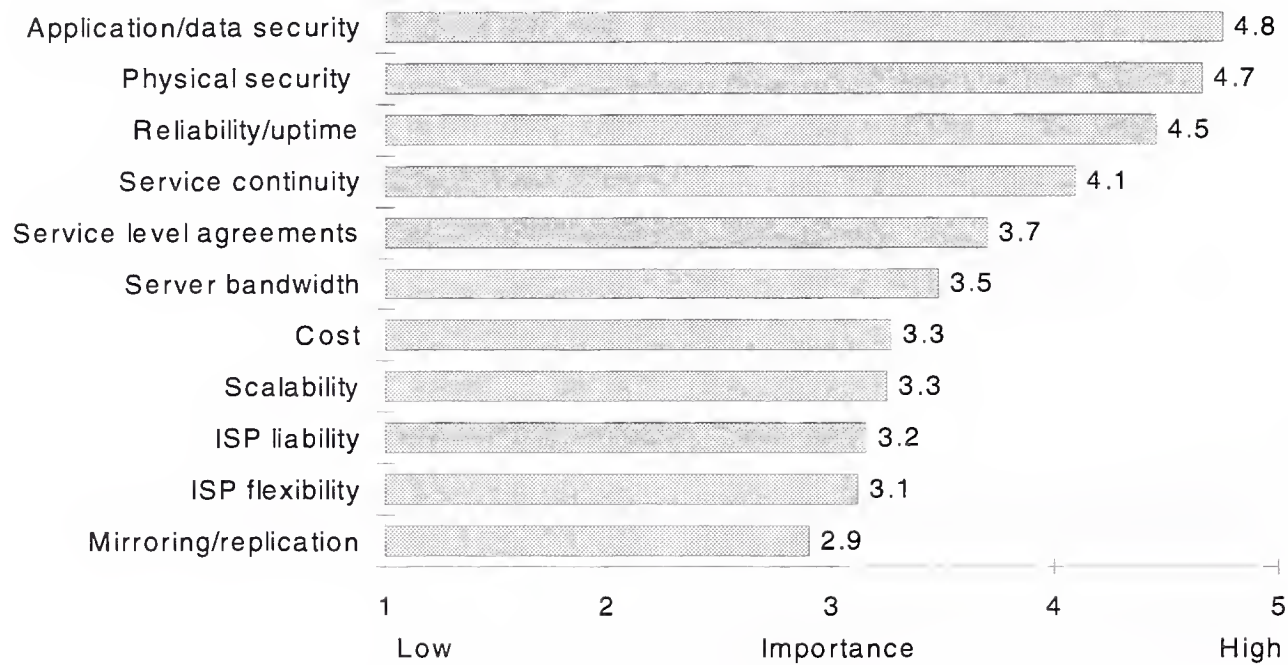
Current Importance of Web Hosting Characteristics, Worldwide



Sample: 69

Source: INPUT

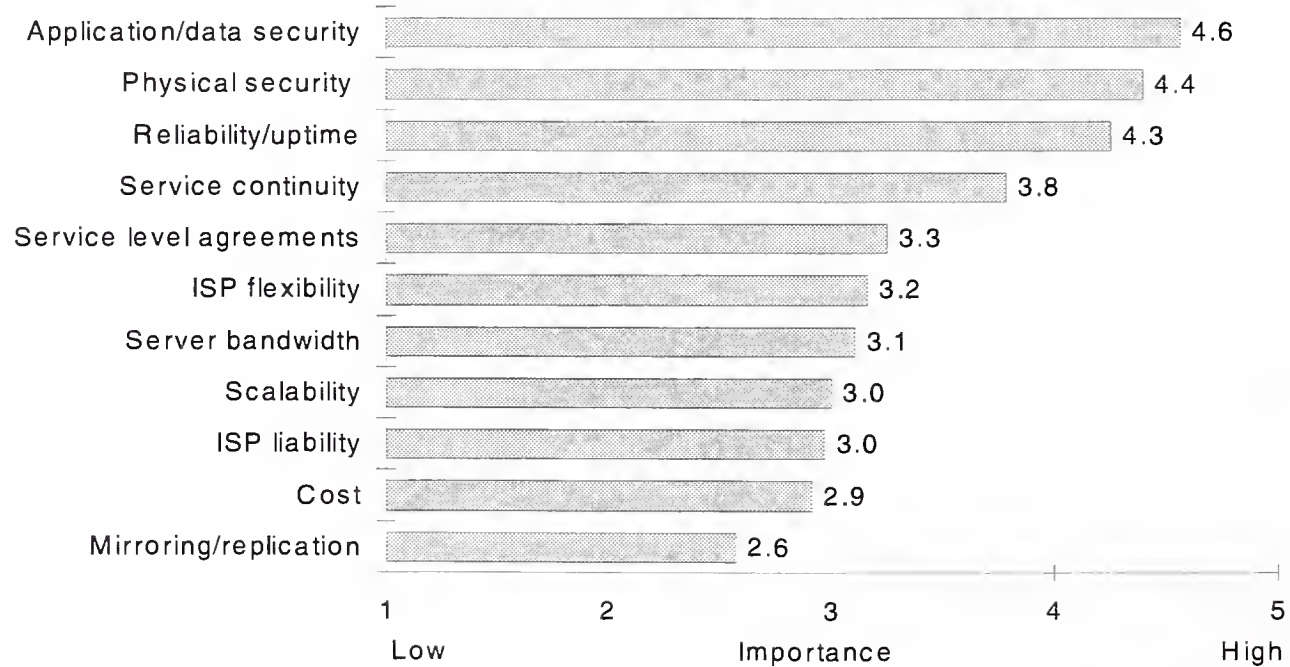
Exhibit VI-7

Current Importance of Web Hosting Characteristics, US

Sample: 33

Source: INPUT

Exhibit VI-8

Current Importance of Web Hosting Characteristics, Europe

Sample: 36

Source: INPUT

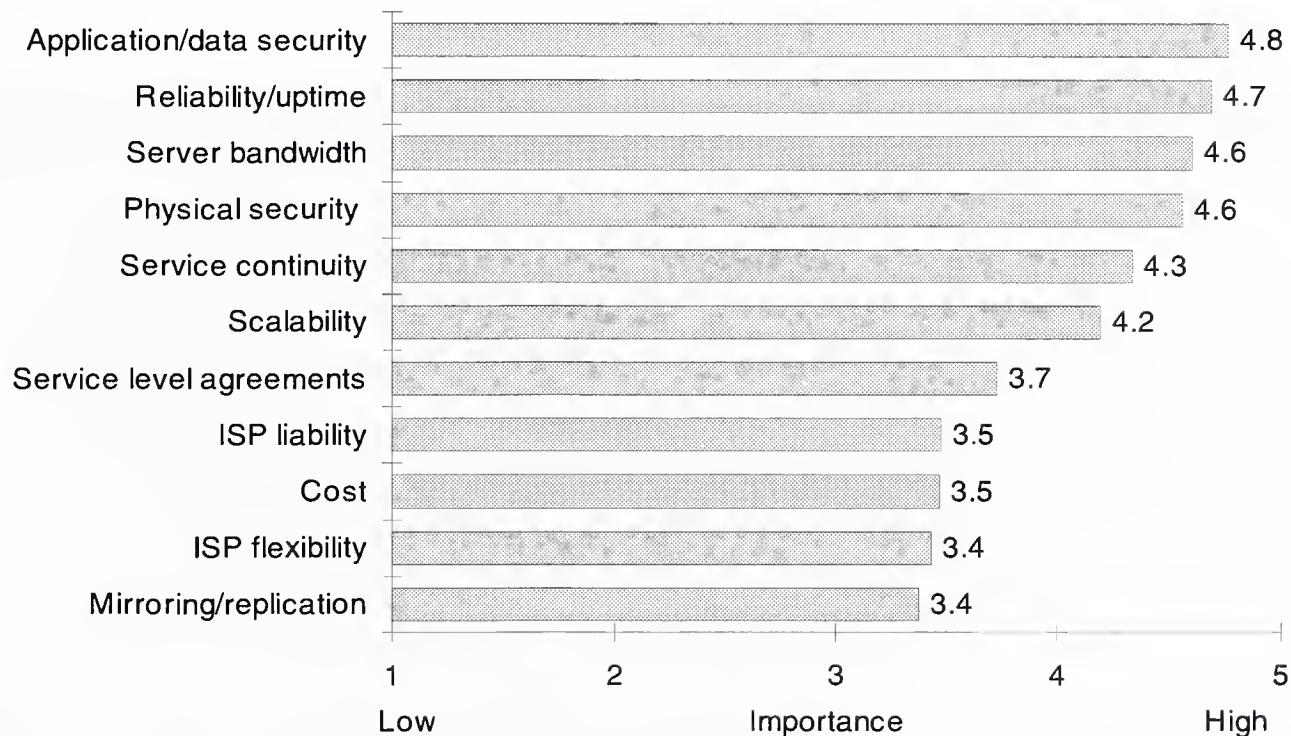
Exhibits VI-9 to VI-11 show how important respondents expect each aspect of their Web hosting service to become over the next two years. Exhibit VI-12 shows the difference in importance for each characteristic. Reliability and security issues are already of very high importance and will remain so.

Over the coming two years and beyond, buyers will place greater emphasis on server bandwidth and server scalability. This reflects the increasingly ambitious and demanding nature of corporate Web sites. Both of these components will increase to critical importance, rated at up to 4.6 out of 5.

With the sharp expected increase in the use of co-located Web servers and the emphasis on capacity issues, users are planning to place greater demands on their sites, and therefore their hosting services, as it becomes increasingly difficult to stand out in the crowded Web market.

Exhibit VI-9

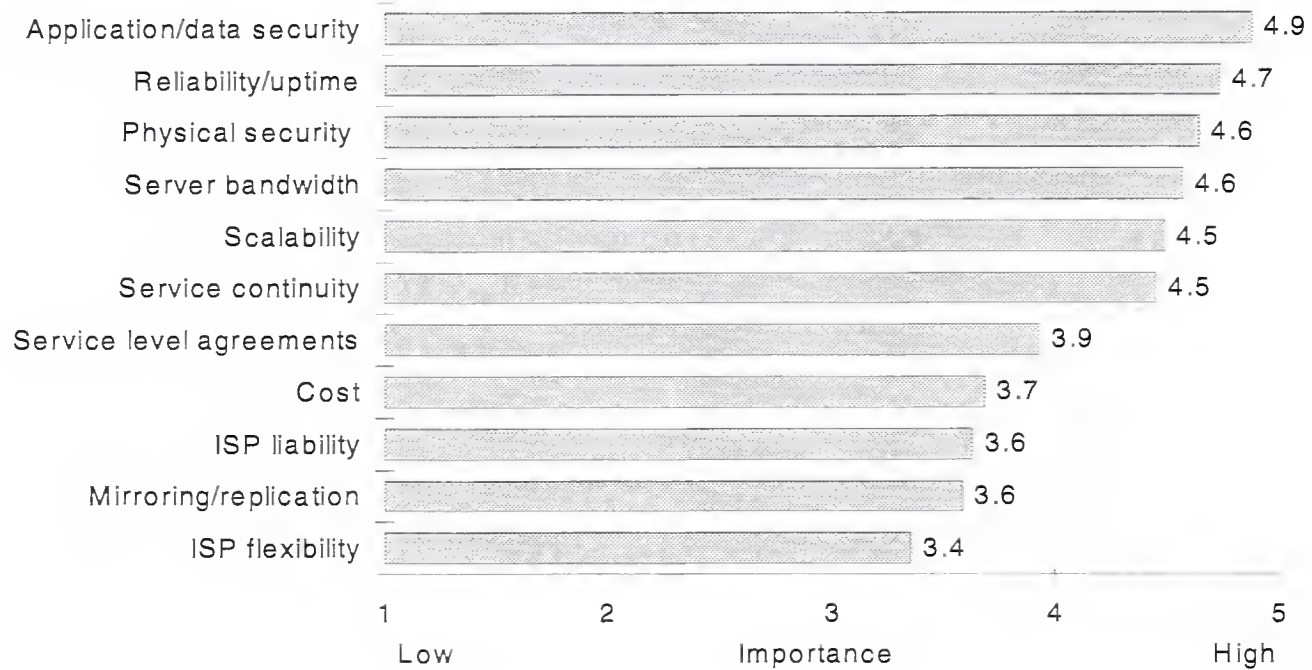
Expected Importance of Web Hosting Characteristics, 2000, Worldwide



Sample: 90

Source: INPUT

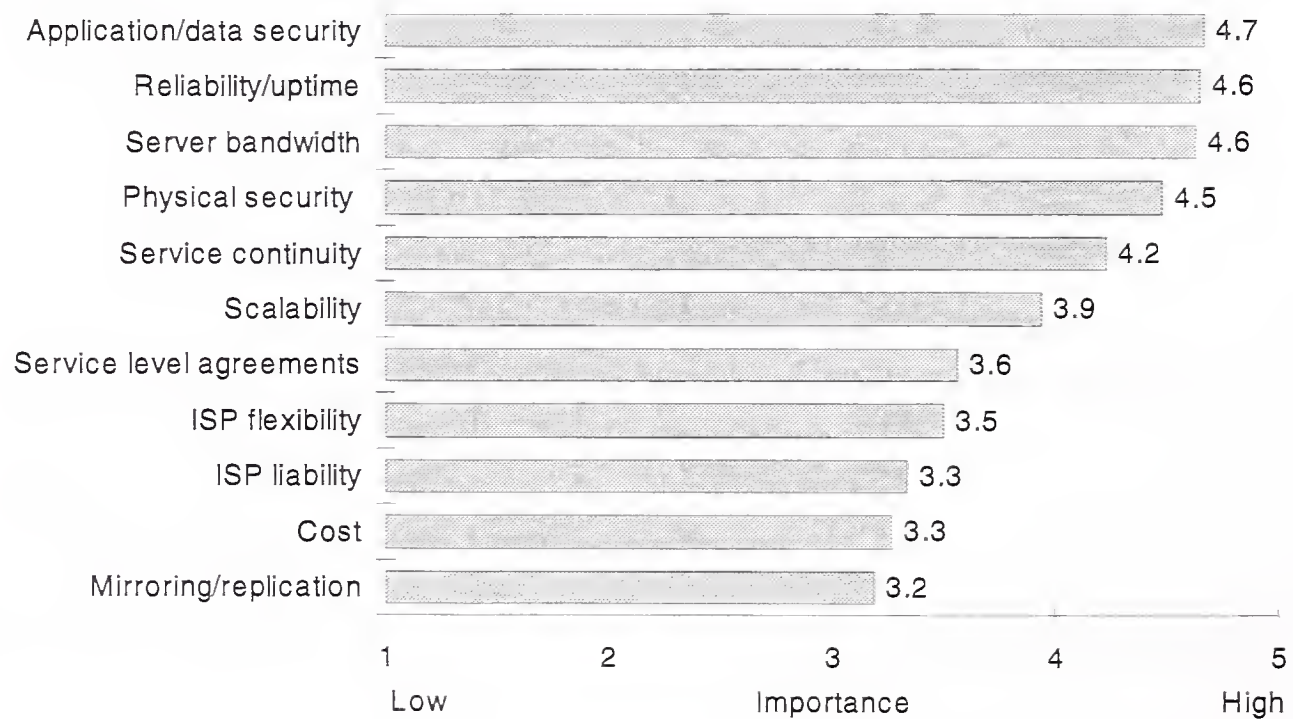
Exhibit VI-10

Expected Importance of Web Hosting Characteristics, 2000, US

Sample: 42

Source: INPUT

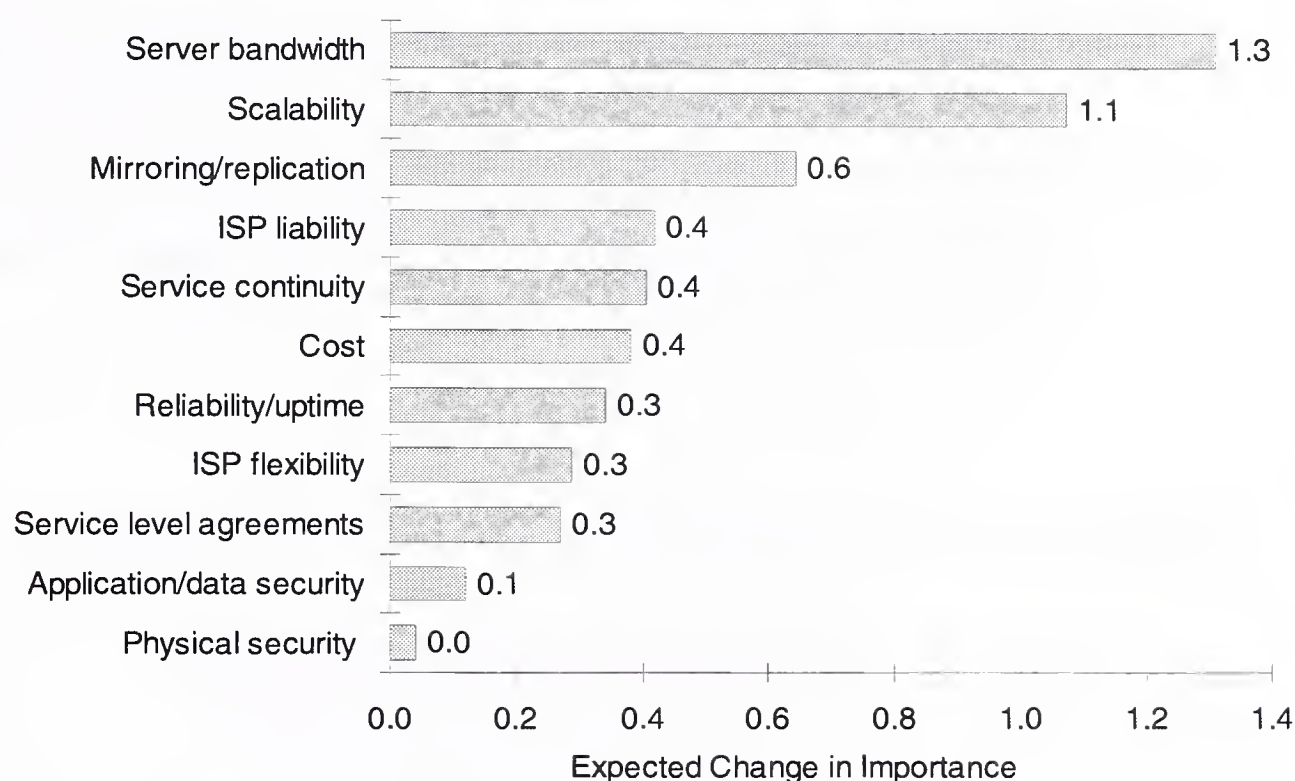
Exhibit VI-11

Expected Importance of Web Hosting Characteristics, 2000, Europe

Sample: 48

Source: INPUT

Exhibit VI-12

Expected Change in Importance of Web Hosting Characteristics, Worldwide

Sample: 90

Source: INPUT

Exhibits VI-13 to VI-15 show the satisfaction ratings given; Exhibit VI-16 shows the difference between the importance currently given to each characteristic and the satisfaction rating received.

Buyers are reasonably satisfied with the aspects of their Web hosting services currently considered most important: security and reliability issues. However, they are not satisfied with the characteristics expected to increase considerably in importance: server bandwidth and scalability. Users expect to see improvements in these areas take effect rapidly—their importance will increase to critical proportions by 2000 as measured above, and that increase is taking place now.

The organizations interviewed are not receiving adequate capacity for either their current or future needs. This may be due to lack of capacity at the ISP, or inadequate service coverage by the customer. ISPs should consider:

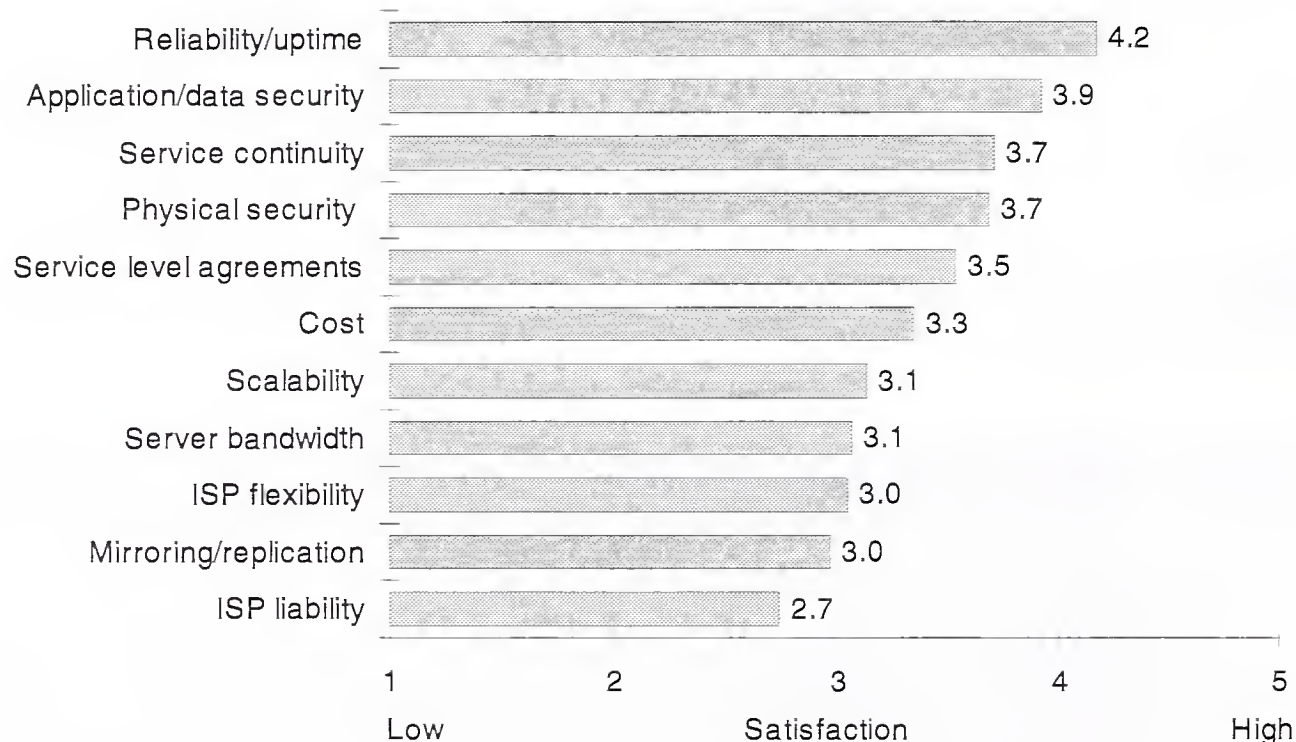
- Taking a proactive approach to managing customers' server capacity (network and system). Where applicable, consult with customers regularly to determine short- and long-term requirements; monitor

usage and make recommendations on the results; proactively make users aware on an individual basis of service upgrade options.

- De-emphasizing possible undue focus on issues of lesser importance (according to respondents, cost and content mirroring/replication although no aspect is unimportant) and concentrate on bringing server capacity up to requirements, both to answer current dissatisfaction and to meet the future requirements of resource-heavy sites serving ever-increasing numbers of users.

Exhibit VI-13

Satisfaction With Web Hosting Characteristics, Worldwide

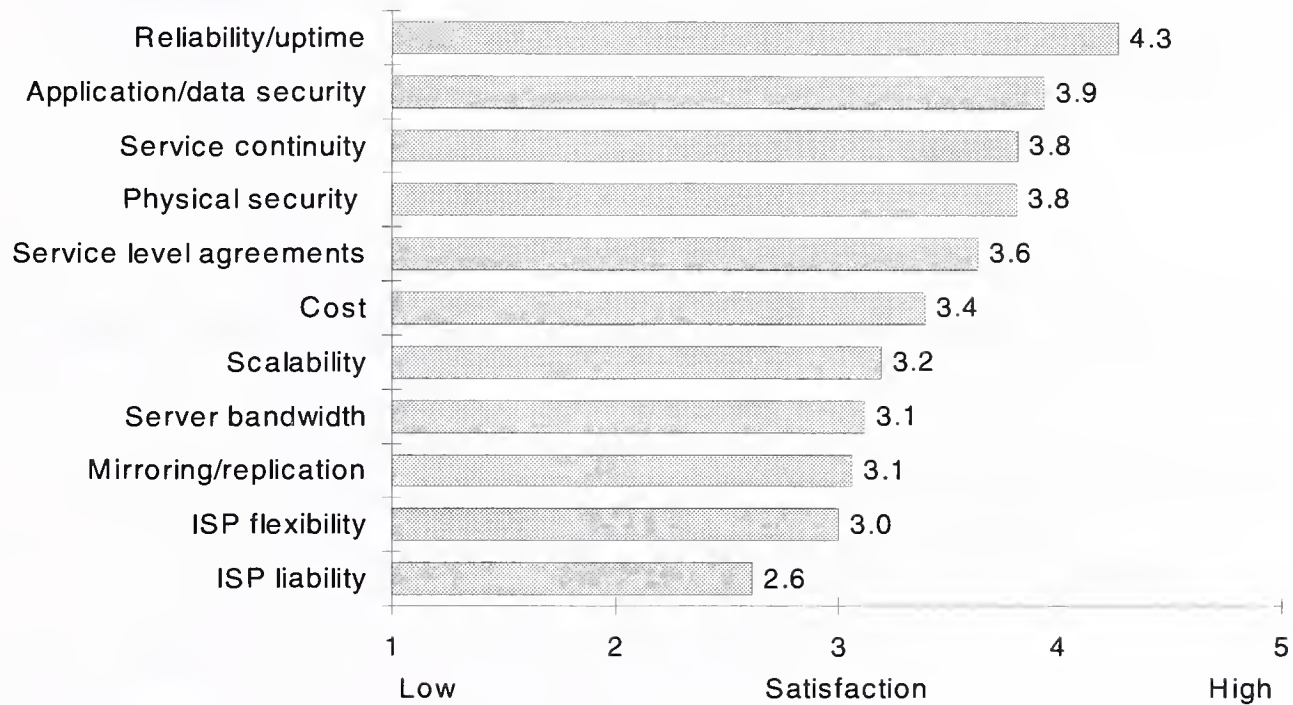


Sample: 64

Source: INPUT

Exhibit VI-14

Satisfaction With Web Hosting Characteristics, US

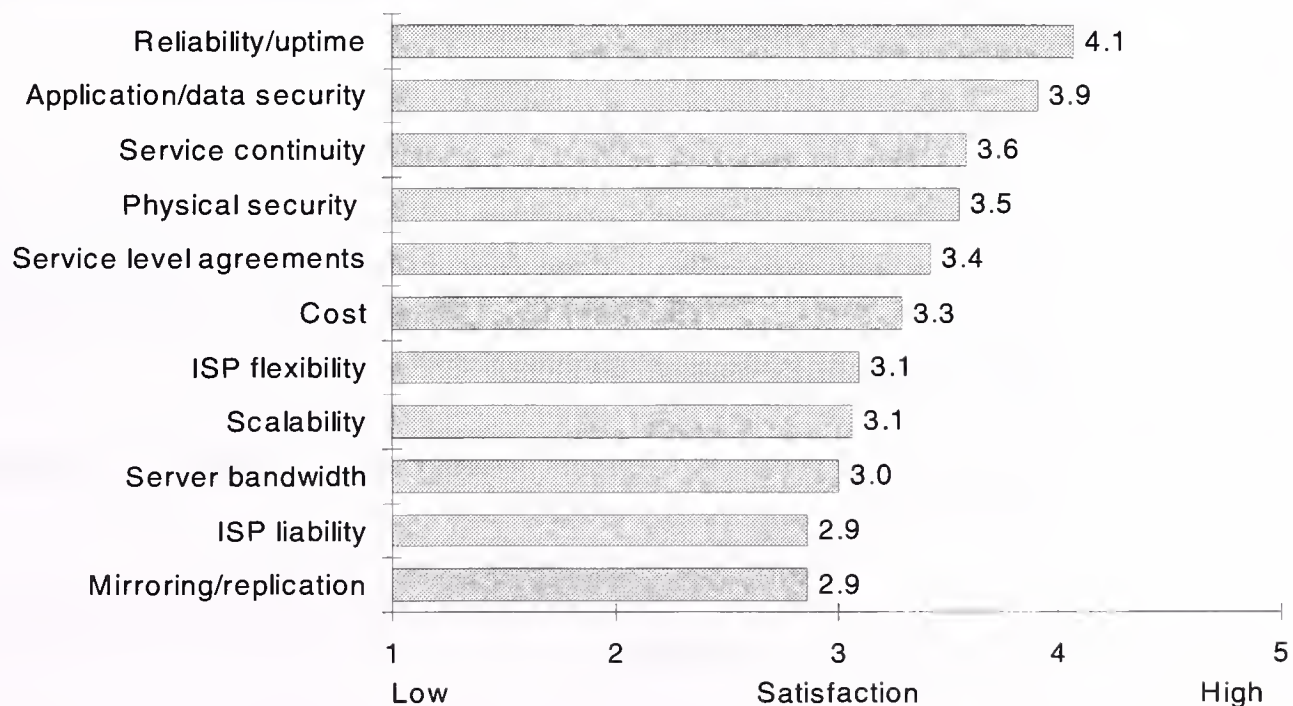


Sample: 33

Source: INPUT

Exhibit VI-15

Satisfaction With Web Hosting Characteristics, Europe

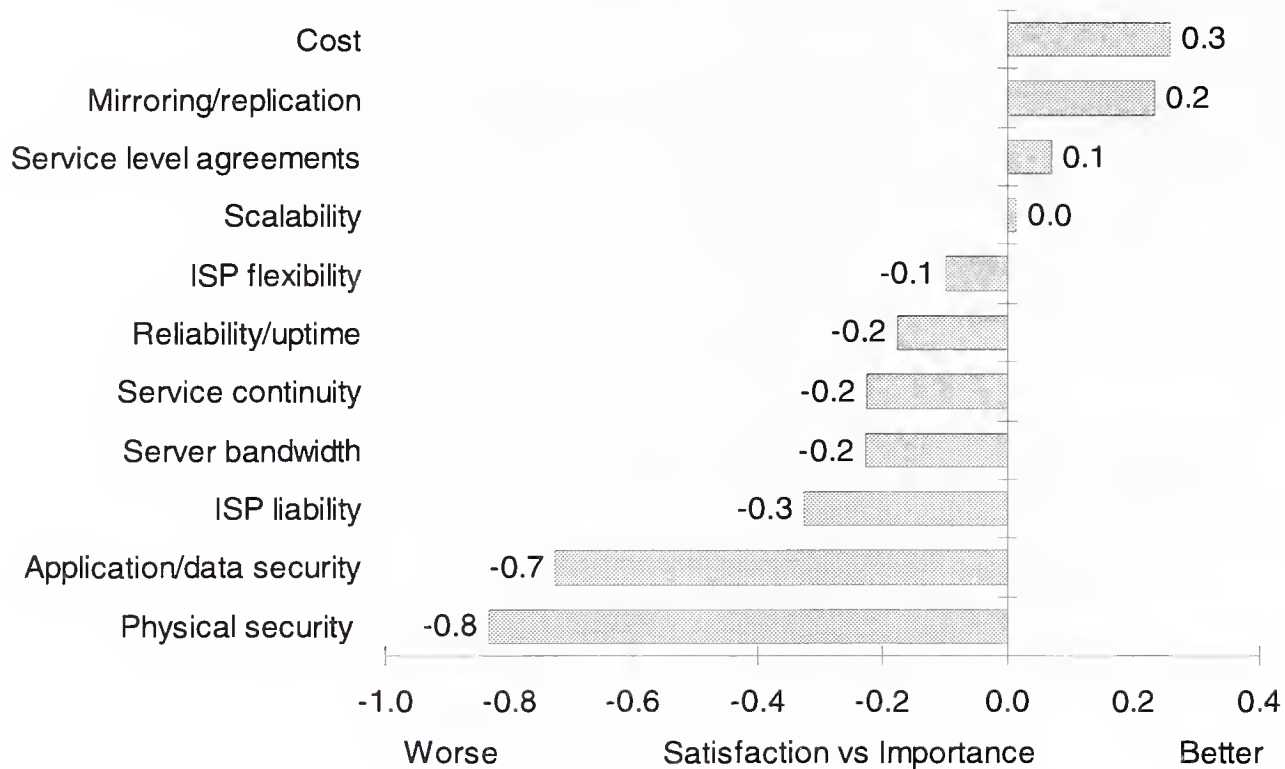


Sample: 31

Source: INPUT

Exhibit VI-16

Difference Between Importance of and Satisfaction With Web Hosting Characteristics, Worldwide



Sample: 69

Source: INPUT

Respondents were asked how their Web hosting service could be improved. Many stated a need for increased bandwidth available to the server (discussed above).

Other comments, reflected above, were:

- **Management**—four respondents felt that their ISP did not manage the server or its connection to required standards. One respondent wanted the ISP to view the Web service as a business function instead of as a pure technology-based service.
- **Security**—one respondent expressed concern over the quality of application security provided.
- **Service levels**—one respondent stated that a lack of a solid service guarantee was a problem.

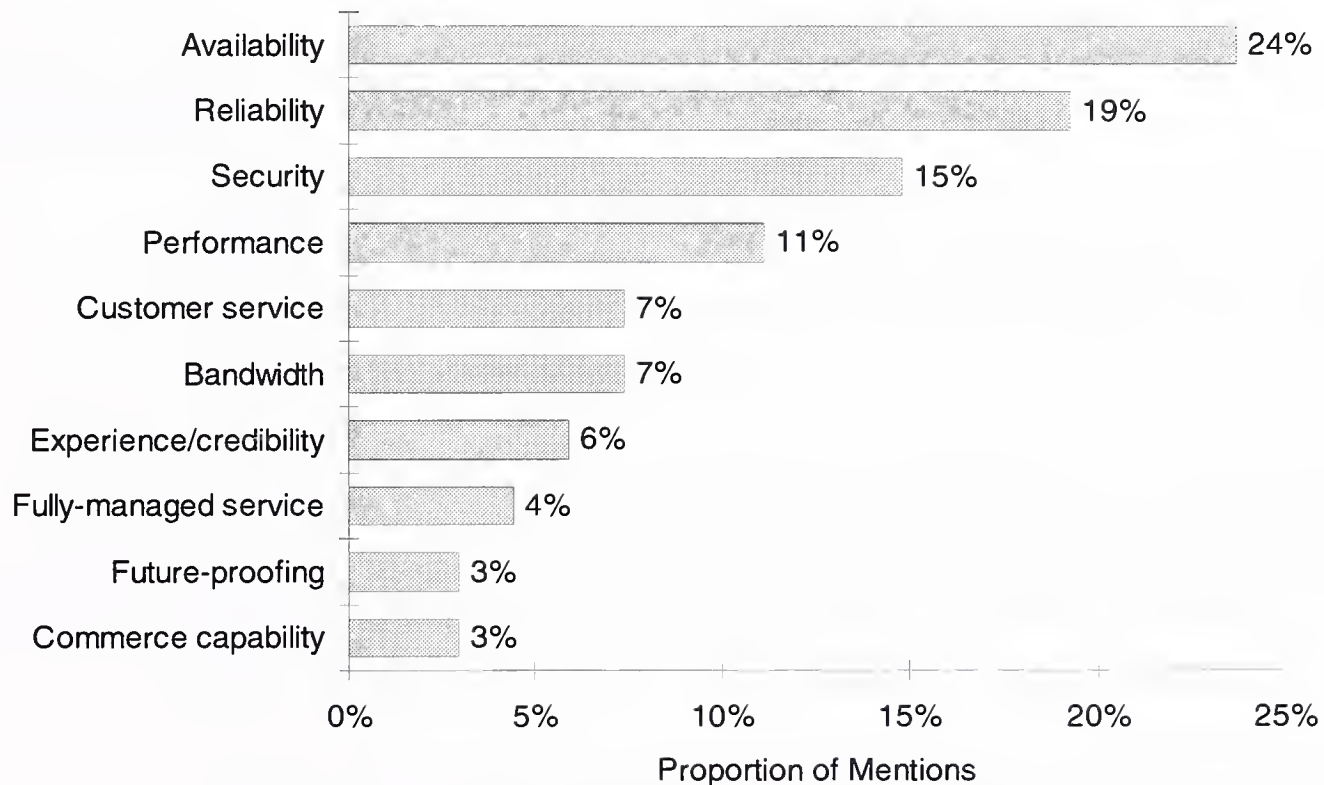
C

Purchasing Criteria

As shown in Exhibit VI-17, buyers seek suppliers that can ensure a robust, secure service above all other issues. The criteria used for purchasing decisions are similar to the characteristics of hosting services considered most important.

Exhibit VI-17

Criteria Used for Purchasing Web Hosting Services, Worldwide



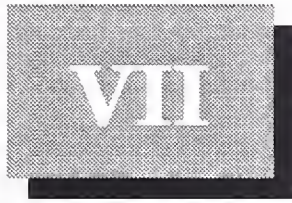
Sample: 135

Source: INPUT

Other criteria, each mentioned by between one and three respondents, were:

- Ability to run bespoke applications
- Adequate control over Web site
- Backup facility
- Breadth of services

- Capacity/scalability
- Combination of technical skill and business understanding
- Consultancy service
- Adherence to industry standards
- Integration with EDI services
- Liability
- Responsiveness to changing requirements
- Secure transactions
- Service level agreements



Application Hosting Usage and Plans

A

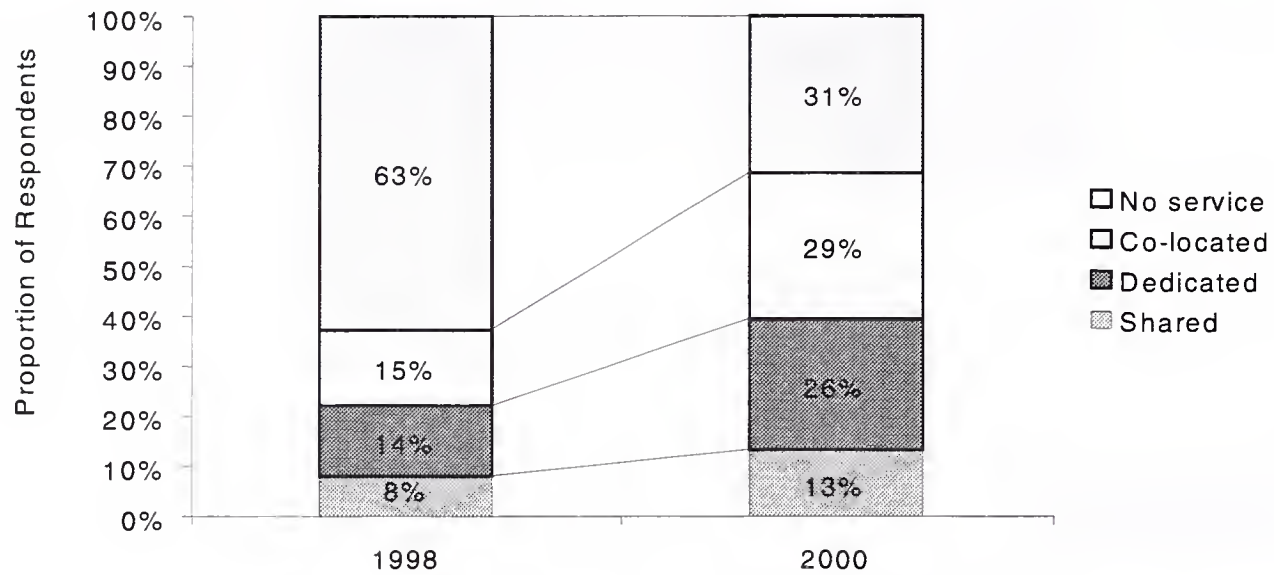
Server Ownership

Application hosting services cover application servers, database servers, and private Intranet servers, with some overlap between the categories (as discussed elsewhere). For example, Lotus Notes/Domino provides functionality in all three areas.

Exhibits VII-1 to VII-3 show the expected increase in the use of shared, dedicated, and co-located servers. As a proportion of all respondents, usage of all options will increase. As a proportion of those respondents who are currently using or plan to use a hosting service, however, use of shared servers is expected to drop slightly.

Growth is most pronounced in Europe; respondents expect to achieve similar usage levels as US respondents by 2000, but starting from a lower base.

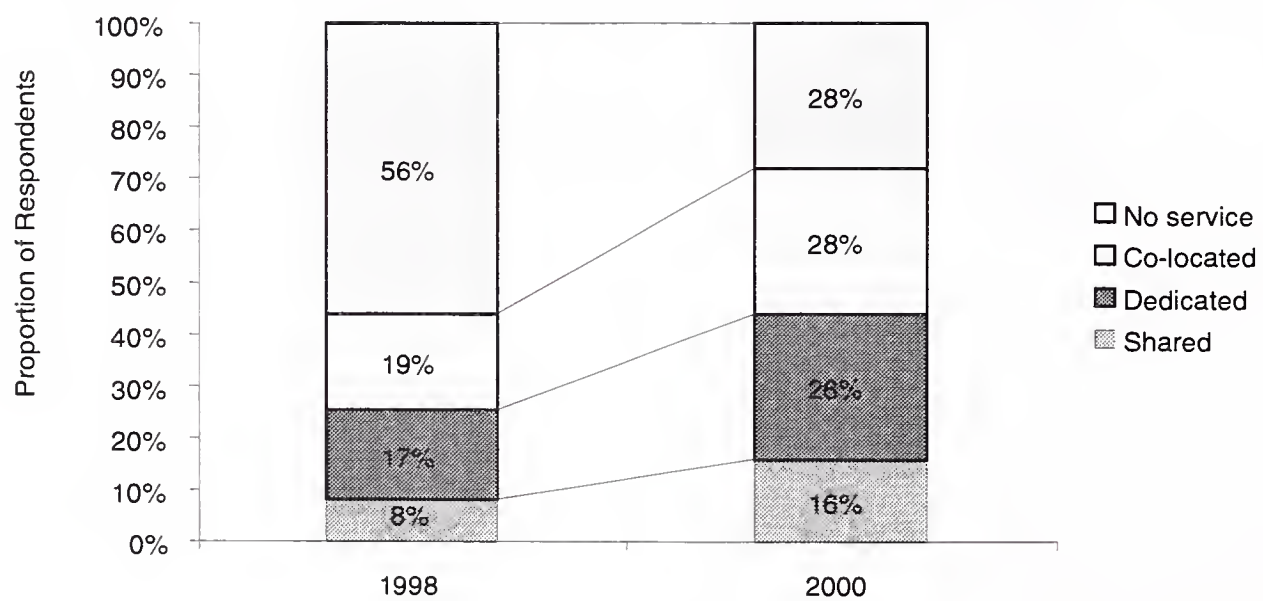
Exhibit VII-1

Current and Expected Hosted Application Server Ownership, Worldwide

Sample: 150

Source: INPUT

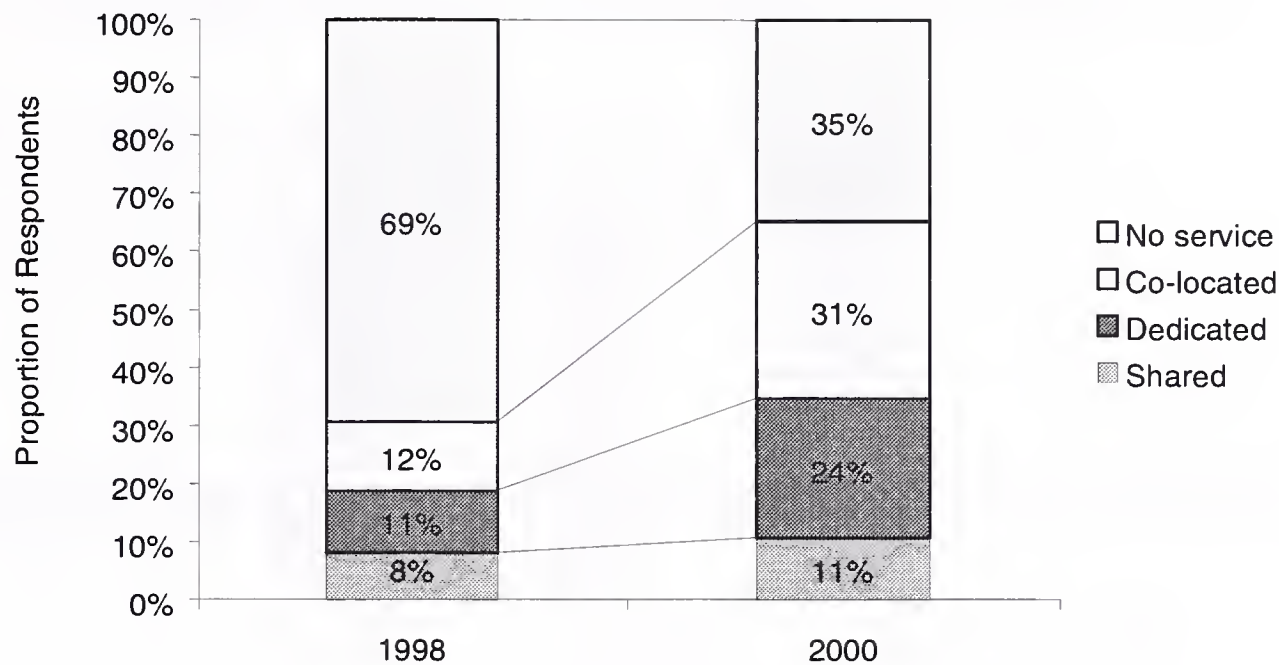
Exhibit VII-2

Current and Expected Hosted Application Server Ownership, US

Sample: 75

Source: INPUT

Exhibit VII-3

Current and Expected Hosted Application Server Ownership, Europe

Sample: 75

Source: INPUT

B**Management Responsibility**

As with Web hosting services, ISPs should be ready to accept a greater degree of management responsibility. Currently, as Exhibits VII-4 to VII-6 show, system, application, and content management is most commonly performed by users themselves, accessing the server remotely. ISPs' most active roles are in system management of hosted servers.

Exhibits VII-7 to VII-9 show that buyers want ISPs to take over more of the management role, particularly system management. This is seen as a benefit of a hosting service that currently is not being delivered according to customers' preferences. Exhibit VII-10 shows the difference between current and preferred management roles, and highlights these preferences.

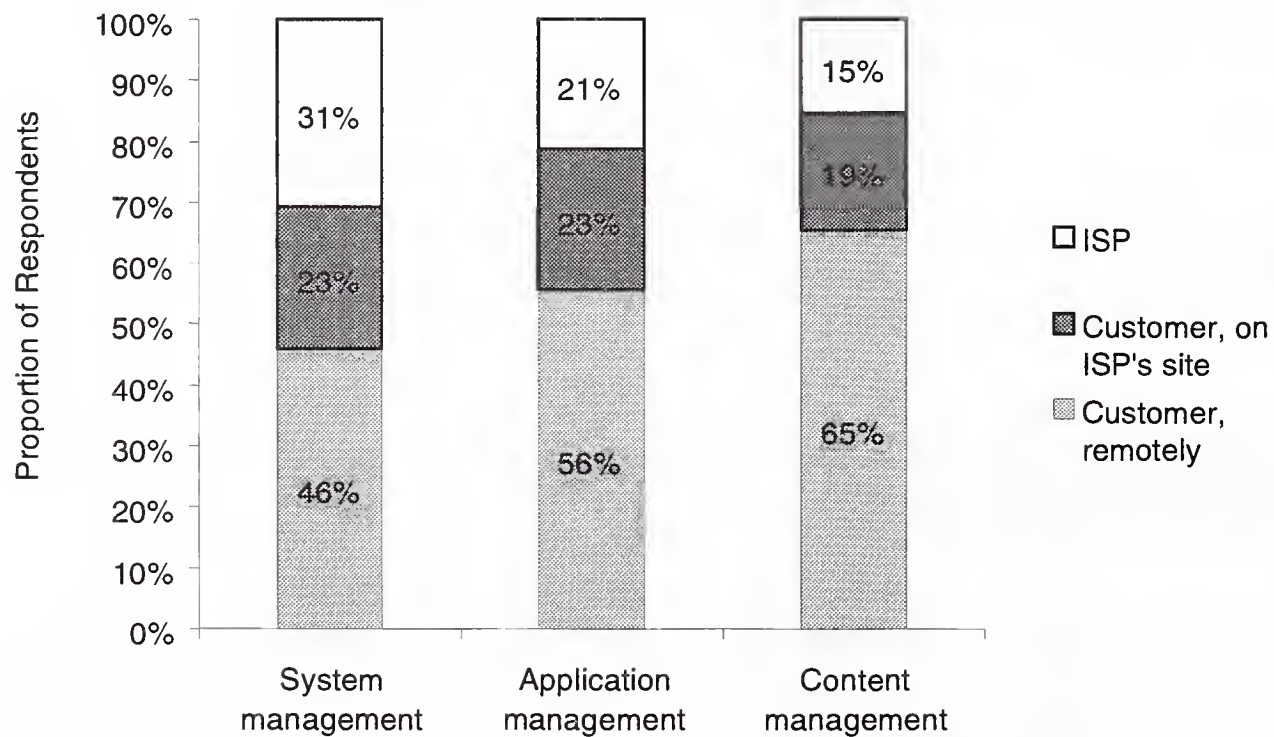
Buyers expect a higher level of management from ISPs to support these and other applications currently being hosted than they currently receive. The market for fully-managed application hosting solutions is beginning to take shape; early applications suitable for hosting remotely included

groupware and shared workspaces. Hosting services that provide access to high-end enterprise applications have been, and still are, limited by the ability of underlying enterprise applications to operate natively in the Internet environment.

Vendors such as SAP and Oracle are progressing rapidly with Internet- and Intranet-enabling their enterprise solutions, and several ISPs during 1997 and 1998 have announced services, or plans to introduce services, based on supplying remote access to these and similar applications.

Exhibit VII-4

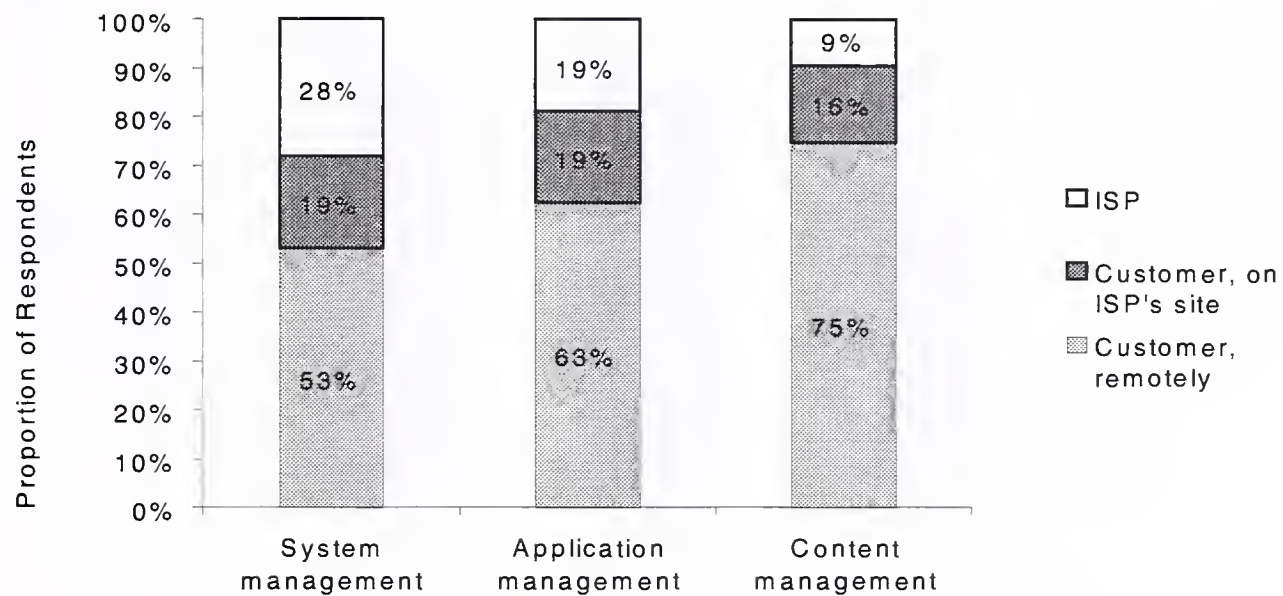
Hosted Application Server Management Responsibilities, Worldwide



Sample: 52

Source: INPUT

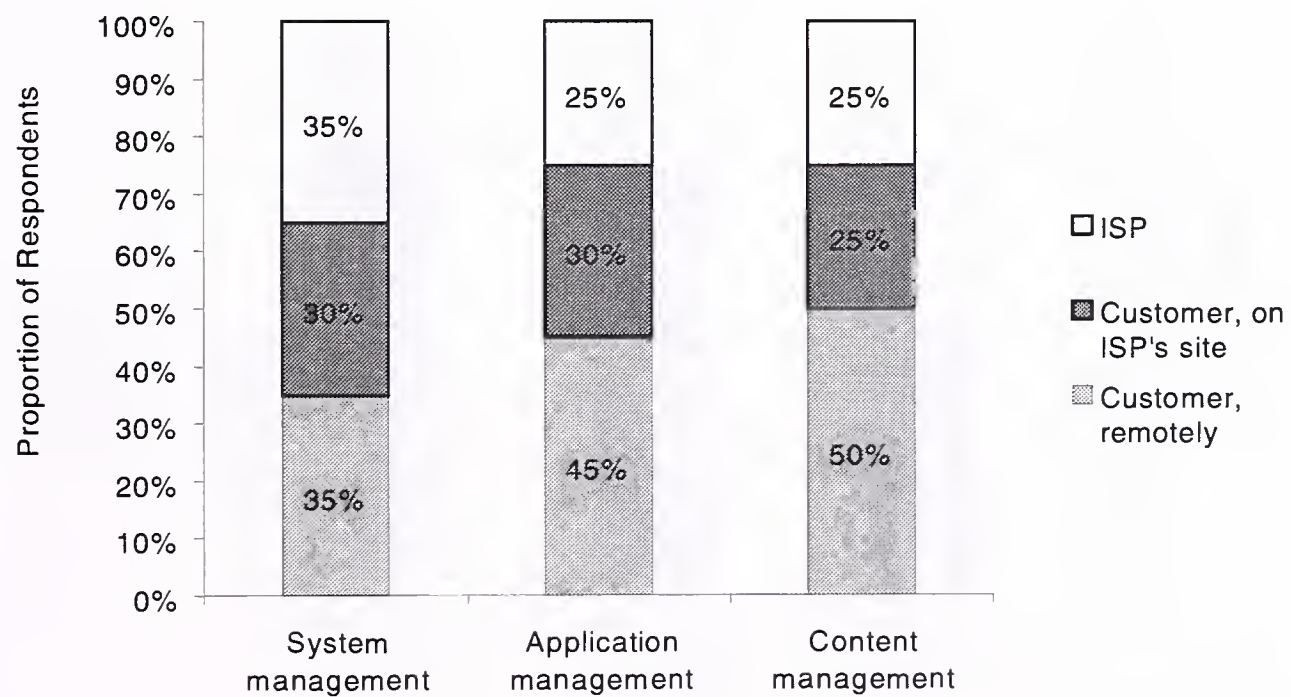
Exhibit VII-5

Hosted Application Server Management Responsibilities, US

Sample: 32

Source: INPUT

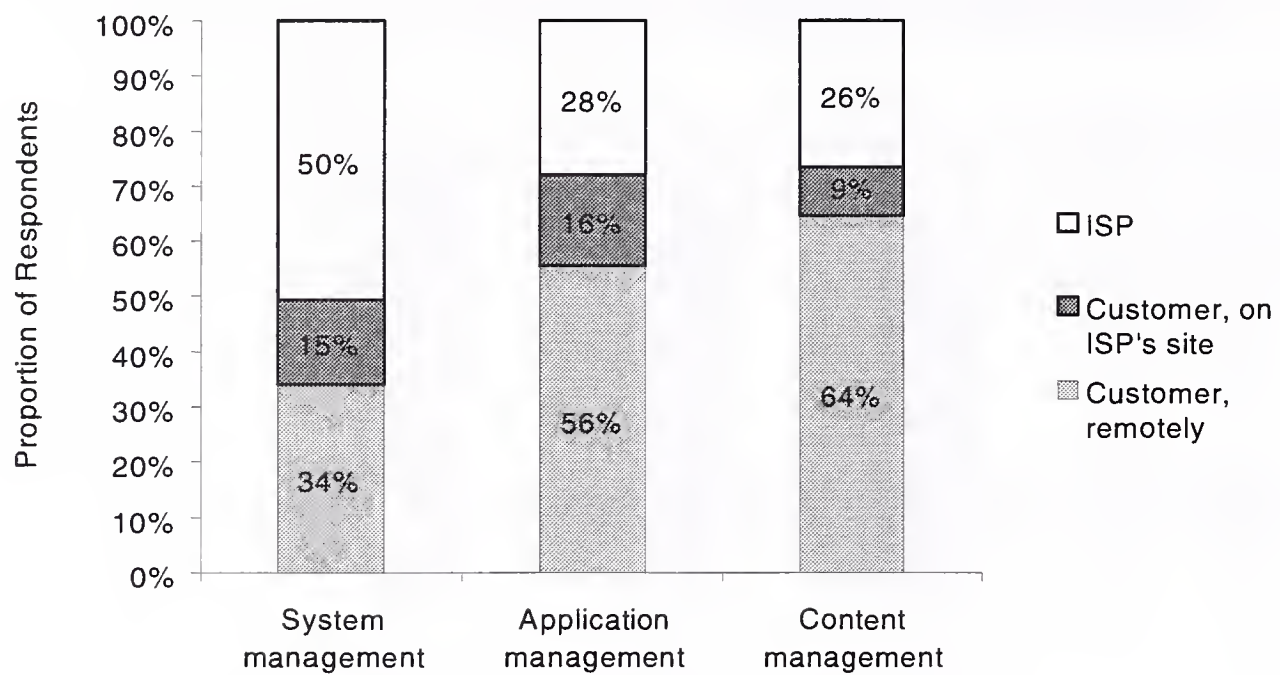
Exhibit VII-6

Hosted Application Server Management Responsibilities, Europe

Sample: 20

Source: INPUT

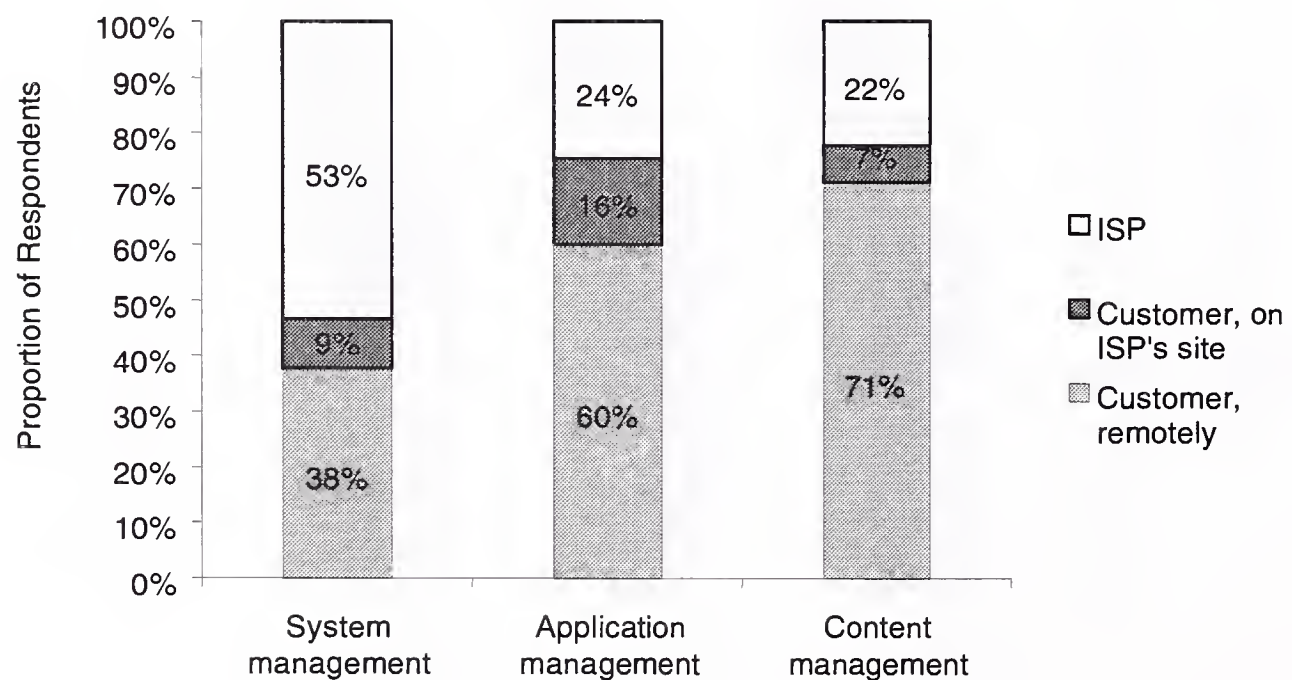
Exhibit VII-7

Preferred Application Hosting Management Responsibilities, Worldwide

Sample: 80

Source: INPUT

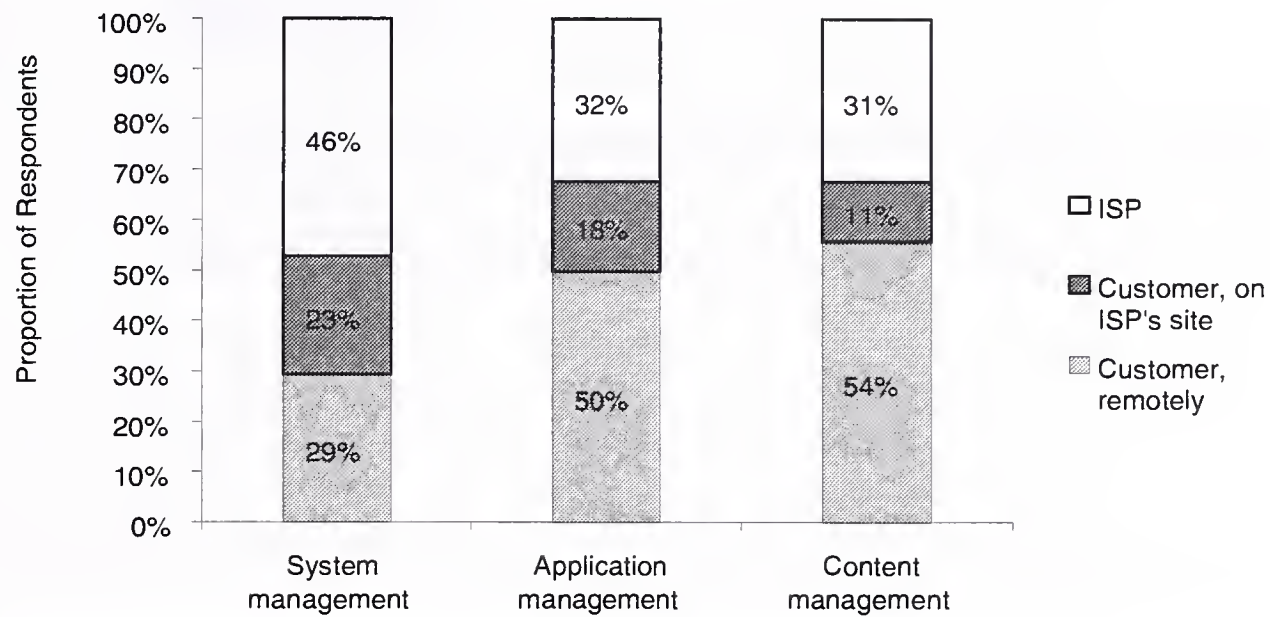
Exhibit VII-8

Preferred Application Hosting Management Responsibilities, US

Sample: 45

Source: INPUT

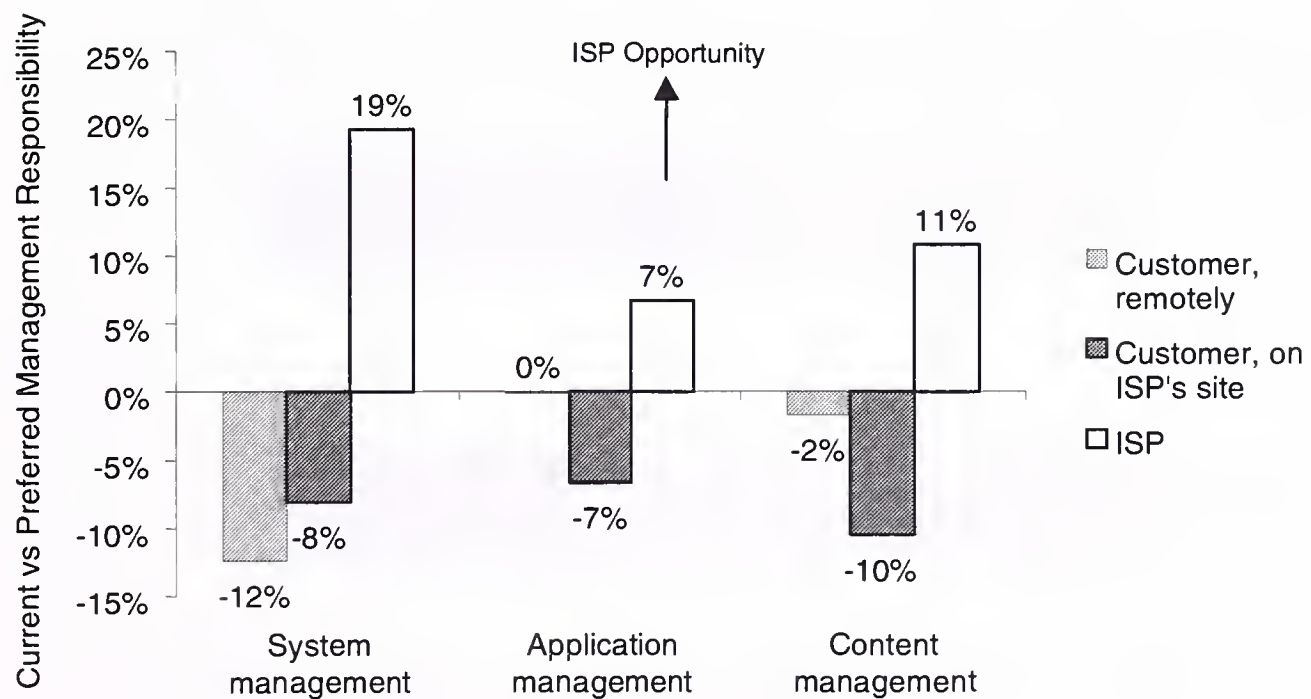
Exhibit VII-9

Preferred Application Hosting Management Responsibilities, Europe

Sample: 35

Source: INPUT

Exhibit VII-10

Difference Between Current and Preferred Application Hosting Management Responsibilities, Worldwide

Sample: 80

Source: INPUT

C

ISP Consistency

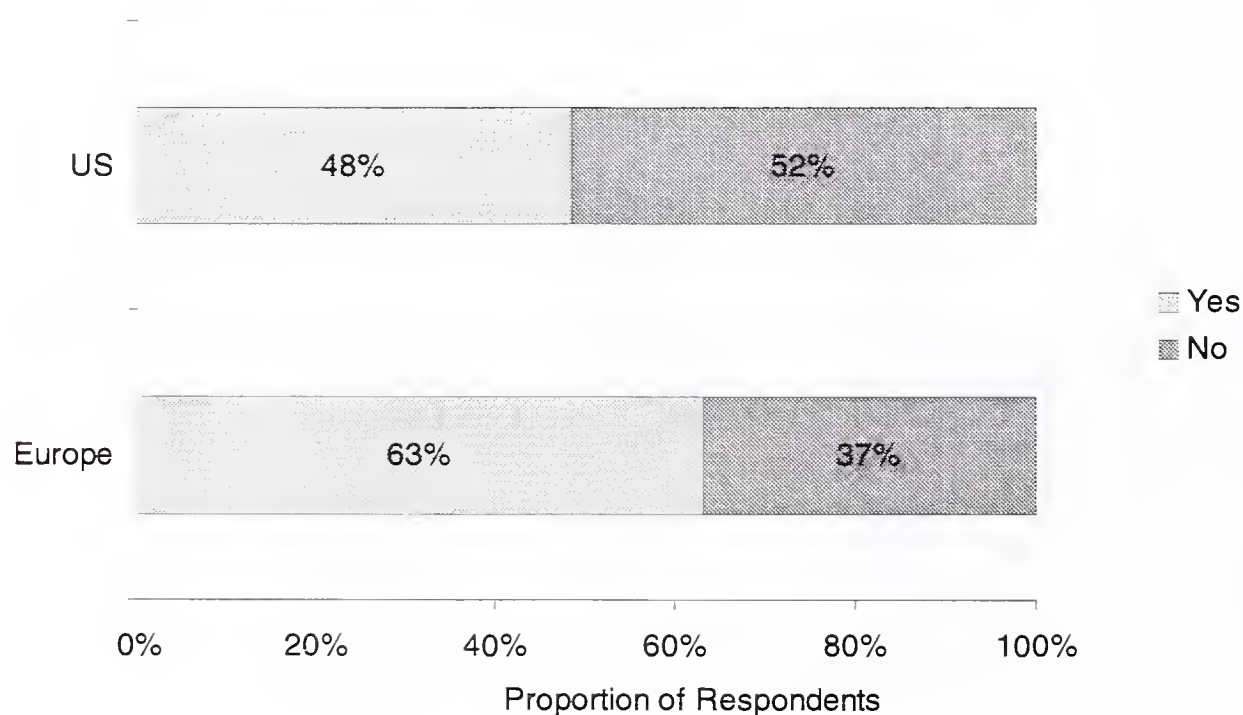
Provision of an Internet access service does not guarantee an ISP additional service business from a corporate customer. Exhibit VII-11 shows that many organizations seek alternative suppliers of Web hosting services, particularly in the US, where buyers use their existing access provider and an alternative hosting provider in equal measure.

For the same reasons given for Web hosting—high customer turnover due to the ease with which users can change suppliers—ISPs cannot rely on buyers operating a one-stop-shop policy. Integrated services will not necessarily capture business that otherwise would be lost to competing suppliers. ISPs must take a proactive sales approach to selling additional services to existing customers of Internet access.

No reasons were given for using a different ISP for application hosting than for Internet access.

Exhibit VII-11

Use of Same ISP for Internet Access and Application Hosting



Sample: 80

Source: INPUT



Application Hosting Benefits, Satisfaction, and Criteria

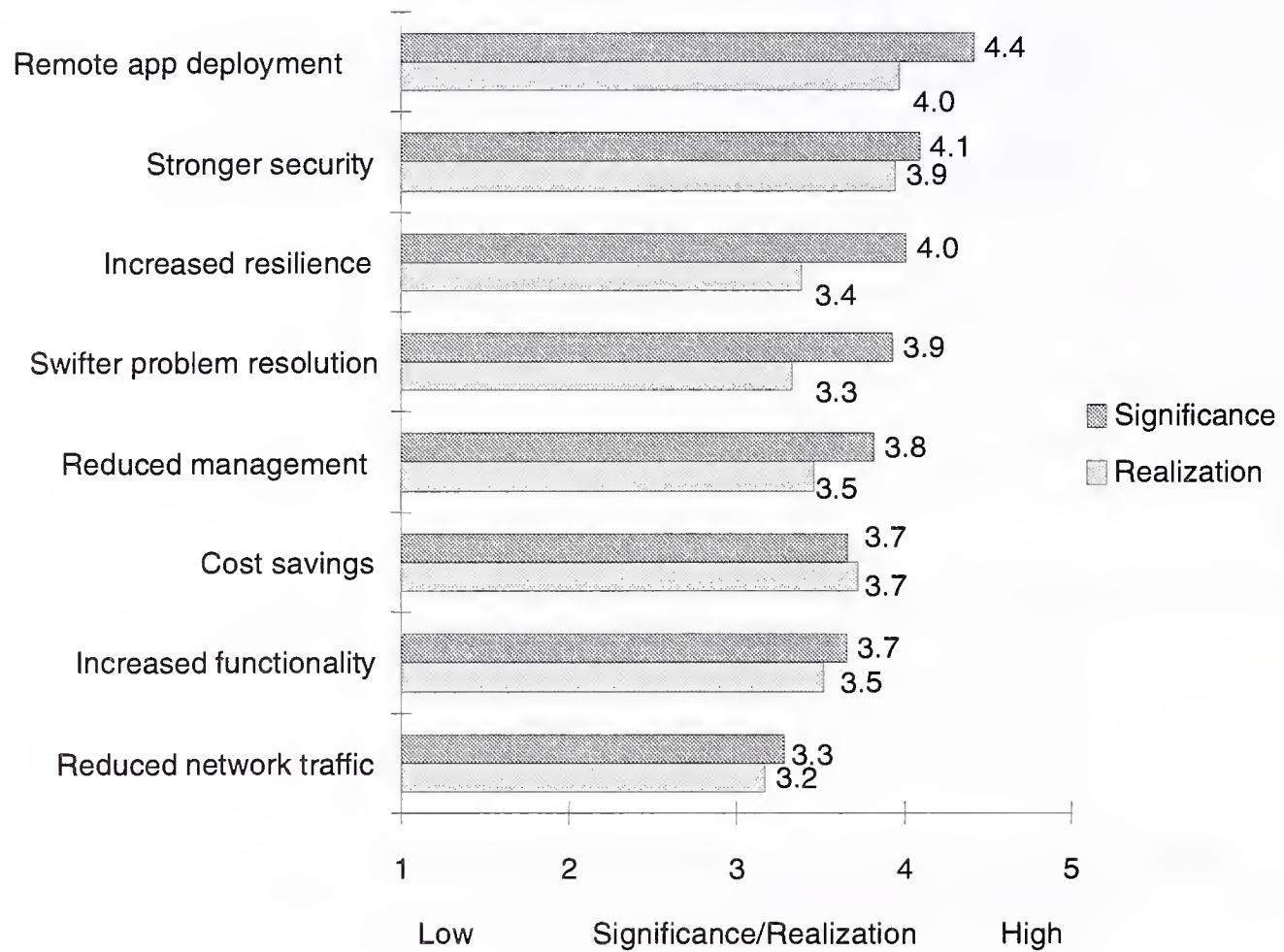
A

Benefits

Similar to the benefits rated for Web hosting services, increasing the robustness of an application through the enhanced security, reliability, and problem resolution of a hosted service, as opposed to in-house provision, is seen as a great benefit by buyers.

Even greater than this, however, is the potential to distribute access to corporate applications across offices and branches. By using an ISP as a hub, with its wide geographic reach, application hosting services can provide an effective solution to application distribution and deployment. The high levels of realization achieved by users show that this benefit is real and attainable.

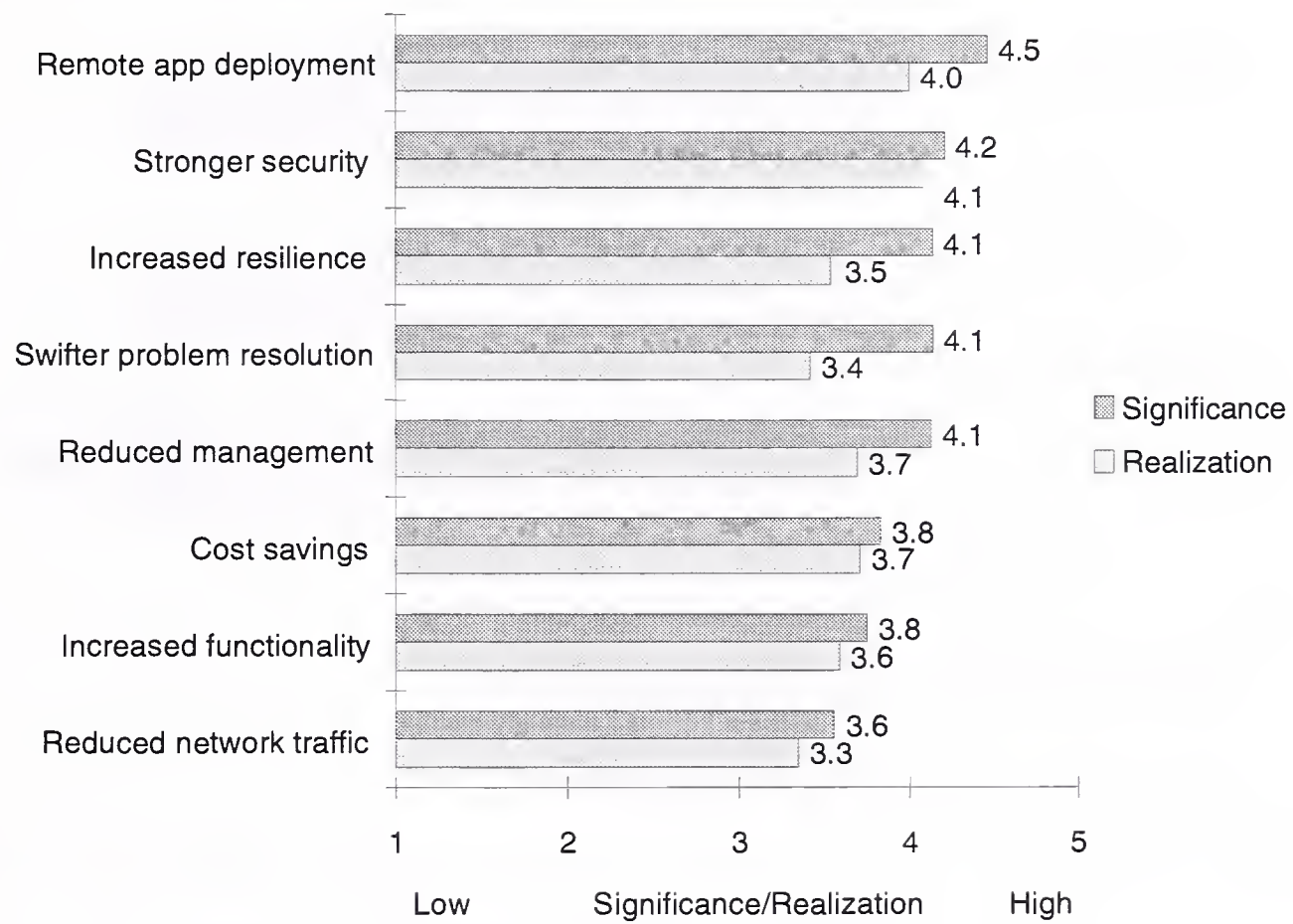
Exhibit VIII-1

Application Hosting Benefits, Worldwide

Sample: 98

Source: INPUT

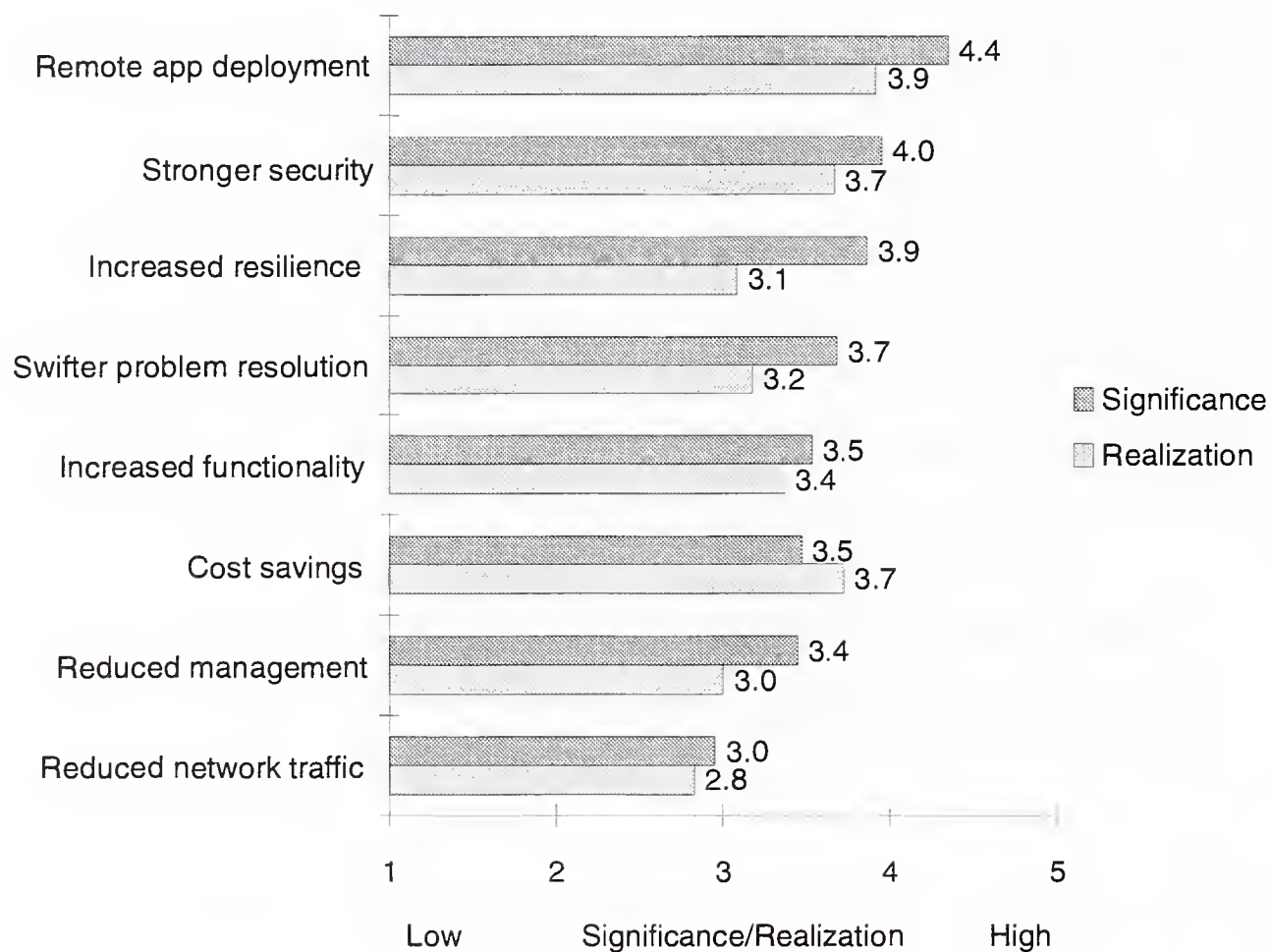
Exhibit VIII-2

Application Hosting Benefits, US

Sample: 53

Source: INPUT

Exhibit VIII-3

Application Hosting Benefits, Europe

Sample: 45

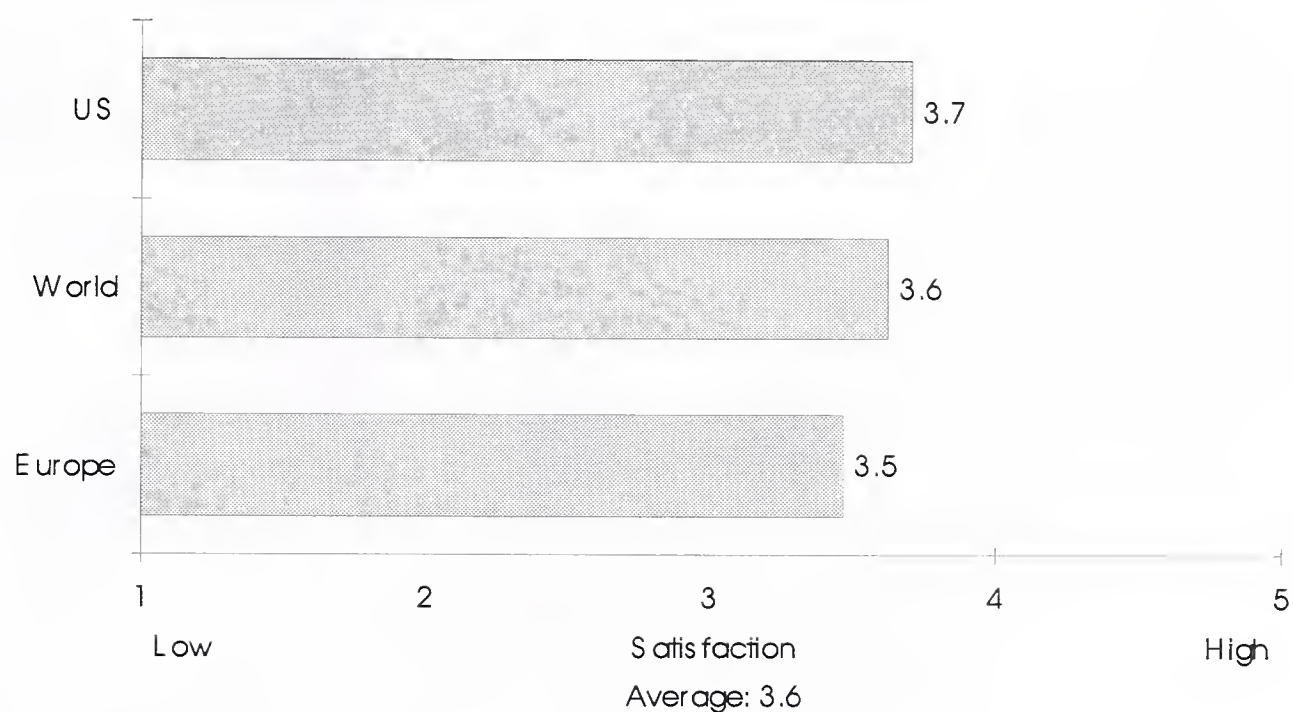
Source: INPUT

B

Satisfaction

Exhibits VIII-4 to VIII-7 show the overall satisfaction ratings given by respondents to their application hosting service by region and by industry sector. Unlike Internet access, buyers are only moderately satisfied with their services, averaging 3.6 overall. It should be noted that despite the relatively high apparent rating given by respondents in the retail sector, the sample of retail industry respondents who gave a rating was very small, at nine organizations.

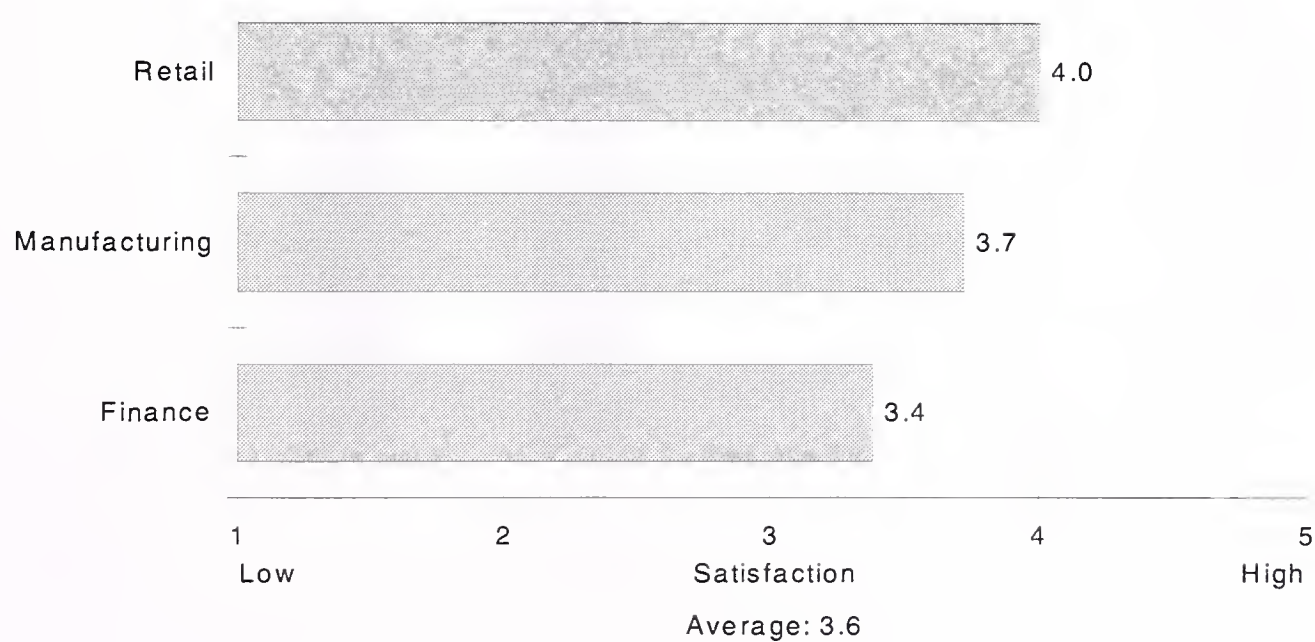
Exhibit VIII-4

Overall Satisfaction With Application Hosting Services, by Region

Sample: 48

Source: INPUT

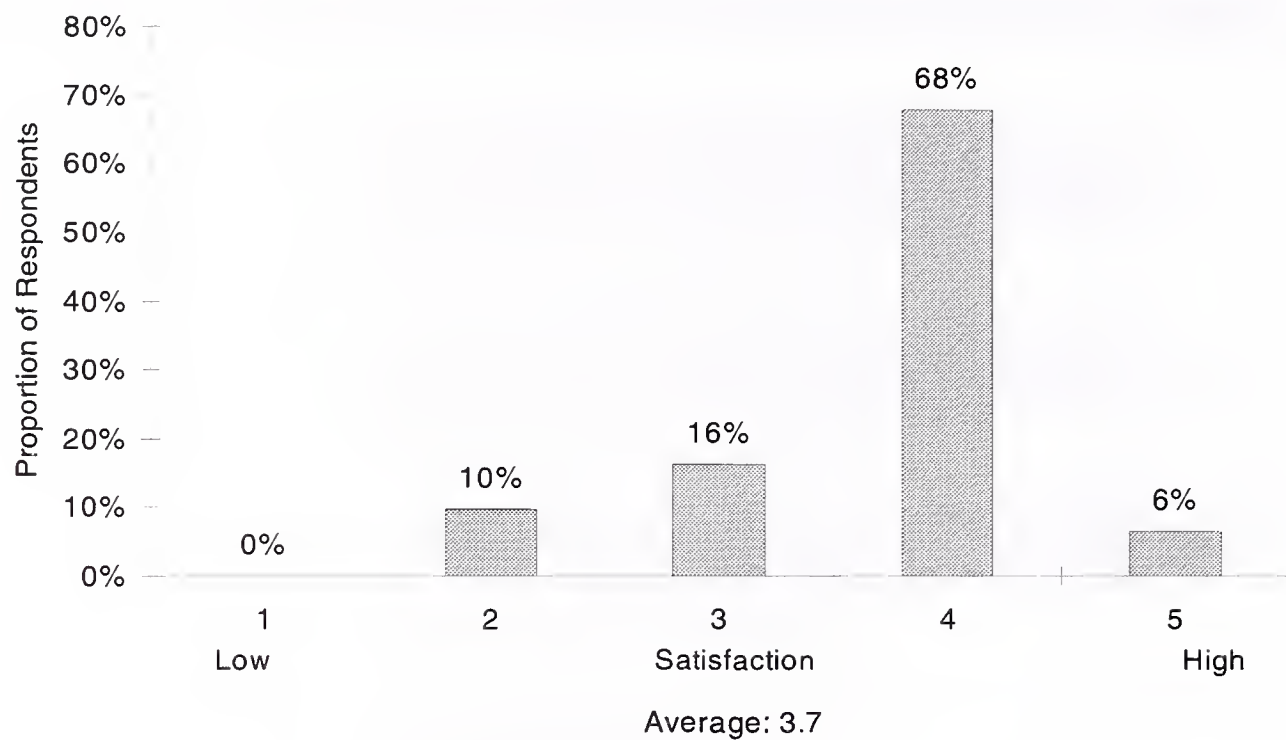
Exhibit VIII-5

Overall Satisfaction With Application Hosting Services, by Industry

Sample: 48

Source: INPUT

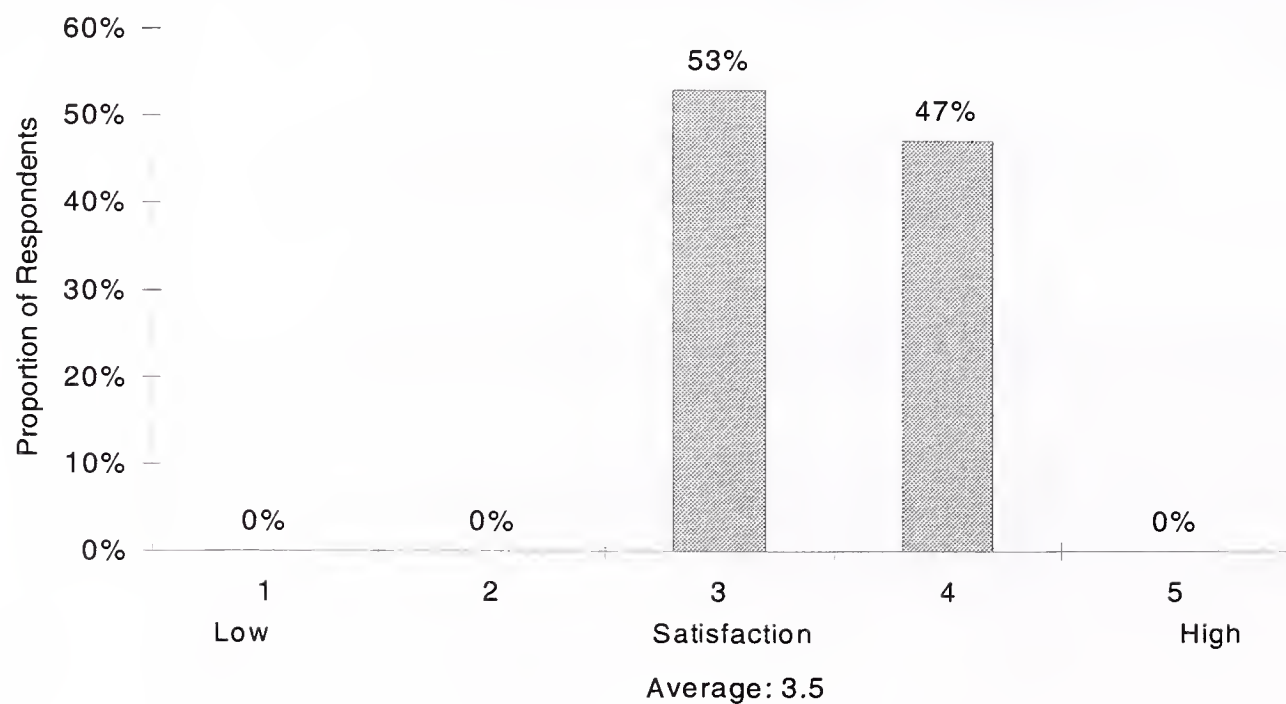
Exhibit VIII-6

Overall Satisfaction With Application Hosting Services, US

Sample: 31

Source: INPUT

Exhibit VIII-7

Overall Satisfaction With Application Hosting Services, Europe

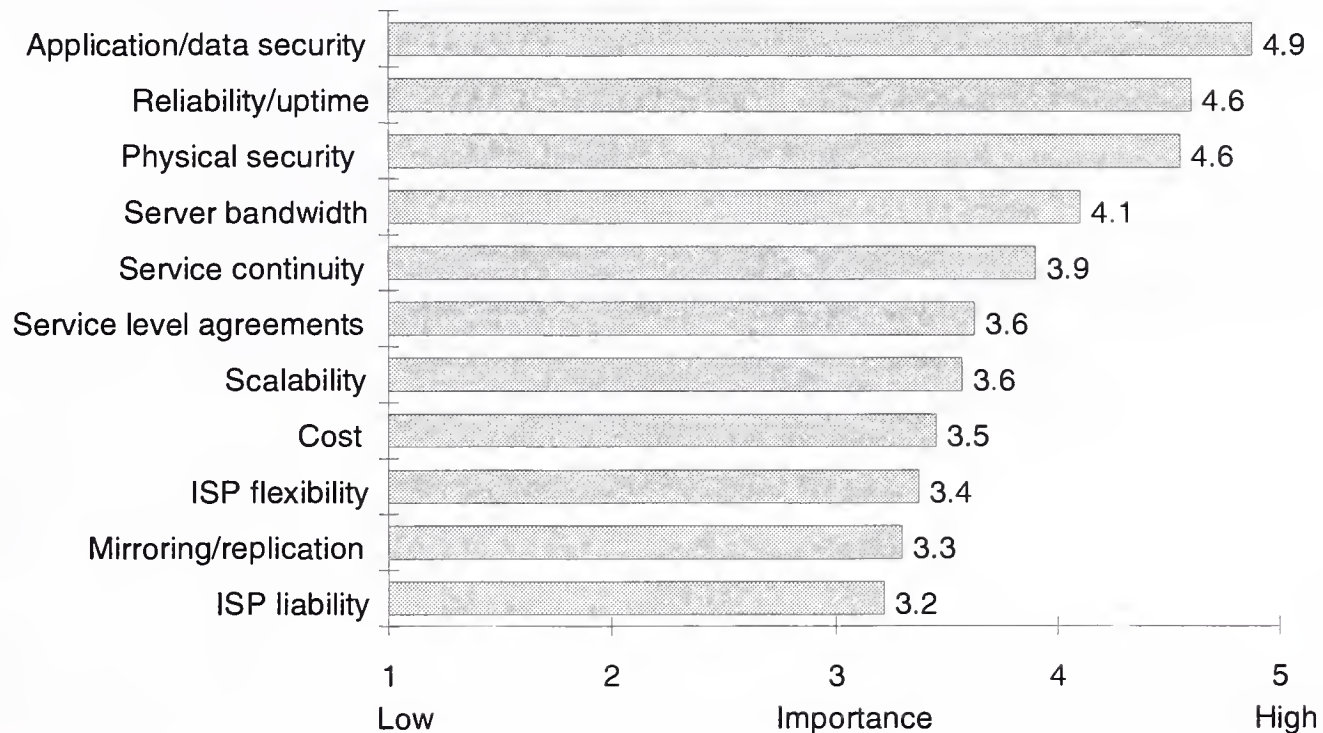
Sample: 17

Source: INPUT

Exhibits VIII-8 to VIII-10 show how important respondents currently consider characteristics of application hosting services. Reflecting users' concerns with all hosting services, security and reliability issues top the list with very high ratings. US and European respondents share the same concerns at this high level.

Exhibit VIII-8

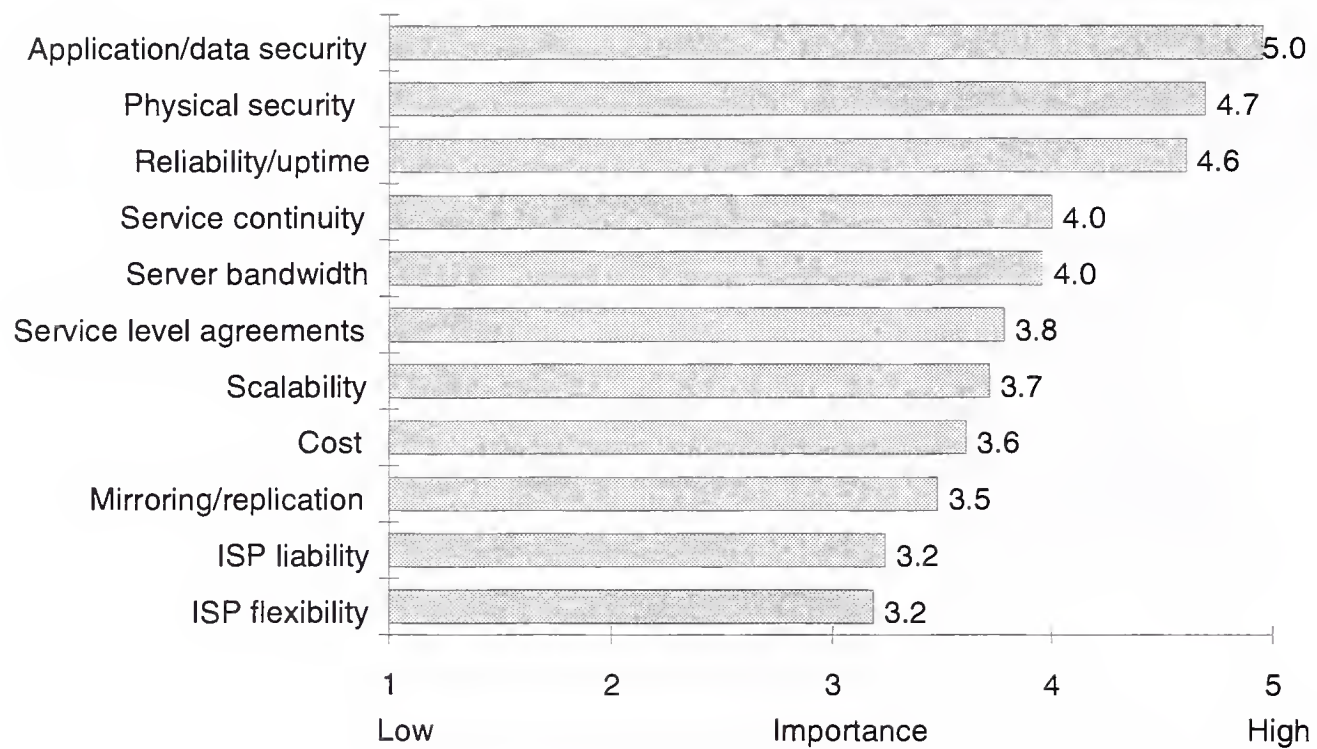
Current Importance of Application Hosting Characteristics, Worldwide



Sample: 40

Source: INPUT

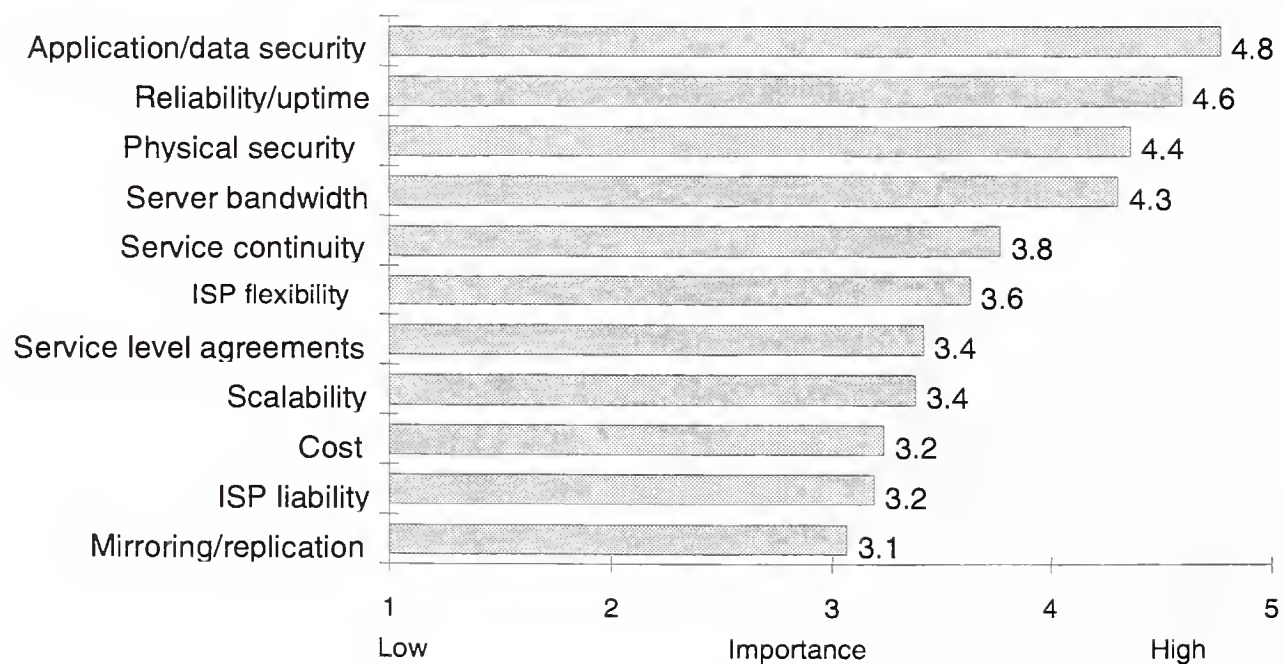
Exhibit VIII-9

Current Importance of Application Hosting Characteristics, US

Sample: 23

Source: INPUT

Exhibit VIII-10

Current Importance of Application Hosting Characteristics, Europe

Sample: 17

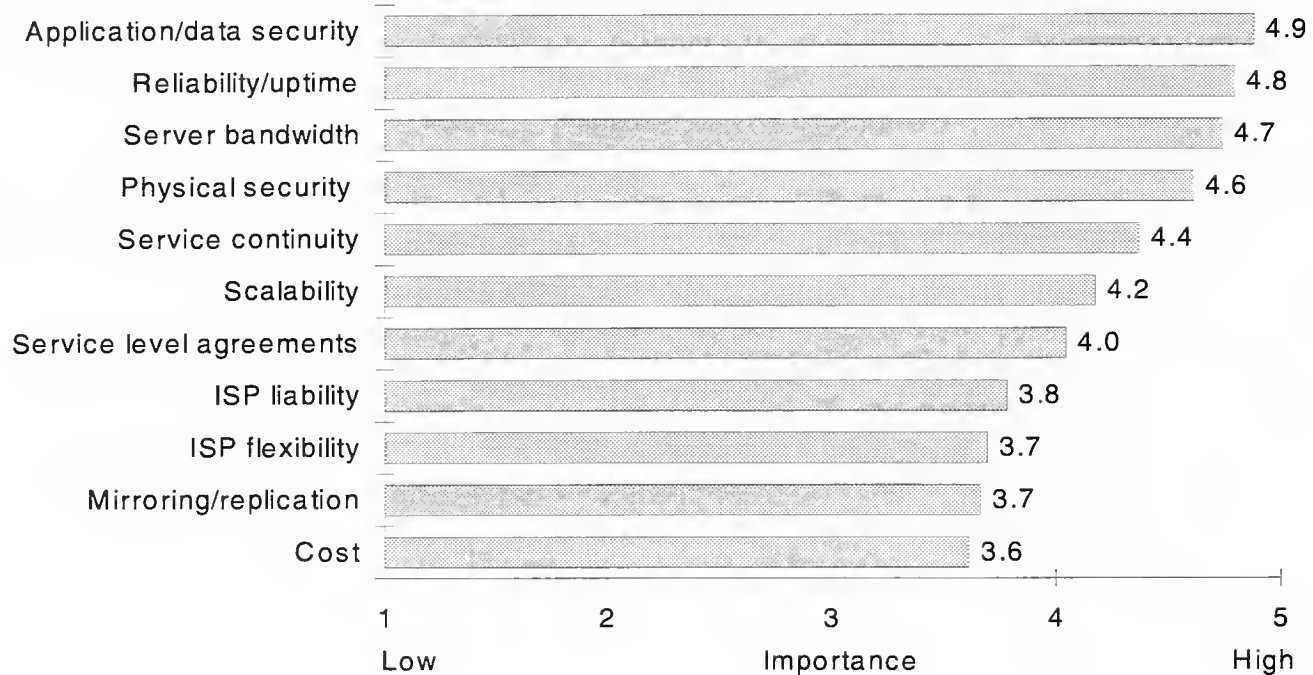
Source: INPUT

Exhibits VIII-11 to VIII-13 show the expected importance of each characteristics by 2000, and Exhibit VIII-14 shows the difference between current and future importance. As with Web hosting services, buyers are looking to increase the capacity of their application servers—server bandwidth and scalability are the two components of an application hosting service expected to grow in importance more than other characteristics, to reach at least 4 out of 5 in all sectors.

Users will also place significantly increased emphasis on service continuity and service level agreements, and both issues will assume a high level of importance over the next two years.

The message to ISPs remains consistent: buyers first and foremost expect to receive a secure, reliable, and highly-available service. Additional features, though important, are secondary to these fundamental requirements.

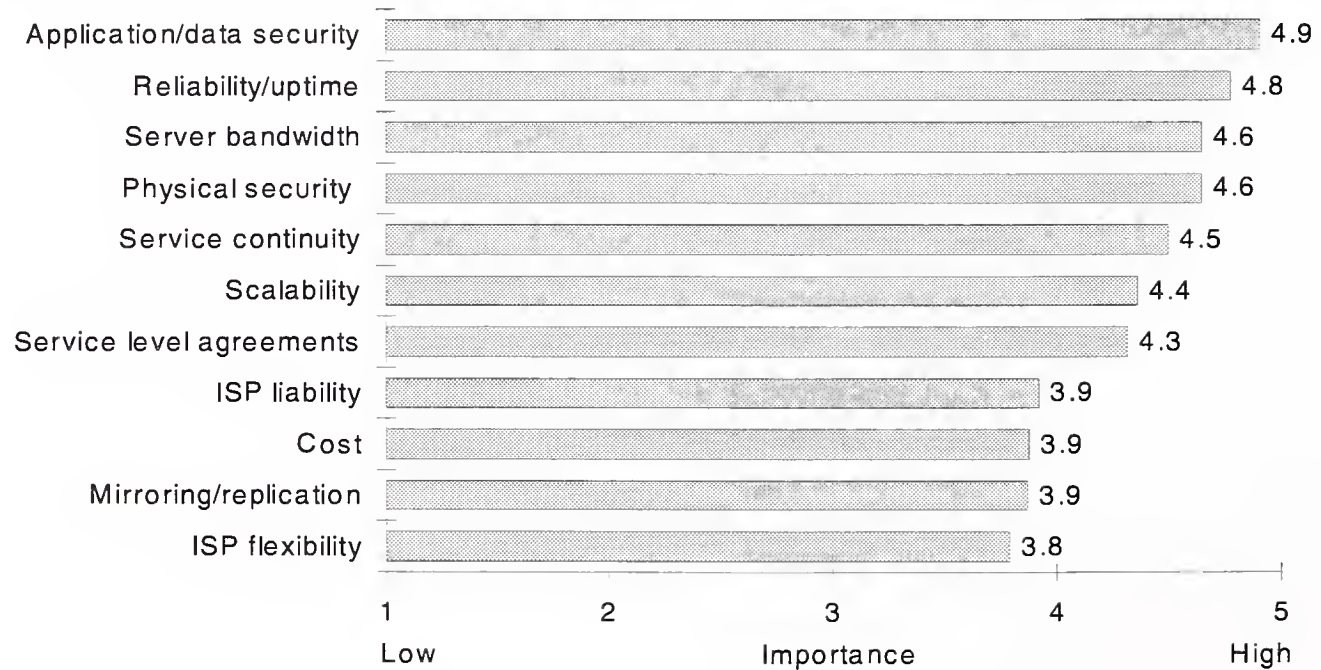
Exhibit VIII-11

Expected Importance of Application Hosting Characteristics, 2000, Worldwide

Sample: 77

Source: INPUT

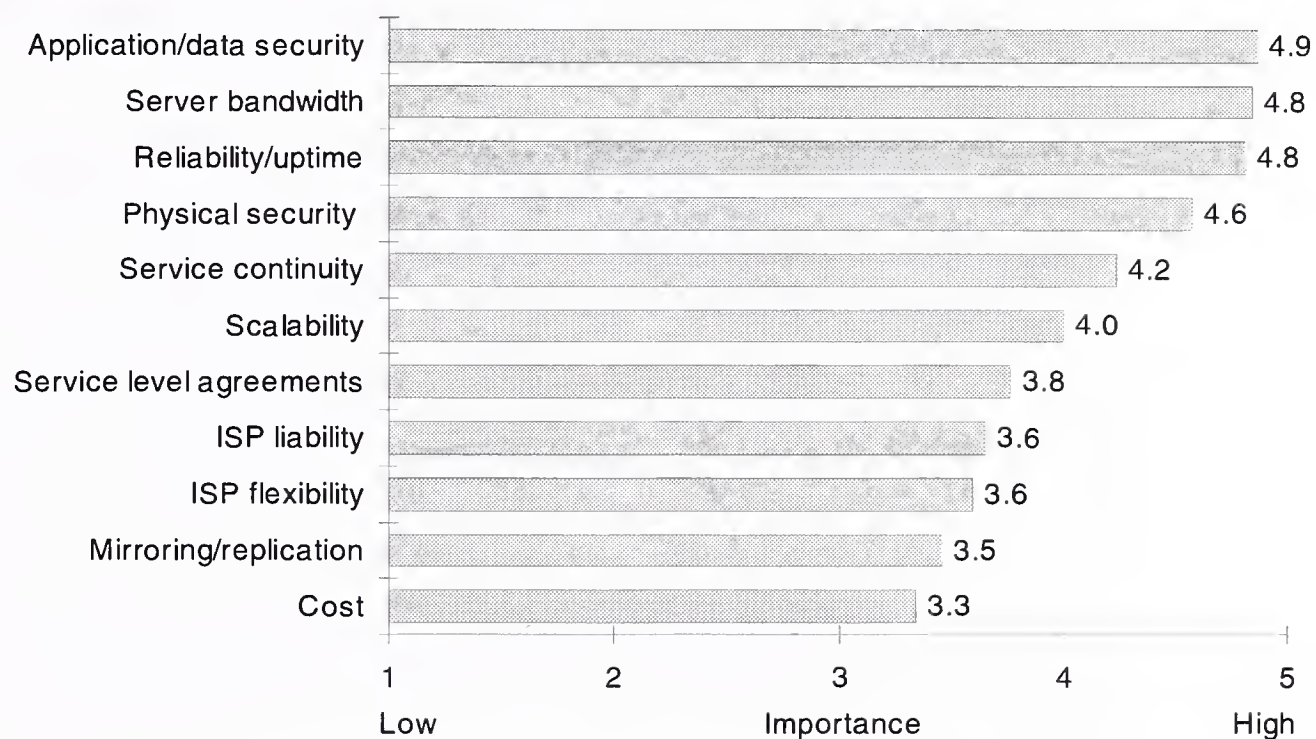
Exhibit VIII-12

Expected Importance of Application Hosting Characteristics, 2000, US

Sample: 39

Source: INPUT

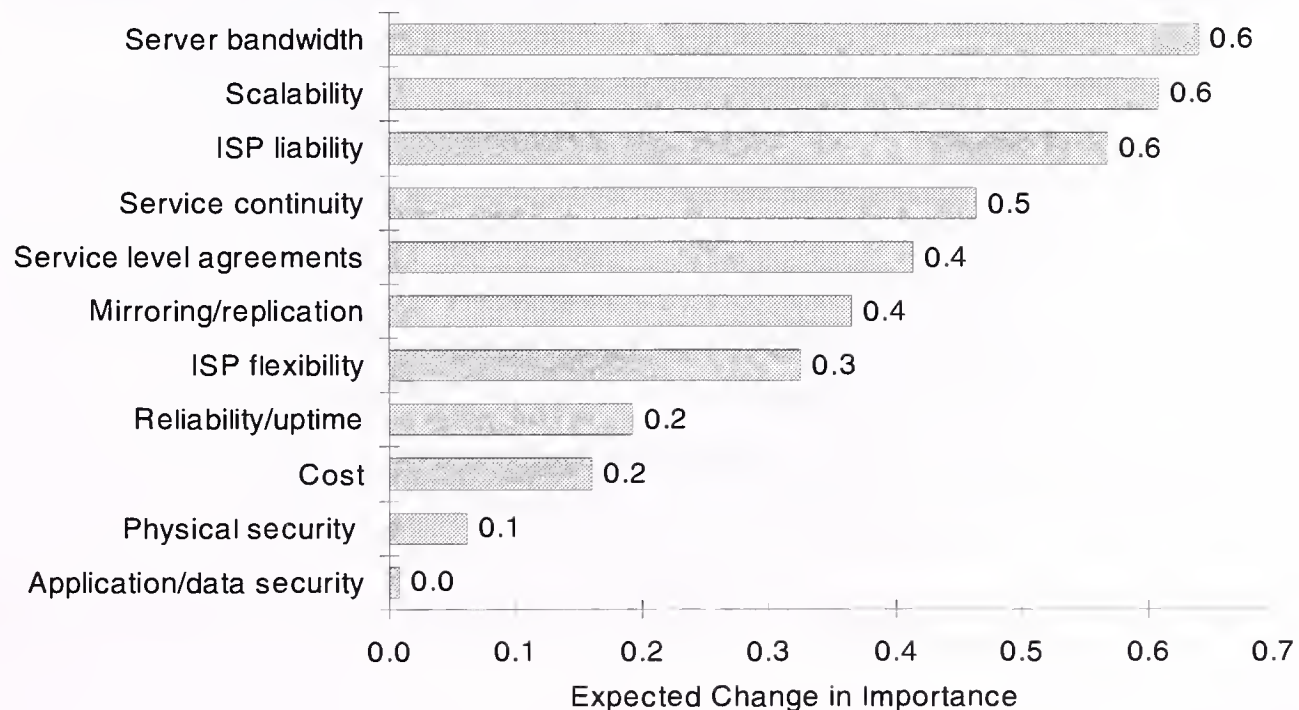
Exhibit VIII-13

Expected Importance of Application Hosting Characteristics, 2000, Europe

Sample: 38

Source: INPUT

Exhibit VIII-14

Expected Change in Importance of Application Hosting Characteristics, Worldwide

Sample: 77

Source: INPUT

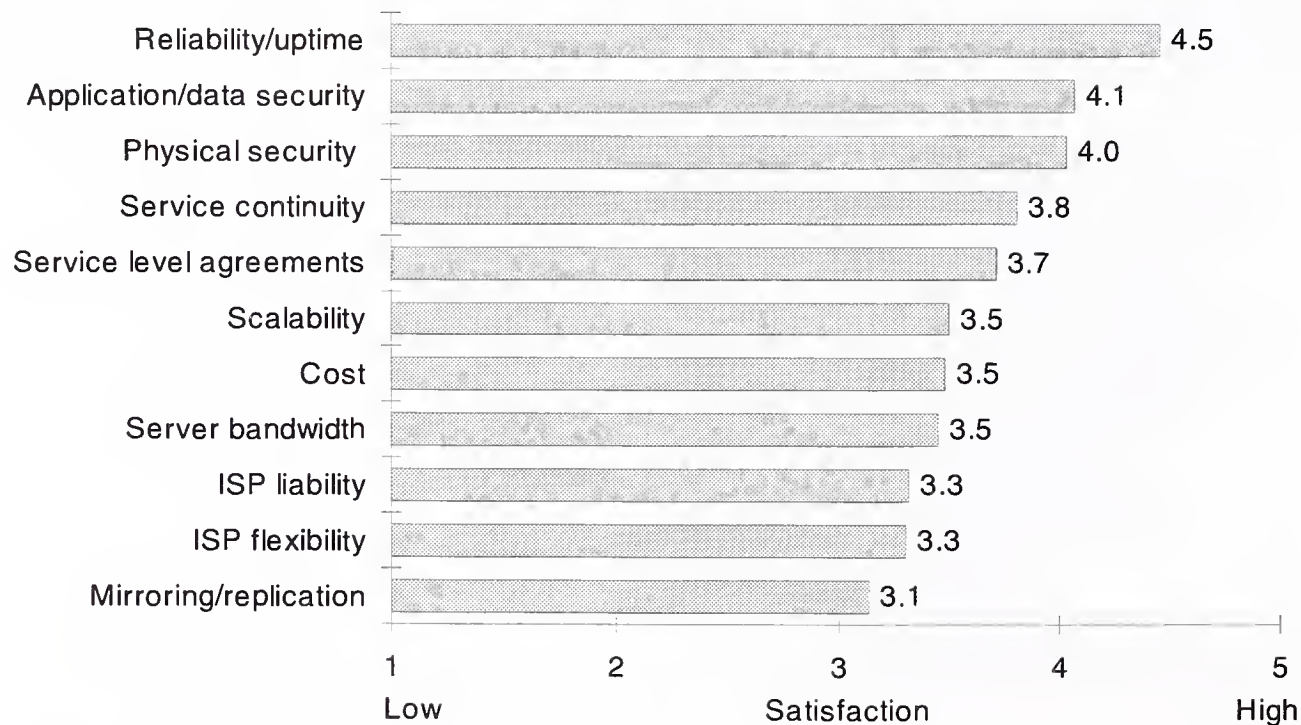
Exhibits VIII-15 to VIII-17 show the satisfaction ratings given for application hosting service components; Exhibit VIII-18 shows the difference between the importance currently given to each characteristic and the satisfaction rating received.

Buyers are reasonably satisfied with the aspects of their application hosting services currently considered most important: security and reliability issues. In particular, the rating given by both US and European respondents to reliability/uptime is unusually high, averaging 4.5 out of 5.

However, buyers are less satisfied with the characteristics expected to increase considerably in importance: server bandwidth and scalability. The same pattern was observed with Web hosting services, and the same advice to ISPs applies. ISPs should take a proactive approach to managing customers' network and system capacity, recommend upgrades as applicable before capacity problems are encountered, and consult regularly with customers over application and related capacity requirements.

Exhibit VIII-15

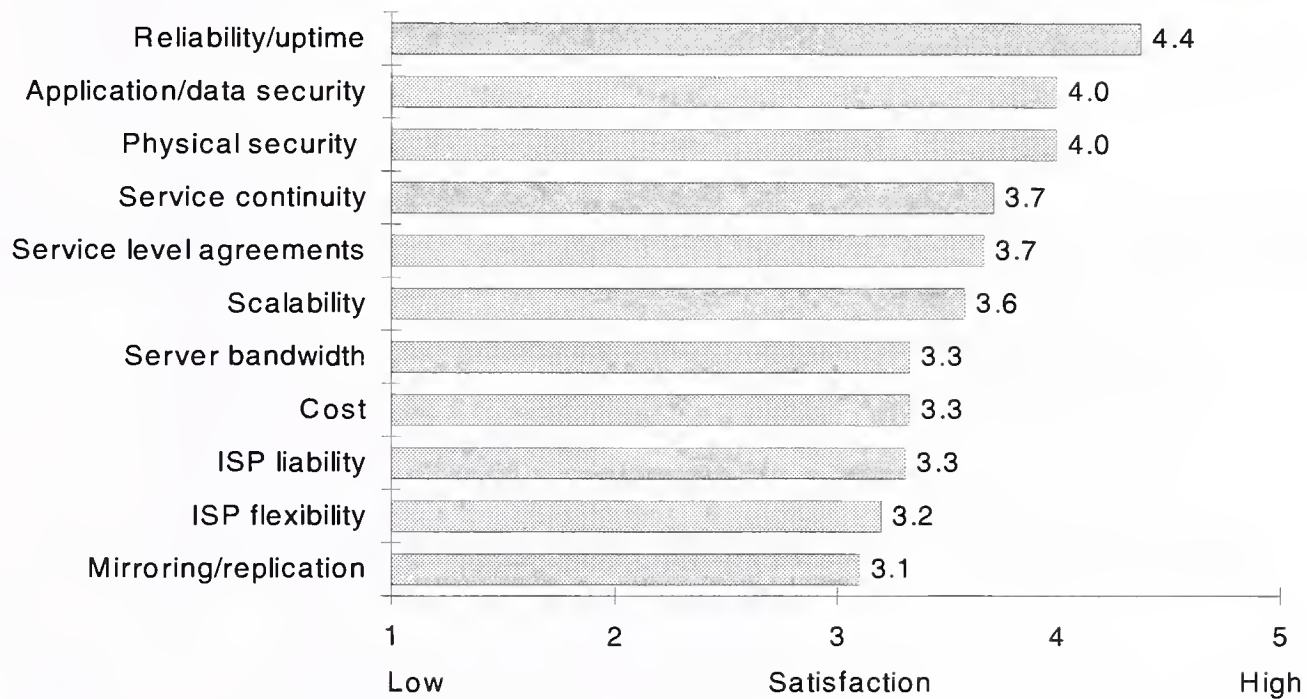
Satisfaction With Application Hosting Characteristics, Worldwide



Sample: 31

Source: INPUT

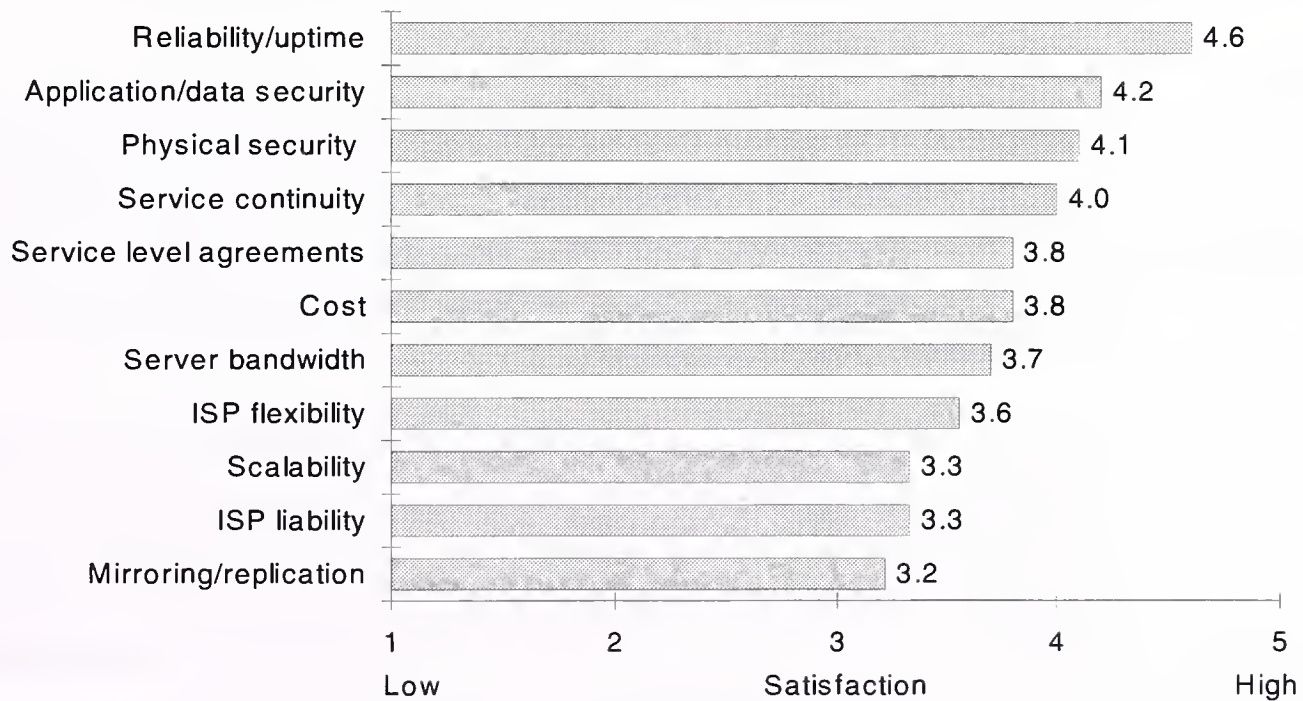
Exhibit VIII-16

Satisfaction With Application Hosting Characteristics, US

Sample: 21

Source: INPUT

Exhibit VIII-17

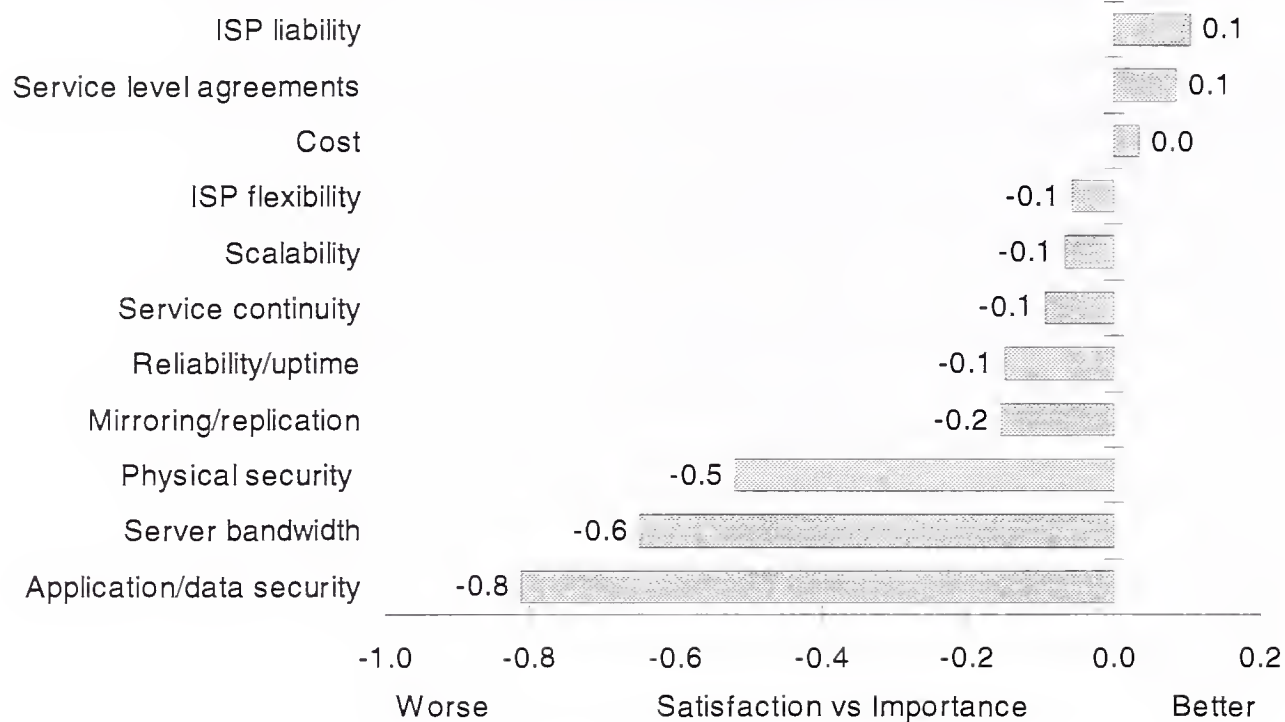
Satisfaction With Application Hosting Characteristics, Europe

Sample: 10

Source: INPUT

Exhibit VIII-18

Difference Between Importance of and Satisfaction With Application Hosting Characteristics, Worldwide



Sample: 40

Source: INPUT

C

Purchasing Criteria

Exhibit VIII-19 shows that users' primary criteria for purchasing application hosting services include the service components rated most importance: reliability and security. However, cost remains a check list item for purchasing decisions, despite the comparatively low importance attached to it, as shown above.

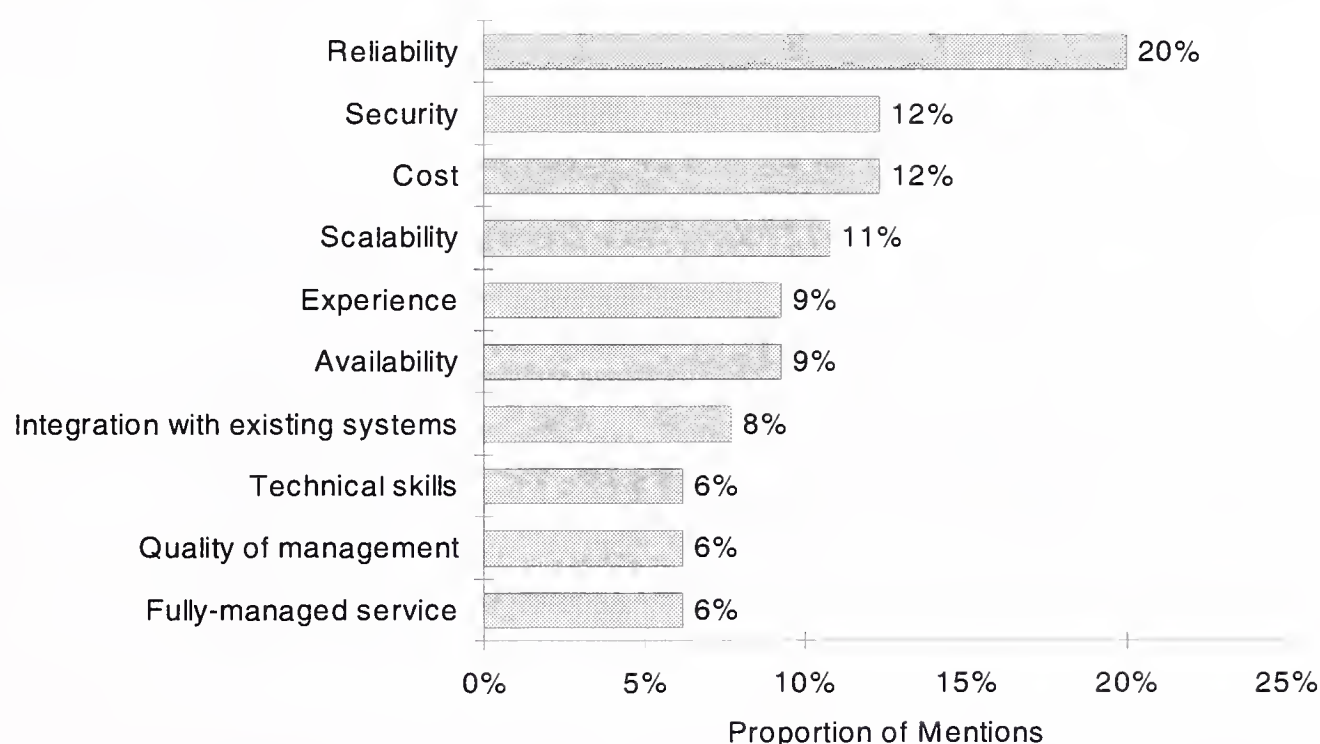
Several respondents stated that an ISP's experience in the application hosting market, and related credibility, is a primary criterion. This indicates the need for many ISPs without a solid background in application hosting to develop such services or, as INPUT believes is more likely, gain such services and good branding through acquisition.

A similar proportion of respondents stated the need for application integration skills and services. As applications hosted by ISPs increase in value beyond the low end to mission-critical enterprise applications,

buyers will increasingly need to perform back-end integration with existing, non-hosted applications and databases. Systems integration and consultancy services are required of ISPs by these users, and providers entering the ISP market from this background must capitalize on these skills.

Exhibit VIII-19

Criteria Used for Purchasing Application Hosting Services, Worldwide



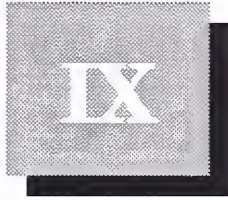
Sample: 65

Source: INPUT

Other criteria, mentioned by between one and three respondents, were:

- Advice service (not as part of consultancy service)
- Breadth of services
- Focus on business issues
- Commercial sensitivity
- Commitment to long-term relationship
- Credibility
- Customer service

- Development services
- Integration with EDI services
- Extranet ability
- Flexibility
- Global presence
- Integrated hosting and Internet access services
- Openness of information
- Performance
- Quality of infrastructure
- Setting of realistic expectations
- Responsiveness
- Service level agreements



Extranet Service Usage and Plans

A

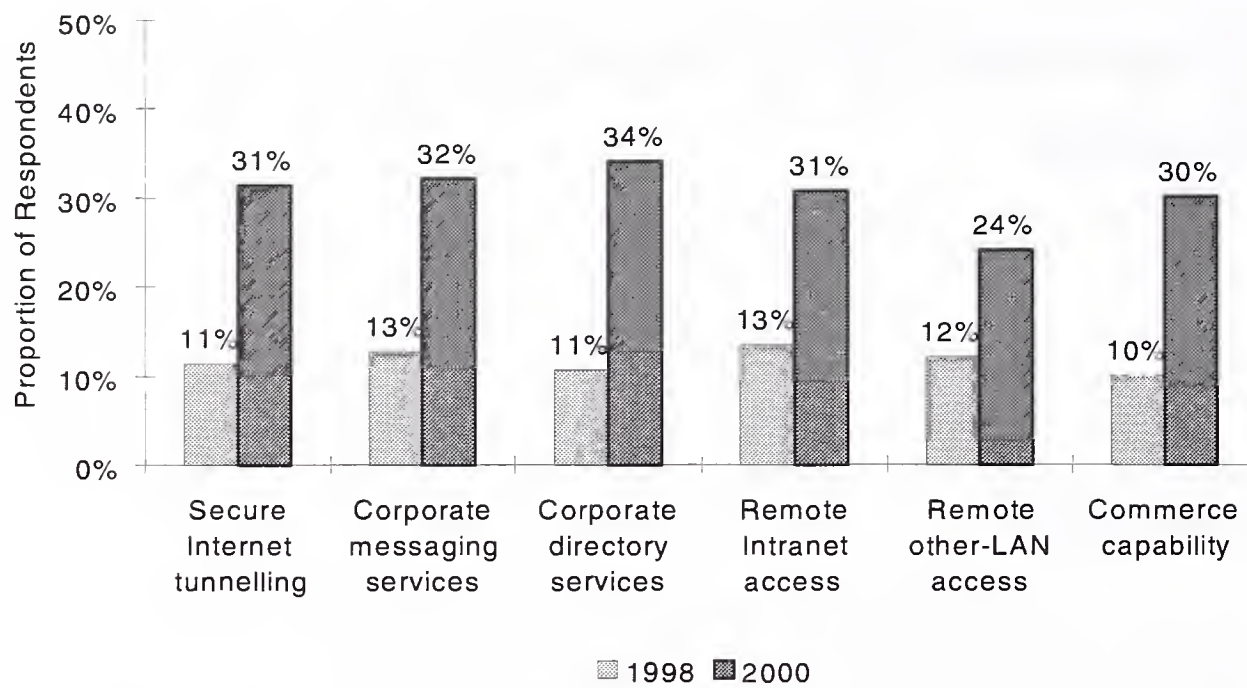
Current and Future Usage

As shown earlier in this report, use of Extranet services within the survey sample is expected to double in the next two years. Growth of the Extranet market overall will be even higher, however, due to this survey's sample characteristics—respondents were already active users of Internet services at the time of interviewing. In using Extranet services, buyers seek to replace high-cost VPNs from non-Internet providers and private WAN connections operated in-house.

In the US, around 30% of respondents currently use an Extranet service, and the figure in Europe is approximately 10%. By 2000 these figures are expected to increase to around 45% for both regions.

Current and planned use of individual Extranet service components is shown in Exhibits IX-1 to IX-3. Use of these components is consistent across respondents. Buyers regard these as standard components of Extranet services; no component is regarded as unimportant.

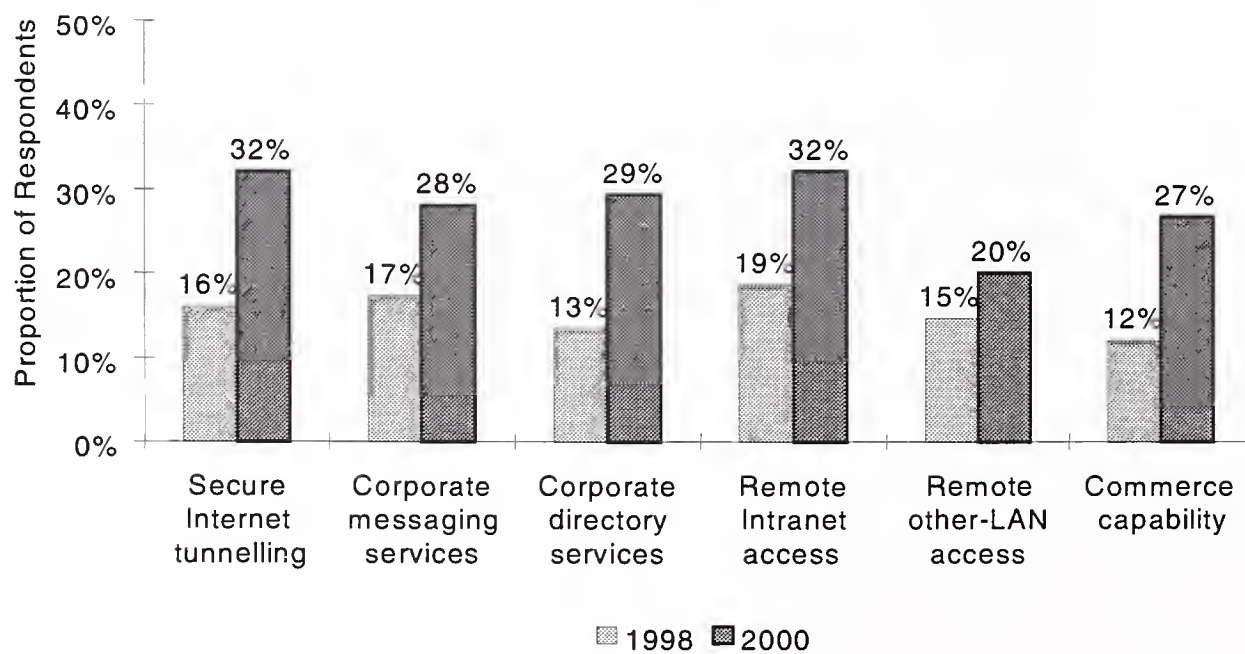
Exhibit IX-1

Current and Expected Use of Extranet Services, Worldwide

Sample: 150

Source: INPUT

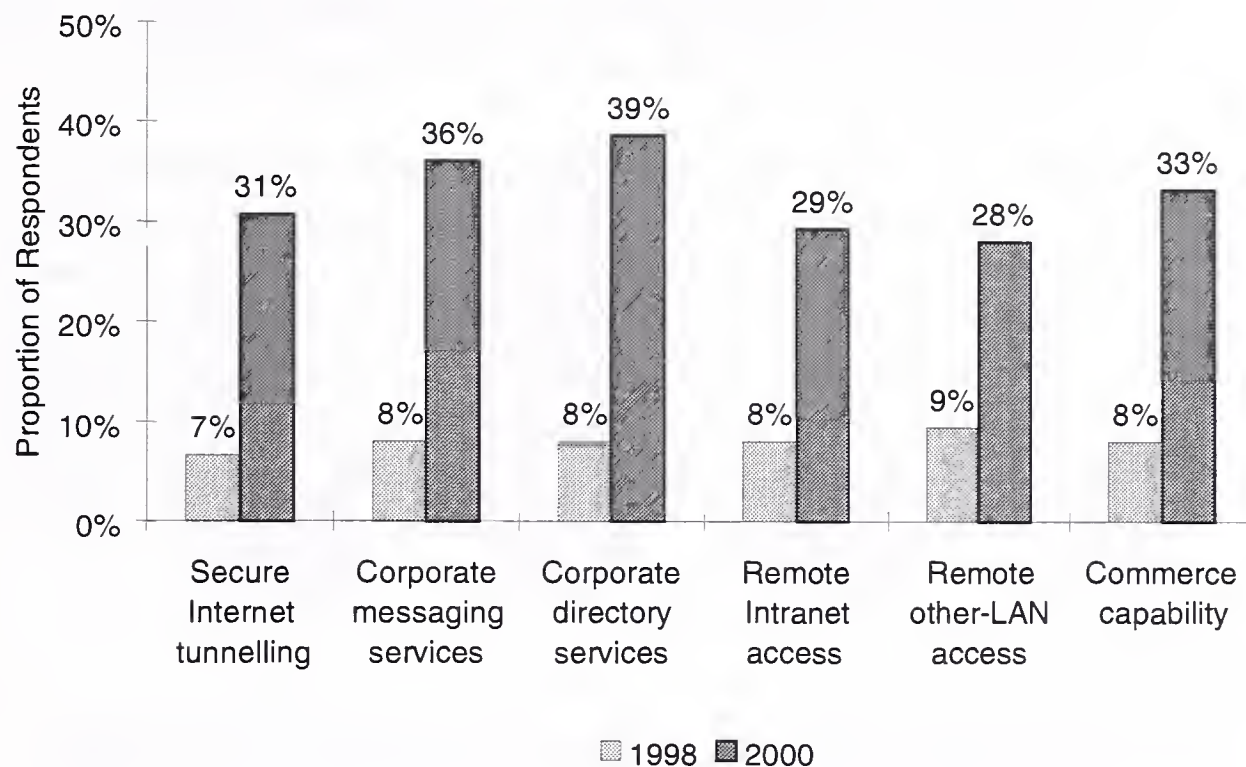
Exhibit IX-2

Current and Expected Use of Extranet Services, US

Sample: 75

Source: INPUT

Exhibit IX-3

Current and Expected Use of Extranet Services, Europe

Sample: 75

Source: INPUT

B**Best VPN Implementation Methods**

Respondents were asked which method of implementing a VPN (Internet or non-Internet) was most appropriate to their organization. Exhibits IX-4 to IX-6 show there is a marked difference of views between US and European organizations. US respondents stated that an Internet-based, ISP-provided service is most appropriate, both currently and in two years' time.

European organizations currently do not regard an external Internet service-based approach as appropriate. Instead they consider in-house VPN provision using self-developed or standard products the most suitable method. Within two years, this will change significantly, and European organizations expect to be able to make use of ISP Extranet services.

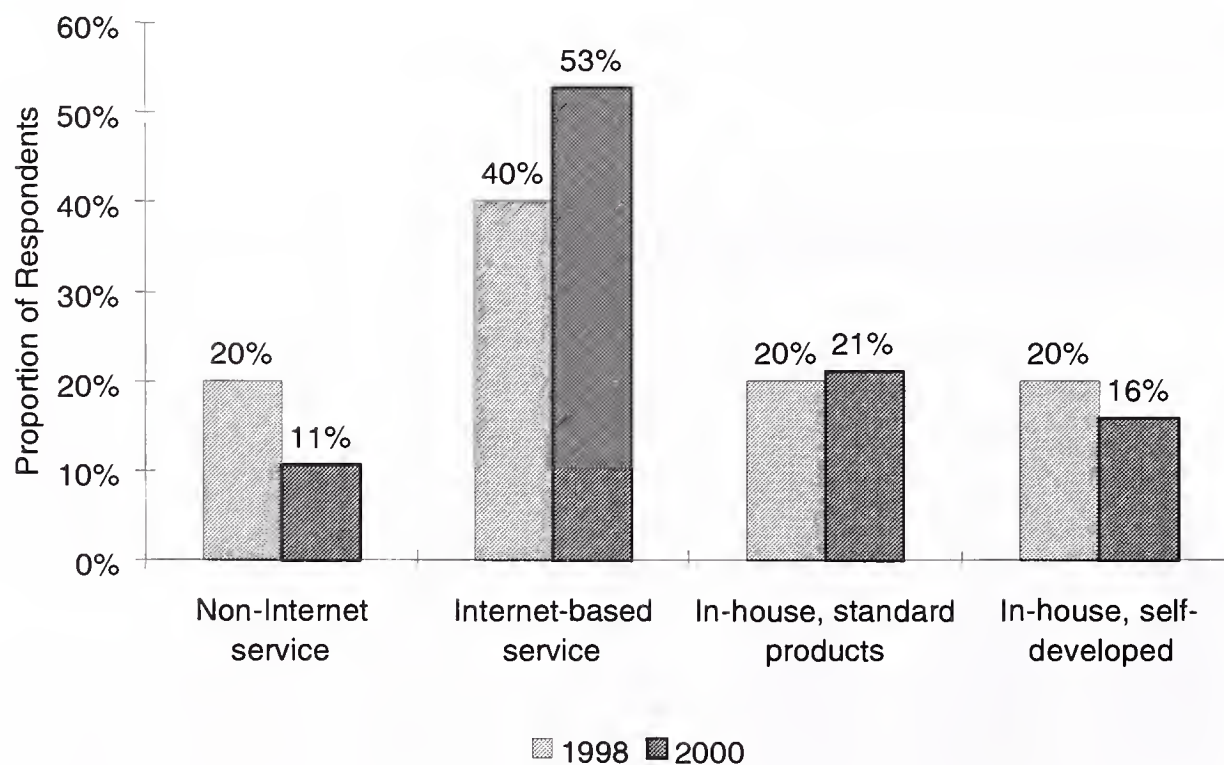
The reason for this is that ISP Extranet services are currently more advanced in the US than in Europe. Many ISPs offering Extranet services restrict coverage to the national (primarily US) market, with

international availability handled on a case by case basis. This is due to the private, highly confidential nature of Extranet communications. Many ISPs restrict Extranet traffic to their own networks and do not route it over the public Internet where they can offer no guarantee of security or performance. As a result, geographic coverage is limited.

This provides another argument for market consolidation. Basic Internet access can, and is, provided adequately by ISPs who route traffic across disparate networks operated by competitors and by non-competitors. To provide an Extranet service with security and performance guarantees, the role of an ISP's own network becomes much more important. Larger ISPs are better placed to offer such services due to the extent of their networks. As ISPs grow through acquisitions, their ability to provide widespread Extranet services increases.

Exhibit IX-4

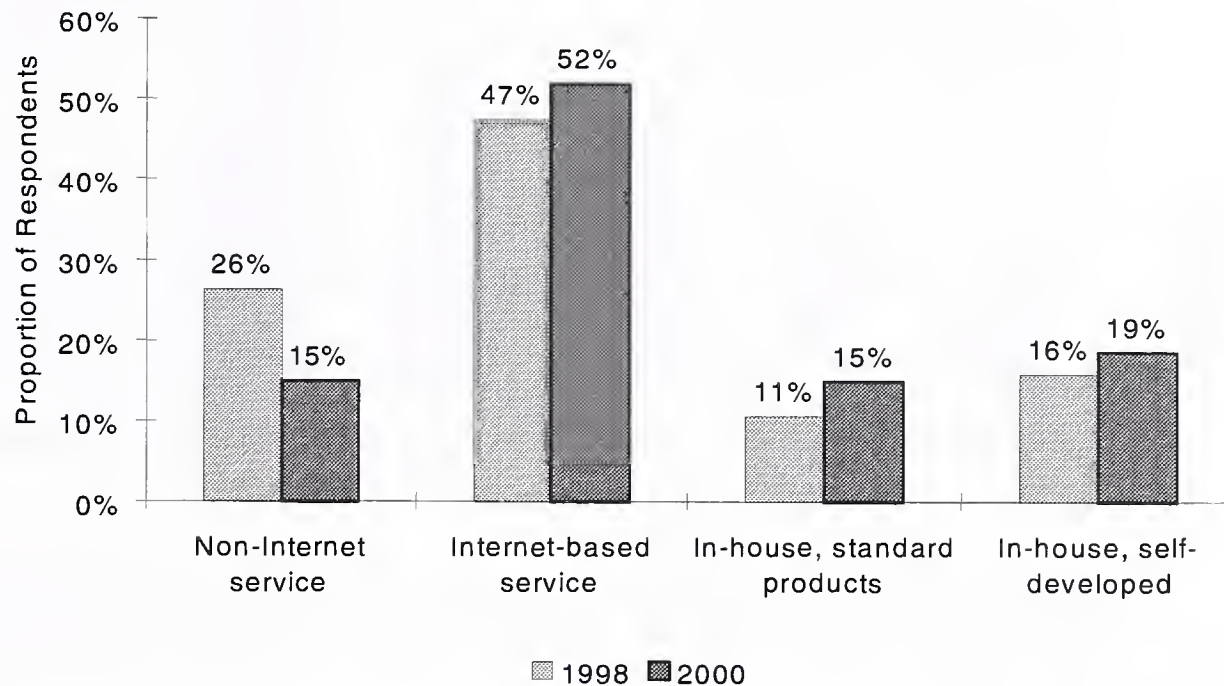
Most Appropriate VPN Implementation Method, Worldwide



Sample: 57

Source: INPUT

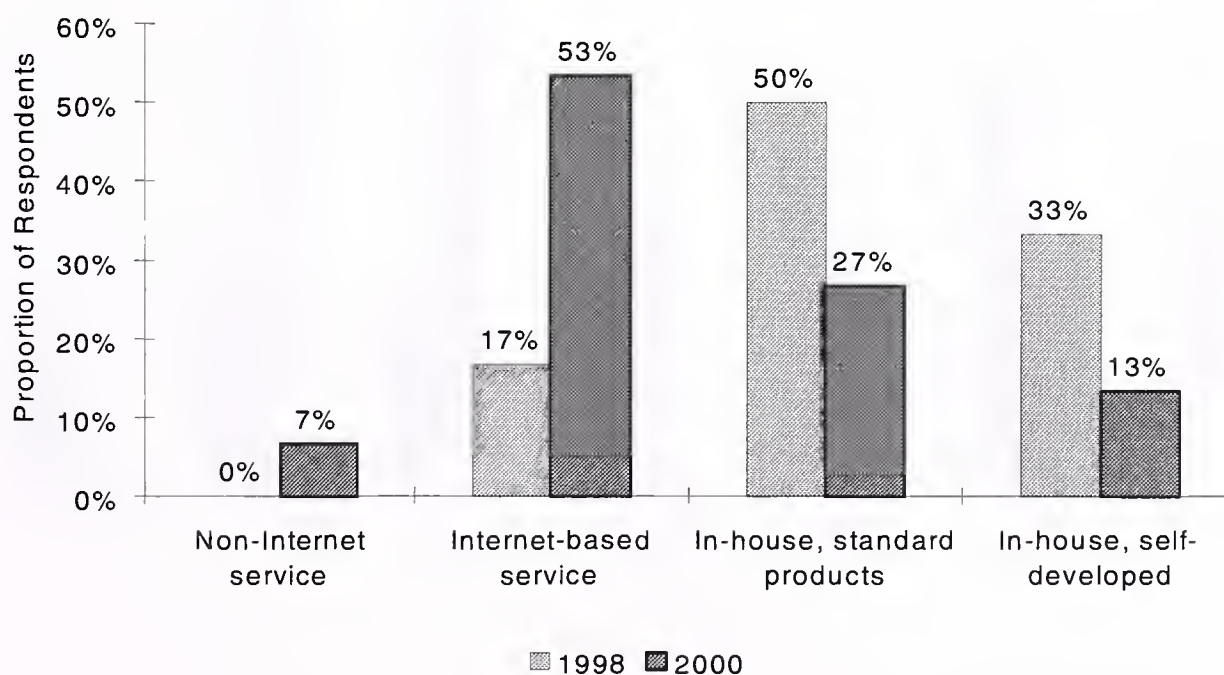
Exhibit IX-5

Most Appropriate VPN Implementation Method, US

Sample: 27

Source: INPUT

Exhibit IX-6

Most Appropriate VPN Implementation Method, Europe

Sample: 30

Source: INPUT

C

Scope of Extranet Deployment

Extranets connect physically separated Intranets. Connected Intranets may belong to one company (a geographically disperse private Intranet), or different companies (trusted parties which seek to gain benefit by accessing each others' data and/or applications).

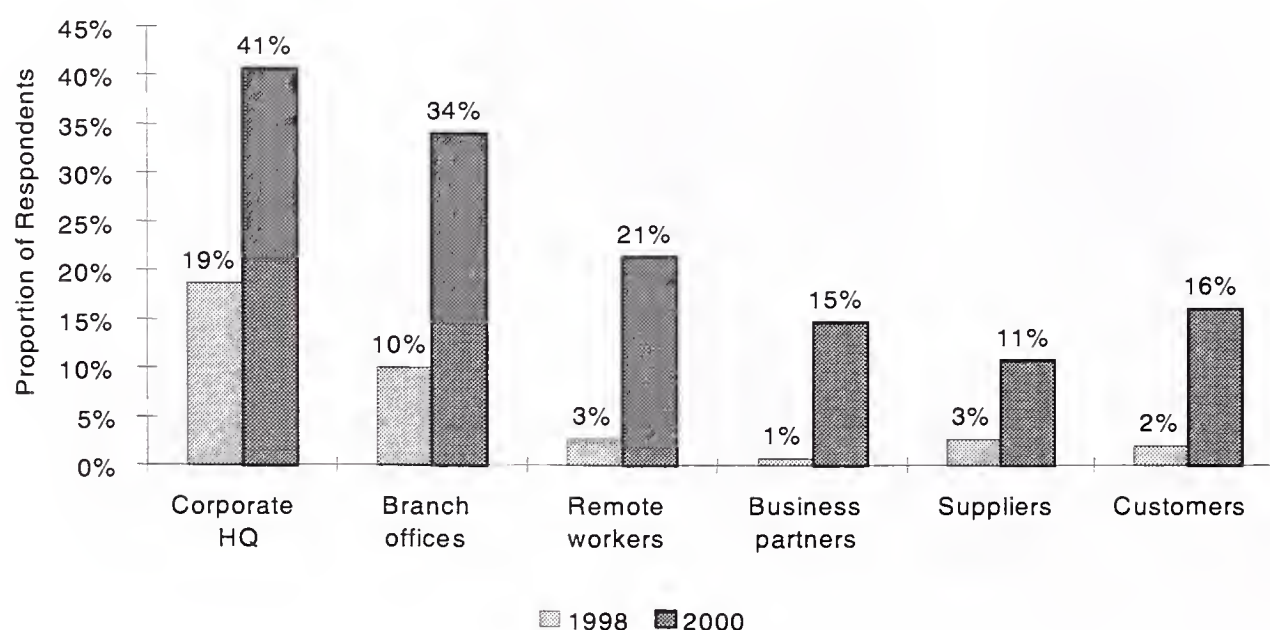
Exhibits IX-7 to IX-9 show the types of organization that respondents currently and plan to connect to via an Extranet. Interestingly, despite the attention given to the potential of Extranets to connect partners, customers, and suppliers, buyers are focused internally. Connecting branch offices to corporate headquarters is the focus for users that are already using an Extranet service. Currently, external organizations such as partners, suppliers, and customers are secondary.

By 2000, still most Extranet coverage will be internal, with approximately one in six of large companies connecting to partners, customers, or suppliers.

This provides an opportunity for ISPs and technology vendors (alone or in partnership) to bid for enterprise-wide service contracts that cover one company's disperse offices, as opposed to multiple organizations.

Exhibit IX-7

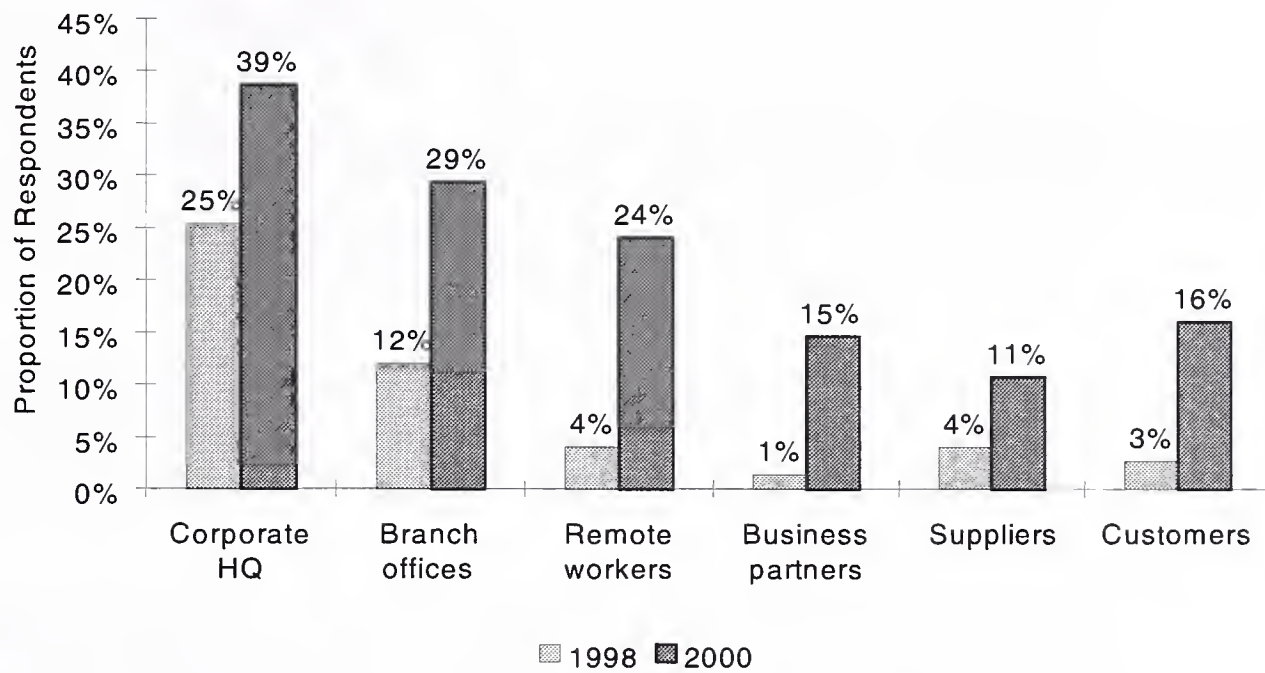
Current and Expected Scope of Extranet Deployment, Worldwide



Sample: 150

Source: INPUT

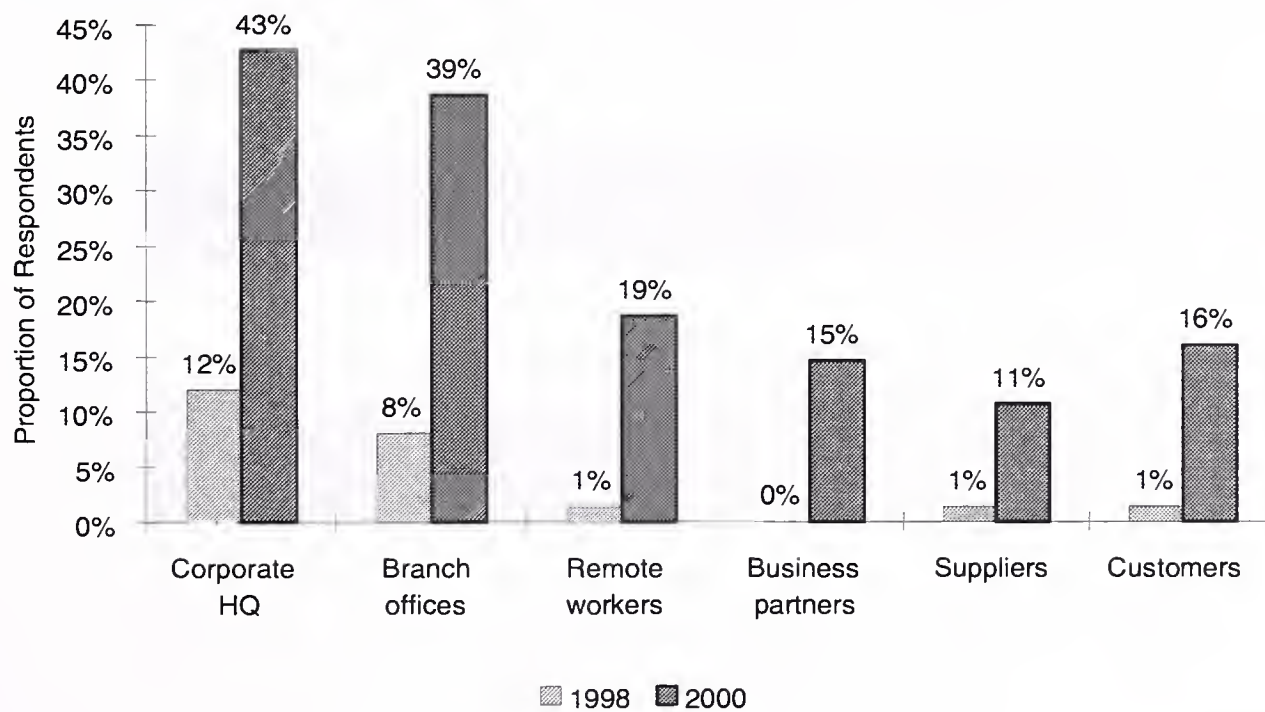
Exhibit IX-8

Current and Expected Scope of Extranet Deployment, US

Sample: 75

Source: INPUT

Exhibit IX-9

Current and Expected Scope of Extranet Deployment, Europe

Sample: 75

Source: INPUT

D

ISP Consistency

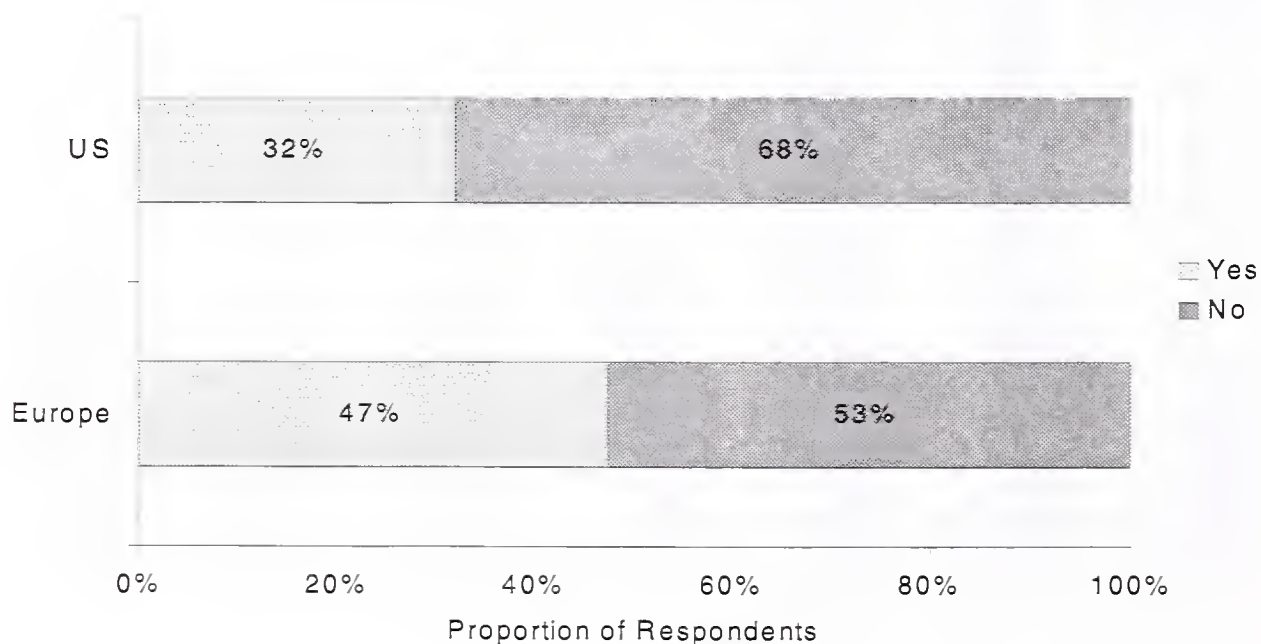
Robust, internationally-available Extranet services are not yet offered by most ISPs, and are an integrated component of very few ISP's standard offerings. More so than for Web or application hosting services, buyers tend to seek a specialized supplier of Extranet services, different from their corporate Internet access provider. Exhibit IX-10 shows the current use of the same ISP for Internet access and Extranet services.

As the Extranet market matures, the ISP market consolidates into fewer, larger providers, and Extranet capabilities become a standard component of ISP offerings, more buyers will use one ISP for multiple services, including Extranets.

Few respondents gave their reasons for using a different ISP for Extranet services than for Internet access. Those who did were unconfident of their ISP's ability to provide an Extranet service or were concerned over their ISP's lack of experience in this area.

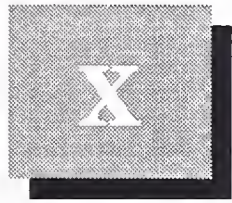
Exhibit IX-10

Use of Same ISP for Internet Access and Extranet Services



Sample: 44

Source: INPUT



Extranet Benefits, Satisfaction, and Criteria

A

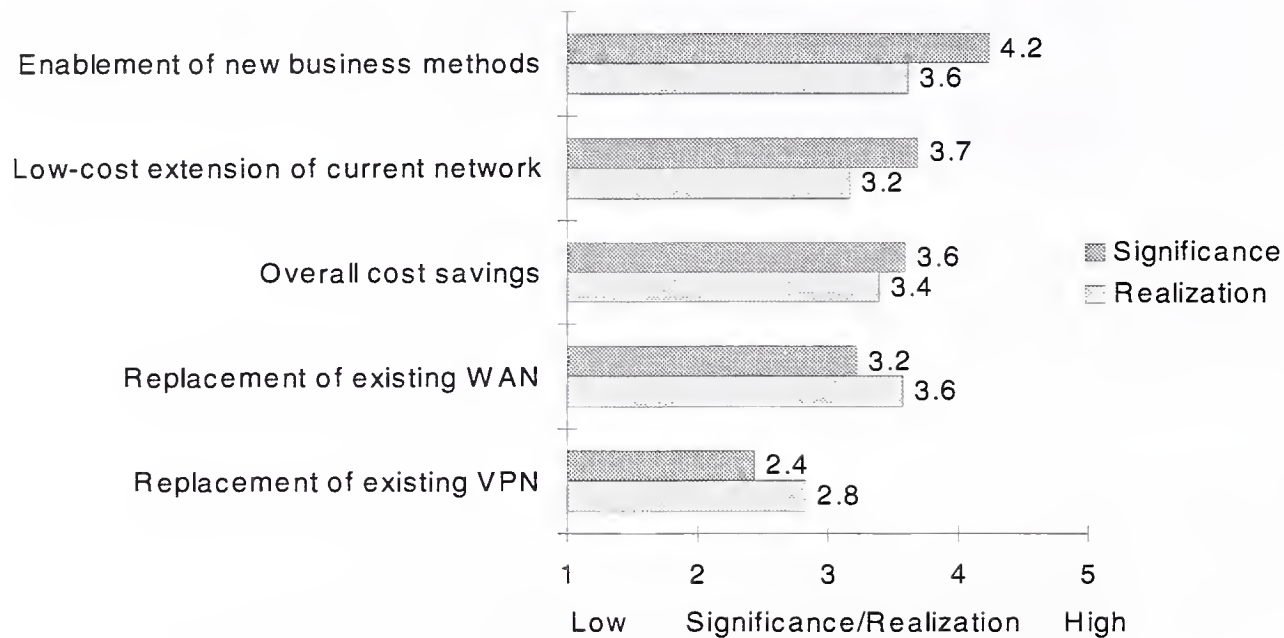
Benefits

Exhibits X-1 to X-3 show how significant buyers regard the benefits of using Extranets and of using ISP-provided Extranet services compared with in-house provision. By far the greatest perceived benefit is inherent to Extranets themselves—without the Internet as a low-cost, open, and ubiquitous network platform, users would not be able to connect to other organizations without costly private and/or proprietary WAN services. By using the Internet to connect their branches and other organizations, new business methods ensue such as low-cost, rapid communication, information sharing, and commerce.

Buyers are less concerned over other potential benefits. Replacement of existing VPNs and WANs is significant for organizations with those services.

Too few European respondents currently use an Extranet service to be able to measure to what degree benefits have been realised, but the significance of potential benefits can be measured.

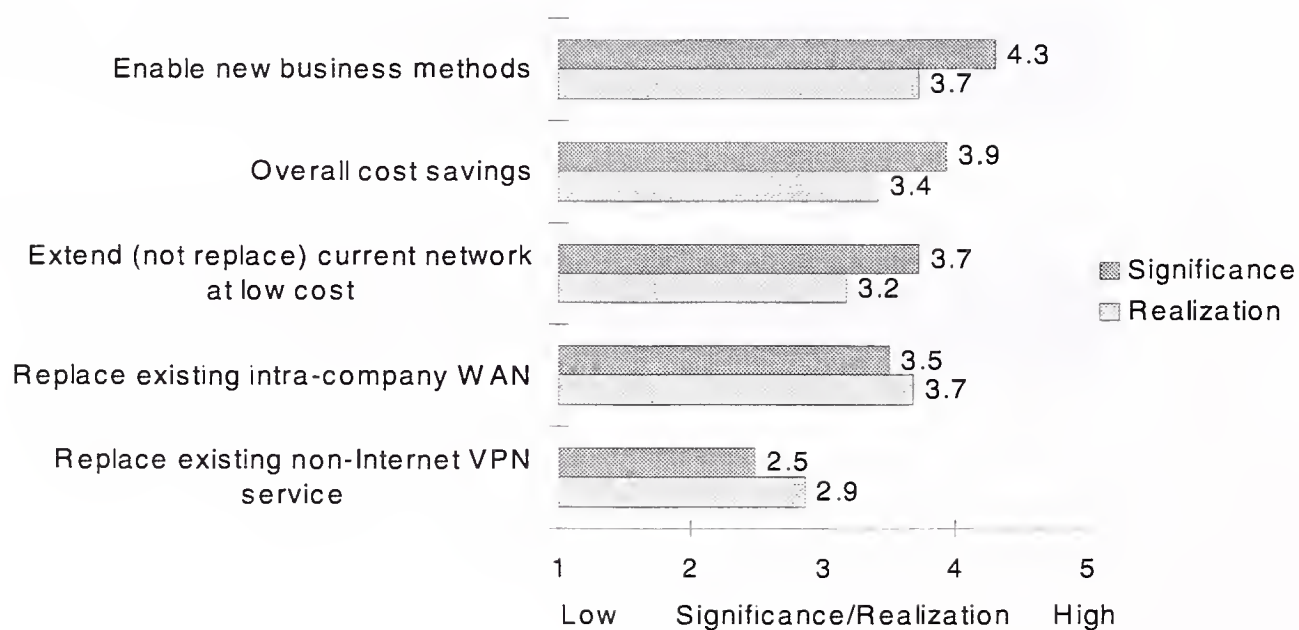
Exhibit X-1

Extranet Service Benefits, Worldwide

Sample: 61

Source: INPUT

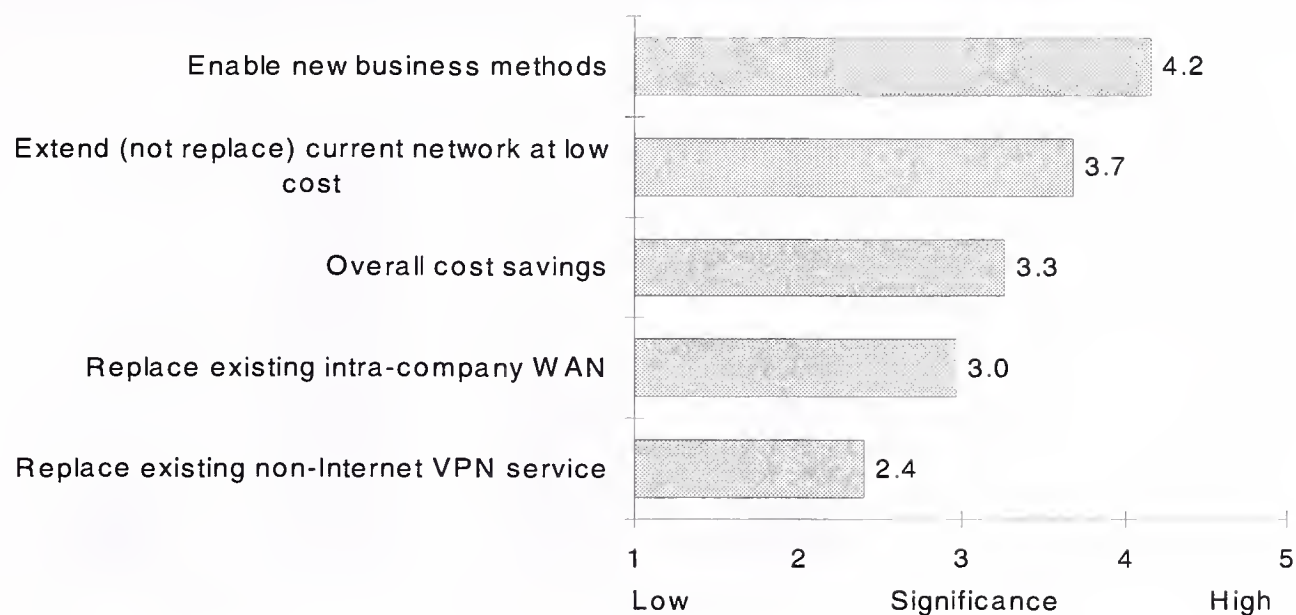
Exhibit X-2

Extranet Service Benefits, US

Sample: 30

Source: INPUT

Exhibit X-3

Extranet Service Benefits, Europe

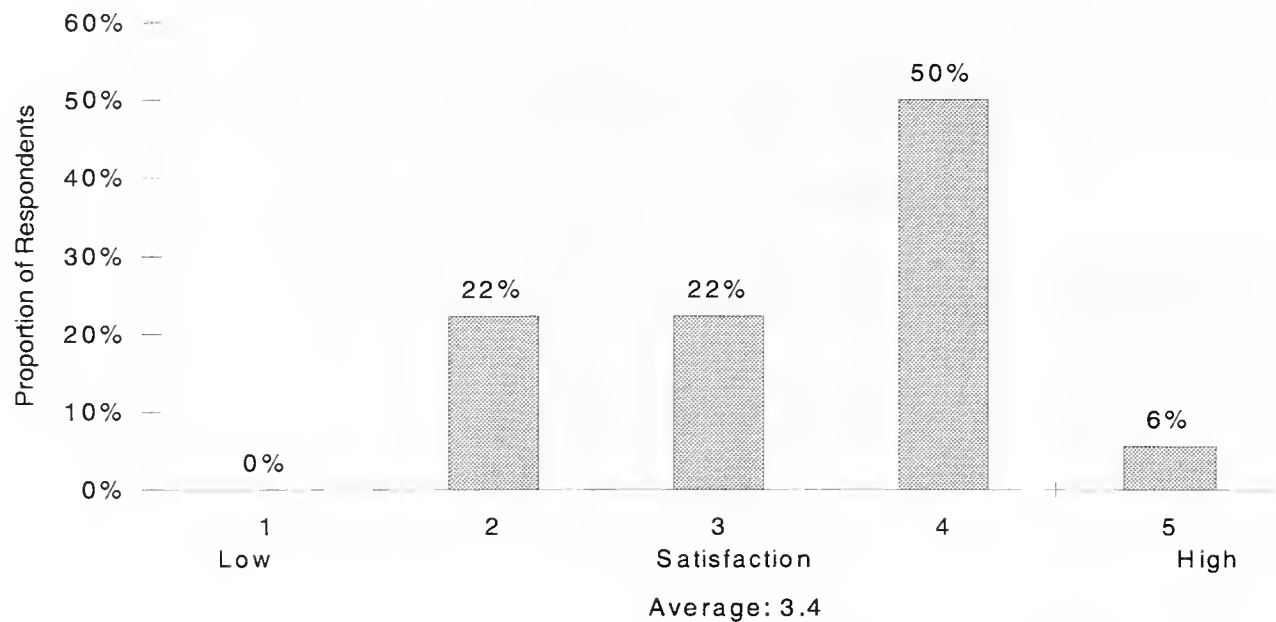
Sample: 31

Source: INPUT

B**Satisfaction**

Only a small number of respondents gave a satisfaction rating to their existing Extranet service; their responses are shown in Exhibit X-4. Overall, buyers are reasonably satisfied with the service they receive.

Exhibit X-4

Overall Satisfaction With Extranet Services

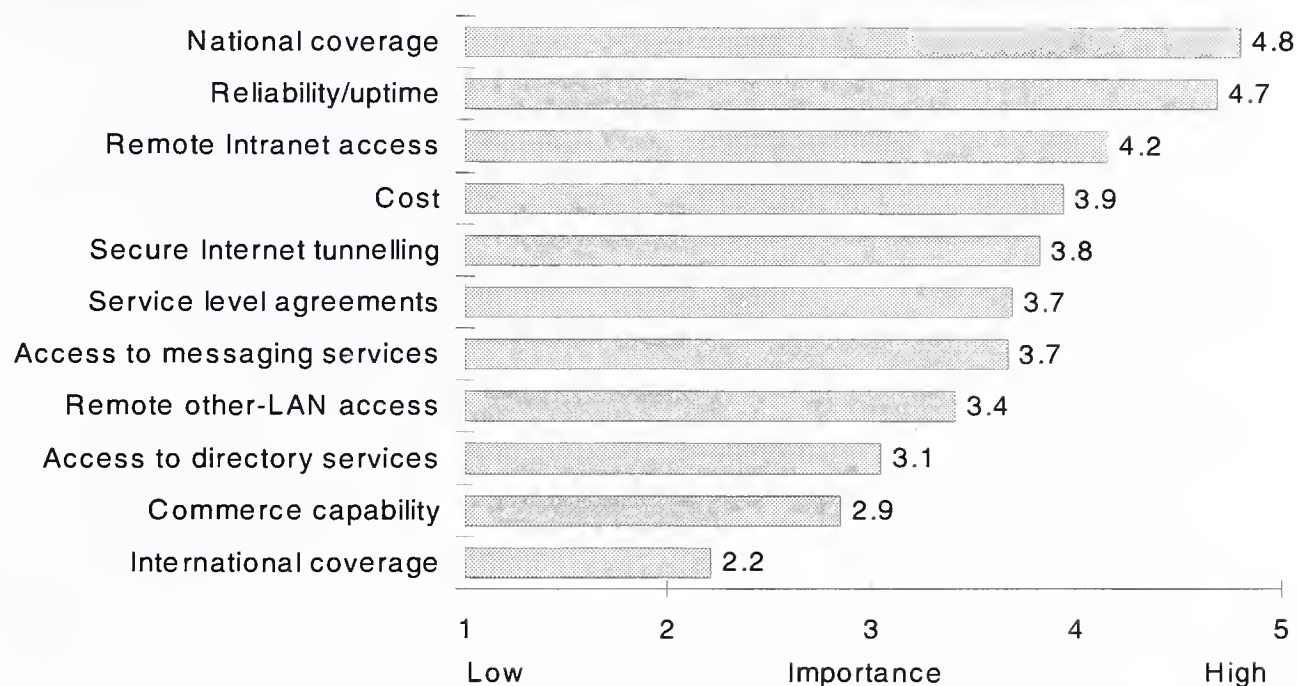
Sample: 18

Source: INPUT

Exhibits X-5 to X-8 show the current and expected future importance of components of an ISP-provided Extranet service. As with Internet access services, reliability and national coverage are of prime importance.

Exhibit X-9 shows the difference between current and future importance. Again, as with Internet access, international coverage will increase greatly in importance, due largely to the expansion of network operations by US respondents overseas. Directory services will increase in importance, although they are considered of lesser importance currently. INPUT believes that directory services will become extremely important for large-scale Intranets connected via an Extranet. Ford Motor Company's is an example of a large-scale Extranet built on directory services, with 200,000 staff and resources stored.

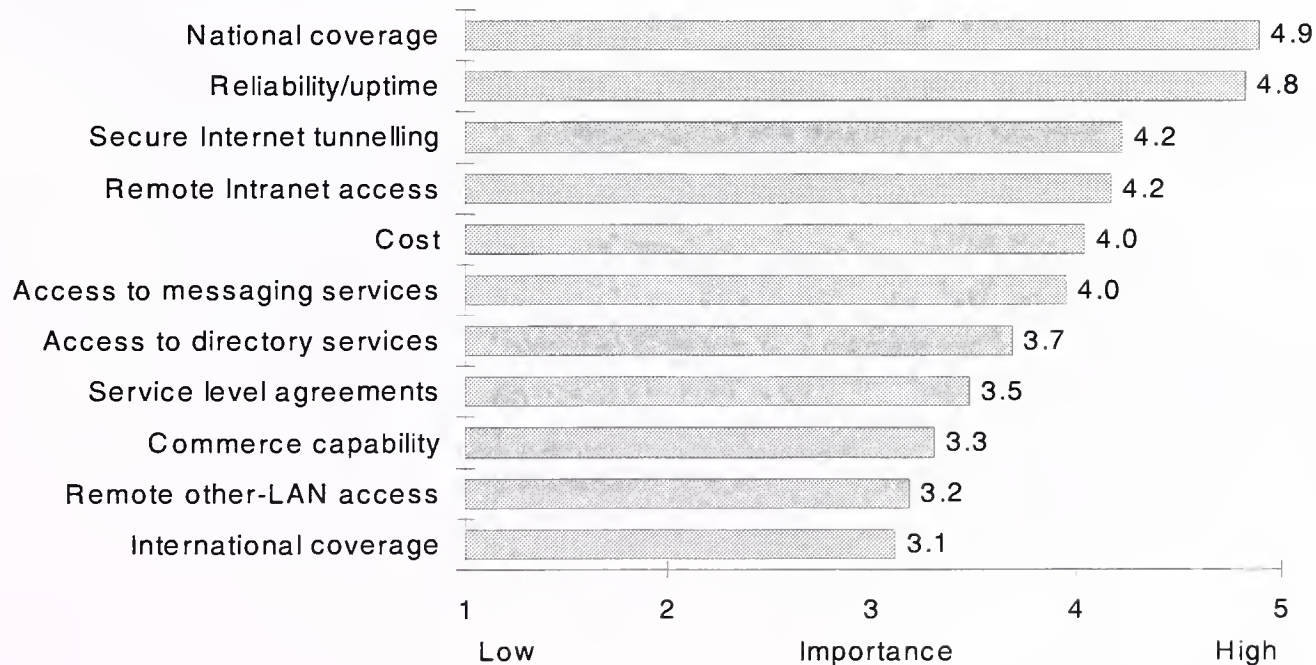
Exhibit X-5

Current Importance of Extranet Service Characteristics, Worldwide

Sample: 20

Source: INPUT

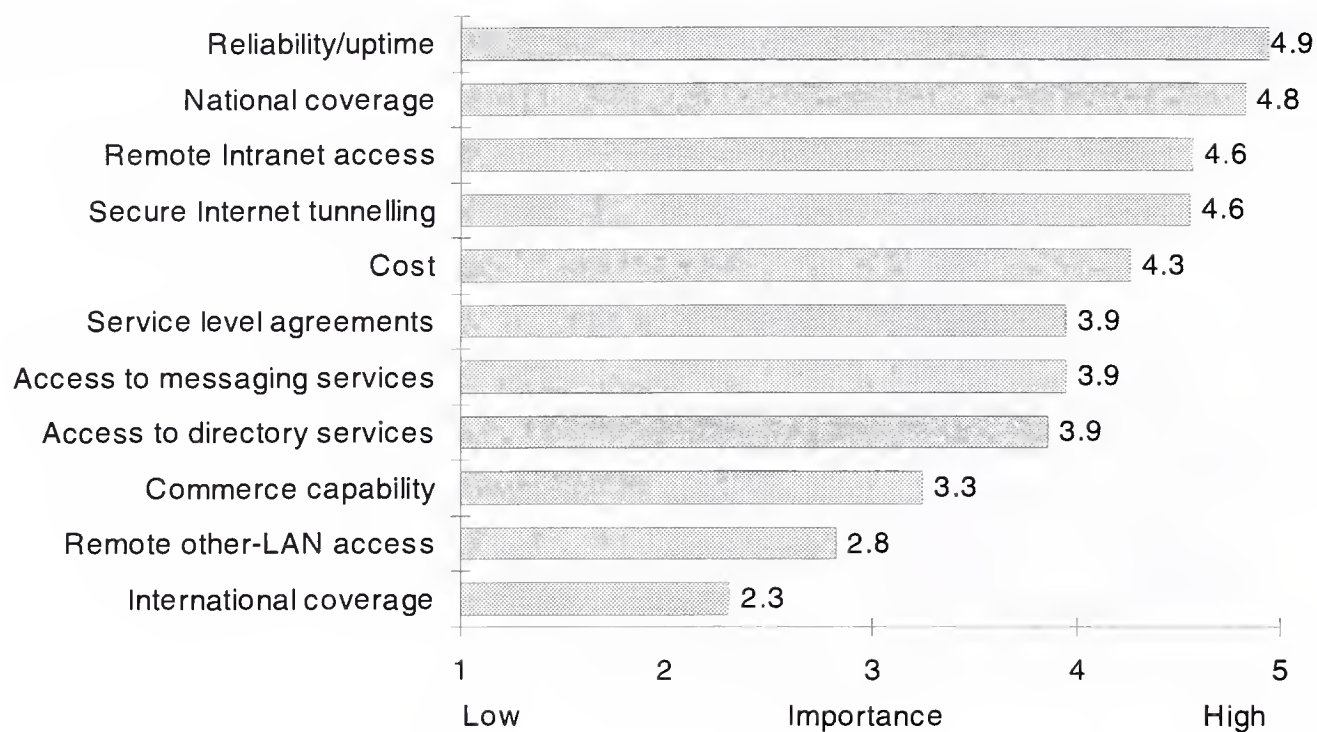
Exhibit X-6

Expected Importance of Extranet Service Characteristics, 2000, Worldwide

Sample: 48

Source: INPUT

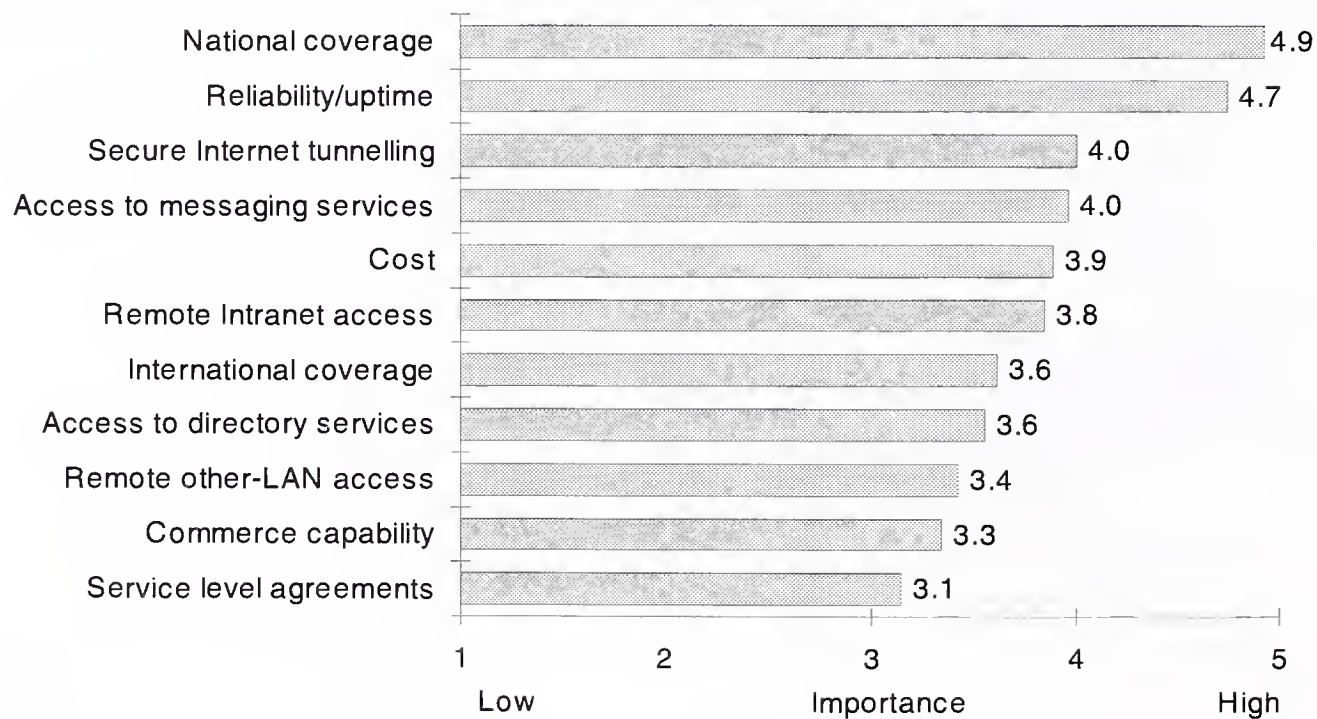
Exhibit X-7

Expected Importance of Extranet Service Characteristics, 2000, US

Sample: 21

Source: INPUT

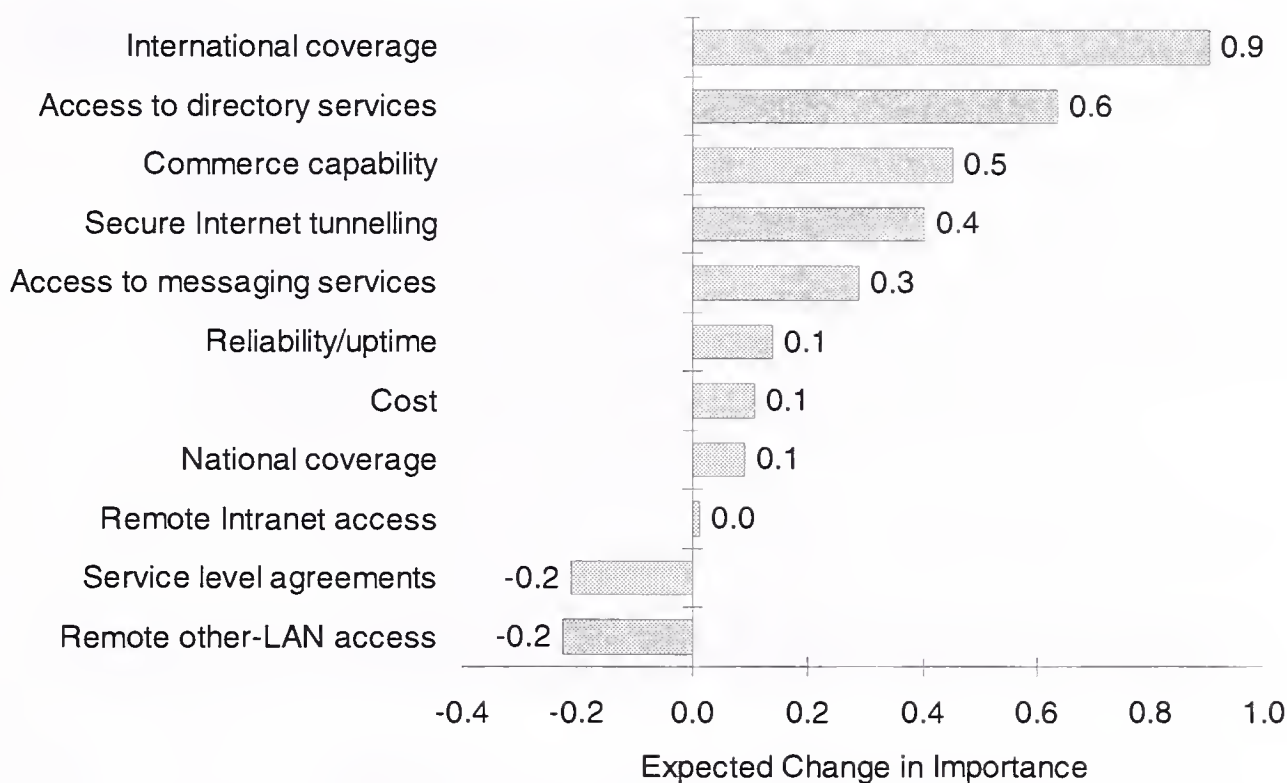
Exhibit X-8

Expected Importance of Extranet Service Characteristics, 2000, Europe

Sample: 27

Source: INPUT

Exhibit X-9

Expected Change in Importance of Extranet Service Characteristics, Worldwide

Sample: 48

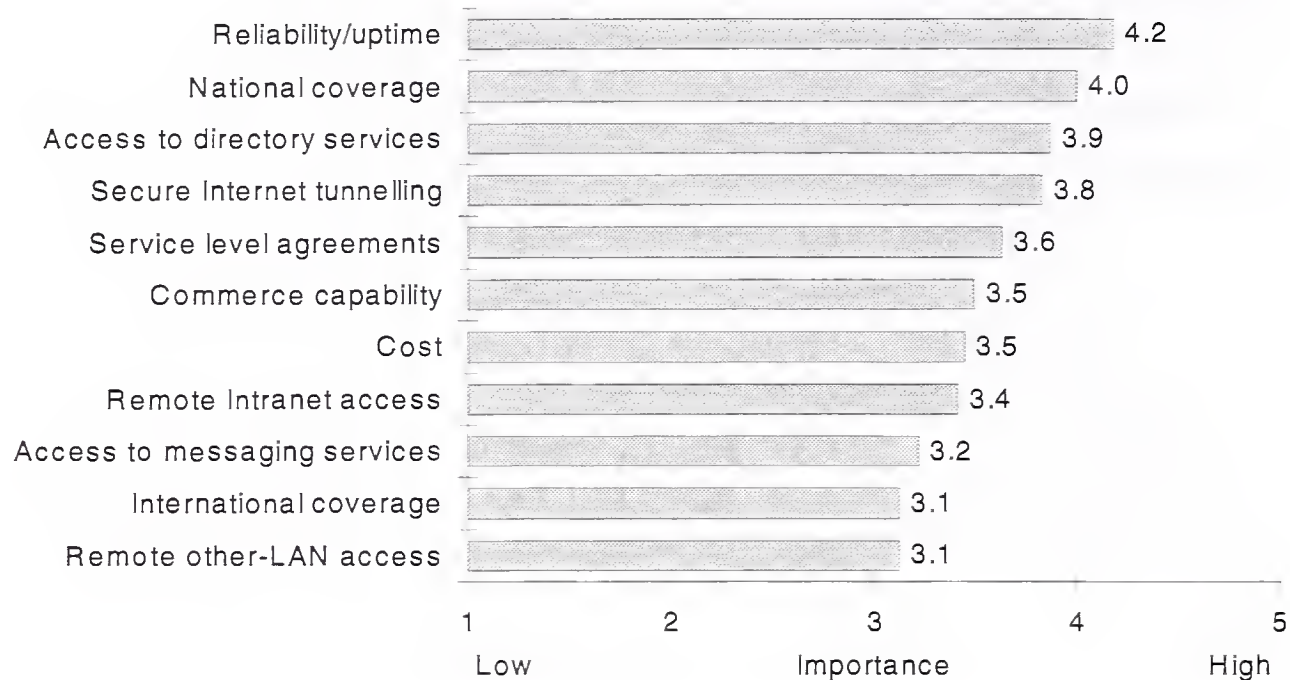
Source: INPUT

Exhibit X-10 shows the satisfaction ratings given to each Extranet service component; Exhibit X-11 shows the difference between satisfaction rating and current importance of component.

The most important characteristics are rated reasonably well, but buyers are currently not satisfied with breadth of international coverage, the issue due to rise most in importance over the next two years.

As discussed above, many Extranet services are restricted to national markets, or are otherwise restricted according to the extent of an ISP's network. Buyers expect to roll out geographically widespread Extranets within the next two years and beyond, and ISPs should ensure suitable coverage. In many cases this will happen through acquisition, furthering ISP market consolidation.

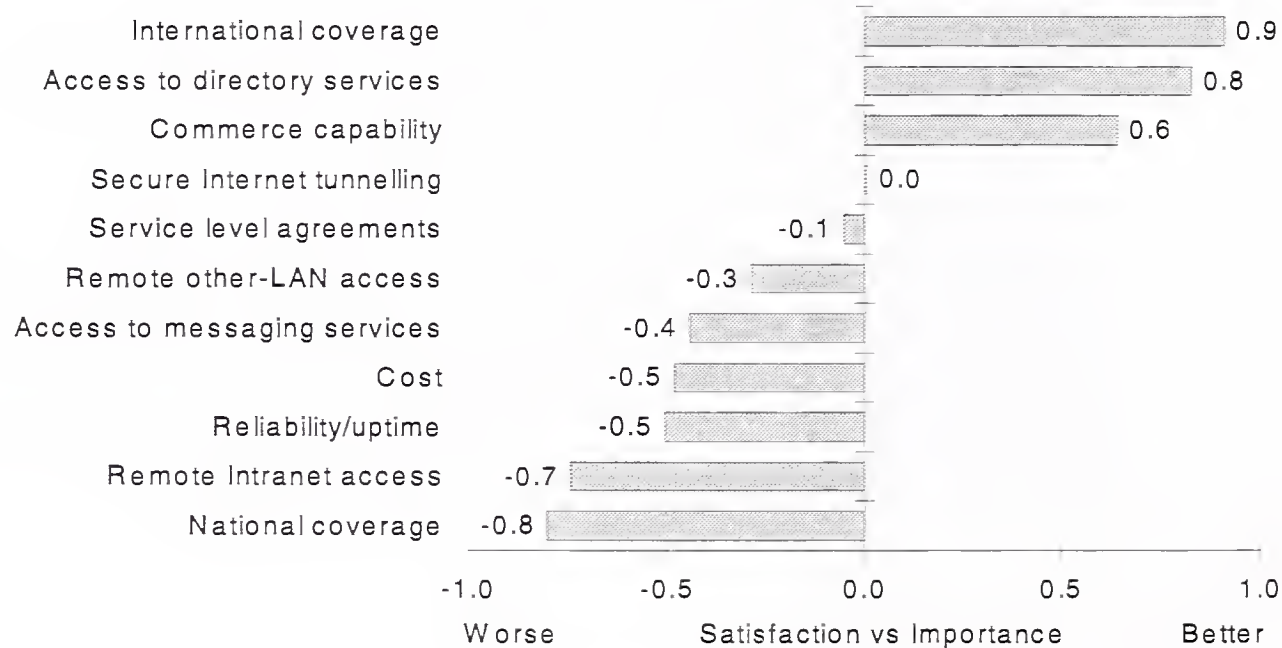
Exhibit X-10

Satisfaction With Extranet Service Characteristics, Worldwide

Sample: 12

Source: INPUT

Exhibit X-11

Difference Between Importance of and Satisfaction With Extranet Service Characteristics, Worldwide

Sample: 20

Source: INPUT

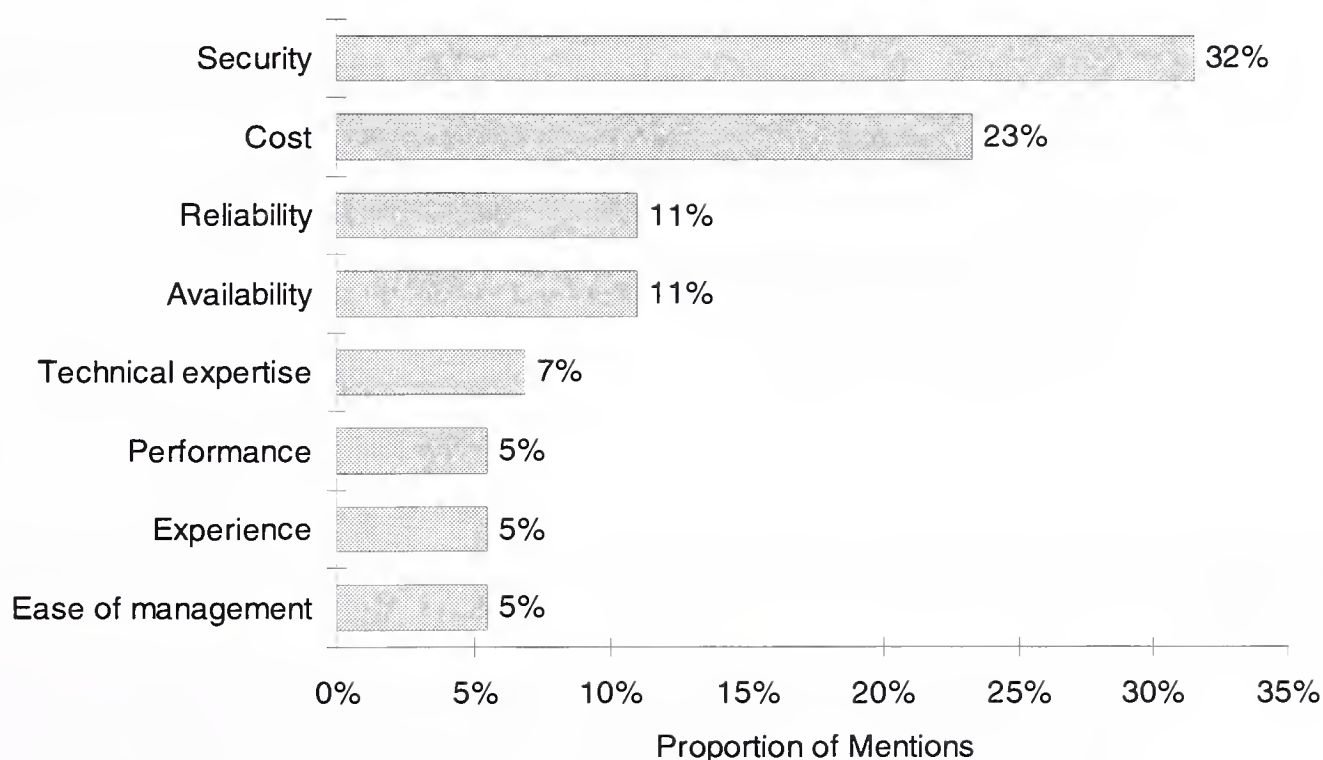
C

Purchasing Criteria

Exhibit X-12 shows the primary criteria used by buyers to purchase Extranet services. Security is a major concern but, surprisingly, issues of reliability and availability were stated by fewer respondents than expected. Unlike other ISP services discussed in this report, cost is a major factor in buyers' purchasing decisions. Extranet service pricing is currently high. As the market for Extranet services matures and more organizations make use of such services, Extranet capability will become a standard component of ISPs' corporate services.

Exhibit X-12

Criteria Used for Purchasing Extranet Services, Worldwide



Sample: 73

Source: INPUT

Other criteria, mentioned by between one and three respondents, were:

- Breadth of services
- Commercial sensitivity

- Credibility
- Customer service
- Commerce capability
- Flexibility
- Functionality
- Geographical coverage
- Integration with an application hosting service
- ISP's stability
- Long term commitment from ISP
- Scalability
- Scope of service access (including partners and remote workers)
- Size of ISP's customer base
- Service level agreements
- Technical advice

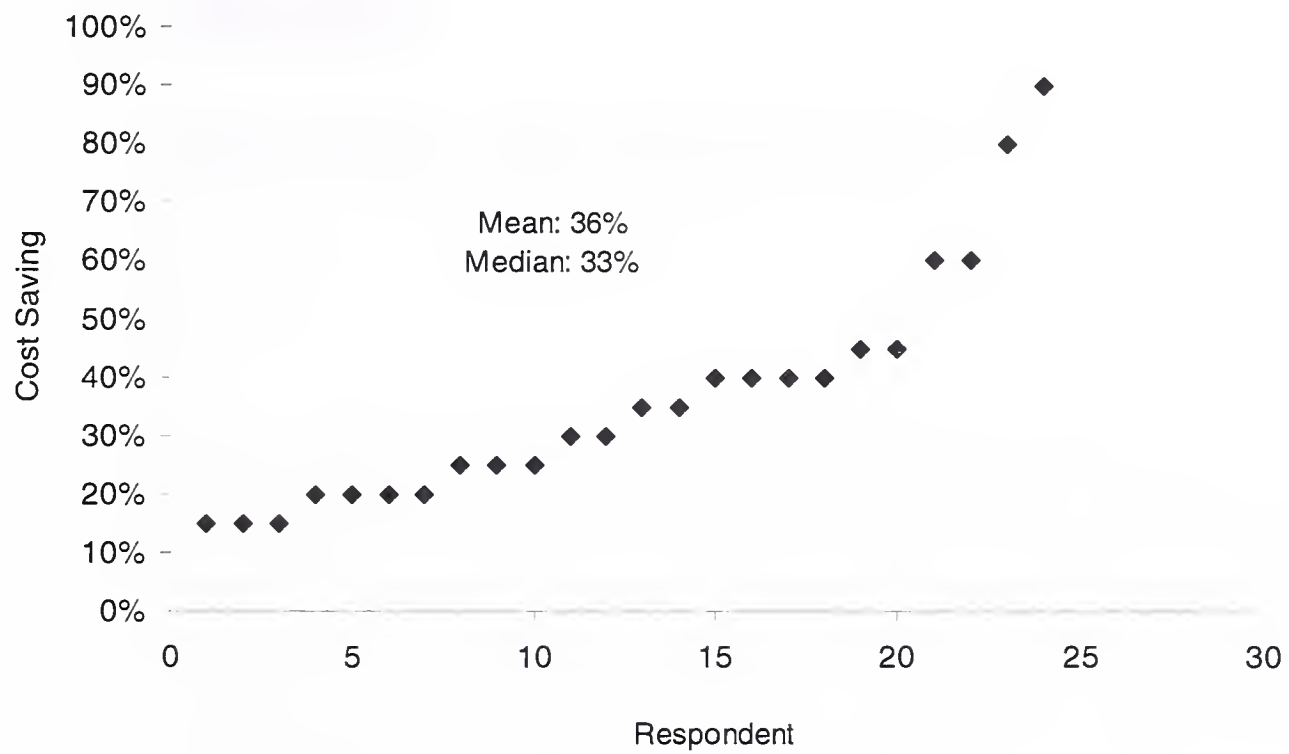
D

Cost Savings

Respondents were asked to state what cost saving they had achieved, or expect to achieve, by replacing a proprietary, non-Internet VPN with an Internet-based Extranet. Exhibit X-13 shows cost savings expressed as a proportion of expenditure on an existing VPN.

Most buyers have achieved, or expect to achieve, cost savings of between 20% and 50%. Cost is a more important factor to buyers for Extranet services than for other ISP services, and is the second most important criterion for purchasing decisions. As shown above, Extranet service pricing will decrease as the market grows, and INPUT expects actual cost savings over existing VPNs to increase.

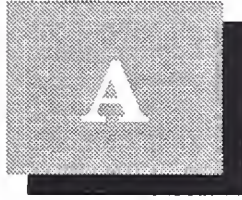
Exhibit X-13

Expected Extranet Cost Savings, Worldwide

Sample: 24

Source: INPUT

(Blank Page)

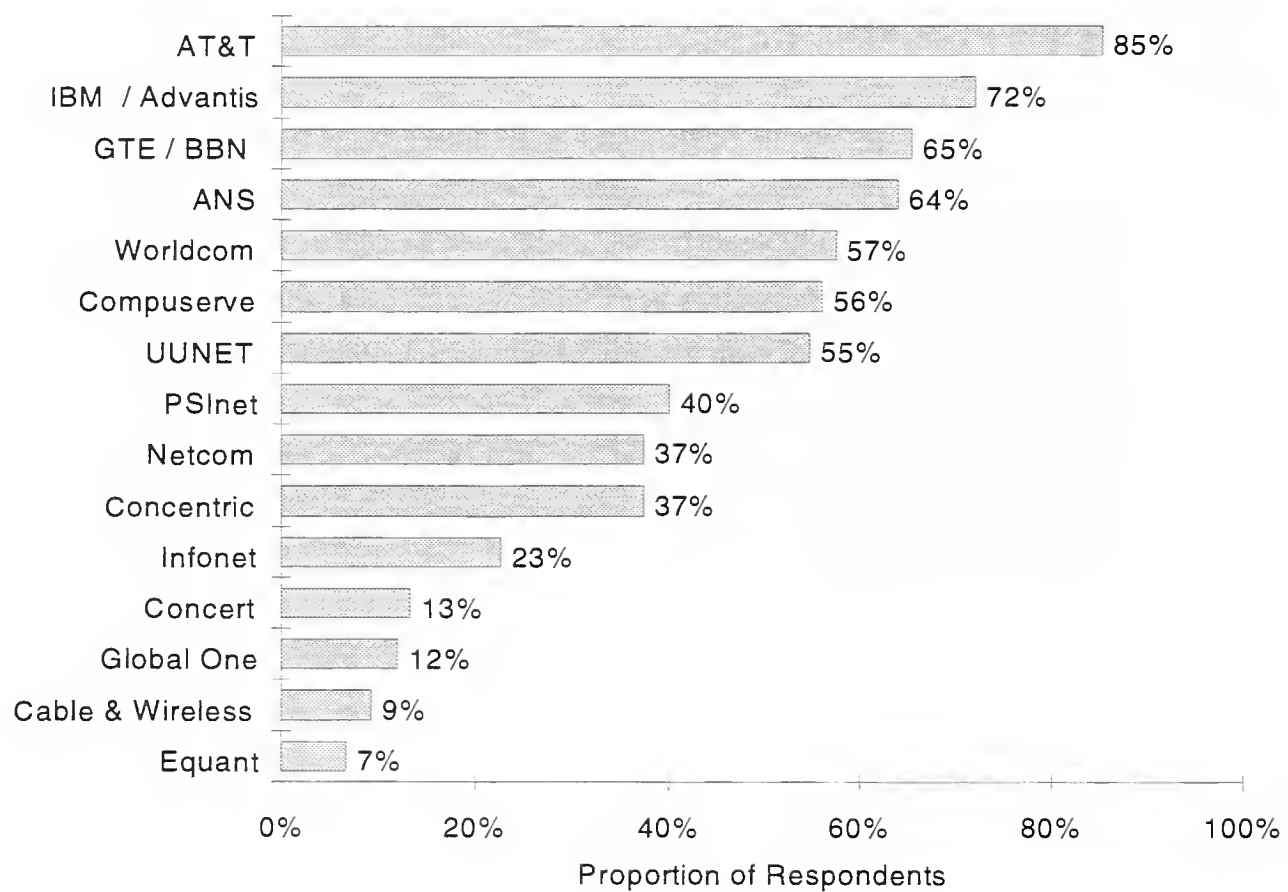


Vendor Awareness

This Appendix shows the visibility of individual ISPs in the four country markets covered in this report: the US, UK, France, and Germany. Respondents were asked which ISPs they recognized as being able to provide high-quality corporate Internet access and related hosting and Extranet services. The results reveal how successful providers have been in promoting their services to buyers in the finance, manufacturing, and retail industries.

A
US

Exhibit A-1

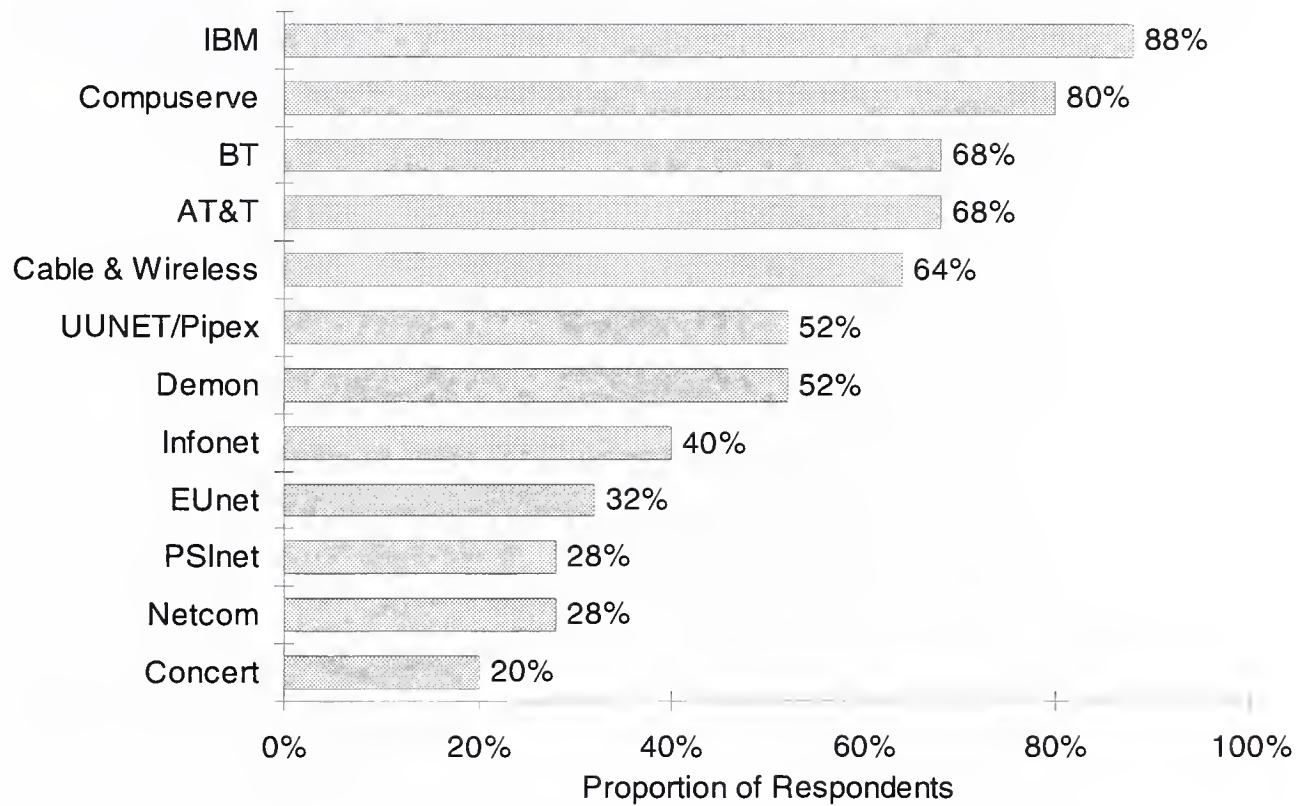
Vendor Awareness, US

Sample: 75

Source: INPUT

B
UK

Exhibit A-2

Vendor Awareness, UK

Sample: 25

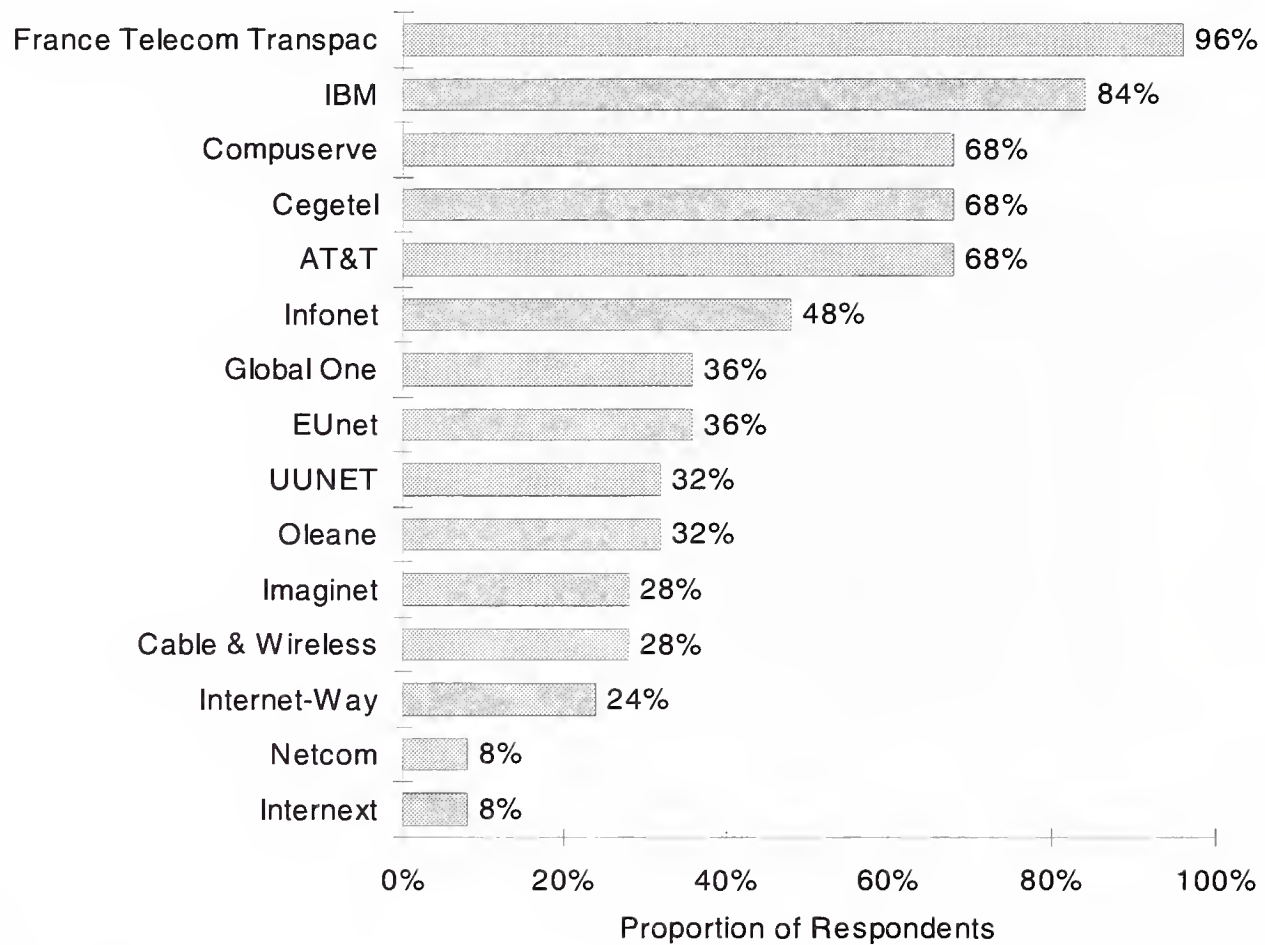
Source: INPUT

C

France

Exhibit A-3

Vendor Awareness, France



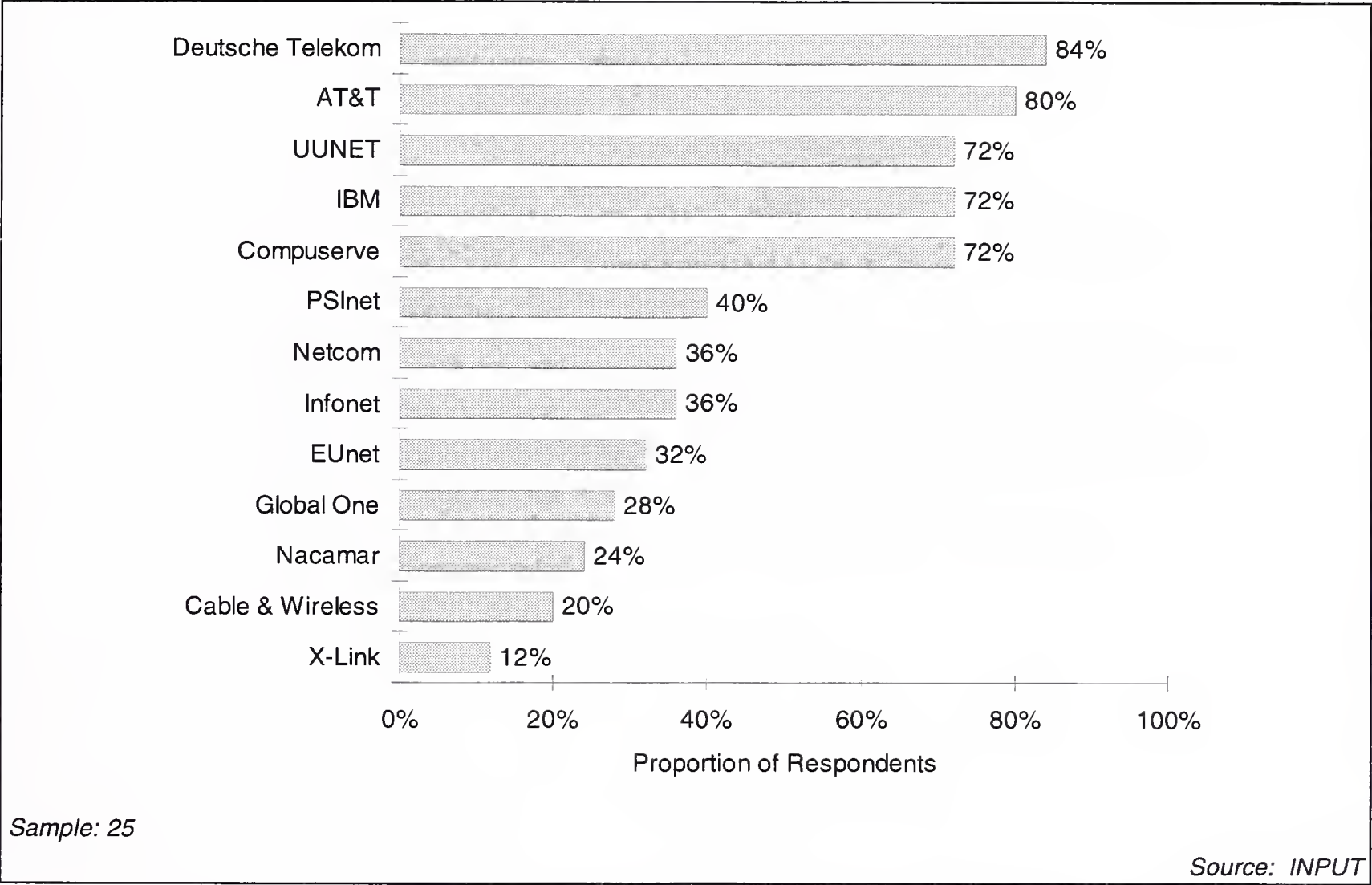
Sample: 25

Source: INPUT

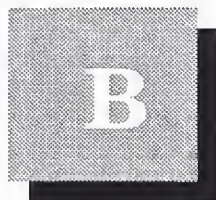
D
Germany

Exhibit A-4

Vendor Awareness, Germany



(Blank Page)



Buyer Questionnaire

This survey is to determine your satisfaction with, and improvements you would like in the provision of Internet access and hosting services.

In this survey, "ISP" is an Internet Service Provider. It can be a dedicated ISP (e.g. UUNET or Netcom), a telco (e.g. BT or AT&T), or a hybrid network services vendor (such as IBM Global Services or Infonet). This survey is concerned only with Internet-based services.

You will be provided with a copy of the results of this survey.

Are you the person who is most able to **evaluate the use of Internet services** on behalf of your organization? If not, to whom should I speak? (Close the interview and contact the specified person)

1. What Internet services do you currently use, and which do you expect to use within two years? **If respondent currently uses a service, then they must also use it in start-2000, unless they explicitly say they expect not to use that service at that time. E.g. Internet access will usually be ticked in both boxes.**

- | | Currently
(start-98) | By start-
2000 |
|--|-------------------------|-------------------|
| a. Internet access | [] | [] |
| <i>Description: a service connecting your company to the Internet via a leased line, ISDN, etc.</i> | | |
| b. Public Web server hosting | [] | [] |
| <i>Description: your company's Web presence is on a server hosted by an ISP. You may rent Web space on a shared server, rent a dedicated server, or own the Web server</i> | | |
| c. Application / database server hosting | [] | [] |
| <i>Description: you rent or own a server (shared or dedicated) hosted by an ISP and used to run one or more applications or databases. May be for public or (more likely) private access. E.g.: your workgroup application or orders database.</i> | | |
| d. Extranet / Internet VPN services | [] | [] |
| <i>Description: a service that connects disperse offices and/or customers / suppliers / partners over the Internet and provides a secured virtual private network (or "tunnel") between them. Can be used for remote LAN access by mobile / home workers as well as for inter-office or inter-company communications. Must be Internet-based, not a private WAN or any non-Internet connection</i> | | |

If respondent does not currently have Internet access, terminate interview.

If respondent ticked fewer than three boxes out of the eight, terminate interview.

A. Characteristics

2. How many people are in your organisation in total? _____

3. What proportion can use email over the Internet? _____ %

4. What proportion have access to the World Wide Web? _____ %

5. Please estimate how much of your network traffic is purely internal and how much goes onto the Internet (count all traffic: incoming and outgoing)

	Currently (start-98)	In two years (start-2000)
a. Stays internal	_____ %	_____ %
b. Goes external	_____ %	_____ %

must total 100%

for each year

6. What proportion of your external traffic do you expect to be accounted for by Internet access via an ISP and how much by private WAN links? (Private WAN includes connections to proprietary EDI and other non-Internet network services)

	Currently (start-98)	In two years (start-2000)
a. Internet	_____ %	_____ %
b. Private WAN	_____ %	_____ %

must total 100%

for each year

B. Internet Access Services

Current and Planned Usage

7. Who is your primary ISP for corporate Internet access?

8. Which other ISPs do you use, if any?

9. What is the total bandwidth between your company and your ISP(s)? (note: must record units, either Mbps (megabits per second) or Kbps (kilobits per second))

a. Currently _____ (Kbps or Mbps?)

b. Expected in one year _____ (Kbps or Mbps?)

c. Expected in two years _____ (Kbps or Mbps?)

10. What level of uptime guarantee do you have from your ISP, and what level do you expect to require in two years' time? (Tick only one box per column)

	Currently (start-98)	By start-2000
a. 100%	[]	[]
b. 99.5% - 100%	[]	[]
c. 99.0 - 99.5%	[]	[]
d. 95% - 99%	[]	[]
e. Under 95%	[]	[]
f. No uptime guarantee	[]	[]
g. Don't know	[]	[]
h. Other (state) _____ (e.g. no more than 4 hours a month downtime)		

11. What level of uptime do you typically achieve per month? (Tick only one)

a. 100%	[]
b. 99.5% - 100%	[]
c. 99.0 - 99.5%	[]
d. 95% - 99%	[]
e. Under 95%	[]
f. Other (state) _____ (e.g. 8 hours a month downtime)	

Satisfaction

12. Overall, how satisfied are you with your current Internet access service (1=unsatisfied, 5=very satisfied)

13. Please rate on a scale of 1 to 5 (1=unimportant, 5=critical) the current and future importance of the following Internet access issues. Please also rate your current satisfaction with your Internet access service (1=unsatisfied, 5=very satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Reliability/uptime	_____	_____	_____
b. Size of ISP's organisation	_____	_____	_____
c. Provides only business services (not consumer)	_____	_____	_____
d. Openness of information (e.g. publishes details of own network and peering agreements)	_____	_____	_____
e. Cost	_____	_____	_____
f. Service level agreements	_____	_____	_____
g. Geographical coverage, national	_____	_____	_____
h. Geographical coverage, international	_____	_____	_____
i. Service continuity (e.g. redundant lines/equipment, backup power generators)	_____	_____	_____

- j. ISP's commitment to improve/upgrade service _____
- k. ISP's customer service _____
- l. Backbone architecture _____

14. In what ways could your Internet access service be improved?

Buying Process

15. Do you expect to change ISP over the next twelve months?

a. Yes []

b. No []

16. If yes, why?

a. _____

And which ISP do you expect to change to (if known)?

b. _____

Costs

17. How are you currently billed for Internet access and which is your preferred billing method? (Tick only one box per column)

	Current	Preferred
a. Flat monthly/quarterly fee	[]	[]
b. Flat annual fee	[]	[]
c. By usage (traffic volume)	[]	[]

C. Hosting Services

Current and Planned Usage

18. Which of the following types of server do you currently host with an ISP, or expect to within two years? (Tick all that apply)

	Currently 2000	By start- (start-98)
a. Public Web server	[]	[]
b. Web commerce server	[]	[]
c. Private Intranet server	[]	[]
d. Application or database server	[]	[]
<i>state application / database, e.g. Lotus Notes, SAP</i> _____		

If respondent ticked any box for a or b, do section C.1 Web Hosting Services

If respondent ticked any box for c or d, do section C.2 Application/Database Hosting Services

C.1 Web Hosting Services

This section is only for services relating to ISP hosting of public Web servers (e.g. www.companyname.com).

19. What type of Web hosting service do you currently use, and which do you expect to use in two years' time? (Tick all that apply)

	Currently (start-98)	By start-2000
a. Shared (you share a ISP's server with other customers)	[]	[]
b. Dedicated (you rent a whole ISP's server)	[]	[]

- c. Owned (aka co-located) ☐ ☐
(you own the server and the ISP hosts it)

20. For the servers hosted on your ISP's network, who performs the following (Tick only one per row)

- | | You, remotely
via internet | You, on
ISP's site | ISP |
|--|-------------------------------|--------------------------|--------------------------|
| a. System management
<i>(e.g. operating system upgrades)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Application management
<i>(e.g. database configuration)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Content management
<i>(e.g. database entry, Web site updates)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Routine physical operations
<i>(e.g. maintenance, hardware upgrades)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

21. For the same categories, which is most desirable to your company (Tick only one per row)

- | | You, remotely
via internet | You, on
ISP's site | ISP |
|--|-------------------------------|--------------------------|--------------------------|
| a. System management
<i>(e.g. operating system upgrades)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Application management
<i>(e.g. database configuration)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Content management
<i>(e.g. database entry, Web site updates)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Routine physical operations
<i>(e.g. maintenance, hardware upgrades)</i> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Benefits

22. How significant to your company are the following potential benefits of Web hosting services compared with in-house Web server provision (1=insignificant, 5=extremely significant). If you currently use hosting services, to what extent have those benefits been realised (1=not realised, 5=completely realised)

	Significance	Realisation
a. Cost saving	_____	_____
b. Reduce network traffic	_____	_____
c. Reduce internal IT management/admin	_____	_____
d. Stronger security	_____	_____
e. Swifter problem resolution	_____	_____
f. Increased functionality (eg commerce)	_____	_____
g. Increased resilience/redundancy	_____	_____
h. Other _____	_____	_____
i. Other _____	_____	_____
j. Other _____	_____	_____

Satisfaction

23. Overall, how satisfied are you with your current ISP's Web hosting services (1=unsatisfied, 5=very satisfied)

24. Please rate on a scale of 1 to 5 (1=unimportant, 5=critical) the current and future importance of the following Web server hosting issues. Please also rate your current satisfaction with your hosting service (1=unsatisfied, 5=very satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Reliability/uptime	_____	_____	_____
b. Cost	_____	_____	_____
c. ISP's flexibility <i>(responsiveness to changing requirements)</i>	_____	_____	_____
d. Service level agreements	_____	_____	_____
e. Service continuity <i>(e.g. redundant machines, hot disk swapping)</i>	_____	_____	_____
f. Physical security <i>(security of machine and site)</i>	_____	_____	_____
g. Application/data security <i>(e.g. authentication, firewall)</i>	_____	_____	_____
h. Bandwidth to/from server	_____	_____	_____
i. ISP liability <i>(ISP is liable for security breaches, etc.)</i>	_____	_____	_____
j. Server scalability/upgradability_____		_____	_____
k. Server mirror/replication	_____	_____	_____

- a. Setup costs _____
- b. Ongoing annual costs _____

C.2 Application/Database Hosting Services

This section is only for services relating to ISP hosting of applications or databases - such as a Lotus Notes server or a private company database accessed by staff via the Internet. The application or database may be public or (more likely) private.

31. What type of application/database hosting service do you currently use, and which do you expect to use in two years' time? (Tick all that apply)

	Currently (start-98)	By start-2000
a. Shared (<i>you share a ISP's server with other customers</i>)	<input type="checkbox"/>	<input type="checkbox"/>
b. Dedicated (<i>you rent a whole ISP's server</i>)	<input type="checkbox"/>	<input type="checkbox"/>
c. Owned (aka co-located) (<i>you own the server and the ISP hosts it</i>)	<input type="checkbox"/>	<input type="checkbox"/>

32. For the servers hosted on your ISP's network, who performs the following (Tick only one per row)

	You, remotely via internet	You, on ISP's site	ISP
a. System management (<i>e.g. operating system upgrades</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- | | | | |
|---|-----|-----|-----|
| b. Application management
(e.g. database configuration) | [] | [] | [] |
| c. Content management
(e.g. database entry, Web site updates) | [] | [] | [] |
| d. Routine physical operations
(e.g. maintenance, hardware upgrades) | [] | [] | [] |

33. For the same categories, which is most desirable to your company
(Tick only one per row)

- | | | | |
|---|-------------------------------|-----------------------|-----|
| | You, remotely
via internet | You, on
ISP's site | ISP |
| a. System management
(e.g. operating system upgrades) | [] | [] | [] |
| b. Application management
(e.g. database configuration) | [] | [] | [] |
| c. Content management
(e.g. database entry, Web site updates) | [] | [] | [] |
| d. Routine physical operations
(e.g. maintenance, hardware upgrades) | [] | [] | [] |

Benefits

34. How significant to your company are the following potential benefits of application/database hosting services compared with in-house server provision (1=insignificant, 5=extremely significant). If you currently use hosting services, to what extent have those benefits been realised (1=not realised, 5=completely realised)

	Significance	Realisation
a. Cost saving	_____	_____
b. Reduce network traffic	_____	_____
c. Reduce internal IT management/admin	_____	_____
d. Stronger security	_____	_____
e. Swifter problem resolution	_____	_____
f. Increased functionality (eg commerce)	_____	_____
g. Increased resilience/redundancy	_____	_____
h. Ability to share application with other offices	_____	_____
i. Other _____	_____	_____
j. Other _____	_____	_____
k. Other _____	_____	_____

Satisfaction

35. Overall, how satisfied are you with your current ISP's application/database hosting services (1=unsatisfied, 5=very satisfied)

36. Please rate on a scale of 1 to 5 (1=unimportant, 5=critical) the current and future importance of the following application/database server hosting issues. Please also rate your current satisfaction with your hosting service (1=unsatisfied, 5=very satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Reliability/uptime	_____	_____	_____
b. Cost	_____	_____	_____
c. ISP's flexibility (responsiveness to changing requirements)	_____	_____	_____

- | | | | |
|---|-------|-------|-------|
| d. Service level agreements | _____ | _____ | _____ |
| e. Service continuity
(e.g. redundant machines, hot disk swapping) | _____ | _____ | _____ |
| f. Physical security
(security of machine and site) | _____ | _____ | _____ |
| g. Application/data security
(e.g. authentication, firewall) | _____ | _____ | _____ |
| h. Bandwidth to/from server | _____ | _____ | _____ |
| i. ISP liability
(ISP is liable for security breaches, etc.) | _____ | _____ | _____ |
| j. Server scalability/upgradability | _____ | _____ | _____ |
| k. Server mirror/replication | _____ | _____ | _____ |

37. In what ways could your ISP's application/database hosting service be improved?

Buying Process

38. Please list the most important criteria you use when seeking application/database hosting services

39. Do you use the same provider for application/database hosting as you do for corporate Internet access?

- a. Yes []
- b. No []

40. If no, why? Which ISP do you use for hosting?

Costs

41. If you have used application/database hosting services, how much did (or would) the same application cost to set up and run in-house? How much does it cost to run the application using an ISP hosting service? Include all related hardware, software, labour and communications costs.

In-house:

- a. Setup costs _____
- b. Ongoing annual costs _____

ISP Hosting Service:

- a. Setup costs _____
- b. Ongoing annual costs _____

D. Extranet / VPN Services

Current and Planned Usage

42. If you have an Internet-based Extranet/VPN service, what does/will it include now and in two years' time? (Tick all that apply)

	Currently (start-98)	By start-2000
a. Secure Internet tunnelling	[]	[]
b. Access to corporate messaging services	[]	[]
c. Access to corporate directory services	[]	[]

- | | | |
|-----------------------------------|--------------------------|--------------------------|
| d. Remote Intranet access | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Remote non-Intranet LAN access | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Commerce capability | <input type="checkbox"/> | <input type="checkbox"/> |

43. If you have not implemented, or do not intend to implement an Internet-based Extranet/VPN, why not? (Tick all that apply)

- | | |
|---|--------------------------|
| a. Too expensive | <input type="checkbox"/> |
| b. No need for any kind of Extranet/VPN | <input type="checkbox"/> |
| c. Satisfied with existing non-Internet VPN | <input type="checkbox"/> |
| d. Security concerns | <input type="checkbox"/> |
| e. No suitable services available | <input type="checkbox"/> |
| f. Market is immature | <input type="checkbox"/> |
| g. Haven't considered it yet | <input type="checkbox"/> |
| h. Other (state) _____ | |

44. What is, or would be the most appropriate method of implementing Extranets/VPNs within your company, now and in two years' time (Tick only one per column)

- | | Currently
(start-98) | By start-2000 |
|--|--------------------------|--------------------------|
| a. Use non-Internet carrier service | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Use Internet-based ISP service | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Implement yourself using off-the-shelf products | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Implement yourself using inhouse-developed products | <input type="checkbox"/> | <input type="checkbox"/> |

45. Which of the following do you currently, or plan to, include in a Internet-based Extranet/VPN (Tick all that apply - if respondent ticks a category for 1998, it must also be ticked for 2000, unless respondent states otherwise)

	Currently (start-98)	By start-2000
Corporate headquarters	[]	[]
Branch offices	[]	[]
Remote users (mobile/home workers)	[]	[]
Business partners	[]	[]
Suppliers	[]	[]
Customers	[]	[]

Benefits

46. How significant to your company are the following potential benefits of an Internet-based VPN/Extranet (1=insignificant, 5=extremely significant). If you have implemented already, to what extent have those benefits been realised (1=not realised, 5=completely realised)

	Significance	Realisation
a. Cut existing costs	_____	_____
b. Replace existing intra-company WAN	_____	_____
c. Replace existing non-Internet VPN service	_____	_____
d. Extend (not replace) current network at low cost	_____	_____
e. Enable new business methods (e.g. <i>electronic commerce, remote working</i>)	_____	_____
f. Other _____	_____	_____
g. Other _____	_____	_____
h. Other _____	_____	_____

Satisfaction

47. Overall, how satisfied are you with your ISP's Internet-based Extranet/VPN service (1=unsatisfied, 5=very satisfied) (if applicable)

48. In relation to Internet-based Extranet/VPN services, how important are the following issues to your company (1=unimportant, 5=critical), now and in two years. If you already have such a service, how satisfied are you with each issue (1=not satisfied, 5=highly satisfied)

	Importance now	Importance in two years	Current satisfaction
a. Secure Internet tunnelling	_____	_____	_____
b. Access to messaging services	_____	_____	_____
c. Access to directory services	_____	_____	_____
d. Remote Intranet access	_____	_____	_____
e. Remote non-Intranet LAN access	_____	_____	_____
f. Commerce capability	_____	_____	_____
g. Geographical coverage, national	_____	_____	_____
h. Geographical coverage, international	_____	_____	_____
i. Cost	_____	_____	_____
j. Reliability/uptime	_____	_____	_____
k. Service level agreements	_____	_____	_____

49. In what ways could your Internet-based Extranet/VPN service be improved (if applicable)?

- a. Setup costs _____
- b. Ongoing annual costs _____

56. Overall, what cost saving have you, or do you expect you could achieve by replacing your non-Internet VPN with an Internet-based Extranet/VPN? (state as percentage)

_____ %

E. Vendor Awareness

57. How well do you perceive the following ISPs are able to provide high-quality corporate Internet access and related services such as Web hosting and Extranet services (1=poorly able, 5=highly able)

If respondent is not aware of a vendor's services, state "N"

Use the relevant country list

US

- a. ANS _____
- b. AT&T _____
- c. Cable & Wireless _____
- d. Compuserve _____
- e. Concentric _____
- f. Concert _____
- g. Equant _____
- h. Global One _____
- i. GTE Internetworking / BBN _____
- j. IBM / Advantis _____
- k. Infonet _____
- l. Netcom _____

m. PSInet _____

n. UUNET _____

o. Worldcom _____

UK

a. AT&T _____

b. BT _____

c. Cable & Wireless _____

d. Compuserve _____

e. Concert _____

f. Demon Internet _____

g. EUnet _____

h. IBM _____

i. Infonet _____

j. Netcom _____

k. PSInet _____

l. UUNET/Pipex _____

France

a. AT&T _____

b. Cable & Wireless _____

c. Cegetel _____

d. Compuserve _____

- e. EUnet _____
- f. France Telecom Transpac _____
- g. Global One _____
- h. Imaginet _____
- i. IBM _____
- j. Infonet _____
- k. Internet-Way _____
- l. Internext _____
- m. Netcom _____
- n. Oleana _____
- o. PSInet _____
- p. UUNET _____
- Germany
- a. AT&T _____
- b. Cable & Wireless _____
- c. CompuServe _____
- d. Deutsche Telekom _____
- e. EUnet _____
- f. Global One _____
- g. IBM _____
- h. Infonet _____
- i. Netcom _____
- j. PSInet _____

- k. UUNET _____
- l. X-Link _____
- m. NACAMAR _____

F. Budgets

58. Please estimate your company's annual expenditure on the following.

	Currently (start-98)	By start-2000
a. Total IT budget	_____	_____
b. Internet access	_____	_____
c. Hosting services	_____	_____
d. Internet-based Extranet/VPN services	_____	_____

Thank you for your time and consideration.

(Blank Page)

