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IP LAN Telephony: Probing the Shift in Market Demand



January, 2002

A Primary Research Study by

InfoTech

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TABLE of CONTENTS

	Page
1. EXECUTIVE SUMMARY.....	6
Market Demand Has Shifted.....	6
Implementation Timeframe Has Also Shifted.....	6
Enterprises Decision-Makers Are Cautiously Optimistic.....	7
Enterprise Demand is Bi-Modal.....	7
Data Decision-Makers Leading the Charge at Mid-Sized Businesses	8
Implementation Methods May Be Converging.....	8
Existing Phones Are Still In the Mix in 2005	9
Early Implementers Seem Satisfied.....	9
PBX Vendors/Distributors Have the Inside Track	10
Forecast Projects Major Growth Opportunities	10
2. INTRODUCTION AND METHODOLOGY	11
Objectives	11
Background on Implementation Alternatives	13
Primary Research Methodology.....	15
Research Extensions.....	17
Project Leadership.....	17
3. ANALYSIS OF ENTERPRISE MARKET DEMAND.....	18
Analyzing IP LAN Telephony Market Demand Among Enterprises	18
Prioritizing Key Decision Factors Affecting Implementation	27
Quantifying the Market Demand for IP-enabled Applications	32
Evaluating the Results of Initial Implementations	36
Assessing Changes in Spending on Telecom and Data Networking	40
Comparing Preferences in Suppliers.....	43
4. ANALYSIS OF MID-SIZE BUSINESS MARKET DEMAND.....	46
Analyzing IP LAN Telephony Market Demand Among Mid-Sized Businesses	46
Prioritizing Key Decision Factors Affecting Implementation	51
Quantifying the Market Demand for IP-enabled Applications	52
Comparing Preferences in Suppliers.....	56
5. MARKET FORECAST FOR IP LAN TELEPHONY: 2000-2006	58
Forecast Methodology	58
Market Forecasts	61

LIST of EXHIBITS

	Page
1 Implementation Method: IP-Enabled.....	13
2 Implementation Method: IP-Centric	14
3 Distribution of Enterprises Interviewed	15
4 Distribution of Mid-Sized Businesses Interviewed.....	16
ENTERPRISE MARKET	
5 Timeframe to Begin Implementing IP LAN Telephony	18
6 Likelihood of Implementing IP LAN LAN Telephony	19
7 Market Demand by Size of Enterprise.....	20
8 Market Demand by Size of Site.....	21
9 Market Demand by Industry Segment.....	22
10 Composition of Decision Makers.....	23
11 Market Demand by Type of Decision Maker.....	24
12 Market Demand by Data Decision Maker Within Site Size Segment.....	25
13 Market Demand by Voice Decision Maker Within Site Size Segment.....	26
14 Rationale for Implementing Decisions	27
15 Changes In Implementation Plans During 2001	28
16 Importance Rating of Reasons for Implementation Changes.....	29
17 Likelihood of Major Upgrade to Data Network Infrastructure	30
18 Importance Rating of Decision Factors to Upgrade Corporate WAN	31
19 Market Demand for Messaging Applications	32
20 Market Demand for Collaboration Applications.....	33
21 Market Demand for Personal Productivity Applications.....	34
22 Market Demand for Customer Service Applications.....	35
23 Evaluation of Initial Implementation Results vs. Expectations	36
24 Evaluation of Potential Benefits	37
25 Decisions Regarding Further Implementation	38
26 Were Initial Systems Worth What Paid For?	39
27 Changes in Spending on Telecom and Data Networking	40
28 Changes in Spending by Early Implementers	41
29 Changes in Spending by Type of Decision Maker	42
30 Preferred Supplier for Providing Implementation Support	43
31 Decision Maker Preferences for Supplier Support.....	44
32 International Market Demand for IP LAN Telephony.....	45
MID-SIZED BUSINESS MARKET	
33 Timeframe to Begin Implementing IP LAN Telephony.....	46
34 Likelihood of Implementing IP LAN Telephony	47

35 Market Demand by Size of Site.....	48
36 Market Demand by Size of Business	49
37 Market Demand by Type of Decision Maker	50
38 Rationale for Implementation Decisions	51
39 Market Demand for Messaging Applications	52
40 Market Demand for Collaboration Applications.....	53
41 Market Demand for Personal Productivity Applications.....	54
42 Market Demand for Customer Service Applications.....	55
43 Preferred Supplier for Providing Implementation Support	56
44 Decision Maker Preferences for Supplier Support	57
FORECASTS	
45 Market Forecast by Line Size Segment.....	61
46 Market Forecast by Implementation Method.....	62
47 Projected Mix of Phones Installed in 2005.....	63
48 Market Forecast by Company Size Segment	64
49 Market Forecast IP LAN Telephony vs. Traditional CPE.....	65
50 Equipment Revenue: IP LAN Telephony vs. Traditional CPE.....	66
51 Total Revenue Mix: IP LAN Telephony vs. Traditional CPE	67

1. EXECUTIVE SUMMARY

Market Demand Has Shifted

325 enterprises and mid-sized businesses participated in this year's study to assess the potential market demand for IP LAN Telephony. These systems, in which IP phones are connected directly to a LAN, are designed to either replace or transform the current circuit-switched business phone systems. 65% of the participants represented enterprises, with between 500 and 100,000 employees. The other 35% were mid-sized businesses with 100 to 500 employees. Based on primary research conducted during the 3^d quarter of 2001, the market demand has shifted significantly compared to our research from the previous year. Our key measure of market demand is the percent of sites that are "Very Likely" to implement IP LAN Telephony within the next four years. The following table illustrates how the market demand has shifted during the past year.

<u>Comparison of Market Demand</u>	<u>2000 Study</u>	<u>2001 Study</u>
• Enterprise (Ent) Sites	42%	34%
• Mid-Sized Business (MSB) Sites	14%	22%
• Ent Sites – Voice Decision-maker	25%	33%
• Ent Sites – Data Decision-maker	62%	34%

Implementation Timeframe Has Also Shifted

Another key indicator of market acceptance is the percentage of companies that have begun to implement this new technology. In our previous study, conducted during the 3^d quarter of 2000, over half of the enterprises and almost a quarter of mid-sized businesses expected to have begun implementing IP LAN Telephony by the end of 2001. As indicated in the following table, those estimates were not achieved. However, the projected adoption curve for the end of 2002, is even more optimistic, despite the shortfall in 2001.

<u>% of Companies Implementing</u>	<u>2000 Study</u>	<u>2001 Study</u>
• Enterprises by end of 2001	55%	42%
• MSB by end of 2001	23%	21%
• Enterprises by end of 2002	74%	77%
• MSB by end of 2002	49%	49%

Enterprises Decision-Makers Are Cautiously Optimistic

Over 60% of the enterprise decision-makers Agreed or Strongly Agreed with the following statement: *The decision to implement IP LAN Telephony is no longer a question of “if we should do it”, but is now a question of “when we should do it”.* However, only 43% were in agreement with this assertion: *IP LAN Telephony offers lower Total Cost of Ownership than traditional PBXs.* So some of the decline in enterprise market demand can be attributed to the uncertainty regarding the business case for this new technology. The equipment vendors have just recently begun to respond to this issue by developing sales tools that can now calculate TCO and ROI for IP LAN Telephony. The slumping economic environment and the resulting declines in corporate IT spending have also contributed to the lower market demand. Consequently, enterprise decision-makers have strongly endorsed “migration” rather than “replacement”, as reflected in the 68% agreement level on this perspective: *Adding IP Telephony Gateway cards to our existing PBXs is a cost effective method for migrating to IP LAN Telephony.* It is not surprising that 78% of the voice decision-makers shared that opinion, but even 59% of the data networking decision-makers support that viewpoint.

Enterprise Demand is Bi-Modal

Among the enterprises that participated in this study, the strongest demand occurs at their largest sites. Almost half of these locations with more than 1,000 phones were considered “Very Likely” to implement IP LAN Telephony within the next four years. Due to the large investment in these high-end systems, the most likely implementation method will be to IP-enable the existing PBX, by inserting IP Telephony gateway cards for interfacing with IP phones on the LAN. Enterprises also exhibited strong demand at their smallest sites, those with fewer than 40 phones. Almost 40% of these small locations were rated “Very Likely”. In this case, the preferred implementation method will be to install media gateways at these small sites and connect them over the corporate IP Wide Area Network (WAN) to Call Processing servers and Application servers located at larger central sites. This networked approach enables these small sites to access the same telephony features and communications applications as the larger locations in the enterprise. And this can be done without installing complete IP LAN Telephony systems or Key Telephone systems at these remote sites.

At the mid-range sites of these enterprises, locations with 41 to 1,000 phones, the market demand is much lower, with only 17% of these sites viewed as “Very Likely” to implement IP LAN Telephony. This may be a reflection of uncertainty whether to IP-enable the existing PBXs or hold off and implement LAN-based telephony systems when the PBXs are scheduled to be replaced.

Data Decision-Makers Leading the Charge at Mid-Sized Businesses

40% of the Mid-Sized Business decision-makers that participated in this study were responsible for data networking. Although they represented only 23% of all of the sites in this market segment, their companies accounted for almost half of the "Very Likely" sites for IP LAN Telephony. They gave the "Very Likely" rating to 45% of their sites, while the voice decision-makers gave that designation to only 15% of their sites. Over 70% of the data decision-makers Agreed or Strongly Agreed with the following statement: *The decision to implement IP LAN Telephony is no longer a question of "if we should do it", but is now a question of "when we should do it".* This compares with 57% of their voice counterparts. Over 70% of the data network managers and executives also agreed that: *IP LAN Telephony offers lower Total Cost of Ownership than traditional PBXs.* Only 29% of the voice decision-makers shared that positive outlook. The telecom managers did achieve the highest rating on one opinion question. Over 80% of them agreed with the view that: *Adding IP Telephony Gateway cards to our existing PBXs is a cost-effective method for migrating to IP LAN Telephony.* However, this response may be aimed more at protecting their turf than endorsing IP LAN Telephony. Surprisingly, 64% of the data networking decision-makers also agreed with the IP Telephony gateway approach.

Implementation Methods May Be Converging

There are two methods of implementing IP LAN Telephony:

- IP-Enabled
- IP-Centric

Under the IP-Enabled method, IP Telephony gateway cards can be added to existing PBXs, which will enable them to interface with IP phones and soft phones connected to local and remote LANs. This approach provides enterprises with the option to preserve much of their investment in digital and analog phones, and the corresponding line and trunk circuit cards. Under the IP-Centric method, the PBX is replaced with a communications server, which executes the call processing software. This method has been perceived as essentially a pure-IP approach, whereby all of the existing phones are replaced by IP phones or soft phones in which the PC serves as the phone. However, the IP-Centric approach does utilize gateways with voice interface cards to support analog devices, such as fax machines and basic analog phones. Gateways are also used by IP-Centric systems to connect to the PSTN (public-switched telephone network) via either analog or digital trunks. Some IP-Centric systems also provide digital gateways that enable these LAN-based systems to support proprietary digital phones. Thus, gateways may allow an existing PBX to be IP-enabled and then migrate to a full IP-Centric architecture, while preserving a significant amount of the original investment.

Existing Phones Are Still In The Mix In 2005

The participants in this study were asked to project what the mix of phones would be across all of the IP LAN Telephony systems that they were likely to implement by 2005. In the case of IP-Enabled systems, these users were expecting to retain 63% of their existing digital and analog phones. 20% of the stations would be IP phones and another 9% would employ Softphone software that would enable them to use their PCs as their phones. Soft phone users would also have the option to attach a standard handset or headset to their PC. The remaining 8% of the users anticipate the availability of wireless IP phones operating over a wireless LAN.

In the case of IP-Centric systems, the mix would essentially be reversed. 62% of the sets would be IP phones, 15% Softphones, and 6% wireless. But even with IP-Centric systems, the users indicated that they would expect to retain 17% of their existing phones.

Early Implementers Seem Satisfied

About one-fourth of the enterprise participants in this study had completed their initial implementation of IP LAN Telephony systems. Over half of these early implementers indicated that these initial systems were "Worth What Paid For". 32% said they were analyzing this issue. Only 16% gave a negative response to that question. These enterprises were also asked whether the cost saving and other benefits met or exceeded their expectations. 63% said they did, but 37% said that they did not. This is another reflection of the uncertainty that exists on whether IP LAN Telephony will reduce their Total Cost of Ownership.

On the positive side, almost 40% of these initial implementers have committed to purchase additional systems, and one-third have selected their primary equipment vendor for these systems. 28% noted that they had made a final decision on the overall architecture that they would employ, including the IP WAN infrastructure that connects their sites. However, only 6% had made their decision on the implementation rollout schedule for additional systems. This reinforces the conclusion that for many of these companies it is no longer a question of "If"; it is now a question of "When"?

These early implementers also indicated whether the capabilities of the system and support met their expectations. In general, the capabilities of the systems received high marks. 85% stated that Voice Quality met or exceeded their expectations, and 80% noted that they were satisfied with System Reliability and System Scalability. The lowest satisfaction ratings came in the category of support. In almost 40% of the cases, the expertise and support of the equipment vendors did not meet expectations. VARs and distributors scored even lower with 45% dissatisfaction in this support category. It is clear that all of the vendors and their channels need to improve their skills in this critical area.

PBX Vendors/Distributors Have the Inside Track

On the important subject of support, all of the participants in the study were asked which of the following types of suppliers they would prefer to use to support them in implementing IP LAN Telephony.

- Current PBX vendor or distributor
- Current data network equipment vendor or VAR
- Other – Systems Integrator, Service Provider or New Convergence VAR

Half of the enterprise telecom managers and 40% of the IT executives (CIO, CTO, CFO) preferred their current PBX vendor or distributor. Surprisingly, the data network managers gave the PBX vendor/distributors an even greater vote of confidence at 60%, compared to only one-third that opted for their current data network equipment vendor/VAR. The fact that the majority of the data decision-makers would prefer the PBX vendor/distributor indicates one of two possibilities.

- They feel that their VAR has very little expertise in Telephony
- Their current PBX distributor also is supporting the IP LAN Telephony system of the leading data networking vendor

Forecast Projects Major Growth Opportunities

The forecast for IP LAN Telephony was derived from an analysis of the market demand from our primary research, and then extrapolating that to the overall U.S. market using InfoTech's database model of the complete installed base of CPE (customer premises equipment). This database, called *InfoTrack for Enterprise Communications*, tracks quarterly shipments in the various line size segments. *InfoTrack* also provides a five-year forecast of CPE line shipments and the overall installed base.

For the year 2001, InfoTrack is projecting total shipments of 1.5 million IP station lines in the U.S. That represents 12% of the total CPE lines shipped in this year, excluding shipments of very small key systems with up to 10 phones. By 2006, shipments of IP station lines are expected to grow to more than 7 million, accounting for half of the total line shipments in that year. This represents a compound annual growth rate of 37% per year. During that same time period, line shipments of traditional CPE are projected to decline by 8% per year.

The IP-Centric model will account for between 65 and 75% of the total station lines shipped. However, existing terminals, which make up the majority of the stations on IP-Enabled systems, are not included in the shipment projections, but are included in the installed base totals. In 2005, we project that the installed base of IP LAN Telephony station lines will be split equally between IP-Centric and IP-Enabled systems.

2. INTRODUCTION AND METHODOLOGY

Objectives

This is the third consecutive year in which InfoTech has published an extensive primary research study on the IP LAN Telephony market. As a result, we are not only able to assess the market demand, but we are also able to analyze the changes in demand and the reasons for those changes.

There are a number of market conditions that are different this year that could have an affect on demand. The 2001 study attempted to assess the impact of these conditions:

- The downturn in the economy has caused companies to constrain their spending on IT and Telecom
- The market for traditional PBXs was down 15% in 2001 and shipments of Key/Hybrid systems were off by more than 25%
- Over 40% of enterprises have already begun implementing IP LAN Telephony, compared to only 16% a year ago
- Decision-makers are getting some first-hand experience regarding the potential impact of IP LAN Telephony on Total Cost of Ownership (TCO)
- Equipment vendors have begun to provide sales tools that help customers evaluate the TCO and ROI of this technology
- The major PBX vendors, who had been late to enter this market, have all made major product introductions this past year and have begun to ship significant quantities of these systems
- Equipment vendors are putting more emphasis on the value of their distributed network architectures that enable an IP LAN Telephony system at one site to serve users on remote LANs at other sites
- A significant number of enterprises have completed their initial implementations and system evaluations and are now beginning to make architectural decisions that could lock them in to a single vendor
- Early implementers of this new technology have been critical of the expertise and support capabilities of equipment vendors and their channel partners
- IP-enabled applications are beginning to emerge that could drive enterprises to deploy IP-based networked applications

The 2001 primary research study on IP LAN Telephony was designed to answer the following questions:

- What is the current market demand and how has it changed during the last 12 months?
- How will the U.S. market demand grow between now and 2005?
- Are the adoption curves for IP LAN Telephony ahead of or behind earlier projections?

- How does the demand vary between enterprises and mid-sized businesses?
- Which market segments show the greatest demand, within such segment categories as size of the system (number of phones) and industry markets)?
- What are the major differences in market outlook between *voice* decision-makers and *data* decision-makers and what impact are they likely to have on the market?
- What are the factors that will influence the customer decision regarding the method of implementing IP LAN Telephony?
- What are the primary decision criteria that will drive the market demand?
- What is the market demand for IP-enabled applications?
- Which type of supplier is preferred for supporting the implementation of IP LAN Telephony?
- Which type of supplier is preferred for IP WAN supporting and other professional services related to IP LAN Telephony?
- What is the 5-year forecast for this market?
- How does the market forecast vary by line-size segment?
- How does the forecast vary between enterprise, mid-sized, and small business segments?
- How does the market forecast vary by implementation method?
- How does the revenue forecast for equipment compare with the forecast for applications?
- To what extent have businesses changed their implementation plans for 2002 and why?
- Will implementing IP LAN Telephony require the enterprise to undergo a major upgrade of their existing LAN and/or WAN?
- What impact will the growth of IP-enabled applications have on plans for upgrading the corporate WAN?
- What lessons have been learned by the initial implementers of this new technology?
- To what extent are the initial implementers satisfied with the capabilities of these new systems?
- To what extent are the initial implementers satisfied with the support capabilities of the suppliers of these new systems?
- To what extent are the initial implementers satisfied with the potential savings and productivity benefits of these new systems?
- To what extent are the initial implementers making commitments to purchase additional systems?
- How does the spending on Telecom and Data Networking in 2001 compare with 2000?
- How does the projected spending on Telecom and Data Networking in 2002 compare with 2001?
- What product categories will have the biggest increase or biggest decrease in Telecom and Data Network spending?
- How do the spending patterns of initial implementers compare with the overall enterprise average?

Background on Implementation Alternatives

There are two methods of implementing IP LAN Telephony:

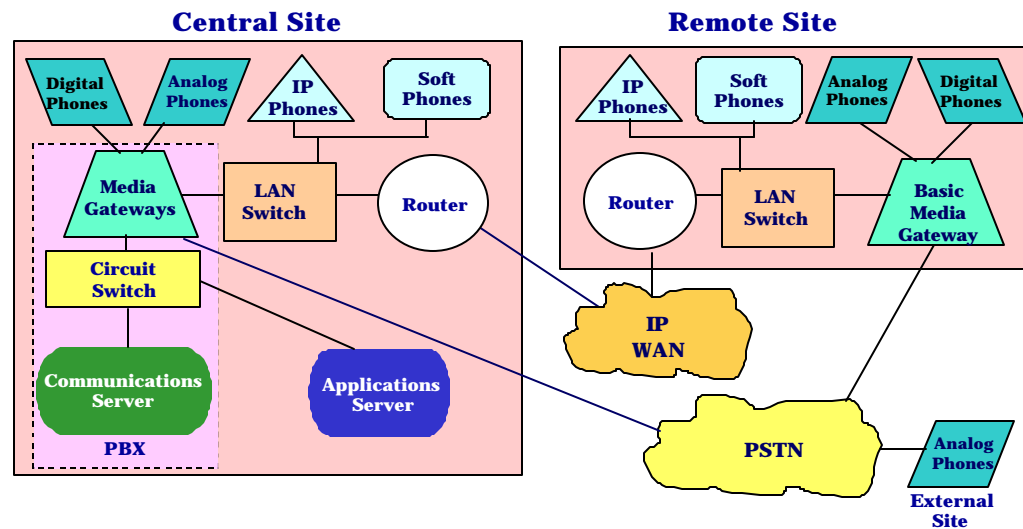
- IP-Enabled
- IP-Centric

Under the IP-Enabled method, IP Telephony gateway cards can be added to existing PBXs, which will enable them to interface with IP phones and soft phones connected to local and remote LANs. This approach provides enterprises with the option to preserve much of their investment in digital and analog phones, and the corresponding line and trunk circuit cards. Thus, gateways may allow an existing PBX to be IP-enabled and then migrate to a full IP-Centric architecture, while preserving a significant amount of the original investment.

As shown in Exhibit 1, an IP-enabled system at a central site can support users at a remote site, without having to install communications servers and applications servers at the remote site. Media gateways are installed at the remote site to provide connectivity to the PSTN, so that local calls do not have to be back-hauled over the IP WAN to the central site.

Since all of the call processing is performed at the central site, the remote site would be unable to make calls if the IP WAN were disabled or congested. Consequently, the remote site requires a set of telephony features for survivability purposes. In this example, that software is located in the Basic Media Gateway.

Exhibit 1
Enterprises
Implementation Method: IP-Enabled



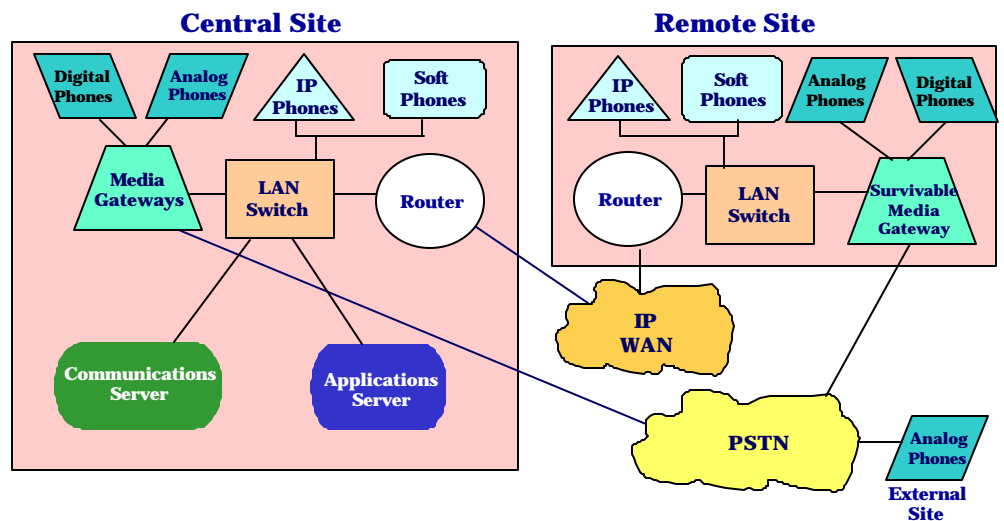
Source: InfoTech: End-user Primary Research, 2001

Under the IP-Centric method, the PBX is replaced with a communications server, which executes the call processing software. This method has been perceived as essentially a pure-IP approach, whereby all of the existing phones are replaced by IP phones or soft phones in which the PC serves as the phone. However, the IP-Centric approach does utilize gateways with voice interface cards to support analog devices, such as fax machines and basic analog phones. Gateways are also used by IP-Centric systems to connect to the PSTN (public-switched telephone network) via either analog or digital trunks. Some IP-Centric systems also provide digital gateways that enable these LAN-based systems to support proprietary digital phones.

In Exhibit 2, the call processing for the remote site is also performed at the central site. Therefore the remote site requires survivable telephony software. In this example, that software is located in the Survivable Media Gateway. This could provide a more robust set of telephony features than the Basic Media Gateway in Exhibit 1. In some IP-Centric implementations the survivable telephony software may be located in the router or the LAN switch.

In some cases, PBX architectures that are highly modular and have robust and powerful media gateways, the circuit switch module could be eliminated. That would allow existing PBX users to implement the IP-enabled method and then migrate to the IP-Centric method, while preserving much of their original investment

Exhibit 2
Enterprises
Implementation Method: IP-Centric



Source: InfoTech: End-user Primary Research, 2001

Primary Research Methodology

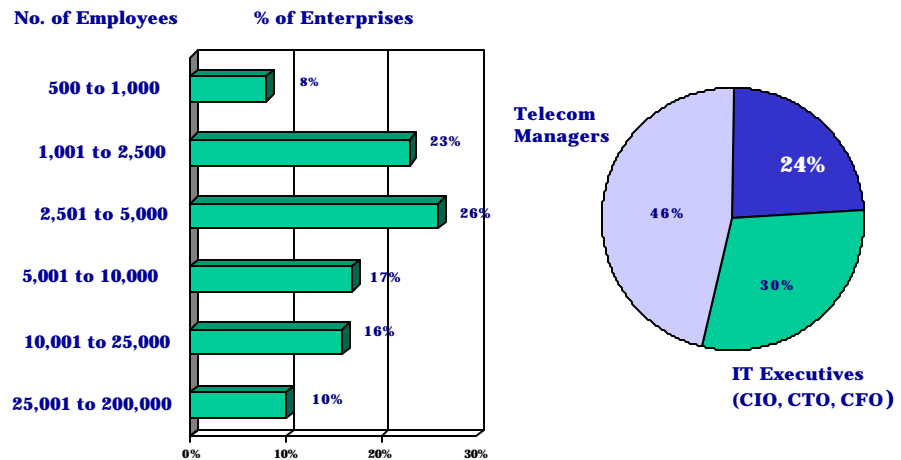
Analyses presented in this study were driven by comprehensive primary research, which was conducted specifically for this report. This primary research included a mix of written surveys and telephone interviews, with over 350 points of contact with key industry players, including those with:

- Decision-makers for both voice systems and data networks
- Leading suppliers of CPE (Customer Premises Equipment) and data network equipment, that have introduced IP LAN Telephony systems

Interviews were completed with 325 qualified decision-makers, including representatives of Enterprises (between 500 and 200,000 employees) and Mid-Sized Businesses (between 100 and 499 employees). These decision-makers have the responsibility for decision-making regarding IP LAN Telephony implementation for their respective companies.

Decision-makers from 210 enterprises participated in this study. Exhibit 3 provides a graph that shows the distribution of these companies based upon their size (number of employees). 46% of these decision-makers were telecom managers, 24% were data network managers, and the remaining 30% were IT Executives (CIO, CTO, CFO).

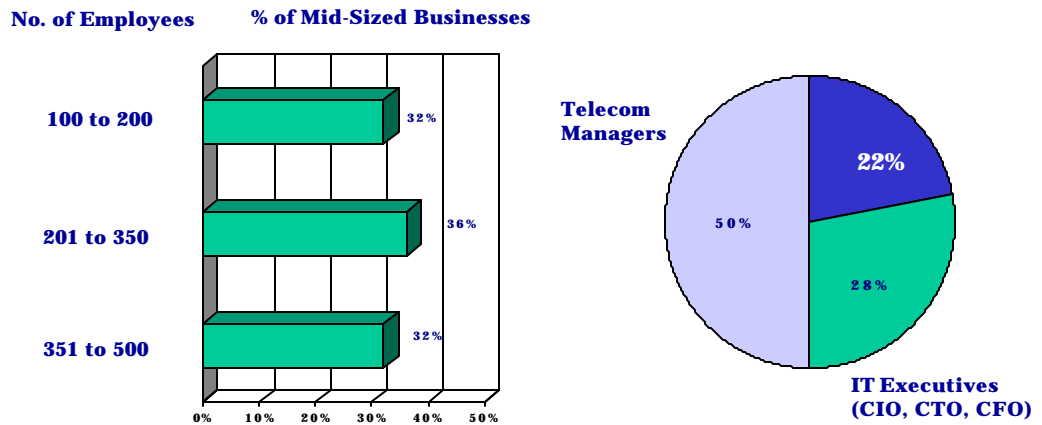
Exhibit 3
Enterprises
Distribution of Enterprises Interviewed



Source: InfoTech: End-user Primary Research, 2001

Decision-makers from 125 mid-sized businesses participated in this study. Exhibit 4 provides a graph that shows the distribution of these companies based upon their size (number of employees). Half of these decision-makers were telecom managers, 22% were data network managers, and the remaining 28% were IT Executives (CIO, CTO, CFO).

Exhibit 4
Mid-sized Businesses
Distribution of Mid-Sized Businesses Interviewed



Source: InfoTech: End-user Primary Research, 2001

Research Extensions

In addition to end-user interviews, over 25 interviews were conducted with manufacturers/developers and distribution channels of IP Telephony solutions. These interviews were conducted with key executives and managers in marketing, offer/product management, R&D, sales, and customer service.

Key issues addressed in these contacts included:

- Description of IP LAN Telephony products
- Comparison of different architectures
- IP-enabled applications
- Network architecture
- Support for networked applications
- Network management approach
- Value proposition
- Primary customer benefits
- Pricing for typical configurations

Quantitative analysis of primary research findings regarding market demand, implementation methods and installed base projections were linked with our *InfoTrack* databases to drive forecasts of IP LAN Telephony market volumes and impact analysis on traditional CPE markets.

The InfoTech *InfoTrack for Enterprise Communications* database, comprises the world's most extensive and detailed tracking of currently installed CPE systems and quarterly shipment performance, with segmentations by vendor/model, distribution channels, system size, and vertical markets.

Project Leadership

Project Leader for the overall study was Terry White [E-mail: twhite@pbimedia.com]. Terry is a Sr. Director of InfoTech, where he focuses on primary research involving enterprise networking and carrier infrastructure technologies and applications. Terry and his market/competitive analyst team continuously conduct expert primary research focused on critical emerging markets, such as managed IP/VPNs, converged network services, network hosted applications, broadband services, wireless, e-commerce, and professional services

3. ANALYSIS OF ENTERPRISE MARKET DEMAND

Analyzing IP LAN Telephony Market Demand Among Enterprises

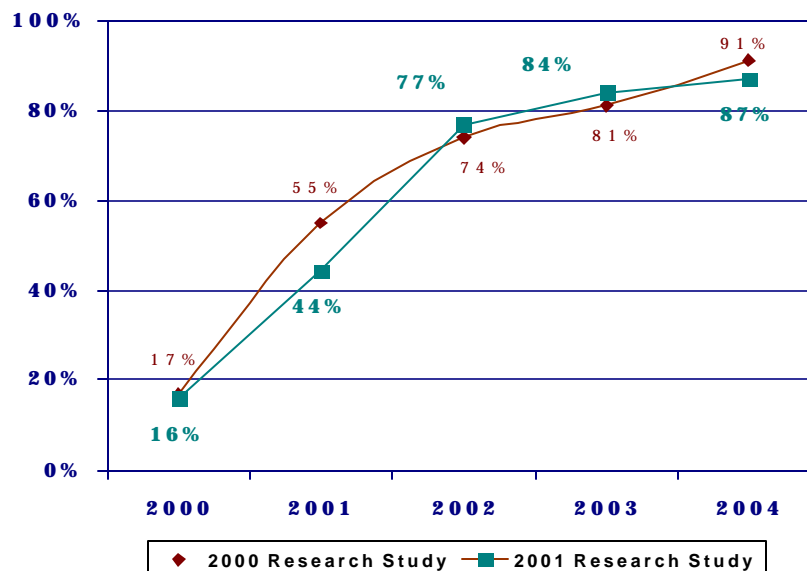
The results from the 2001 study indicate that the adoption curve for IP LAN Telephony is lagging behind the rate projected in the 2000 study. One year ago, 55% of the enterprises indicated that they expected to begin implementing this technology by the end of 2001. However, in the current study, the adoption rate for 2001 dropped to 44%. In the early years of a new technology it is not unusual for the actual adoption rate to lag behind the projected rate.

By the end of 2002, the adoption curve is projected to rebound to 77%, which is slightly ahead of the 74% projected in the last year's study. It appears that the shortfall in 2001 was due to enterprises that decided to delay their initial implementation from 2001 to 2002.

It should be noted that for most enterprises, initial implementation means installing IPLAN Telephony in as few as one or two sites. In some cases, these initial implementations reflect enterprises that are IP-enabling a few of their existing PBXs.

Exhibit 5
Enterprises
Timeframe to Begin Implementing IP LAN Telephony

% of Enterprises

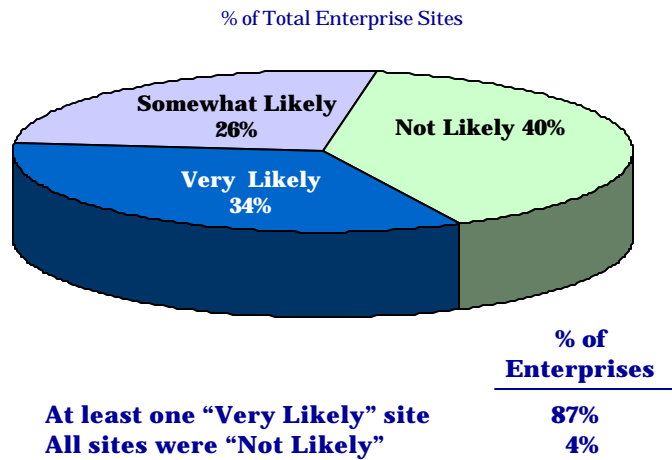


Source: InfoTech: End-user Primary Research, 2001

The decision-makers who participated in the 2001 study felt that 34% of their sites in the U.S. were “Very Likely” to implement IP LAN Telephony, during the next four years. This represents a decline in demand compared to the 2000 study in which 42% of the sites were rated “Very Likely”.

On the other hand, the percentage of enterprises that indicated they had at least one “Very Likely” site increased to 87%. In the previous two studies, two-thirds of the enterprises met this threshold condition. There continue to be 4 or 5% that classify all of their sites as “Not Likely” to implement this new technology.

Exhibit 6
Enterprises
Likelihood of Implementing IP LAN Telephony

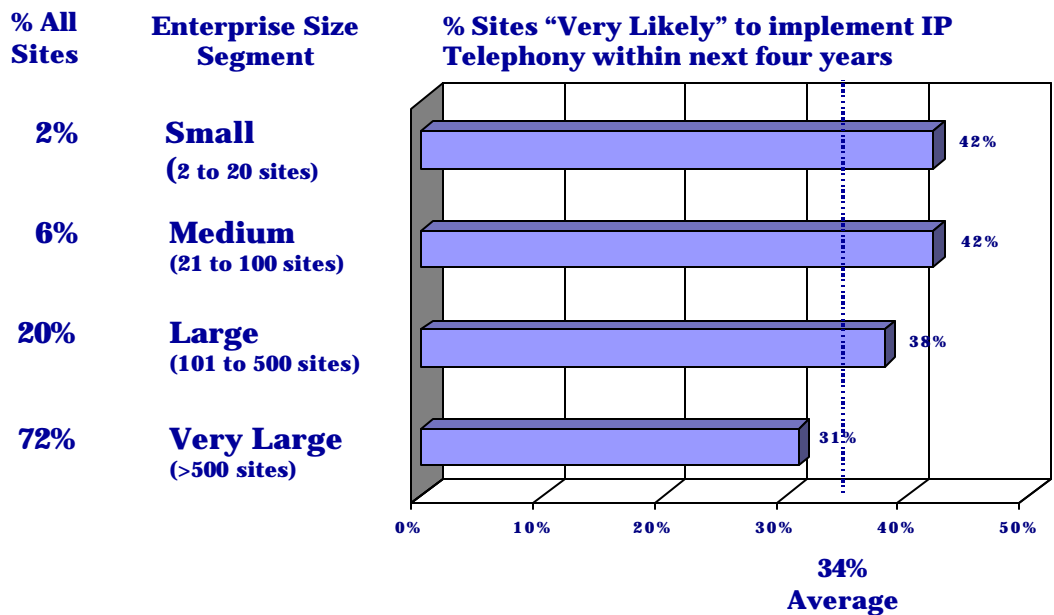


Source: InfoTech: End-user Primary Research, 2001

Enterprises with up to 100 sites rated 42% of their sites as “Very Likely” candidates for IP LAN Telephony. This is up from 30% in the 2000 study. However, among Large and Very Large enterprises, those with more than 100 sites, the potential demand declined from 46% to 33%, according to the participants in the 2001 study.

As noted in subsequent exhibits, it appears that many of the enterprise decision-makers in the 2000 study were overly optimistic regarding the percentage of sites that would make the transition to IP LAN Telephony within the four year time horizon of the study.

Exhibit 7
Enterprises
Market Demand by Size of Enterprise



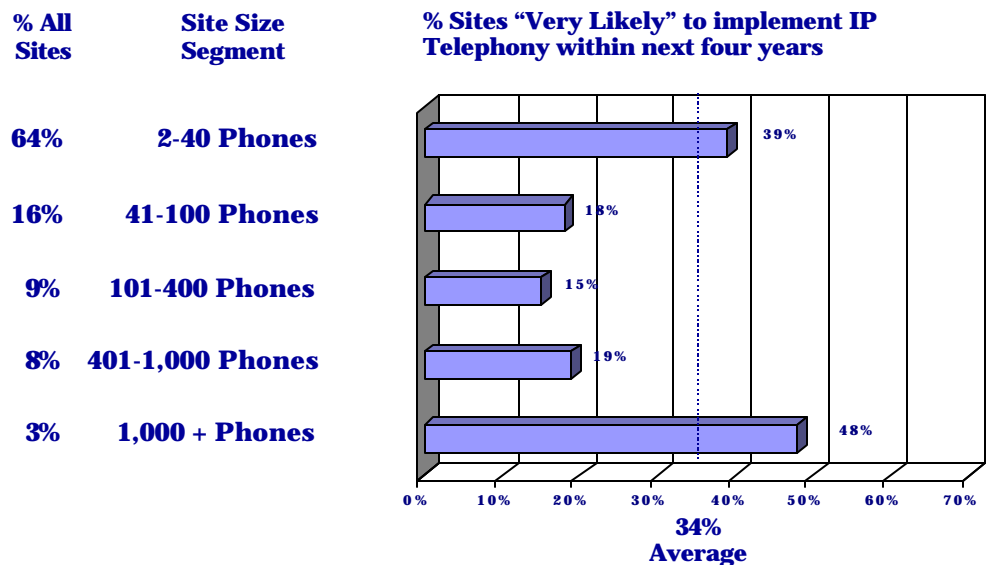
Source: InfoTech: End-user Primary Research, 2001

Among the enterprises that participated in this study, the strongest demand occurs at their largest sites. Almost half of these locations with more than 1,000 phones were considered “Very Likely” to implement IP LAN Telephony within the next four years. Due to the large investment in these high-end systems, the most likely implementation method will be to IP-enable the existing PBX, by inserting IP Telephony gateway cards for interfacing with IP phones on the LAN.

Enterprises also exhibited strong demand at their smallest sites, those with fewer than 40 phones. Almost 40% of these small locations were rated “Very Likely”. In this case, the preferred implementation method will be to install media gateways at these small sites and connect them over the corporate IP Wide Area Network (WAN) to Call Processing servers and Application servers located at larger central sites. This networked approach enables these small sites to access the same telephony features and communications applications as the larger locations in the enterprise. And this can be done without installing complete IP LAN Telephony systems or Key Telephone systems at these remote sites.

At the mid-range sites of these enterprises, locations with 41 to 1,000 phones, the market demand is much lower, with only 17% of these sites viewed as “Very Likely” to implement IP LAN Telephony. This may be a reflection of uncertainty whether to IP-enable the existing PBXs or hold off and implement LAN-based telephony systems when the PBXs are scheduled to be replaced.

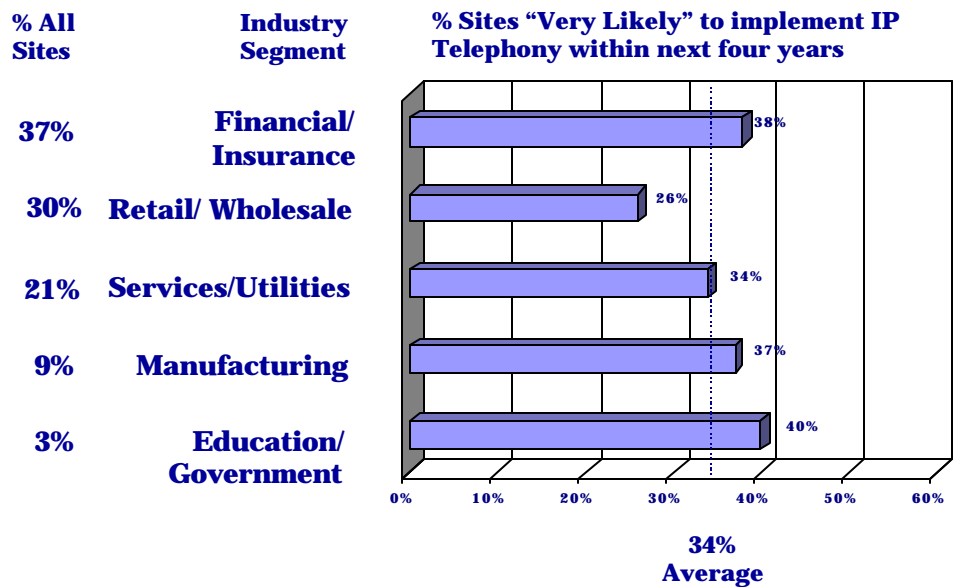
Exhibit 8
Enterprises
Market Demand by Size of Site



Source: InfoTech: End-user Primary Research, 2001

All industry segments, except Retail/Wholesale, expect that roughly 35 to 40% of all of their sites are “Very Likely” to implement IP LAN Telephony. The Education/Government segment had the highest demand at 40%. This was not surprising, as colleges and universities tend to be early adopters of leading edge technology, particularly if it involves network convergence. Enterprises in the retail sector appear to be having some doubts regarding the extent of their investment in new IP LAN Telephony technology at their small store locations.

Exhibit 9
Enterprises
Market Demand by Industry Segment

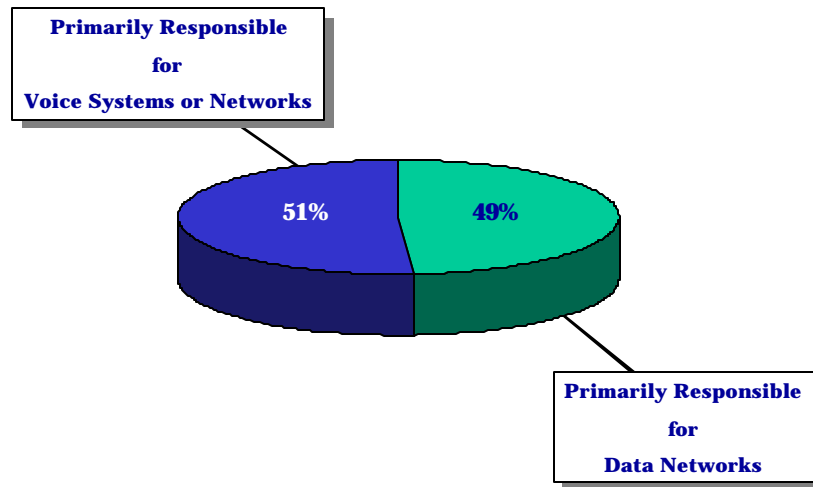


Source: InfoTech: End-user Primary Research, 2001

Among the enterprises that participated in this study, approximately half of them were represented by decision-makers, which are primarily responsible for Voice systems or networks. The other half were data networking decision-makers.

Some of the participants indicated that they represented an organization that was responsible for decisions involving converged voice and data networks. We asked these convergence decision-makers to indicate whether they were more closely associated with voice-related issues or data networking matters. That would enable us to compare the perspective of the voice decision-makers with that of their data networking counterparts.

Exhibit 10
Enterprises
Composition of Decision Makers



Source: InfoTech: End-user Primary Research, 2001

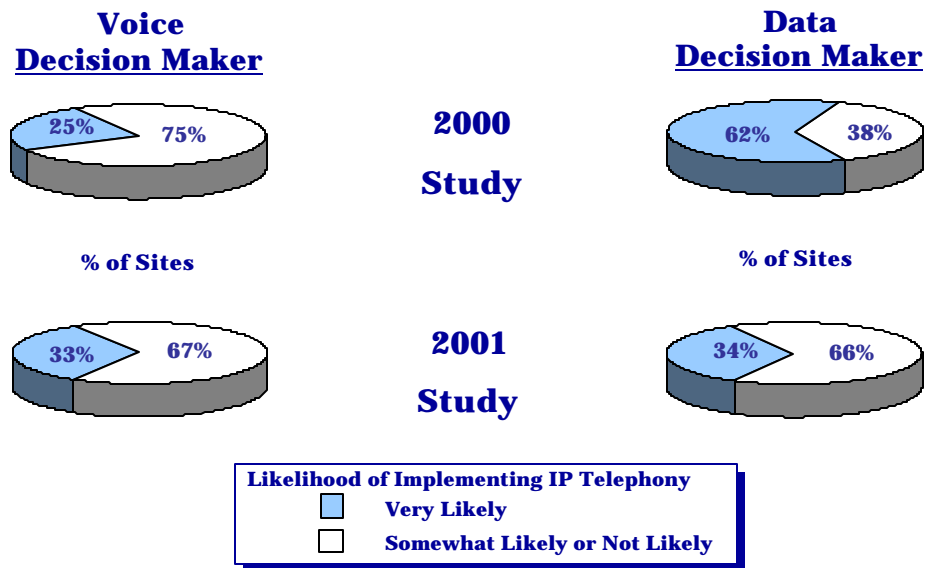
In the 2000 study there was a striking difference between the two groups of decision-makers in terms of the percentage of sites that were considered "Very Likely" to implement IP LAN Telephony. The voice decision-makers indicated that only a quarter of their sites were rated "Very Likely". But the data decision-makers felt that over 60% of their sites were "Very Likely" to implement IP LAN Telephony during the four year planning period of this study.

In the 2001 study, these two groups converged. The voice decision-makers increased their outlook to 33%, and their data counterparts were generally in agreement with a potential demand of 34%. We believe that the data decision-makers were overly optimistic in the 2000 study, and their current perspective is more realistic.

The next few exhibits provide a more detailed analysis of the factors behind the changes in demand between these two groups of decision-makers.

Exhibit 11
Enterprises
Market Demand by Type of Decision Maker

Enterprise Sites Segmented by Decision Maker

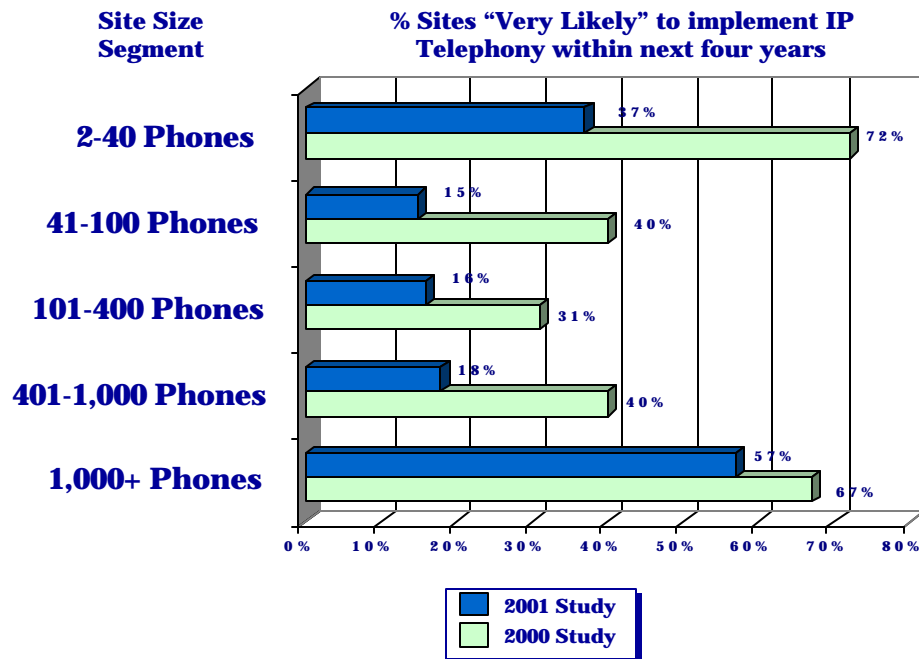


Source: InfoTech: End-user Primary Research, 2001

In the 2001 study, the data decision-makers projected a lower percentage of “Very Likely” sites in every size segment compared to their outlook in the 2000 study. The biggest drop occurred among the Very Small sites, those with between 2 and 40 phones. In the 2000 study, the data decision-makers expected over 70% of these small sites to implement this new technology. In last year’s report, we noted that the data decision-makers were very aware that IP LAN Telephony would enable them to implement this technology at one of their central sites, and extend the functionality of that system to users on remote LANs in multiple locations over an IP Wide Area Network, without having to invest in complete IP Telephony systems at those remote sites.

In the 2001 study, only 37% of these small locations were rated “Very Likely” by the data decision-makers. They were obviously too optimistic a year ago. In the past 12 months, they have become more aware of the requirements and cost of upgrading their WAN data network to support Voice over IP. Coupled with the expectations of lower budgets for IT spending, the data decision-makers have become more cautious in estimating the rate at which they would implement this new technology.

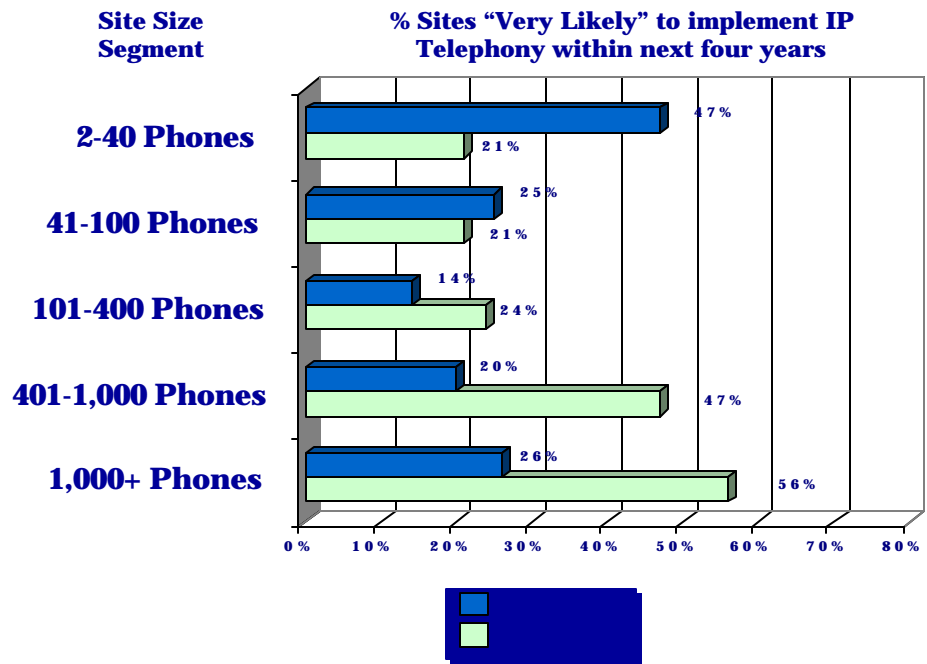
Exhibit 12
Enterprises
Market Demand by Data Decision Maker Within Site Size Segment



Source: InfoTech: End-user Primary Research, 2001

In this year's study, the voice decision-makers were also more cautious regarding the outlook for IP LAN Telephony, except at the smaller locations. A year ago, the voice decision-makers felt that only 21% of the sites with 2 to 40 phones were "Very Likely" to implement IP LAN Telephony. In the 2001 study, they increased their outlook in this segment to 47%. In our report last year, we commented that voice decision-makers are not fully aware of how IP Telephony could be extended over the WAN to serve small remote sites. It appears from this year's study that the voice decision-makers have advanced a long way up the learning curve regarding this advantage of IP LAN Telephony.

Exhibit 13
Enterprises
Market Demand by Voice Decision Maker Within Site Size Segment



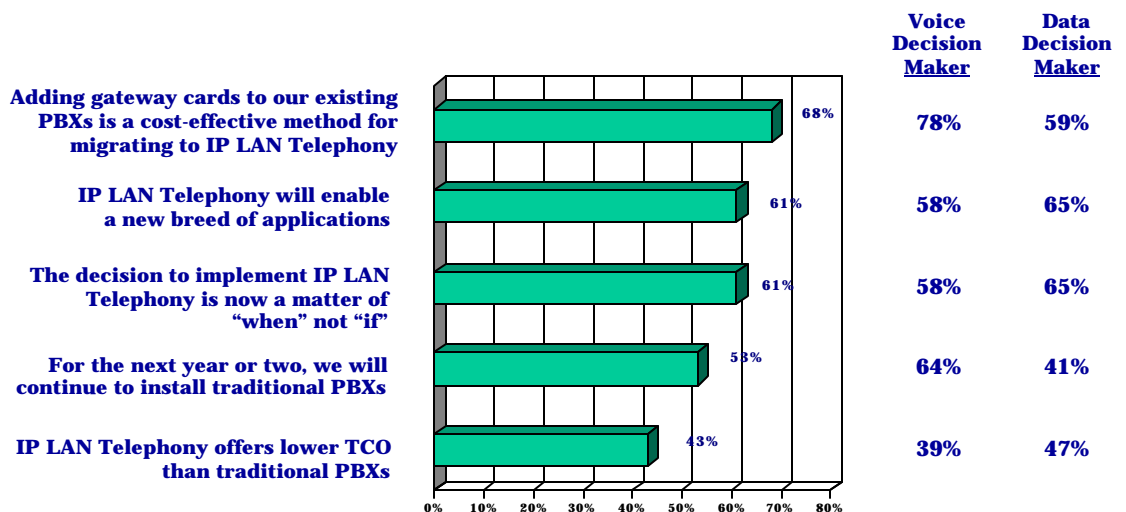
Source: InfoTech: End-user Primary Research, 2001

Prioritizing Key Decision Factors Affecting Implementation

Enterprise decision-makers were asked to rate the extent to which they agreed with or disagreed with five statements that had bearing on their decisions to implement IP LAN Telephony. Over 60% of the enterprise decision-makers Agreed or Strongly Agreed with the following statement: *The decision to implement IP LAN Telephony is no longer a question of “if we should do it”, but is now a question of “when we should do it”.* However, only 43% were in agreement with this assertion: *IP LAN Telephony offers lower Total Cost of Ownership than traditional PBXs.*

So some of the decline in enterprise market demand can be attributed to the uncertainty regarding the business case for this new technology. The equipment vendors have just recently begun to respond to this issue by developing sales tools that can now calculate TCO and ROI for IP LAN Telephony. The slumping economic environment and the resulting declines in corporate IT spending have also contributed to the lower market demand. Consequently, enterprise decision-makers have strongly endorsed “migration” rather than “replacement”, as reflected in the 68% agreement level on this perspective: *Adding IP Telephony Gateway cards to our existing PBXs is a cost effective method for migrating to IP LAN Telephony.* It is not surprising that 78% of the voice decision-makers shared that opinion, but even 59% of the data networking decision-makers support that viewpoint.

Exhibit 14
Enterprises
Rationale for Implementation Decisions



% of decision-makers who Strongly or Generally Agree with these factors that affect implementation decisions

Source: InfoTech: End-user Primary Research, 2001

Among the enterprises that participated in this study, 9% indicated that they had originally planned to implement IP LAN Telephony during 2001, but sometime during that year those plans were cancelled. Another 7% noted that they had cutback the number of installations that they had planned to make that year. And 9% noted that they had already reduced their implementation plans for 2002.

On the plus side, 11% of the enterprises had decided to install more IP LAN Telephony systems during 2002 than their plans called for earlier in the year.

Exhibit 15

Enterprises

Changes In Implementation Plans During 2001

<u>Type of Changes</u>	Installation Year Affected	
	<u>2001</u>	<u>2002</u>
	(% of Enterprises)	
Implementation plans were cancelled	9%	1%
# of planned installations were decreased	7%	9%
# of planned installations were increased	3%	11%

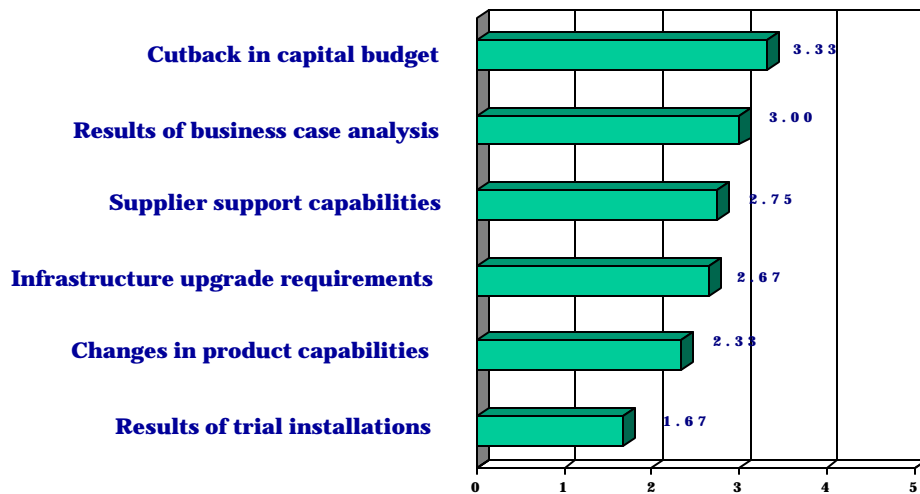
Source: InfoTech: End-user Primary Research, 2001

The number one reason given for changing implementation plans was cutbacks in the capital-spending budget. Uncertainty regarding the business case for IP LAN Telephony also caused some plans to change, as did questions regarding their supplier's capabilities for supporting the implementation of this new technology.

Greater awareness of the upgrades that would be required to their network infrastructure was also cited as a key reason why the number of planned installations had been reduced.

Exhibit 16
Enterprises

Importance Rating of Reasons for Implementation Changes



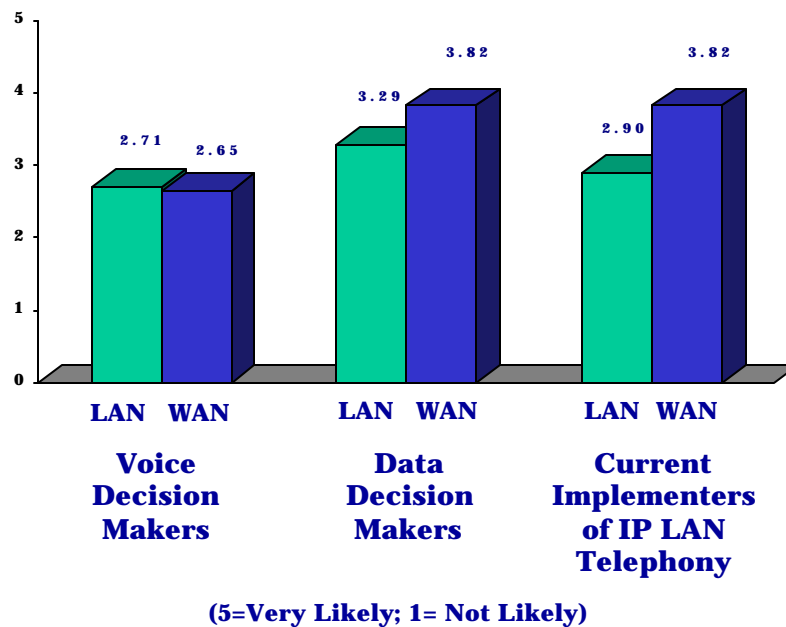
(5=Very Important; 1= Not Very Important)

Source: InfoTech: End-user Primary Research, 2001

Decision-makers were asked whether the implementation of IP LAN Telephony would lead to a major upgrade of their corporate data network infrastructure. The data decision-makers indicated that it was Very Likely that a major upgrade of the WAN would be required. In general, the voice decision-makers did not perceive the need for such an upgrade. However, among the companies that had already begun to implement IP LAN Telephony, decision-makers from both the voice and data networking organizations agreed that their WAN would require a major upgrade.

There was no clear consensus regarding the need for the LAN to undergo a major upgrade due to IP LAN Telephony, although the data decision-makers were leaning somewhat in that direction.

Exhibit 17
Enterprises
Likelihood of Major Upgrade to Data Network Infrastructure



Source: InfoTech: End-user Primary Research, 2001

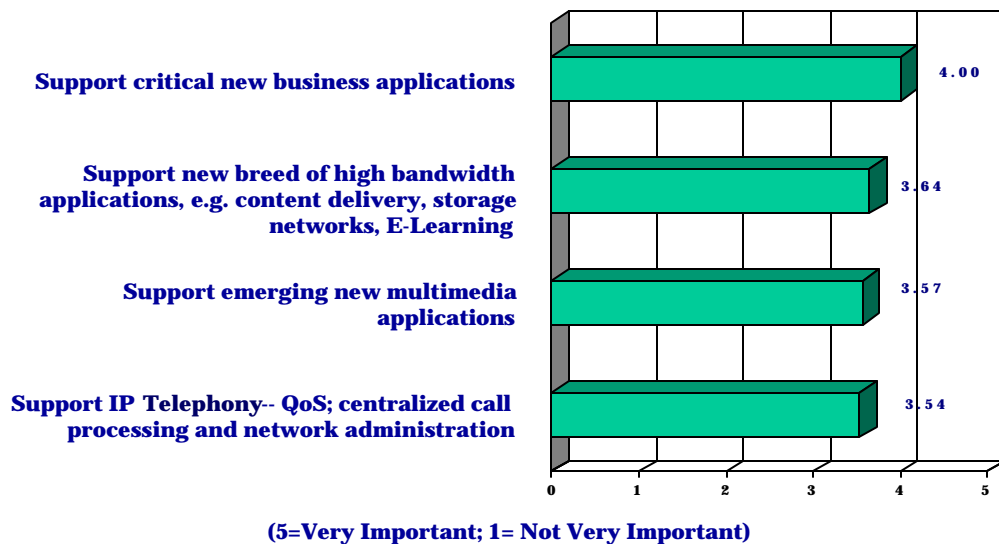
The enterprises that felt it was Very Likely that their WAN data network infrastructure would require a major upgrade were asked to rate the importance of various factors that could drive that decision. The most important reason was to support critical new business applications. The reason that got the lowest importance rating was to support IP Telephony in terms of Quality of Service, centralized call processing and network administration. In fact, the three reasons that referred to the need to support various types of enhanced applications all were considered more important than the fundamental requirement to support IP Telephony.

This indicates that these decision-makers are concerned whether they can justify the cost of the upgrade just to support IP Telephony. They also expect that this upgraded network would enable them to implement a broad range of applications that can not be supported on their current data network infrastructure.

Exhibit 18
Enterprises

Importance Rating of Decision Factors to Upgrade Corporate WAN

Ratings based on Enterprises Very Likely to upgrade WAN data network infrastructure within next four years



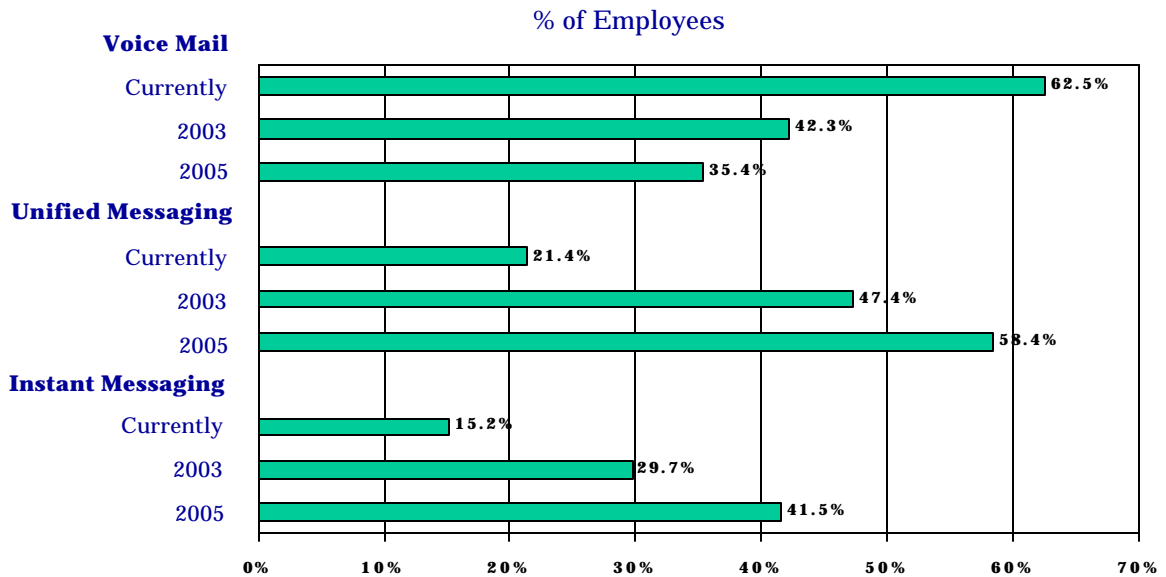
Source: InfoTech: End-user Primary Research, 2001

Quantifying the Market Demand for IP-enabled Applications

By 2005, enterprises expect that implementing IP LAN Telephony will lead to the use of Unified Messaging by almost 60% of their employees, up from 21% currently. This enables users to access their voice mail, E-mail and fax messages using a common user interface. During this same time period, the utilization of Voice Mail as a separate application will decline from 63% to 35% of the employees.

Instant messaging will also become popular during this timeframe achieving a projected utilization rate of over 40% by 2005.

Exhibit 19
Enterprises
Market Demand for Messaging Applications

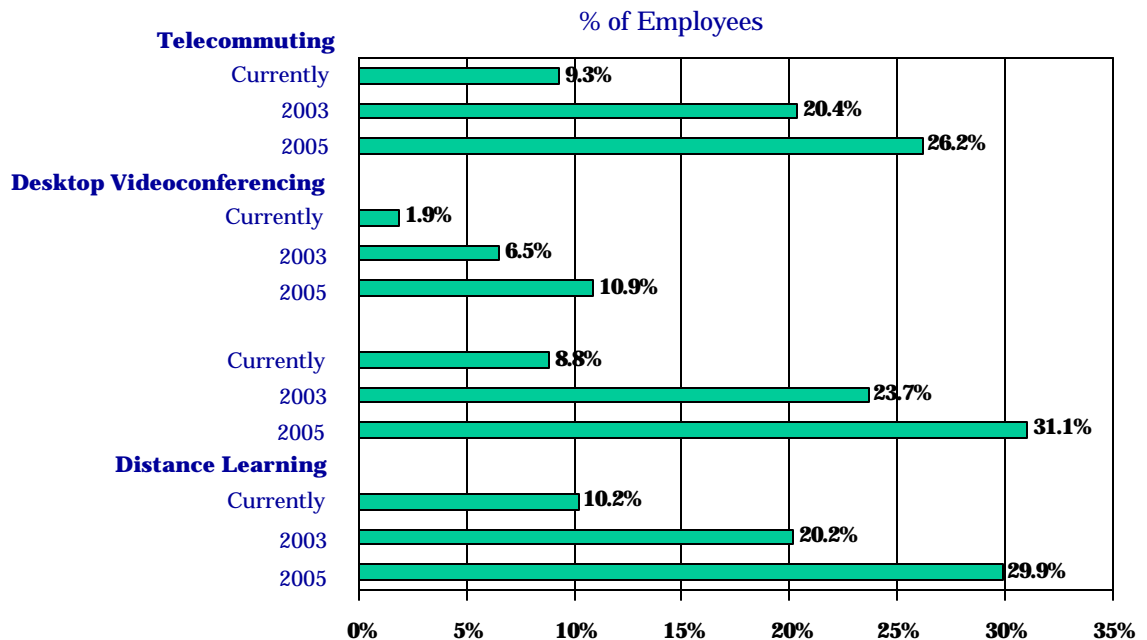


Source: InfoTech: End-user Primary Research, 2001

IP LAN Telephony is also expected to be the catalyst for growth among various types of collaboration applications. Both Distance Learning and Teleconferencing with the sharing of data are expected to achieve penetration of approximately 30% of the employees.

IP LAN Telephony will also be an important factor in the growth of Telecommuting. Remote workers that have broadband access can utilize either an IP phone or Softphone and take advantage of the same telephony features and applications that are available to workers while at their normal office.

Exhibit 20
Enterprises
Market Demand for Collaboration Applications

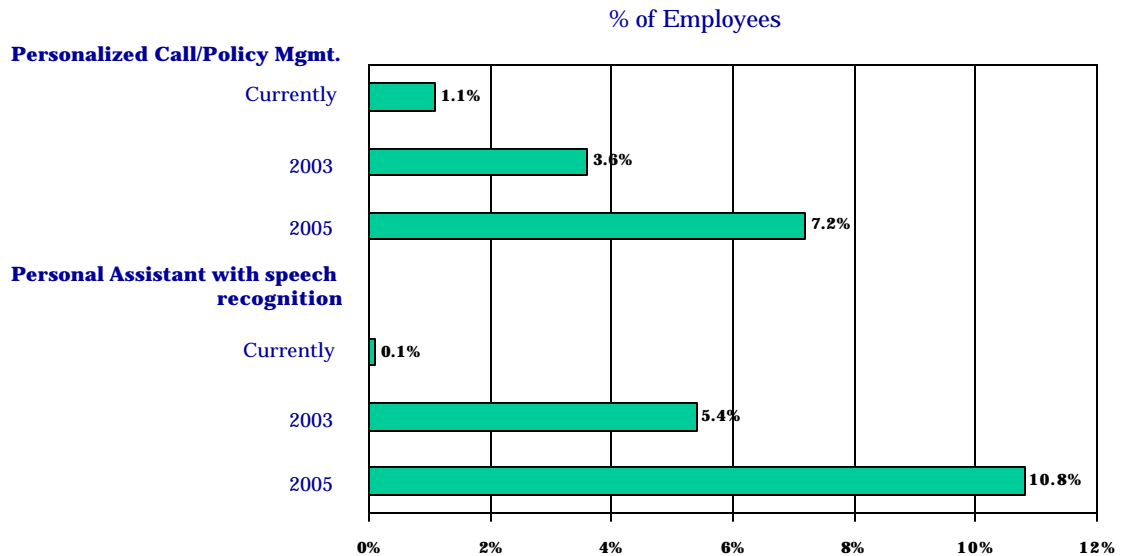


Source: InfoTech: End-user Primary Research, 2001

Personal productivity applications are also projected to receive a boost from IP LAN Telephony. With Personal Assistant software, users can utilize natural speech commands to initiate telephony features, such as making calls by name, establishing conference calls and many other functions that currently require manual initiation. Over 10% of the employees are expected to take advantage of the productivity savings offered by this application.

Personalized management applications will make it easier for users to administer how they want their calls to be screened and processed. For example, users could instruct the system to send all calls to voice mail for a specific time period, except for priority calls from selected parties. This application will also enable enterprises to consolidate the management of corporate directories, and to enable network administrators to assign network policies and privileges on an individual basis instead of assigning individuals to a predefined set of policies. This application is projected to have a 7% take rate.

Exhibit 21
Enterprises
Market Demand for Personal Productivity Applications

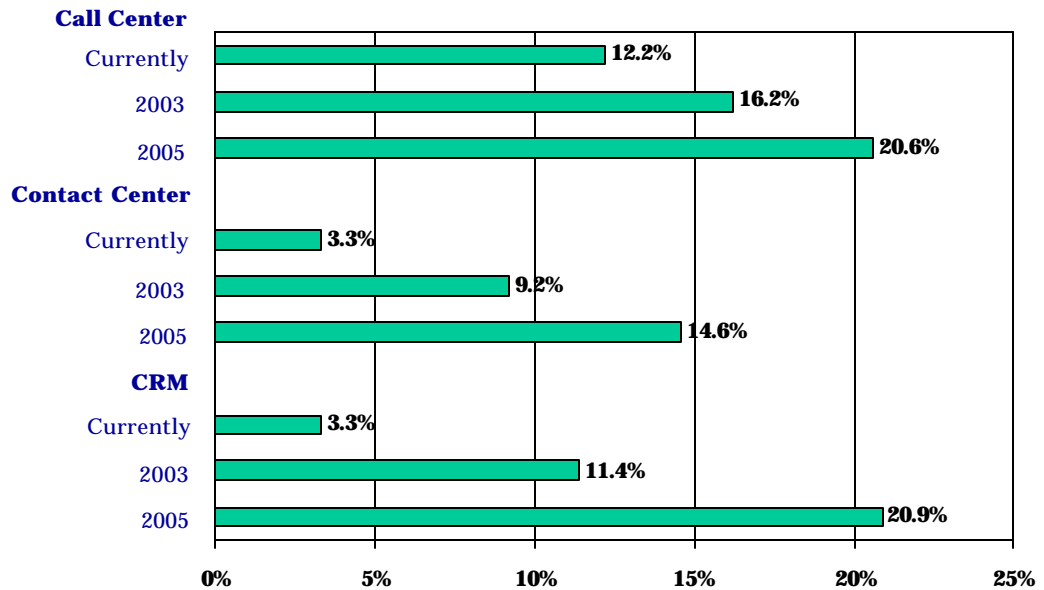


Source: InfoTech: End-user Primary Research, 2001

IP LAN Telephony is expected to drive down the cost of customer service applications. This will enable more companies to afford the implementation of call centers, and will enable other enterprises to expedite the transition from traditional call centers to contact centers. The number of contact center agents is expected to more than quadruple during the next four years. IP LAN Telephony will also facilitate the use of remote (work-at-home) agents.

CRM (Customer Relationship Management) is another application that is expected to grow rapidly as enterprises expand their implementation of call/contact centers and increase their investment aimed at improving customer service.

Exhibit 22
Enterprises
Market Demand for Customer Service Applications



Source: InfoTech: End-user Primary Research, 2001

Evaluating the Results of Initial Implementations

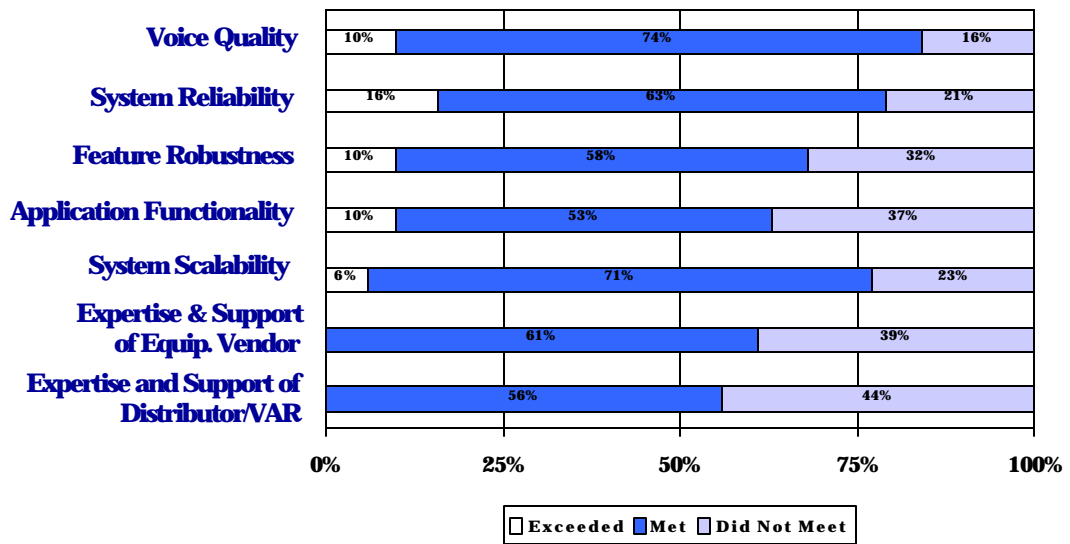
About one-fourth of the enterprise participants in this study had completed their initial implementation of IP LAN Telephony systems. These early implementers were asked whether the capabilities of the system and their supplier met their expectations. In general, the capabilities of the systems received high marks. 85% stated that Voice Quality met or exceeded their expectations, and 80% noted that they were satisfied with System Reliability and System Scalability.

The lowest satisfaction ratings came in the category of support. In almost 40% of the cases, the expertise and support of the equipment vendors did not meet expectations. VARs and distributors scored even lower with 45% dissatisfaction in this support category. It is clear that all of the vendors and their channels need to improve their skills in supporting IP LAN Telephony customers.

Exhibit 23
Enterprises

Evaluation of Initial Implementation Results vs. Expectations

Results of Enterprises that have Completed Initial Implementation

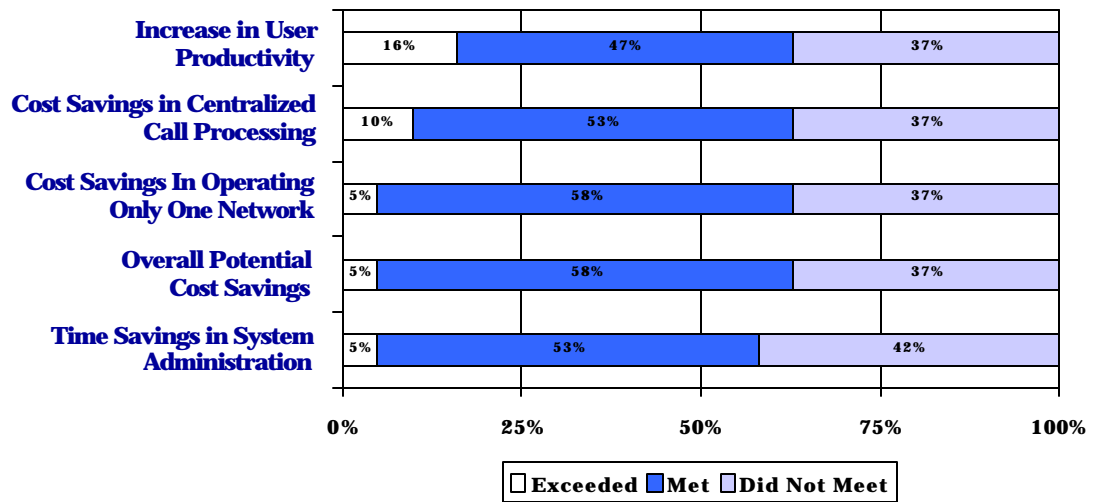


Source: InfoTech: End-user Primary Research, 2001

These early implementers were also asked whether the cost saving and productivity benefits met or exceeded their expectations. Although 63% said they were satisfied, 37% said that the benefits did not meet their expectations. This is another reflection of the uncertainty that exists among enterprise decision-makers whether IP LAN Telephony will reduce their Total Cost of Ownership.

Exhibit 24
Enterprises
Evaluation of Potential Benefits

Results of Enterprises That Have Completed Initial Implementation

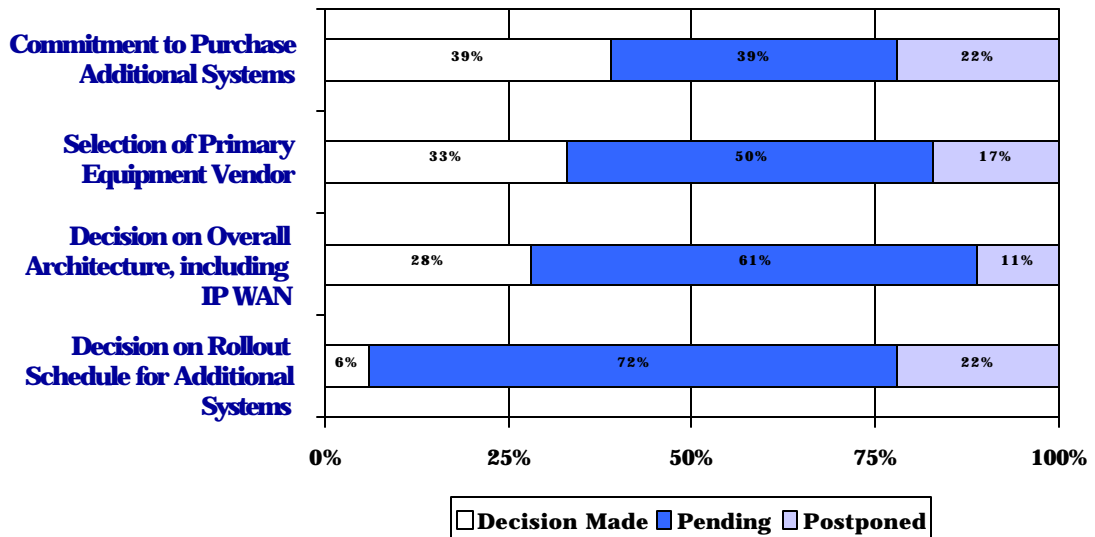


Source: InfoTech: End-user Primary Research, 2001

On the positive side, almost 40% of these initial implementers have committed to purchase additional systems, and one-third have selected their primary equipment vendor for these systems. 28% noted that they had made a final decision on the overall architecture that they would employ, including the IP WAN infrastructure that connects their sites. However, only 6% had made their decision on the implementation rollout schedule for additional systems. This reinforces the conclusion that for many of these companies it is no longer a question of “If”; it is now a question of “When”?

Exhibit 25
Enterprises
Decisions Regarding Further Implementation

Decisions by Enterprises that have Completed Initial Implementation



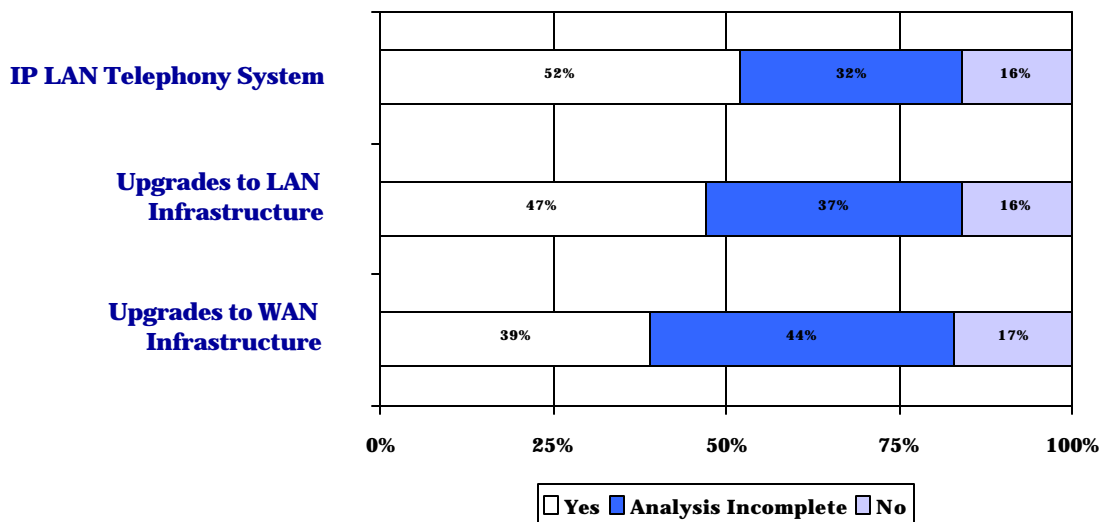
Source: InfoTech: End-user Primary Research, 2001

Over half of these early implementers indicated that these initial systems were “Worth What Paid For”. 32% said they were analyzing this issue. Only 16% gave a negative response to that question. An assessment of the value of associated upgrades to their LAN infrastructure received a similar rating.

However, less than 40% felt that the upgrades that they had made to their WAN infrastructure to accommodate IP LAN were “Worth What Paid For”. 44% indicated that they had not completed their analysis on this issue.

Exhibit 26
Enterprises
Were Initial Systems Worth What Paid For?

Results of Enterprises that have Completed Initial Implementation



Source: InfoTech: End-user Primary Research, 2001

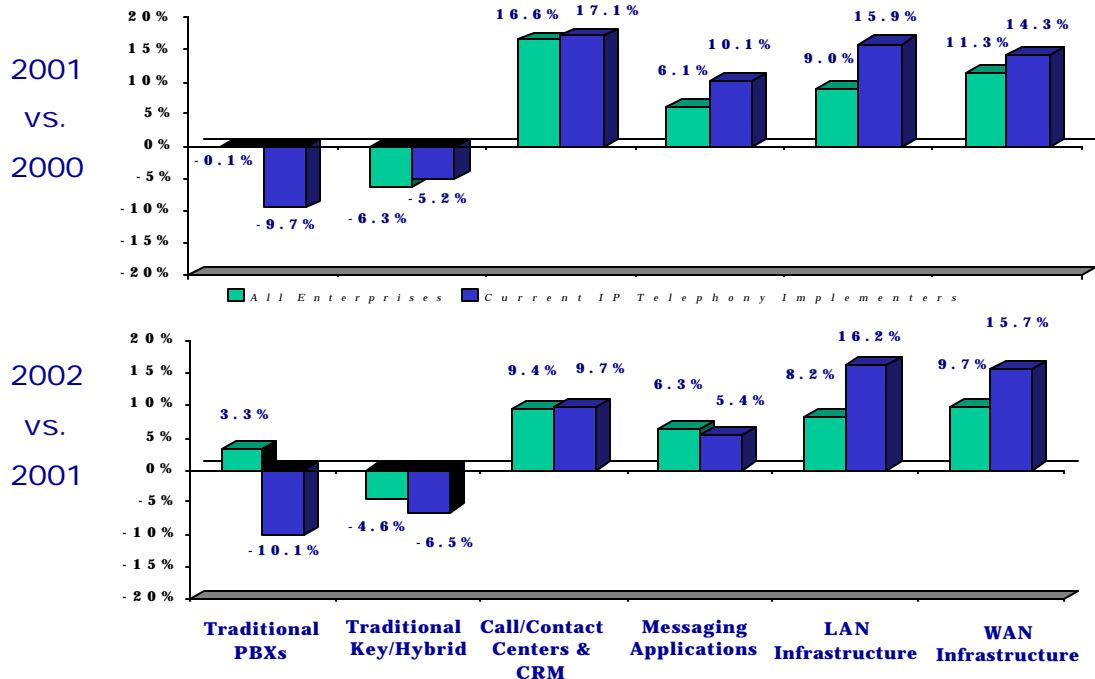
Assessing Changes in Spending on Telecom and Data Networking

Enterprise decision-makers were asked to compare their spending in 2001 vs. 2000 in several categories of Telecom equipment and applications and Data Networking infrastructure. While spending on PBXs was flat, Key/Hybrid spending declined by 6%. The bright spots in telecom were Call/Contact Centers and CRM, up 17%; and Messaging applications, up 6%. Spending on LAN and WAN infrastructure was up around 10%.

Among the early implementers of IP LAN Telephony, their spending increases were somewhat greater than the Enterprise average, but their spending on PBXs declined by 10%. That dip in PBX spending will continue in 2002 among the initial implementers, while overall PBX spending is expected to increase by 3%. This is an indication that once companies begin to invest in IP LAN Telephony, they immediately cutback their spending on traditional PBXs and Key/Hybrid systems. However, their spending on applications does not appear to be adversely affected.

While these early implementers are cutting back on PBXs, their spending increases on LAN and WAN infrastructure were much greater than the enterprise average in 2001, and will continue that trend into 2002.

Exhibit 27
Enterprises
Changes in Spending on Telecom and Data Networking

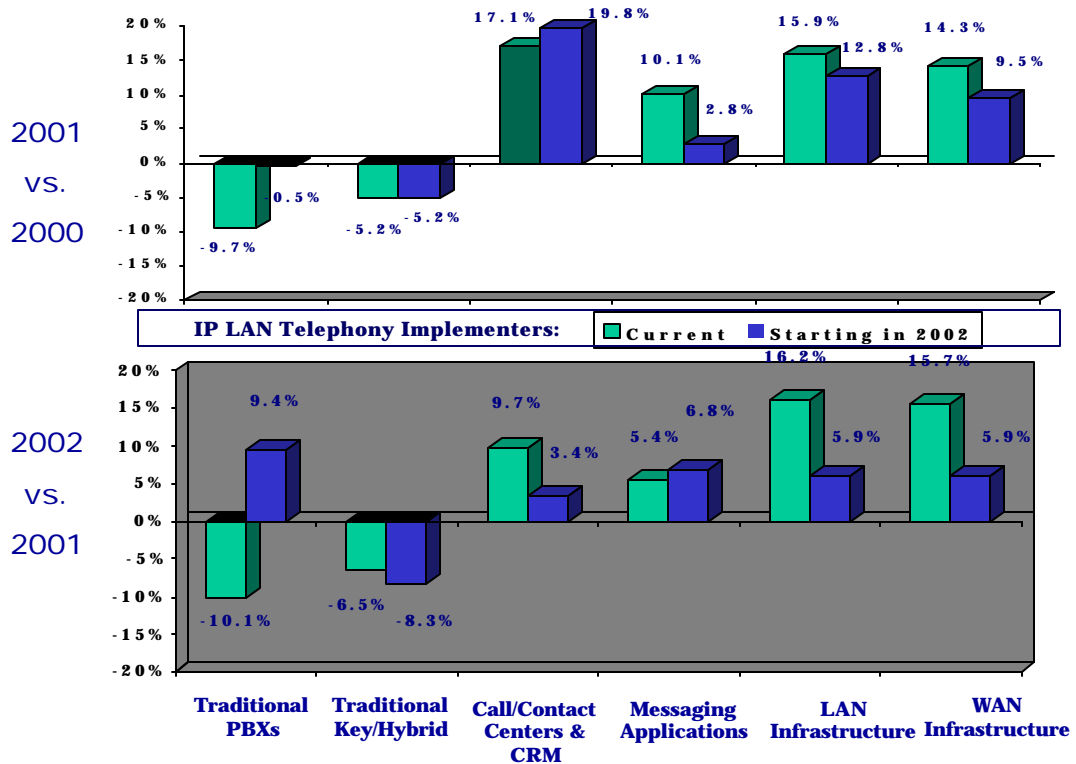


Source: InfoTech: End-user Primary Research, 2001

Having assessed the spending patterns of the early implementers vs. the enterprise average, we next compared their spending patterns to the enterprises that plan to begin implementing IP LAN Telephony in 2002. This latter group expects to increase spending on PBXs by 9% after a year of no growth in that category in 2000. This group is joining the crowd in reducing spending on Key/Hybrid systems. In the other categories, their increased spending is not as high as the enterprise average.

It is particularly interesting that their anticipated spending increases on LAN and WAN infrastructure in 2002, are substantially lower than those who began implementing in 2001. Perhaps they are in for a surprise in this area.

Exhibit 28
Enterprises
Changes in Spending by Early Implementers

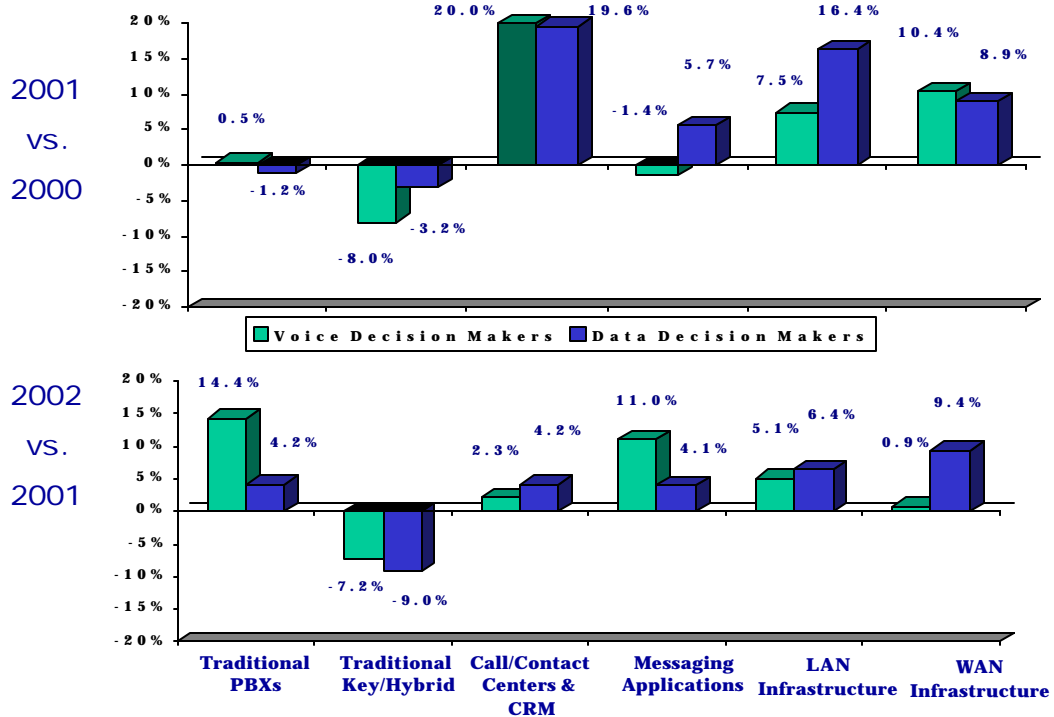


Source: InfoTech: End-user Primary Research, 2001

Having assessed the overall spending patterns of the 2002 implementers, we next compared the spending patterns within this group to assess any differences between the voice decision-makers in this group and their data networking counterparts. Not surprisingly, the voice decision-makers had higher expected spending increases in Telecom, and the data decision-makers had higher expected spending increases in Data Networking. But with the exception of PBXs and Messaging, both groups are projecting lower spending increases in 2002 than in 2001.

Exhibit 29
Enterprises
Changes in Spending by Type of Decision Maker

2002 IP LAN Telephony Implementers: Voice vs. Data Decision Makers



Source: InfoTech: End-user Primary Research, 2001

Comparing Preferences in Suppliers

All of the participants in the study were asked which of the following types of suppliers they would prefer to use to support them in implementing IP LAN Telephony.

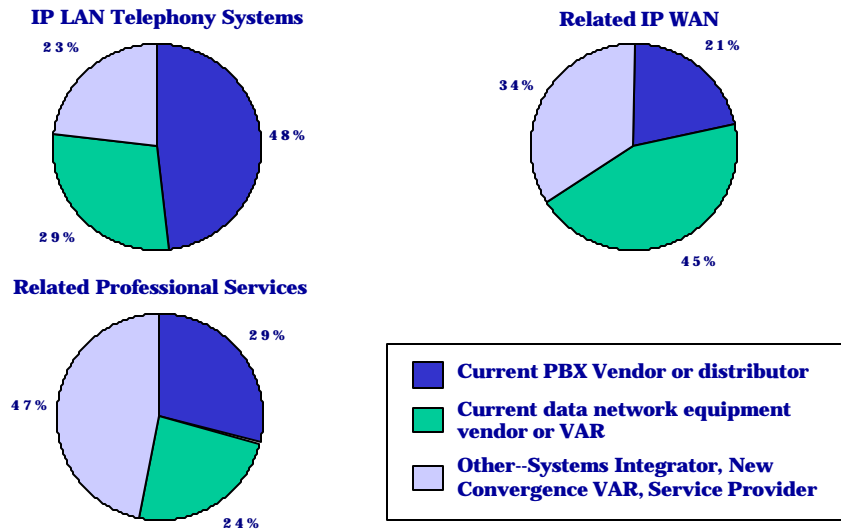
- Current PBX vendor or distributor
- Current data network equipment vendor or VAR
- Other – Systems Integrator, Service Provider or New Convergence VAR

The responses followed a consistent pattern:

- Almost half preferred the current PBX vendor or distributor for supporting IP LAN Telephony
- Almost half preferred the current data network equipment vendor or VAR for supporting the related upgrades to the IP WAN
- Almost half preferred the Other category for providing related professional services

Exhibit 30
Enterprises

Preferred Supplier for Providing Implementation Support



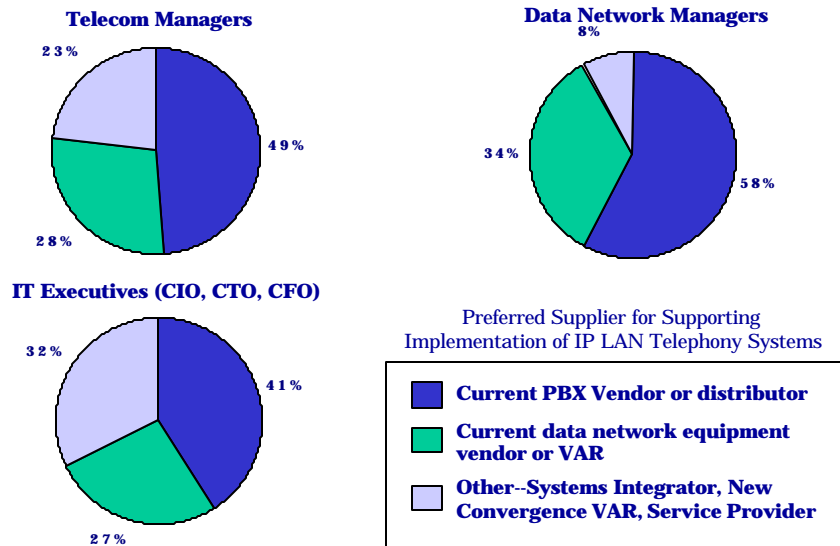
Source: InfoTech: End-user Primary Research, 2001

The previous exhibit regarding preferred suppliers did not evoke any surprises. However, a closer analysis of preferences by type of decision-maker did yield a major unexpected result. All three groups of decision-makers indicated a preference for the current PBX vendor or distributor to support their implementation of IP LAN Telephony.

Half of the enterprise telecom managers and 40% of the IT executives (CIO, CTO, CFO) preferred their current PBX vendor or distributor. Surprisingly, the data network managers gave the PBX vendor/distributors an even greater vote of confidence at 60%, compared to only one-third that opted for their current data network equipment vendor/VAR. The fact that the majority of the data decision-makers would prefer the PBX vendor/distributor indicates one of two possibilities.

- They feel that their VAR has very little expertise in Telephony
- Their current PBX distributor also is supporting the IP LAN Telephony system of the leading data networking vendor

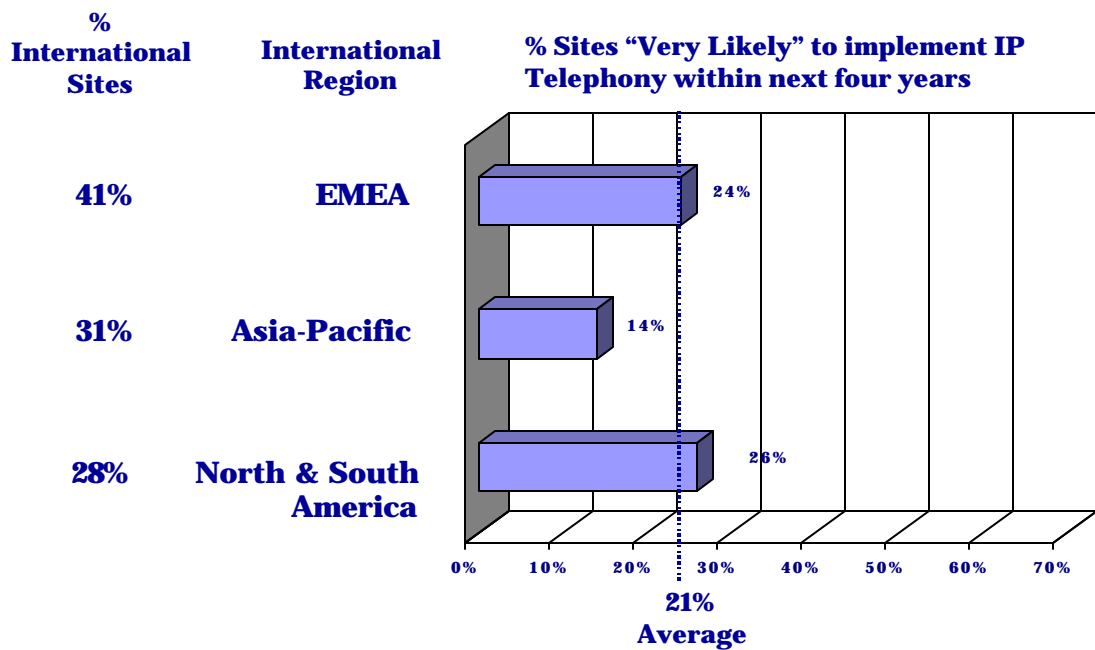
Exhibit 31
Enterprises
Decision Maker Preferences for Supplier Support



Source: InfoTech: End-user Primary Research, 2001

Although this study was focused on the U.S. market, we did ask the enterprises to assess the market demand for IP LAN Telephony in other regions of the world. Overall, they indicated that 21% of their international sites would be “Very Likely” candidates. This represented about one-quarter of their sites in EMEA (Europe, Middle East and Africa), one-quarter of the sites in North and South America (outside the U.S.), followed by 14% of the sites in Asia and Asia/Pacific.

Exhibit 32
Enterprises
International Market Demand for IP LAN Telephony



Source: InfoTech: End-user Primary Research, 2001

4. ANALYSIS OF MID-SIZE BUSINESS MARKET DEMAND

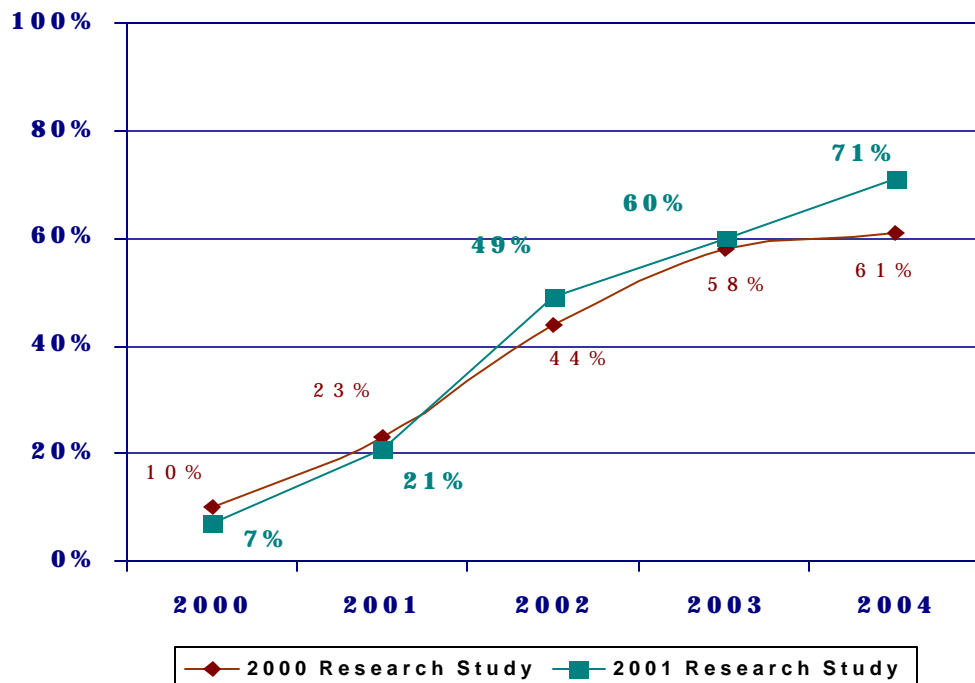
Analyzing IP LAN Telephony Market Demand Among Mid-Sized Businesses

The adoption curve for IP LAN Telephony among mid-sized businesses is somewhat more gradual than for the enterprise market. As noted earlier, by the end of 2001, the percentage of enterprises that have begun implementing IP LAN Telephony is expected to reach 44%. The mid-sized businesses will approach the 50% mark a year later, by the end of 2002.

However, there is a much smaller gap between the adoption rate (23%) projected for 2001 in last year's study, compared to the actual rate (21%) reported in the current study. Based upon the research conducted in the 3rd quarter of 2001, the adoption curve beginning in 2002 will exceed the rate projected a year ago in the 2000 study.

Exhibit 33
 Mid-Sized Businesses
Timeframe to Begin Implementing IP LAN Telephony

% of Mid-Sized Businesses

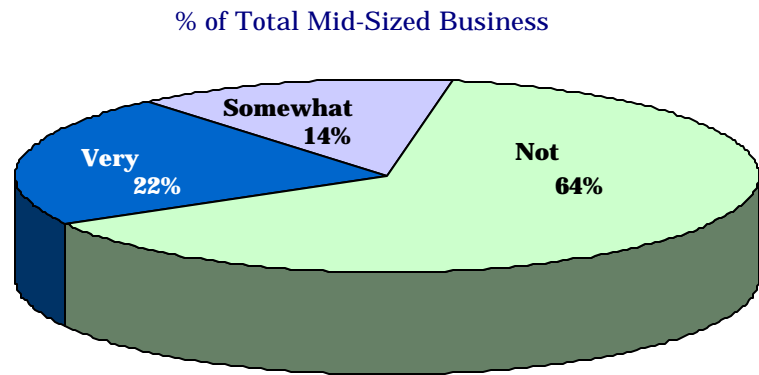


Source: InfoTech: End-user Primary Research, 2001

The mid-sized business decision-makers who participated in the study indicated that 22% of their sites in the U.S. were “Very Likely” to implement IP LAN Telephony, during the four year planning period. This is an increase from the 14% demand noted in the 2000 study. However, it still trails the percentage of “Very Likely” sites in the enterprise market.

Approximately 70% of these mid-sized businesses indicated that they had at least one “Very Likely” site. This is a huge increase compared to the 30% level from the 2000 study. It is clear that the awareness of IP LAN Telephony among mid-sized business decision-makers is much higher now than one year ago. Still 18% continued to state that they were “Not Likely” to implement this technology at any of their sites.

Exhibit 34
Mid-Sized Businesses
Likelihood of Implementing IP LAN Telephony



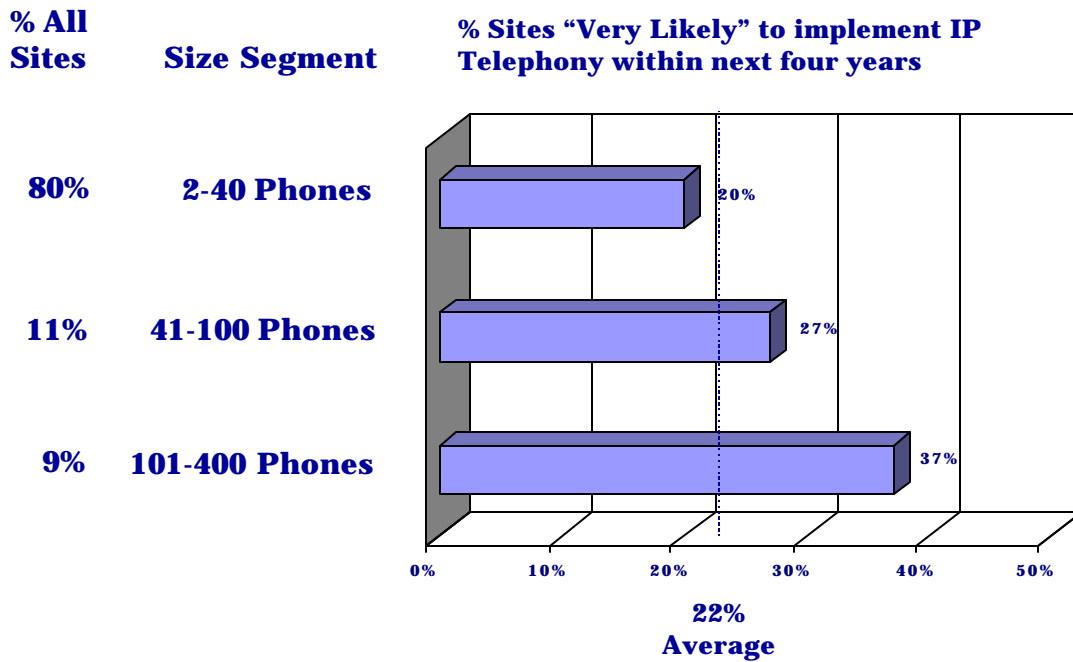
	% of Mid-Sized Businesses
At least one “Very Likely”	71%
All sites were “Not	18%

Source: InfoTech: End-user Primary Research, 2001

In the mid-sized business market, the demand is generally proportionate to the size of the site. So the smaller the site, the lower the demand. Among the mid-sized businesses participating in this study, 80% of their sites have 40 or fewer phones. Only 20% of these small sites are considered to be "Very Likely" candidates for IP LAN Telephony. Many of these sites require only basic telephony and are not likely to be connected to an existing wide area data network.

Excluding the sites with 40 or fewer phones, the percentage of "Very Likely" sites ranges from 27 to 37%.

Exhibit 35
Mid-Sized Businesses
Market Demand by Size of Site

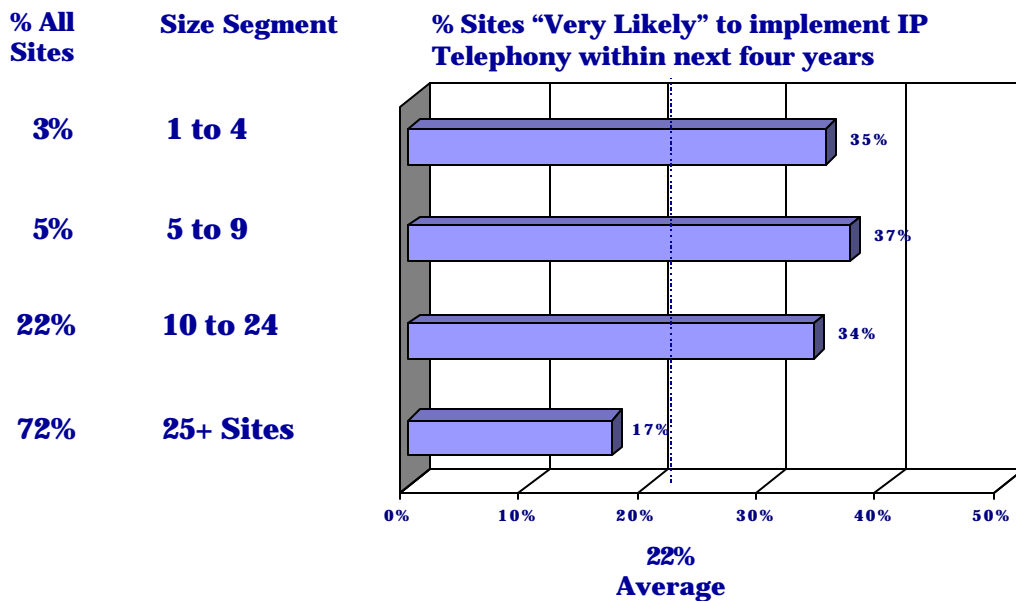


Source: InfoTech: End-user Primary Research, 2001

Among the mid-sized businesses with fewer than 25 sites, an average of 35% of the sites were considered to be “Very Likely” candidates for IP LAN Telephony

The potential demand among the mid-sized businesses in the market segment with 25 or more sites was only 17%, reflecting that a high percentage of these sites are very small sites, which have the lowest demand.

Exhibit 36
Mid-Sized Businesses
Market Demand by Size of Business

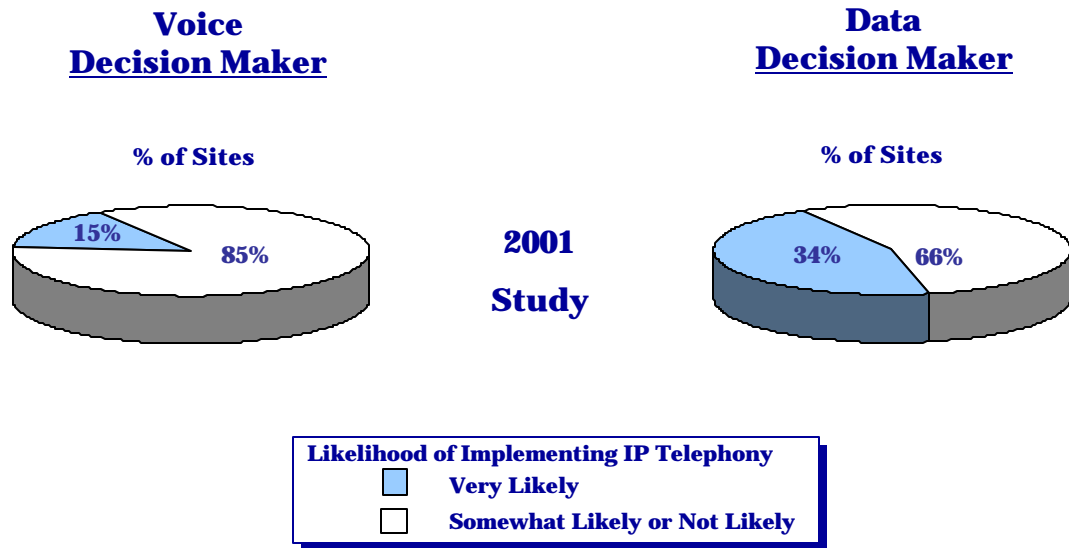


Source: InfoTech: End-user Primary Research, 2001

Among mid-sized businesses, there is still a gap between the market demand projected by the voice decision-makers and the market demand indicated by the data decision-makers. In this year's study, the voice decision-makers represented 61% of the participating mid-sized businesses. They felt that only 15% of their sites were "Very Likely" to implement IP LAN Telephony, which indicates that they are far more skeptical than their data counterparts regarding the justification for this technology in very small sites.

The data decision-makers are more optimistic about the prospects for IP LAN Telephony. They rated 34% of their sites as "Very Likely" candidates for this technology.

Exhibit 37
Mid-Sized Businesses
Market Demand by Type of Decision Maker



Source: InfoTech: End-user Primary Research, 2001

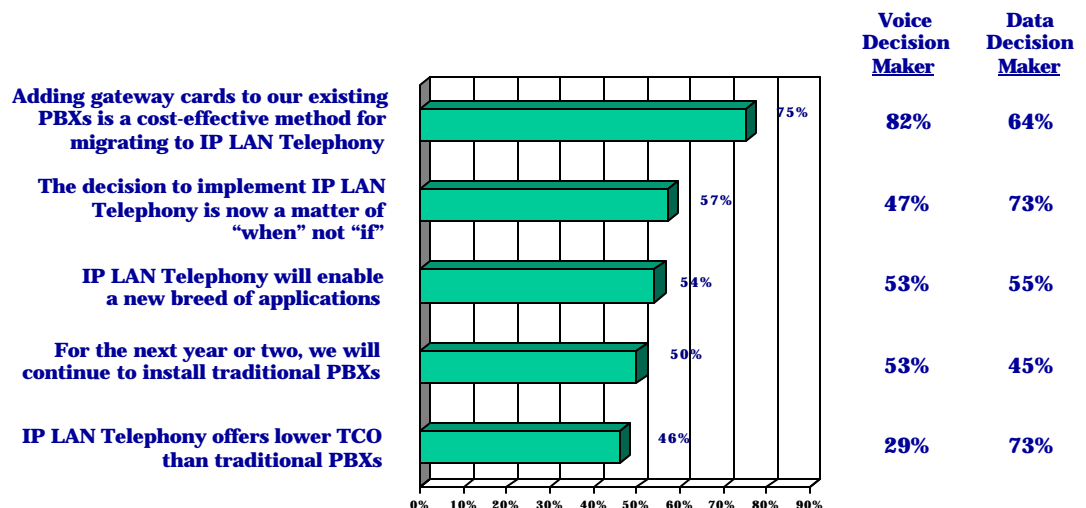
Prioritizing Key Decision Factors Affecting Implementation

Mid-sized business decision-makers were asked to rate the extent to which they agreed with or disagreed with five statements that had bearing on their decisions to implement IP LAN Telephony. Almost 60% of these decision-makers Agreed or Strongly Agreed with the following statement: *The decision to implement IP LAN Telephony is no longer a question of “if we should do it”, but is now a question of “when we should do it”*. Almost three-quarters of the data decision-makers shared this opinion, compared to less than half of the voice decision-makers.

Only 46% agreed with this assertion: *IP LAN Telephony offers lower Total Cost of Ownership than traditional PBXs*. But again there was a huge disagreement between the voice and data decision-makers, with less than 30% of the voice decision-makers supporting this position, compared to 73% of their data counterparts.

Both groups of decision-makers appear to endorse “migration” rather than “replacement”, as reflected in the 75% agreement level on this perspective: *Adding IP Telephony Gateway cards to our existing PBXs is a cost effective method for migrating to IP LAN Telephony*. 82% of the voice decision-makers shared that opinion, but a high percentage of the key/hybrid systems installed in mid-sized businesses cannot be IP-enabled. A surprising 64% of the data networking decision-makers also support the concept of migration using gateway cards.

Exhibit 38
Mid-Sized Businesses
Rationale for Implementation Decisions



% of decision-makers who Strongly or Generally Agree with these factors that affect implementation decisions

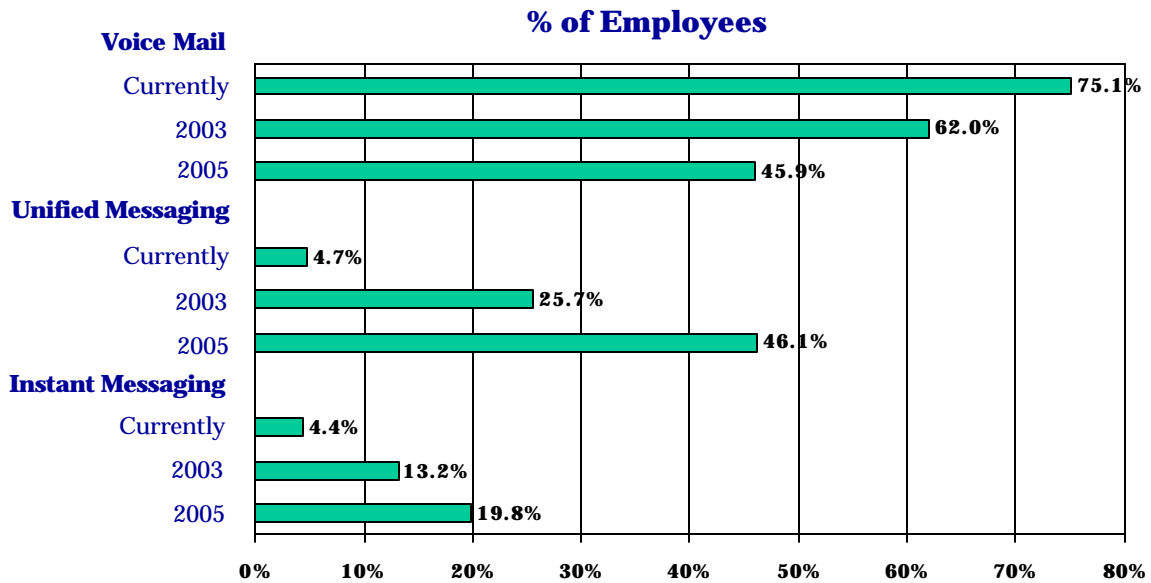
Source: InfoTech: End-user Primary Research, 2001

Quantifying the Market Demand for IP-enabled Applications

By 2005, mid-sized businesses are projecting almost half of their employees will be utilizing Unified Messaging to access their voice mail, E-mail and fax messages using a common user interface. With a current penetration of only 5%, these mid-sized businesses believe that implementing IP LAN Telephony will be the primary catalyst for the growth of Unified Messaging. During this same time period, the utilization of Voice Mail as a separate application will decline from 75% to 46% of the employees.

Instant messaging will also begin to establish a foothold during this timeframe achieving a projected utilization rate of almost 20% by 2005.

Exhibit 39
Mid-Sized Businesses
Market Demand for Messaging Applications



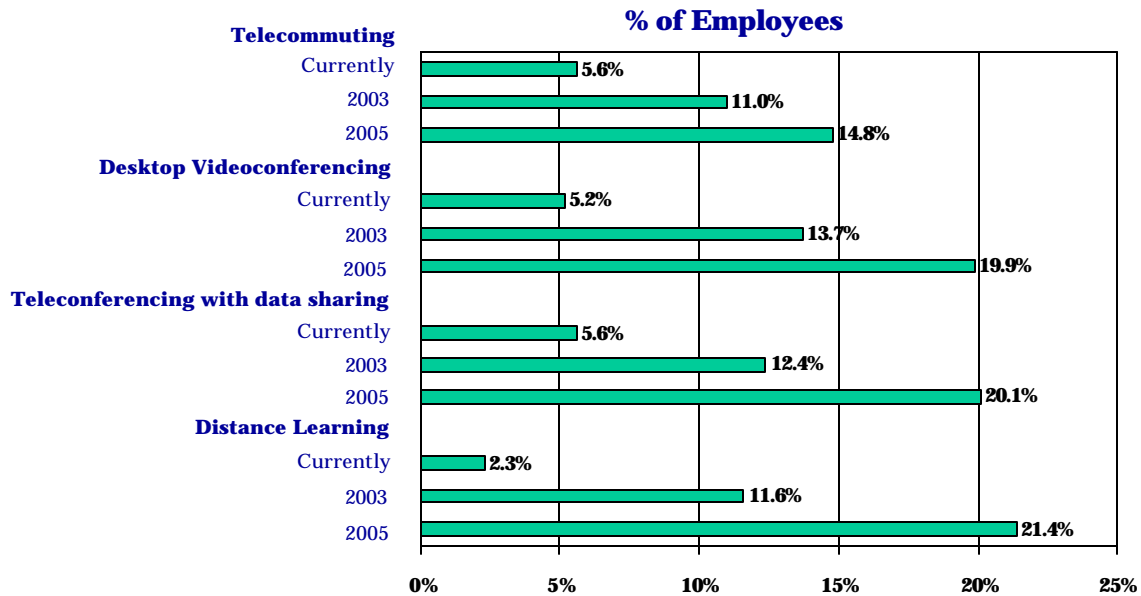
Source: InfoTech: End-user Primary Research, 2001

IP LAN Telephony is also expected to stimulate growth among various types of collaboration applications. Both Distance Learning, Teleconferencing with the sharing of data, and Desktop Videoconferencing are expected to achieve penetration of approximately 20% of the mid-sized business employees.

IP LAN Telephony will also be an important factor in the growth of Telecommuting. Remote workers that have broadband access can utilize either an IP phone or Softphone and take advantage of the same telephony features and applications that are available to workers while at their normal office.

Exhibit 40
Mid-Sized Businesses

Market Demand for Collaboration Applications



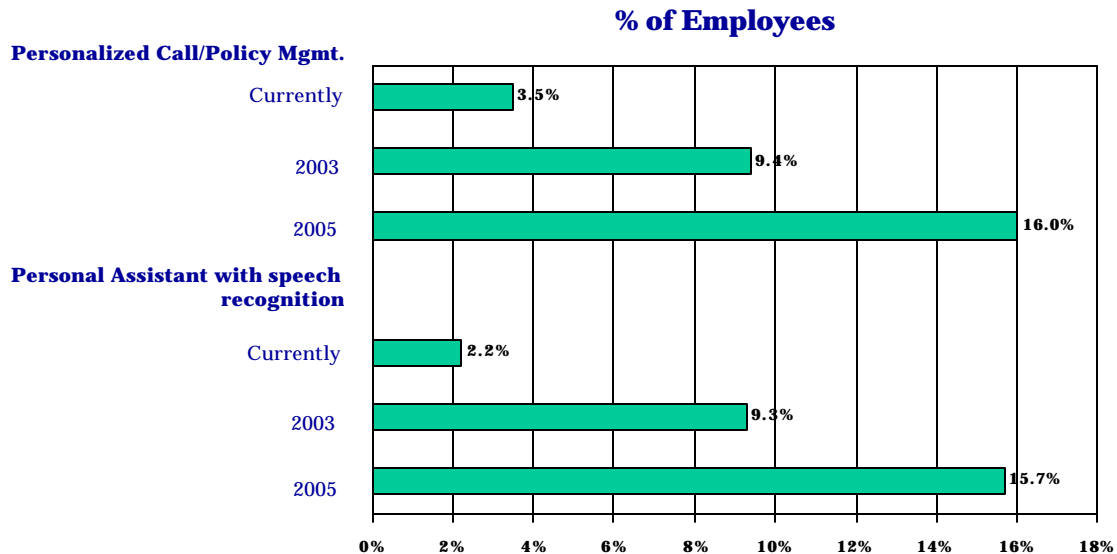
Source: InfoTech: End-user Primary Research, 2001

Personal productivity applications are also projected to receive a boost from IP LAN Telephony. With Personal Assistant software, users can utilize natural speech commands to initiate telephony features, such as making calls by name, establishing conference calls and many other functions that currently require manual initiation.

Personalized management applications will make it easier for users to administer how they want their calls to be screened and processed. For example, users could instruct the system to send all calls to voice mail for a specific time period, except for priority calls from selected parties. This application will also enable enterprises to consolidate the management of corporate directories, and to enable network administrators to assign network policies and privileges on an individual basis instead of assigning individuals to a predefined set of policies.

Slightly over 15% of the employees are expected to take advantage of the productivity savings offered by these two applications.

Exhibit 41
Mid-Sized Businesses
Market Demand for Personal Productivity Applications

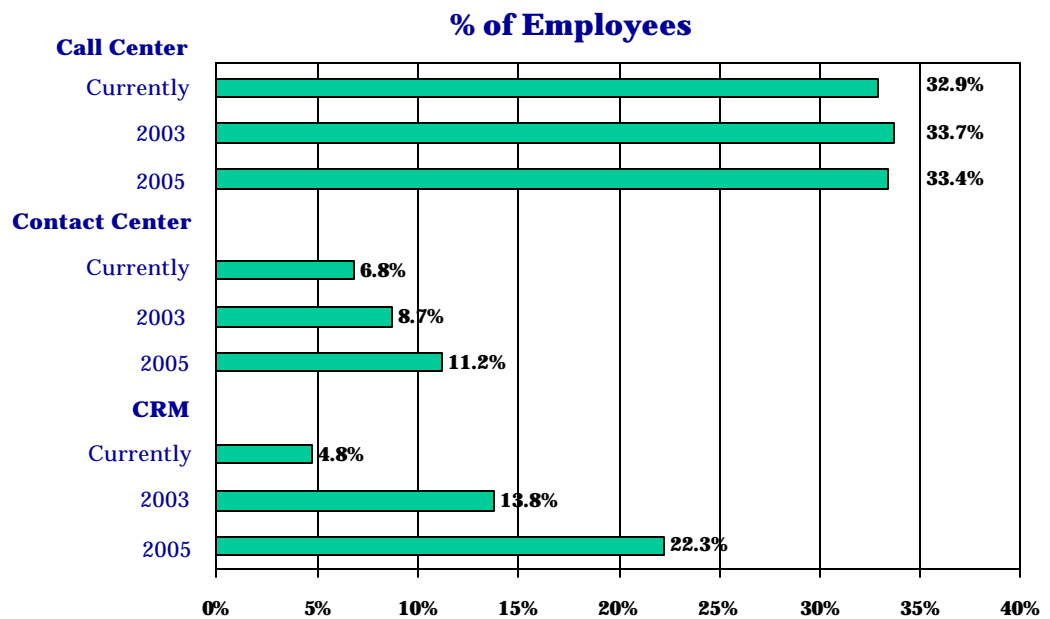


Source: InfoTech: End-user Primary Research, 2001

Mid-sized business decision-makers expect that IP LAN Telephony will cap the growth of traditional call centers. Instead, the market will make the transition to contact centers.

During this transition to contact centers, the market for CRM (Customer Relationship Management) applications is expected to explode. Decision-makers are hoping that IP LAN Telephony will help to make CRM more affordable for mid-sized businesses.

Exhibit 42
Mid-Sized Businesses
Market Demand for Customer Service Applications



Source: InfoTech: End-user Primary Research, 2001

Comparing Preferences in Suppliers

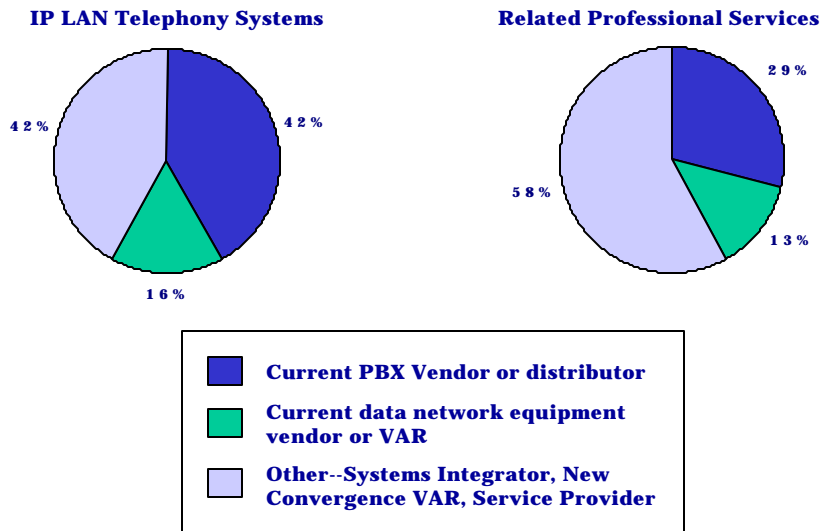
All of the participants in the study were asked which of the following types of suppliers they would prefer to use to support them in implementing IP LAN Telephony.

- Current PBX vendor or distributor
- Current data network equipment vendor or VAR
- Other – Systems Integrator, Service Provider or New Convergence VAR

With respect to support for their implementation of IP LAN Telephony, the mid-sized business decision-makers were split between their Current PBX vendor or distributor and the Other category. Only 16% preferred to use their Current data network equipment vendor or VAR for this fundamental category of support.

Over half preferred the use of suppliers in the Other category for providing related professional services.

Exhibit 43
Mid-sized Businesses
Preferred Supplier for Providing Implementation Support



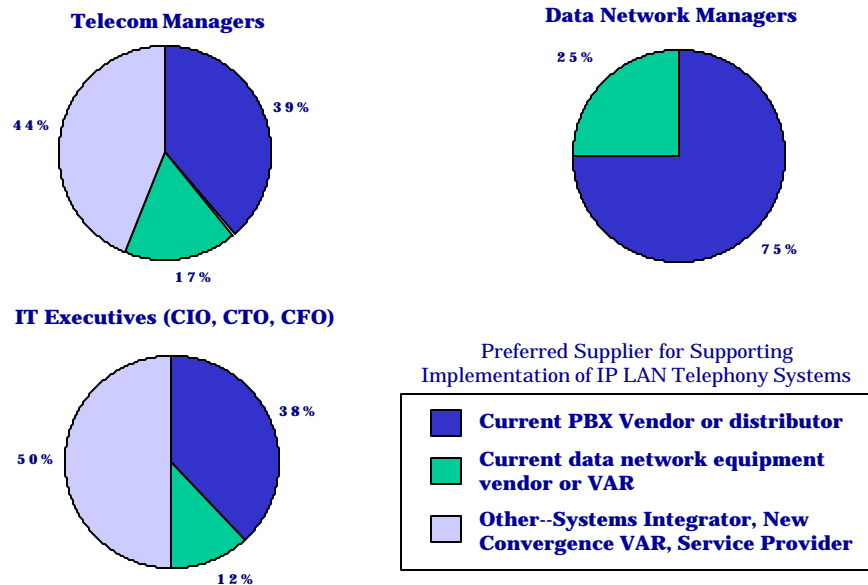
Source: InfoTech: End-user Primary Research, 2001

The previous exhibit regarding preferred suppliers did not evoke any surprises. However, a closer analysis of preferences by type of decision-maker did yield a major unexpected result. All three groups of decision-makers indicated a preference for the current PBX vendor or distributor to support their implementation of IP LAN Telephony.

It is interesting to note that telecom managers and IT executives (CIO, CTO, CFO) would prefer to utilize suppliers from the Other category instead of their current PBX vendor or distributor to support their implementation of IP LAN Telephony systems. Surprisingly, three-quarters of the data network managers would prefer to use their PBX vendor/distributor for this function instead of their current data network equipment vendor/VAR. The fact that the majority of the data decision-makers would prefer the PBX vendor/distributor indicates one of two possibilities.

- They feel that their VAR has very little expertise in Telephony
- Their current PBX distributor also is supporting the IP LAN Telephony system of the leading data networking vendor

Exhibit 44
Mid-sized Businesses
Decision Maker Preferences for Supplier Support



Source: InfoTech: End-user Primary Research, 2001

5. MARKET FORECAST FOR IP LAN TELEPHONY: 2001-2006

Forecast Methodology

InfoTech has been tracking the Customer Premises Equipment market (PBXs and Key Telephone Systems) since 1989. We offer a subscription service entitled *InfoTrack for Enterprise Communications*, which includes detailed data on the installed base, quarterly line shipments, vendor market share and a 5 year forecast. This installed base segmentation is a critical tool for analyzing the market demand of the study sample, and extrapolating it to a forecast for the overall market.

We have also been conducting primary research studies of the IP LAN Telephony market for three years. In the 2000 study, the forecast section included the following breakouts of the five-year U.S. market forecast.

- Unit Forecast of IP Station Lines by Line Size Segment
- Unit Forecast of IP Station Lines by Implementation Method
- Unit Forecast of Station Lines for IP LAN Telephony vs. Traditional CPE
- Revenue Forecast, including a 5-year projection of average price per IP station line

Each of these forecasts has been updated in this 2001 study to reflect the five-year period 2001 to 2006. In addition, we have added the following breakouts to this year's report:

- Unit Forecast of IP Station Lines by Enterprise, Mid-Sized and Small Business Market Segments
- Installed Base View of IP LAN Telephony by Type of Phone in 2005: IP-Enabled vs. IP-Centric
- Forecast of Applications Revenue on IP LAN Telephony systems

The following methodology was utilized to develop the forecasts included in this report:

- The results of the enterprise surveys provided the market demand (percentage of "Very Likely" sites) by 2005 in each of the following line size segments:
 - Sites with 2 to 40 phones
 - Sites with 41 to 100 phones
 - Sites with 101 to 400 phones
 - Sites with 401 to 1,000 phones
 - Sites with more than 1,000 phones
- The results of the mid-sized surveys provided the market demand (percentage of "Very Likely" sites) by 2005 in each of the following line size segments:
 - Sites with 2 to 40 phones
 - Sites with 41 to 100 phones
 - Sites with 101 to 400 phones

- The results of the mid-sized demand analysis were used to estimate the market demand (percentage of “Very Likely” sites) by 2005 in the following line size segment for small businesses:
 - Sites with 11 to 40 phones
We excluded the 2 to 10 station segment, because previous market research indicated that small businesses with up to 10 phones, very unlikely to implement IP LAN Telephony.
- Using the *InfoTrack* database, we computed the average number of lines per system in each of the five line size segments. We used those averages to convert the percentage of “Very Likely” sites in the sample base segments to percentage of installed stations on IP LAN Telephony systems in 2005
- We combined the *InfoTrack* installed bases of PBX lines and Key/Hybrid lines by line size segment (excluding the 2 to 10 station segment) by year through 2006, without making any adjustments for exits due to IP LAN Telephony.
- Using ratios derived from published databases from the U.S. Census bureau and the Small Business Administration, we took the consolidated *InfoTrack* installed base from the previous step for the year 2005 and divided it between enterprise, mid-sized and small business markets.
- We then applied the percentage of “Very Likely” installed stations in each line size segment from our demand analysis and computed the total number of station lines installed on IP LAN Telephony systems in 2005.
- *InfoTrack* provides a quarterly report on IP-PBX line shipments by vendor, and by line size segment. We used this data to develop a view of the installed base of IP LAN Telephony lines for the end of 2001, divided between enterprise, mid-sized, and small business markets.
- We now had a segmented view of the installed base of IP LAN Telephony for both 2001 and 2005. We made assumptions about the growth rate in each segment and filled in the installed base model for the years 2002, 2003, 2004, and 2006.
- We used the difference in the installed base year over year to estimate the shipments of IP LAN Telephony station lines for 2002 through 2006. That forecast, divided by line size segments, is depicted in Exhibit 45.
- We used the shipment data from *InfoTrack* to determine the ratio of IP-Enabled lines vs. IP-Centric lines shipped in 2001. We used the market demand data to determine the ratio of IP-Enabled lines vs. IP-Centric lines in the installed base models for 2005 and 2006. From that we were able to compute the ratio of IP-Enabled lines vs. IP-Centric lines shipped in 2006. We then modeled how the 2001 ratio would evolve each year in order to achieve the 2006 ratio. That

model was used to divide the forecast of station lines between IP-Enabled and IP-Centric. The resulting forecast is depicted in Exhibit 46.

- The participants in our primary research study were asked to estimate what the mix of phones would be on the IP LAN Telephony systems that would be installed at their “Very Likely” sites by 2005. Two projections were made – one for IP-Enabled systems and one for IP-Centric systems. That projection is depicted in Exhibit 47.
- Since we had been using separate installed base models for enterprise, mid-sized and small business markets, we already had developed the shipment breakouts between enterprise, mid-sized and small business market segments. That segmented forecast is depicted in Exhibit 48.
- In exhibit 49, we compare the shipment forecast for IP LAN Telephony, with the shipment forecast of traditional CPE from *InfoTrack*. We have excluded shipments of Key Systems with 10 or fewer phones. This comparative forecast is depicted in Exhibit 49.
- We used sample pricing data that we had received from some of the equipment vendors to price out typical configurations in each line size segment. We developed an average price per station line for each segment, based upon a composite of the vendor prices in those segments. We assumed an annual price decline of approximately 5%. Based upon discussions with the vendors we developed assumptions relative to discount rates. We then used this pricing data to convert the shipment forecast into a revenue forecast. That forecast is depicted in Exhibit 50.
- In sections three and four of this report we presented the market demand projections for both enterprises and mid-sized business with respect to Messaging, Collaboration, Personal Productivity and Customer Service applications. Using pricing data from a number of different sources we developed an average price per employee for the primary application in each of those four segments. We applied those average prices to the incremental demand in 2001 and 2005 to develop a projection of the IP-enabled application revenue in those two years. We also modeled the projected spending on services related to IP LAN Telephony. These included installation, maintenance and professional services. We compared the resulting revenue mix with the corresponding mix for traditional CPE derived from our *InfoTrack* databases. The resulting comparison is depicted in Exhibit 51.

Market Forecasts

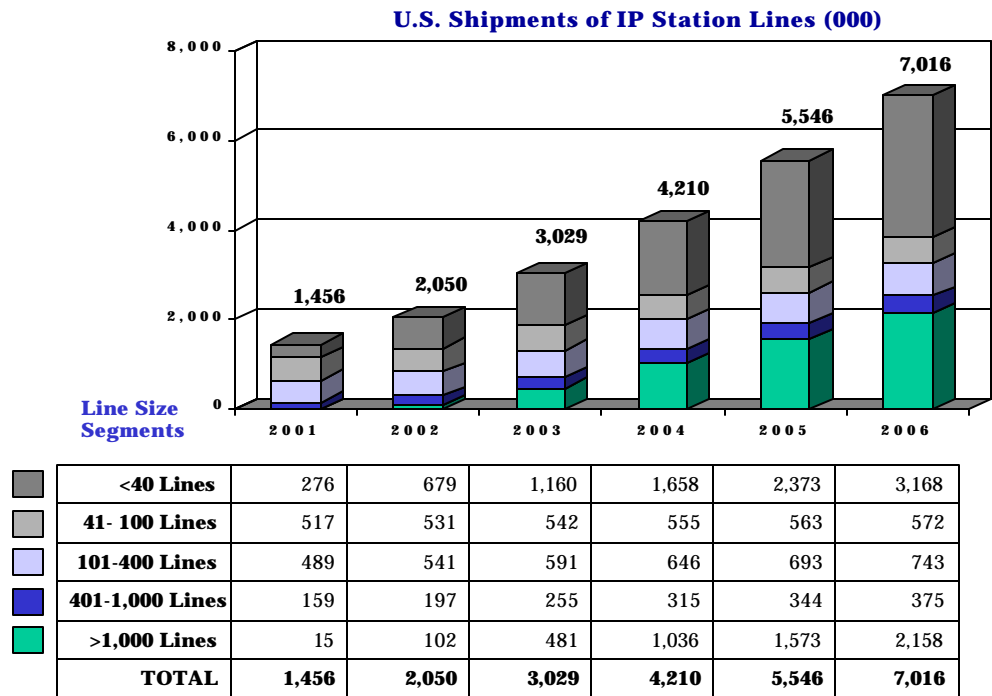
In our previous reports on IP LAN Telephony, the forecast focused only on shipments of IP station lines. However, these systems are actually been shipped with a mix of different phones. Even IP-Centric systems include stations other than IP phones and Softphones, particularly analog devices. And with special gateways, IP-Centric systems can support digital phones also. In the case of IP-Enabled systems, this forecast does not count the existing phones that remain with the system.

The 2001 forecast of 1,456,000 station lines was derived from the actual shipments reported in our *InfoTrack* database through the first three-quarters of 2001. The 2005 forecast of 5,546,000 station lines was extrapolated from the market demand data from our primary research. Shipments in the other years were modeled based on the trajectory from 2001 to 2005. The forecast for 2005 was based strictly on the projection of "Very Likely" sites. As noted earlier, the percentage of "Very Likely" sites in the segments with between 41 and 1,000 phones was substantially lower than the other two segments. That accounts for the constrained forecast in these mid-level size segments.

In the event that some companies decide to also implement IP LAN Telephony systems at their "Somewhat Likely" sites during this period, then this forecast could be considered as conservative.

Exhibit 45

Market Forecast by Line Size Segment



Source: InfoTech: End-user Primary Research, 2001

InfoTrack reports IP line shipments in three categories – IP-enabled PBX, Telephony-enabled LAN (IP phones only) and Converged Systems (mix of IP and other types of stations). In this report, we have combined the latter two categories under the IP-Centric label. According to InfoTrack, IP-Enabled represented one-quarter of the shipments in 2001.

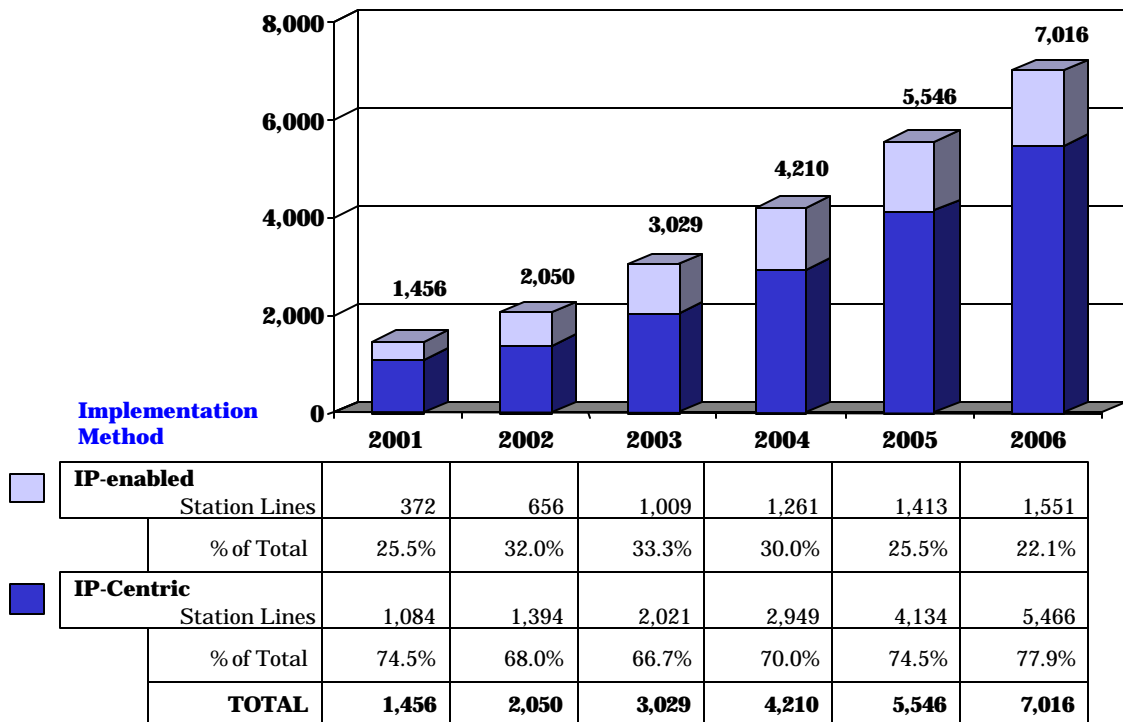
Our analysis of the market demand indicates that the IP-enabled share will increase to one-third in 2003, supported by intensified marketing efforts of the major PBX vendors. The share declines in subsequent years, reaching 22% in 2006. In the later years of this forecast, many of the PBXs that were new or upgraded in anticipation of Y2K, will be due for an upgrade or replacement. At that point, most companies would prefer to replace them with an IP-Centric system.

It should be noted that the IP-Enabled forecast is constrained because it only counts the new phones that are added or installed to replace existing phones. However, as companies implement IP-Centric systems, virtually all of the stations are new shipments so they would all be counted in that case.

Exhibit 46

Market Forecast by Implementation Method

U.S. Shipments of Station Lines (000) of IP LAN Telephony Systems



Source: InfoTech: End-user Primary Research, 2001

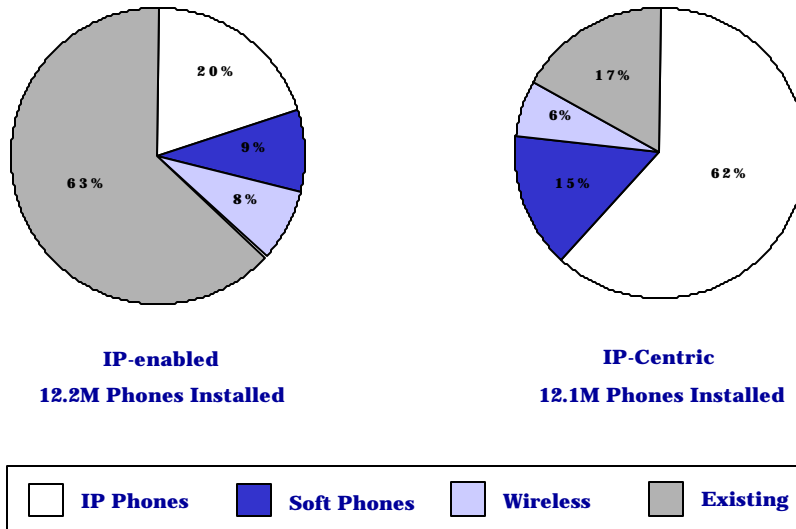
By accumulating the station lines shipped on IP LAN Telephony systems from 1999 through 2005, we can project the size of the installed base in 2005. The participants in our primary research study were asked to estimate what the mix of phones would be on the IP LAN Telephony systems that would be installed at their "Very Likely" sites by 2005. Two projections were made – one for IP-Enabled systems and one for IP-Centric systems.

As noted earlier, the existing phones on IP-Enabled systems were not included in our shipments forecast. However, they are included in projections of the installed base. In fact, the results of the research indicate that existing analog and digital phones would account for over 60% of the phones on IP-Enabled systems in 2005. This compares with only 17% on IP-Centric systems.

In 2005, each of the two implementation methods – IP-Enabled and IP-Centric – is projected to have an installed base of slightly over 12 million lines.

Exhibit 47
Projected Mix of Phones Installed in 2005

Projected U.S. Installed Base of IP LAN Telephony Systems -- 2005



Source: InfoTech: End-user Primary Research, 2001; InfoTrack for Enterprise Communications

For the 2001 study, we have included a segmented forecast which provides a breakout of the IP LAN Telephony shipments for enterprises (500 to 200,000 employees), mid-sized businesses (100 to 499 employees), and small businesses (20 to 99 employees). We excluded small businesses with fewer than 20 employees, because previous market research indicated that the low end of the small business market is very unlikely to implement IP LAN Telephony.

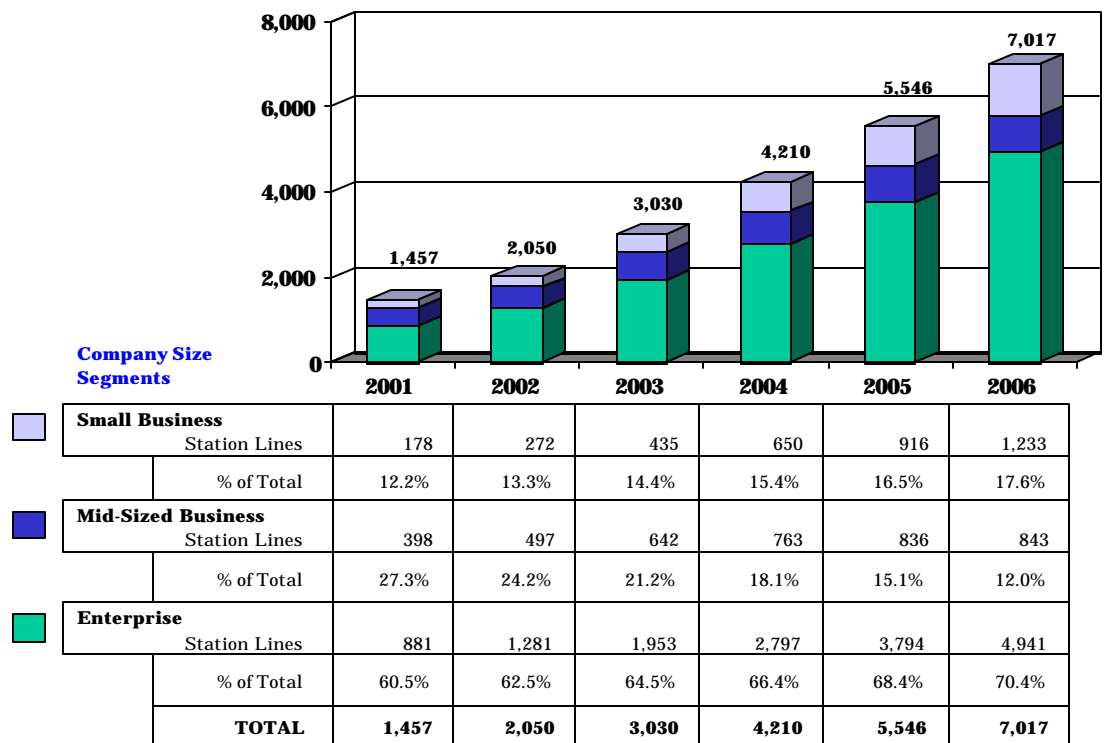
The breakout for 2001 was derived from an analysis of the vendor shipments that are tracked in our *InfoTrack* database. The breakout for 2005 was based on our analysis of the market demand from the primary research. Since the research was focused specifically on the enterprise and mid-sized business markets, we used the results of the low end of the mid-sized business market, combined with previous small business research, to estimate the market demand in the small business segment.

Enterprises accounted for 60% of the shipments in 2001. Based upon the primary research, that dominance is expected to increase to 70% by 2006.

Exhibit 48

Market Forecast by Company Size Segment

U.S. Shipments of Station Lines (000) of IP LAN Telephony Systems



Source: InfoTech: End-user Primary Research, 2001; InfoTrack for Enterprise Communications

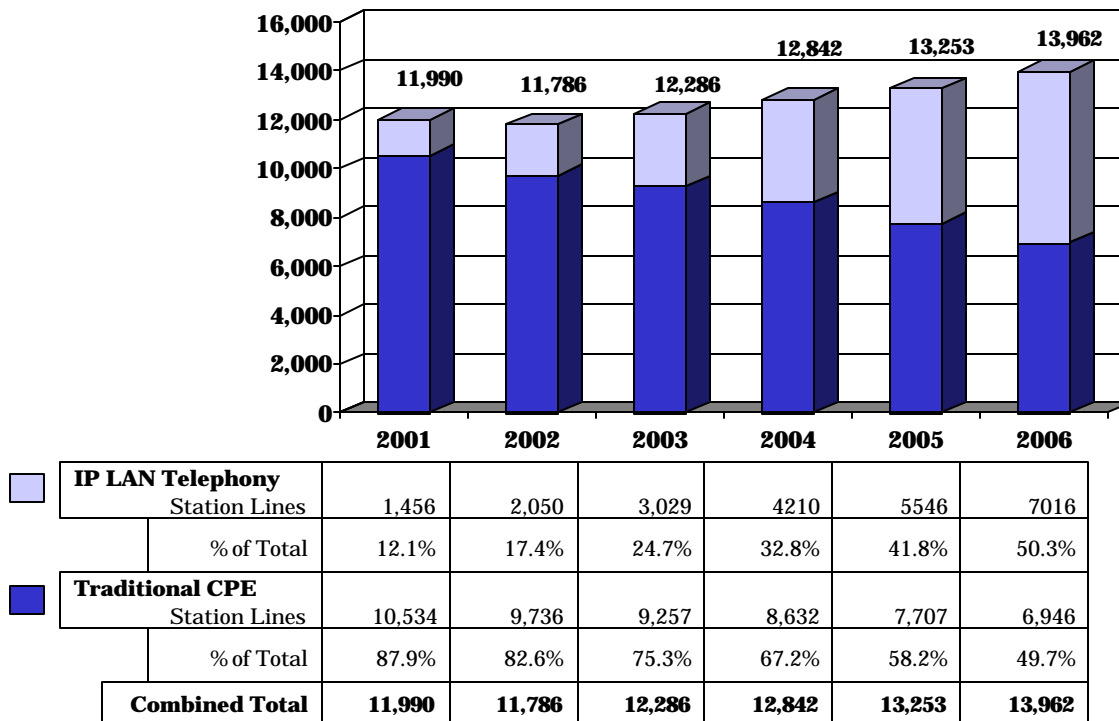
This exhibit compares the total U.S. forecast for IP LAN Telephony with the forecast for traditional customer premises equipment (PBXs and Key/Hybrid telephone systems). The IP LAN Telephony forecast reflects the complete forecast of station line shipments. The forecast for traditional CPE was derived from the forecast contained in our *InfoTrack for Enterprise Communications*, excluding the segment of the market with very small Key Systems, those with 10 or fewer phones.

It is obvious from the graph that the market for traditional CPE is declining. Shipments of traditional PBXs were down 15% in 2001 and in the Key/Hybrid market they were off by more than 25%. Between 2001, overall shipments of traditional CPE are projected to decline by an average rate of 8% per year. During the same period, shipments in the IP LN Telephony market are expected to increase by 37%. Combined the shipments will increase from 12 million in 2001 to almost 14 million in 2006, which represents an average annual growth rate of 3%.

In 2006, IP LAN Telephony shipments will account for half of the total U.S. market.

Exhibit 49

Market Forecast IP LAN Telephony vs. Traditional CPE



Source: InfoTech: End-user Primary Research, 2001; InfoTrack for Enterprise Communications

IP LAN Telephony generated revenue of \$900 million in 2001, which was 17% of U.S. CPE (Customer Premises Equipment) revenue. That

includes only the revenue from system hardware, software and new stations. It does not include the revenue from the applications on these systems. It also does not include the revenue from the data networking equipment from the IP LANs and WANs that are utilized by these IP LAN Telephony systems.

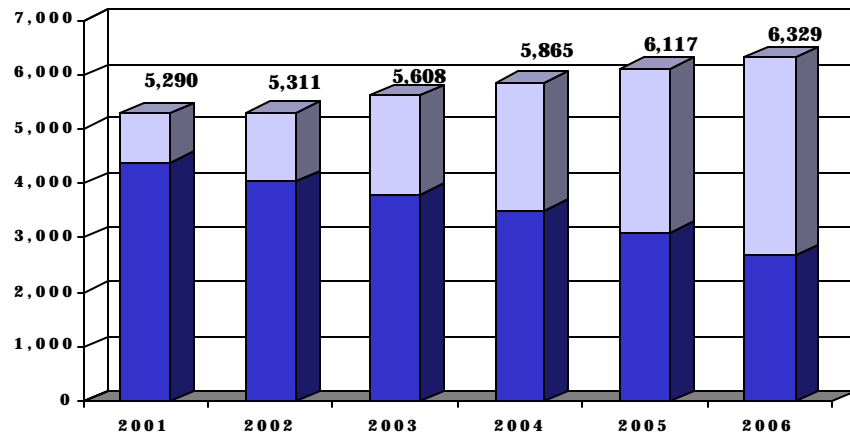
In order to develop the revenue forecast, we had to determine the typical price per IP station line for representative configurations in each of the line size segments. These were developed for both IP-centric systems and IP-enabled PBXs, using a composite of sample pricing data that we had received from some of the equipment vendors. For the IP-centric configurations, we assumed a mix of 15% basic IP Phones, 60% standard IP Phones, 5% executive IP phones, 10% soft phones and 10% analog phones. For IP-enabled systems, we assumed that customers retained 60% of their existing phones, which were not included in the revenue forecast.

Once we had developed the composite price per station line for each segment, we assumed that the price would decline by about 5% per year, due to economies of scale, competitive pressures and Moore's Law. Factoring in estimated discount, this pricing data to convert the shipment forecast into a forecast of revenue.

Exhibit 50

Equipment Revenue: IP LAN Telephony vs. Traditional CPE

U.S. CPE Revenue (\$ Millions)



■	IP LAN Telephony						
	\$ Million	908	1,281	1,808	2,359	3,007	3,639
	% of Total	17.2%	24.1%	32.2%	40.2%	49.2%	57.5%
■	Traditional CPE						
	\$ Million	4,382	4,030	3,800	3,506	3,110	2,690
	% of Total	82.8%	75.9%	67.8%	59.8%	50.8%	42.5%
	Combined Total	5,290	5,311	5,608	5,865	6,117	6,329

Source: InfoTech: End-user Primary Research, 2001; InfoTrack for Enterprise Communications

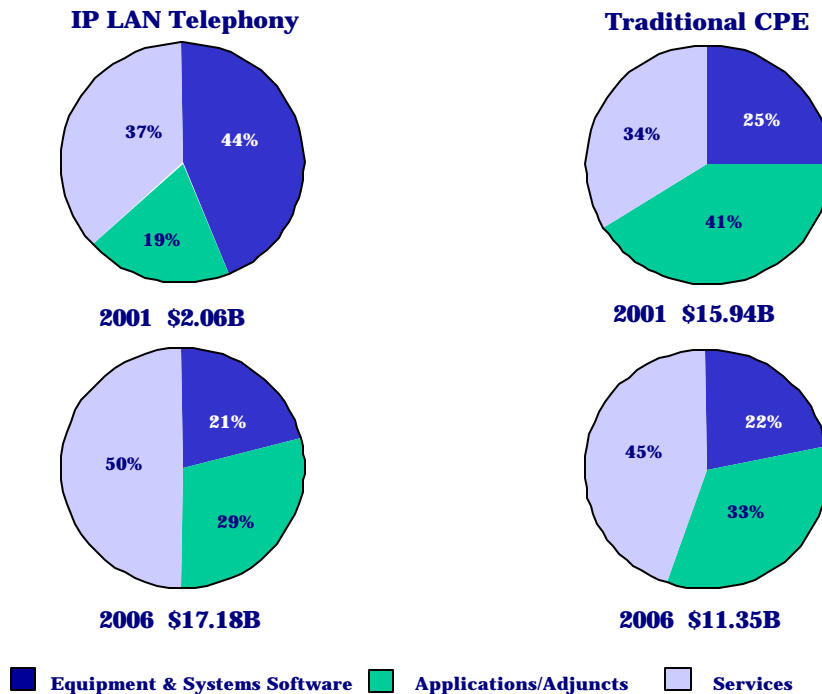
Exhibit 51 reflects the entire revenue mix, including the equipment and systems software revenue from Exhibit 50 plus revenue for applications and adjuncts, as well as a full range of related services. Included in the applications revenue were messaging and IVR applications, along with call centers and contact centers. Services revenue included installation, maintenance and related professional services.

The applications revenue for Traditional CPE was derived from our *InfoTrack for Enterprise Communications*. The services revenue for Traditional CPE was derived from our *InfoTrack for Maintenance Services* and related analyses of the professional services market related to CPE. In the case of IP LAN Telephony, the demand for applications was derived from our primary research and the pricing assumptions were based on sample pricing from several vendors. The services revenue for IP LAN Telephony was modeled based on interviews with end users, vendors and engagement consultants, and included strong growth in professional services related to convergence planning and implementation.

In 2001, equipment and systems software represented 44% of the total IP LAN Telephony revenue of \$2.06 billion. By 2006, that category will represent only 21% of the total of \$17.18 billion. Services will become the dominant revenue generator, reflecting ongoing maintenance contracts for systems installed since 2000 and the expected demand for professional services on convergence.

Exhibit 51

Total Revenue Mix: IP LAN Telephony vs. Traditional CPE



Source: InfoTech: End-user Primary Research, 2001