

INPUT

STRATEGIC MARKET PERSPECTIVE

Critical Applications in the Travel and Lodging Industry

U.S. Market Analysis Program

Critical IT Applications in the Travel and Lodging Industry

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Abstract

This report from INPUT's Market Analysis Program analyzes key applications in the travel and lodging industry.

A survey of 54 U.S. companies within this industry examined their application-related objectives and plans. A further in-depth interview was conducted on 121 critical applications concerning plans over the next three years. The report provides insights into the replacement schedule of critical applications, the methods planned for implementation of these applications, and the expected expenditure on software and services.

This report contains 74 pages and 48 exhibits.

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U.S. Market Analysis Program

Critical IT Applications in the Travel and Lodging Industry

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Introduction

A

Overview

This study, from INPUT's Market Analysis Program, examines the plans of U.S. travel companies with respect to information technology (IT) applications.

This chapter will describe:

- The methodology used for this study
- The analytic approach
- The organization of this report.

B

Methodology

INPUT interviewed 54 U.S. travel companies to learn of their application-related objectives and plans. The questionnaire used is shown in *Appendix A*.

The respondents were selected for being knowledgeable about all of their organization's systems and applications initiatives. The respondents were divided nearly equally between systems specialists and those in more general management positions. Surveys covered all major sectors of the U.S. travel industry, including airlines, travel agencies, hotels, and rental car companies.

INPUT surveys were targeted to reach enterprises belonging to the following Standard Industry Classifications:

- Passenger airlines SIC 4711, 4729
- Railroads—passenger travel SIC 4011, 4111
- Passenger cruises SIC 441, 442, 4489
- Bus travel, inter-city SIC 4111, 4131, 4141
- Travel agencies SIC 4724
- Hotels/motels SIC 70XX
- Automobile rental firms SIC 7514, 7515

A key part of INPUT's methodology was that the questionnaire did not specify particular applications or application groups that INPUT had identified or believed were critical. Instead, respondents were encouraged to identify the applications that they believed were important.

After key applications were identified, a further in-depth interview was conducted on 81 of these critical applications concerning plans over a three-year period. A three-year time frame was selected because, in INPUT's experience, that is the maximum that most organizations are able to plan for.

During September, 1996, INPUT analyzed the questionnaire data both quantitatively and qualitatively.

C

Analytic Approach

Respondents were asked to identify the most important applications and their plans for replacement. In the course of its analysis, INPUT found that the applications could be consolidated and analyzed within the following groups:

- Finance/administration: All financial applications, human resources, payroll, hotel back office systems, order processing
- Gaming/casino: Slot machine tracking, casino cage, player tracking, integrated casino systems

- Operations: Hotel front-office systems, material allocation, purchasing, quality control, enterprise or division-level database systems, flight tracking and scheduling, customer service
- Reservations, sales and marketing: Centralized reservation systems for airlines, hotels and rental cars; yield management, telemarketing, cruise probing

For each application type shown above, INPUT performed the following analyses:

- The percent of travel companies planning to replace the application
- The reasons for the replacement
- The expected size (in dollars) of application replacement costs
- Total spending for travel and lodging industry IT applications, and for the four application groups for the years 1996, 1997 and 1998
- Expected Sources for the replacement systems: packaged software, heavily modified packages, or customized applications
- User satisfaction with currently installed applications

In the research for this study, respondents were given the opportunity to give open-ended reasons for replacing applications. Later in the analysis, these reasons were classified into the following groups:

- Changing business requirements
- The need for better information or integration of information
- Need for improved connectivity
- Impact of technological advances
- Cost/efficiency of the application

The costs include identified personnel costs (both in-house and external) as well as costs for packaged software, systems integration and/or outsourcing. Although some replacement costs involve additional costs for hardware, these costs were not considered because in many cases they were not yet identified or it was believed that no substantial hardware costs would be involved.

Based the on survey responses, projects have been classified into the following size groups:

- Under \$100K
- \$100-500K
- \$500K-1 million
- \$1-5 million
- Over \$5 million

D

Organization of This Report

Chapter II, *Executive Overview*, is a summary of the key findings of this report.

Chapter III, *Travel and Lodging Industry Selection and Spending on New Applications*, examines the demand for these applications across the entire industry.

Chapter IV, *Analysis of Critical Applications in Four Categories*, analyzes spending plans and application requirements in each of the major application types identified in the survey.

Chapter V, *Technology-Related Issues*, discusses technology impacts and issues uncovered during the study.

Appendix A contains the questionnaire used for the survey of travel & lodging industry firms.

Appendix B contains information on the demographics of the respondents.

E

Related INPUT Reports

In addition to this market-specific report, the reader may also be interested in other INPUT reports, which address specific product/service markets and the U.S. and worldwide markets for information services. Such reports include the following INPUT publications:

- *U.S. Market Forecast Compendium, 1995-2000*
- *Revolutionary Changes in Hospital IT Applications*
- *Using the Internet for Business Operations*
- *Worldwide Internet Market, 1995-2000*
- *Critical Applications in the Media Industry*

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Executive Overview

This study examines the plans of U.S. travel companies for creating or replacing critical information systems applications. This chapter provides a summary of:

- Total expected spending on critical applications within the travel sector
- Replacement rates for critical applications
- The reasons why applications are being replaced
- The expected sources of these replacement applications
- Balances between business and technical influences in application selection
- Technology issues, such as Intranet impact, criteria for outside vendor participation, and vendor ratings
- Overall conclusions and recommendations

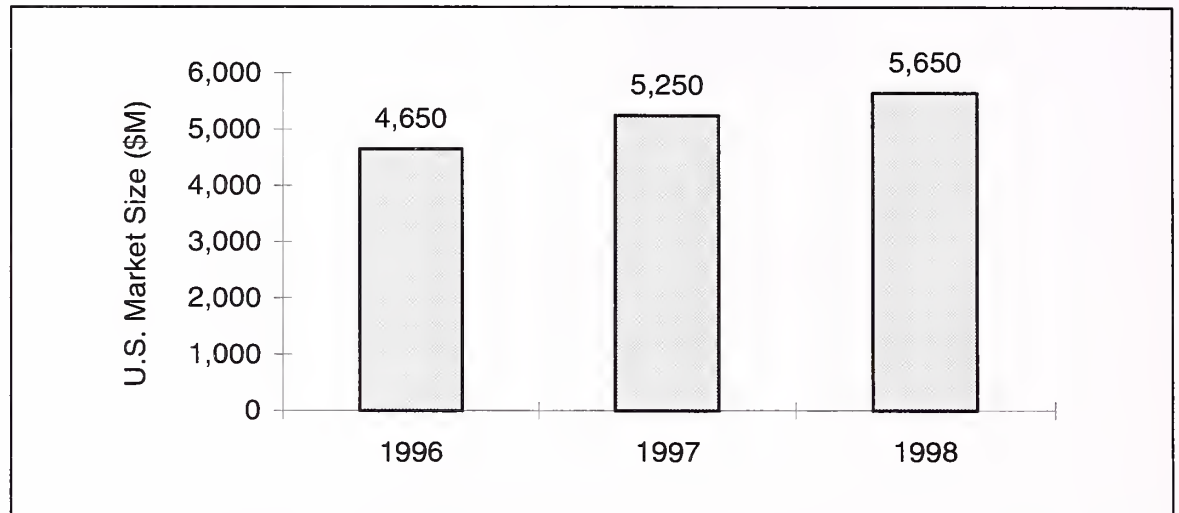
A

Information Services Spending in the Travel Industry, 1996-1998

INPUT surveys identified the projected spending for each critical application, and then projected that result to the various travel sectors covered in this study. Total spending for the travel sector for the years 1996-1998 is shown in Exhibit II-1.

Exhibit II-1

Software and Service Market in the Travel Industry, 1996-1998



Source: INPUT

Growth rates for the industry are projected to be 11% from 1996 to 1997, and 10% from 1997 to 1998. This is slightly below INPUT's forecast of 12% for the U.S. information services industry as a whole.

The primary reason for the lower growth rate is the large market for centralized reservation systems, relatively mature and making up 62% of total industry spending. This market, growing at about 9% per year, has a dampening effect on the entire sector's growth.

Centralized airline reservation systems are concentrated in just seven major vendors worldwide. These are Sabre, Galileo, Amadeus, Worldspan, Infini, Axxess, and Abacus. Given the massive investment required to play in this market, and interlocking ownership of most of these firms by airlines, INPUT considers this market relatively unavailable to IT vendors in general.

An exception to this restriction is EDS, which has attained a unique presence by its investment, development, and operating activities with Worldspan/System One.

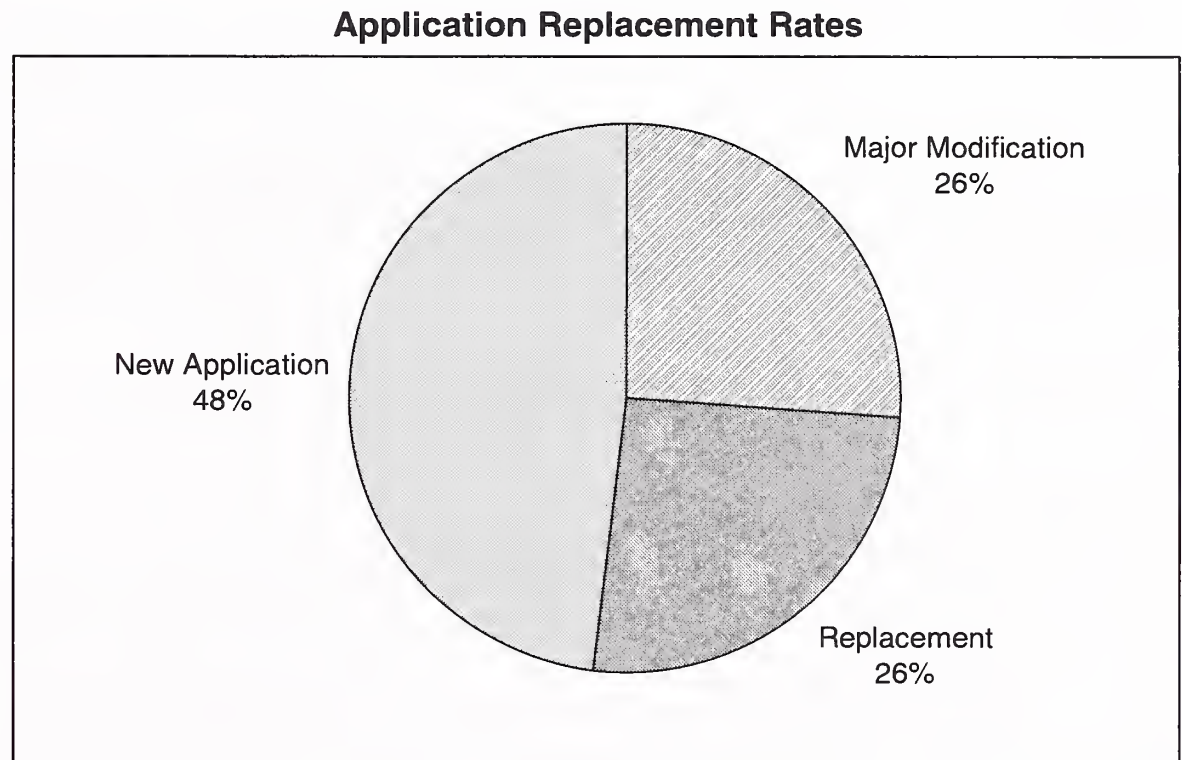
If equipment expenditures were included in this forecast, INPUT estimates that spending levels would increase by 35% to 40%.

B

Application Replacement Rates and Reasons

For each important application identified by survey respondents, the follow-up question asked, was whether it was a brand-new application, a complete replacement of an existing application, or a major modification to the existing application. Total survey results are displayed in Exhibit II-2, below.

Exhibit II-2



N = 81

Source: INPUT

C

Business Changes

The travel and lodging world has become increasingly competitive in the last few years, in all sectors. There is also the pressure the Internet may generate, allowing travelers to make their own travel reservations directly, bypassing agents entirely.

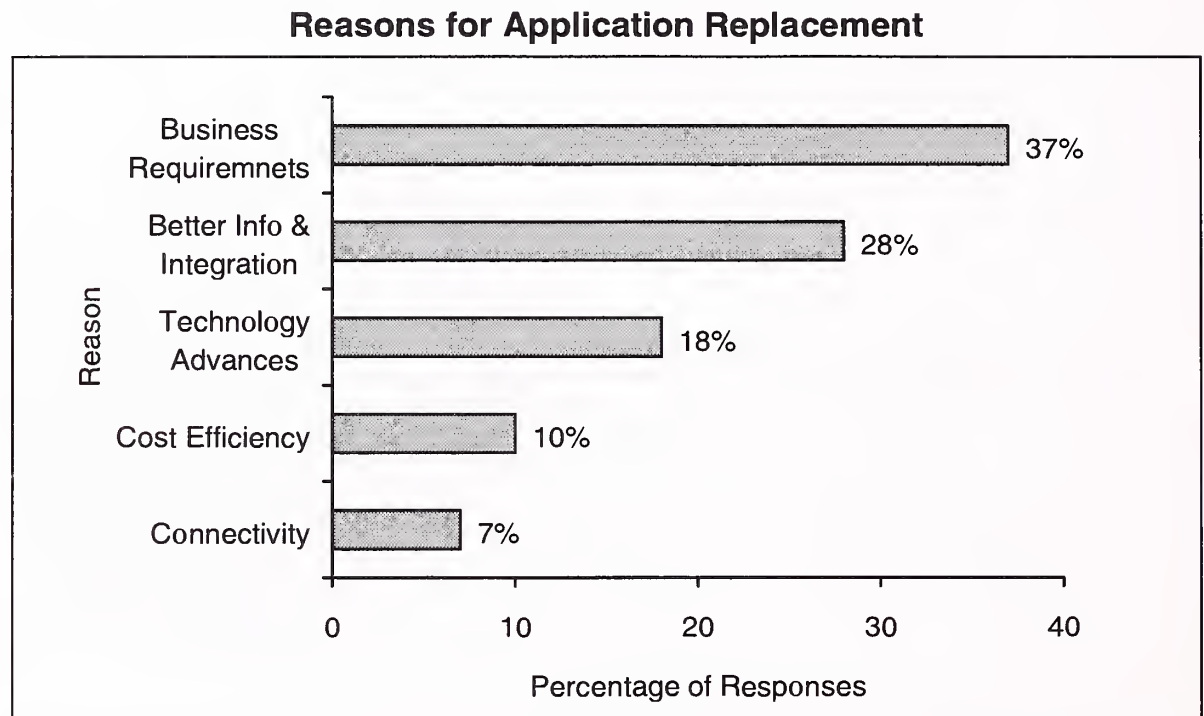
Major corporations are operating their own travel departments and aggressively pursuing the best deals with hotels, airlines, and rental car companies, often going around travel agencies in the process.

In early 1996, airlines reduced the commissions they pay to travel agencies, putting significant profit pressure on the agencies.

Hotels are rebounding from a very depressed economic cycle in the early 1990s; room occupancy rates and average daily room rates are now rising. But the battle to attract customers is fierce, and reservation systems, yield-management systems, and front-office management systems are constantly being improved to be more responsive and employ the newest technology for competitive reasons.

Respondents were asked to give reasons for replacing applications. The results of this analysis for the full survey are shown in Exhibit II-3.

Exhibit II-3



N = 61

Source: INPUT

These results are a significant shift from the early 1990s, when changes were more often driven by the desire to implement the newest technology for its own sake. The emphasis on business requirements shows that most respondents are intently focused on meeting business requirements as these are essential to survival.

Decision makers today are much more likely to make a change because critical business needs demand it: These drivers include superior and immediate customer service, rapid confirmation of airline seat or hotel room prices and availability, and sharper focus on marketing programs directed to current customers and the most likely new prospects.

Connectivity itself is not highly rated here. Bear in mind that the travel industry is already well-connected through proprietary reservation networks

and membership in consortia, such as the Sabre and Galileo airline reservation systems.

Replacements for existing operations applications will be common in hotel front offices and travel agencies, where high penetration occurred during the 1980s and early 1990s, with systems that are now being phased out and replaced by open systems, or those based on IBM-compatible PC desktops or servers.

D

Sources of New Applications

The INPUT survey asked whether the source of new or replacement applications was likely to be in-house staff development, vendor development, or an off-the-shelf software package. In addition, INPUT asked about plans to use outside systems integrators and outsourcing companies for these projects.

The vast majority of projects—almost three-quarters of them—will utilize packaged software with little or no modification.

There are numerous software providers in many market segments, allowing customers to select functionally rich applications from a number of well-known vendors in each niche. For example, to procure a front-office management system, hotels could choose from Fidelio, Encore, Sulcus, Computerized Lodging Systems (CLS), or Hotel Information Systems (recently acquired by CLS). All of these have installed bases in the hundreds, and offer worldwide support and 24-hour-a-day software maintenance.

Almost a quarter of the projects are intended to be performed by in-house staff. INPUT expects that some of these will in fact be diverted to outside vendors as the realities of time pressure and internal expertise become more apparent.

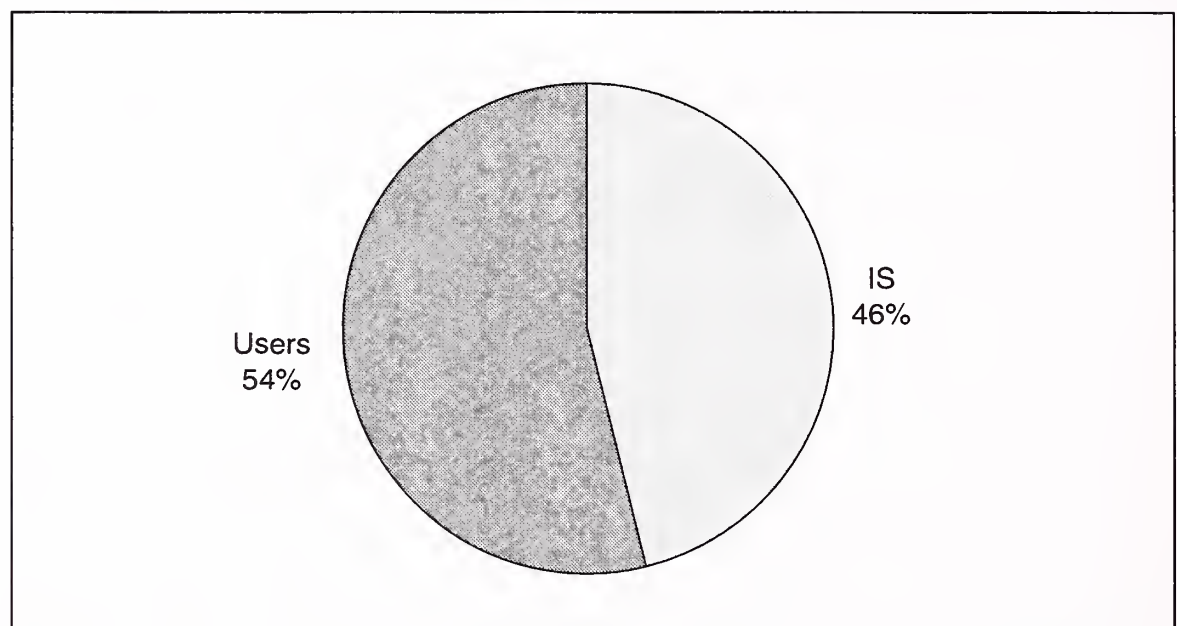
About one in thirty projects is seen as purely customized development performed by outside vendors. This number could increase, as stated above, especially if vendors are aware of in-house development plans and can present realistic and credible alternatives to clients.

In most cases, respondents do not plan to use systems integration companies (90% said no). But INPUT believes the negative responses for systems integration vendors may be overstated. In some cases, the necessity of using outside vendors will not become apparent until the start of the project is closer, and availability of in-house resources better evaluated.

E**Technology Issues****1. Users versus IS Departments—Relative Weight in Decision Making**

INPUT asked about the relative influence of IS departments over users in making software purchases or development decisions. The results of this question are as seen in Exhibit II-4.

Exhibit II-4

Decision-Making Authority, Users Versus IS Departments

N = 66

Source: INPUT

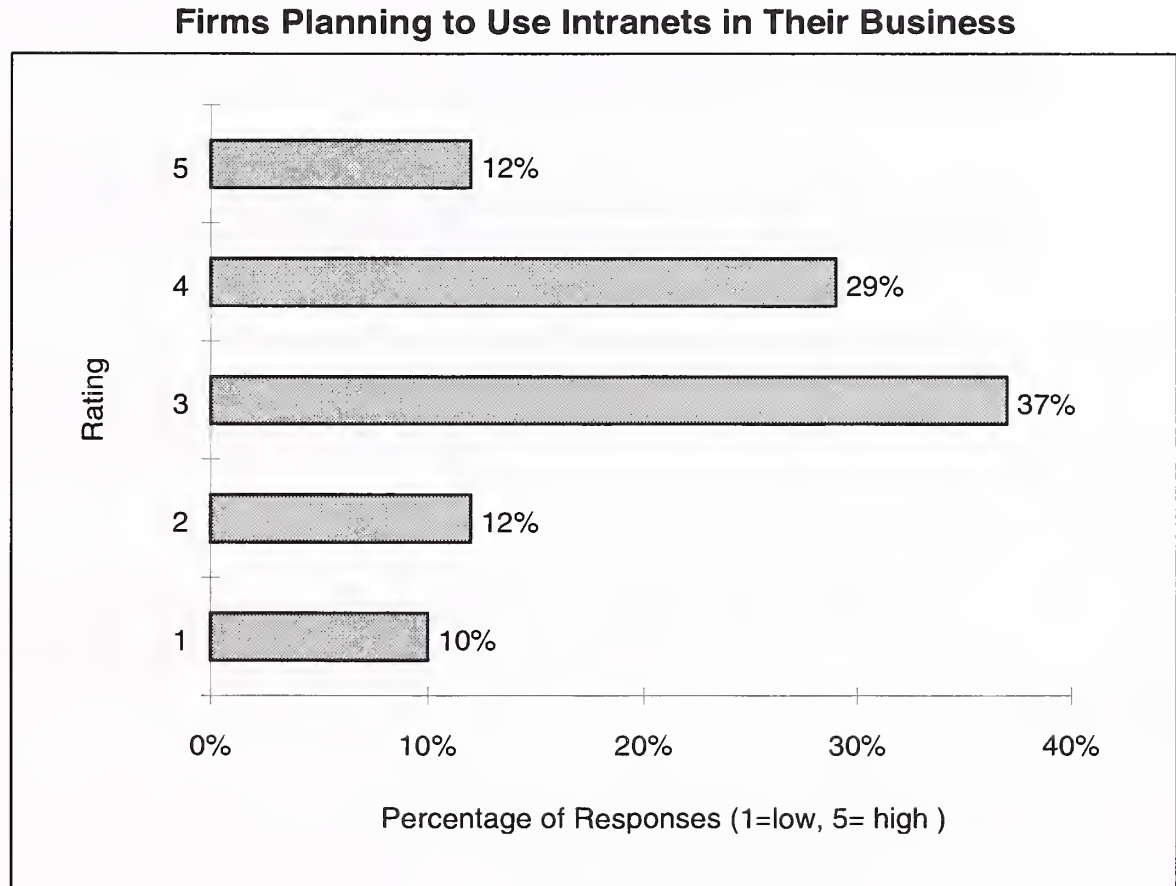
This evenly divided response indicated reasonable balance between these two types of business units with very different missions.

In many small and mid-size hotels and travel agencies, in-house technical staff is not affordable, and is contracted out. So the classic in-house information systems presence is often weak or non-existent. In this context, the strength of the IS function is in fact surprising.

2. Firms Planning To Use Intranets

INPUT queried respondents as to their expectations for use of intranets in their business, using a rating scale of 1 to 5. Ratings are shown in Exhibit II-5.

Exhibit II-5



N = 41; Mean = 3.22

Source: INPUT

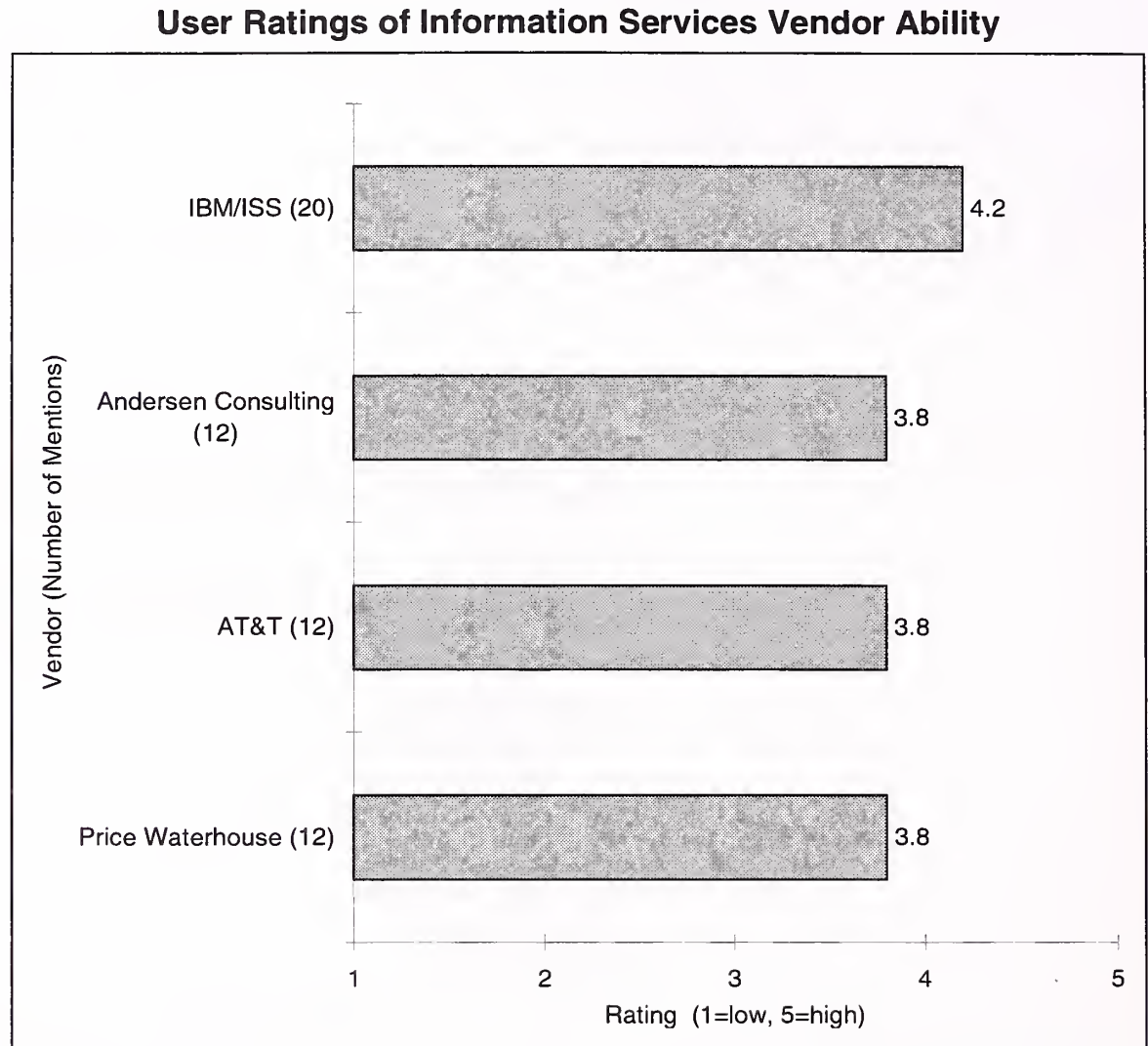
A relatively lukewarm response, 3.22, indicates that many respondents have not closely focused on these opportunities. Ratings of intranet value will be higher in many other industries.

One factor in this mediocre rating is that most of the industry is already tightly linked through centralized reservation systems, and may therefore see intranets as redundant in their own environments.

3. User Ratings of IT Services Vendor Ability

INPUT asked respondents to identify IT services vendors that could successfully complete a project for them and to rate that capability on a scale of 1 to 5. Summary ratings for most frequently mentioned vendors are displayed in Exhibit II-6.

Exhibit II-6



N = 82

Source: INPUT

- IBM/ISSC, AT&T Solutions, and Price Waterhouse had the highest visibility in the sample
- The mean rating, 3.7, displays a good confidence level in the capabilities of vendors
- IBM/ISSC was very well regarded by respondents, with an average rating exceeding 4.0

4. Criteria for Selecting IT Services Vendors

INPUT also asked respondents to rate the importance of seven specific criteria for selecting an outside vendor. Average mean scores for each criteria are shown in Exhibit II-7.

Exhibit II-7

Leading Criteria in Selecting Outside Vendors for IT Projects



N = 68

Source: INPUT

Average rating for all criteria was 4.4. Survey respondents considered all of these criteria important.

Three criteria were especially important, with ratings over 4.5.

Performance guarantees (4.66) are clearly critical to the travel industry; vendors who are willing to provide them may attain competitive advantage.

On-time delivery (4.64) is very important to an industry that needs central reservation and hotel front-office systems to operate continuously, without downtime.

A vendor's technical knowledge (4.53) is highly valued in an industry where many mid-range companies cannot afford full-time technical staff.

F

Conclusions and Recommendations

Based on the research data for this project, other recent work performed by INPUT, and the industry knowledge of its analysts, INPUT has drawn the following conclusions and associated recommendations.

1. Conclusions

- Industry growth will match that of the U.S. information services market as a whole; substantial opportunities also exist in overseas markets, where tourism is actively promoted by many countries.
- Central reservations markets are heavily concentrated in just a few large services, and could be considered a “captive” unavailable market at this time.
- About 50% of identified major applications are replacements, so significant potential exists for upgrades and major modifications to existing technology.
- The need to meet changing business requirements is the primary driver of new information technology applications, closely followed by the need to achieve better integration among departments and functions within an enterprise.
- Major opportunities exist for application software product sales, as this is an industry where standard solutions have been well received.
- Most industry sectors are served by several well-established software and services vendors, setting up a highly competitive climate.
- Travel and lodging is an industry that is both international and multi national in outlook. Most large and mid-range companies are taking a global view of their operations.
- Information systems departments do not wield strong authority compared to business managers in this industry.
- Intranets are not fully appreciated in the industry, because so many players are already linked by reservation systems, both internally and with partners.

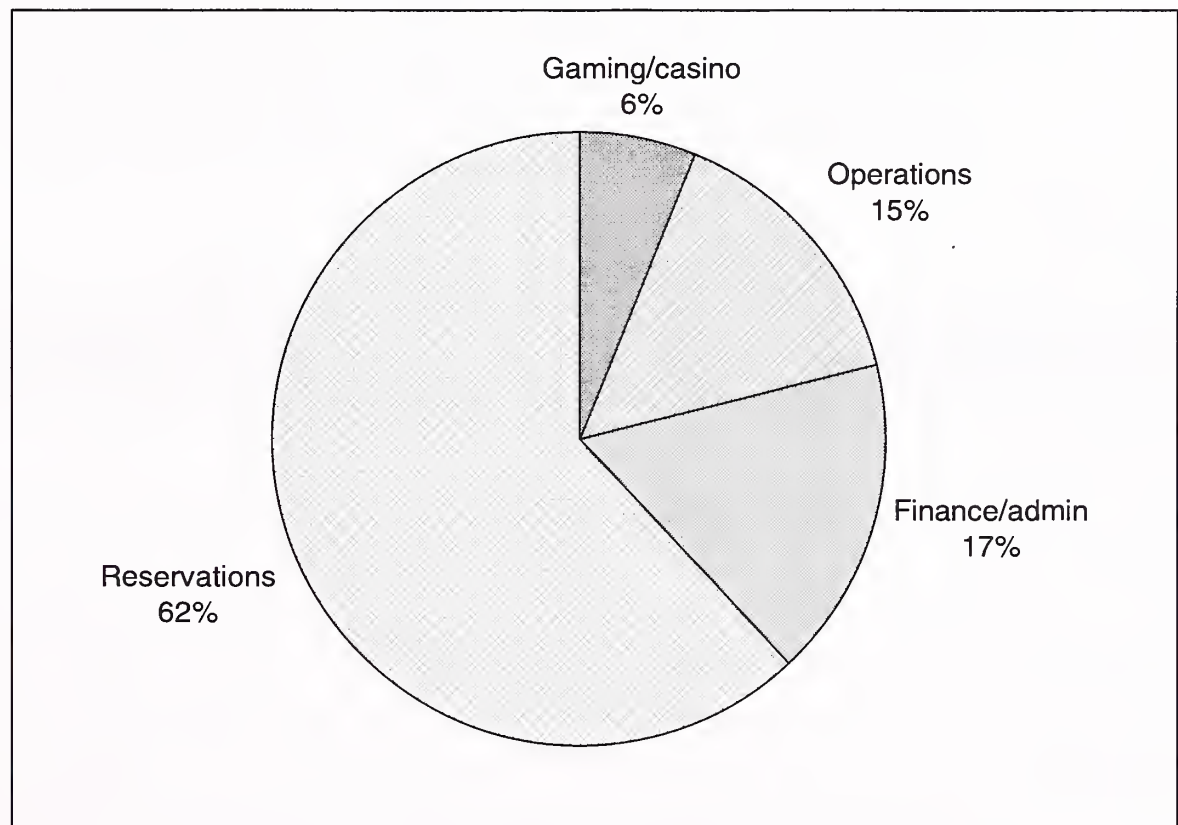
- Services vendors identified by survey respondents were highly rated. There is a receptive climate for services providers in this industry. This is heightened by an inherent shortage of skilled technical staff in many hotel and travel agency firms, which in turn results from the low salary scales in the industry.
- Because of this internal skill shortage, key vendor criteria for success include on-time delivery, performance guarantees, and technical knowledge.

2. Recommendations

INPUT's forecast of industry spending for 1998 has been segmented into the four major application types in this market, as shown in Exhibit II-8.

Exhibit II-8

Percent of Travel Information Services Spending by Application Type, 1998



Source: INPUT

- With 62% of 1998 spending occurring in the central reservations sector, which is strongly concentrated in the hands of seven large consortia, vendors must look to the remaining three sectors for real opportunities.

- Operations is a good target, with about \$820 million forecast for 1998 services expenditures, or 15% of the industry total. Vendors must be certain that their offerings meet specific industry needs, as there are numerous application programs with high functionality that are available in most market segments, such as front office systems for hotels and travel agency management products.
- Finance and administration spending, at 17% of the total in 1998, or \$950 million, is the other attractive sector. Here also, tailored application products exist, such as hotel back-office accounting, but there is room for newer products to be introduced.
- Gaming and casino software is a specialized niche, producing only \$350 million in 1998 revenues. But growth in legalized gambling could well cause this market to expand, and there are only a handful of vendors who offer solutions today.

Another way to identify market opportunities is to examine the matrix shown in Exhibit II-9, which highlights the most pressing reasons for application replacement, in each of the 4 application types. INPUT has marked the most attractive opportunities with an "X", indicating a good combination of buyer need and market availability.

Exhibit II-9

Travel Application Strategies

Reason for Replacement	Connectivity	Cost/Efficiency	Technology Advances	Business Requirements	Better Information & Integration
Centralized Reservations			X	X	X
Finance and Administration				X	X
Gaming and Casino				X	
Operations		X	X	X	X

Source: INPUT

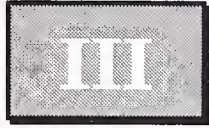
Outsourcing opportunities do exist, but were difficult to measure or identify in this survey, as many respondents might not be aware of outsourcing plans in their organization, or not be willing to discuss them. But many mid-range or even large hotel chains and travel agencies suffer from the lack of in-house technical staff, and cost pressures may force outsourcing decisions in the future.

Because of these technical resource limitations, systems integrators and software development firms will find attractive, if modestly sized markets here. Keys to getting business, as shown in Exhibit II-7, will be the ability to offer performance, guarantees, demonstrate a track record for on-time delivery, display technical competence and showcase skills that complement those of in-house technical staff.

Travel and lodging is an international industry: vendors should be aware of opportunities in Europe and especially Asia, and with multi-national firms here in the U.S.

Although English is an accepted software and screen language in most first-rate international hotels, the mid-range market is much more likely to require native-language screens and local, native language support. U.S. vendors should look carefully for local software or services firms to implement international expansion, especially into Asia and Latin America.

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Travel and Lodging Industry Selection and Spending on New Applications

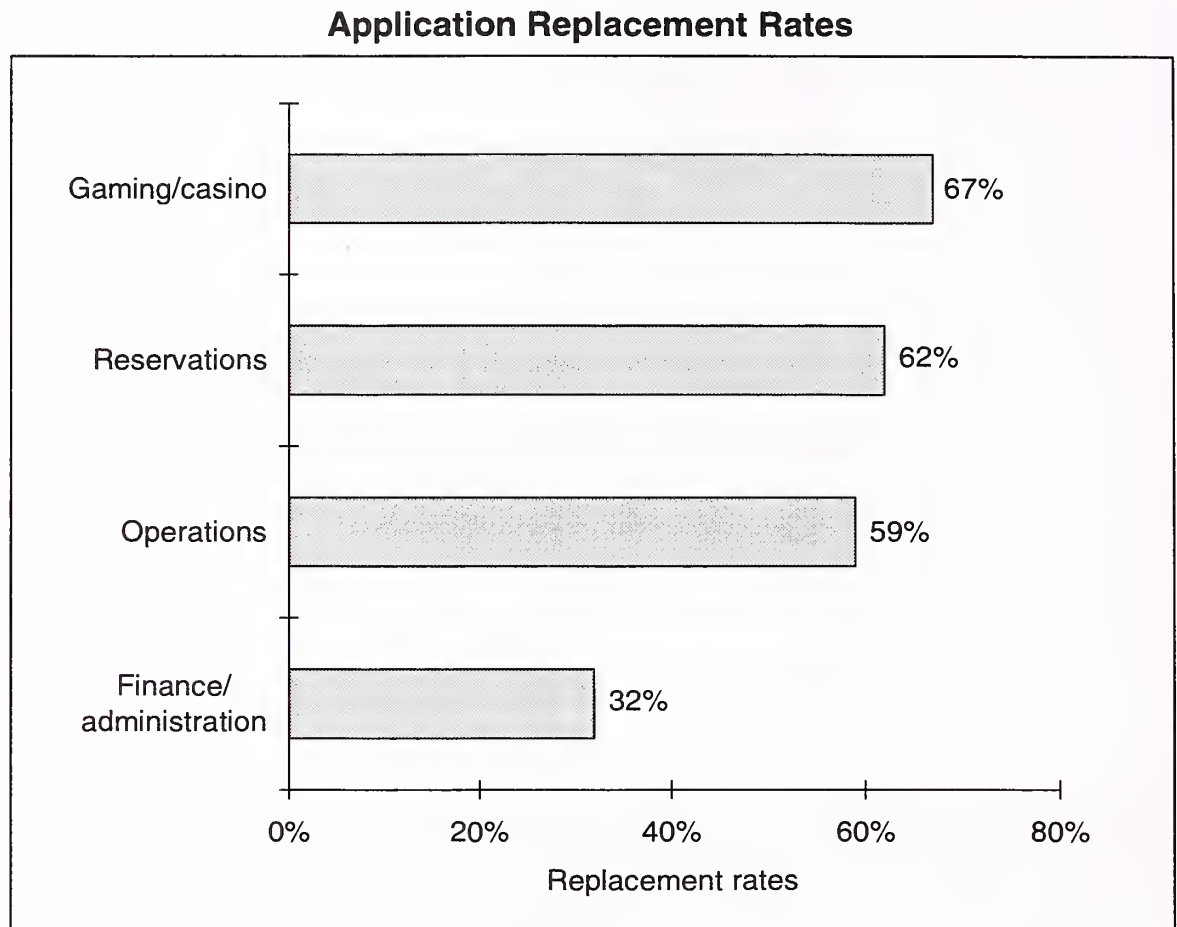
A Rate of Application Replacement

In analyzing application replacement rates, INPUT first categorized applications, based on unprompted, open-ended survey responses, into the following types:

- **Finance/administration:** All financial and administrative applications, human resources, payroll, hotel back-office systems, order processing
- **Gaming/casino:** Slot machine tracking, casino cage, player tracking, integrated casino systems
- **Operations:** Hotel front-office systems, materiel allocation, purchasing, quality control, enterprise or division-level database systems, flight tracking and scheduling, customer service
- **Reservations, sales and marketing:** Centralized reservation systems for airlines, hotels and rental cars; yield management, telemarketing, cruise probing

Plans for replacement were considered positive if the company planned for a complete replacement, or for a major modification to the application, during the next five years. Replacement rates for each of these application types are shown in Exhibit III-1.

Exhibit III-1



N = 81

Source: INPUT

Significant differences exist in replacement rates: two-thirds of gaming and casino applications will be replacements, whereas only one-third of finance and administration applications are replacements, indicating that most of the new finance and administration projects are meeting newly developed client needs.

Reservation systems also rank high (62%) for replacement. Airlines, travel agents, rental car firms, and hotels have had a critical need for these systems for more than a decade, so systems are in place. But modernization and network expansion are mandatory, with rapid response time, comprehensive customer history, and real-time decision making and rate setting required for all such systems.

B

Reasons for Application Replacement

The Travel and lodging world has become increasingly competitive in the last few years, in all sectors. There is also the pressure the Internet may generate, allowing independent travelers to make their own reservations directly, bypassing agents altogether.

Major corporations are operating their own travel department, and aggressively pursuing the best deals with hotels, airlines, and rental car companies, often bypassing travel agencies in the process.

Airlines have reduced the commissions they pay to travel agencies, putting significant profit pressure on the agencies.

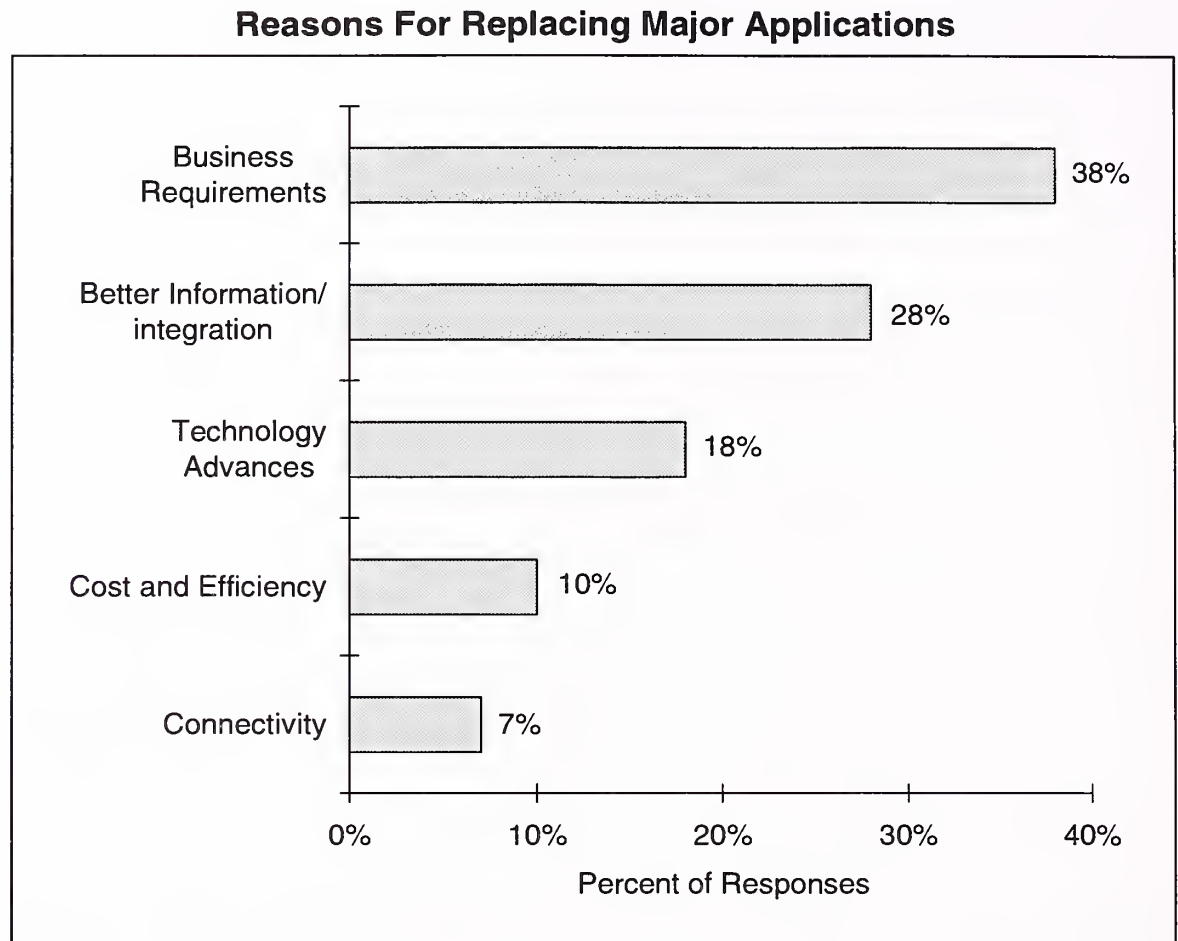
Hotels are rebounding from a very depressed economic cycle in the early and mid-1990s, room occupancy rates and average daily room rates are now rising. But the battle to attract customers is fierce, and reservation systems, yield-management systems, and front-office management systems are constantly being improved to be more responsive and employ the newest technology for competitive reasons.

In the research for this study, respondents were given the opportunity to give open-ended reasons for replacing applications. Later in the analysis, these reasons were classified into the following groups:

- Changing business requirements
- The need for better information or integration of information
- Need for improved connectivity
- The impact of technological advances
- Cost-efficiency of the application

The results of these reason classifications are shown in Exhibit III-2.

Exhibit III-2



N = 61

Source: INPUT

These results are a significant shift from the early 1990s, when changes were more often driven by the desire to implement the newest technology for its own sake. The emphasis on business requirements shows that most respondents are intently focused on meeting the business (customer!) requirements that are essential to survival.

Decision makers today are much more likely to make a change because critical business needs demand it. These drivers include superior, immediate customer service, rapid confirmation of airline seat or hotel room price and availability, and a sharper focus on marketing programs directed at current customers and the most likely new prospects.

Connectivity itself is not highly rated here. The travel and lodging industry is already well connected through proprietary reservations networks and membership in consortia, such as airline reservation systems like Sabre and Galileo.

C**Travel and Lodging Industry IT Spending Forecast**

INPUT asked respondents to estimate the projected cost of each of the major new or replacement applications they identified as critical in the next five years.

Exhibit III-3 shows the distribution by cost category for all new projects identified in the survey. These are services and software expenses only and exclude hardware-associated expenses.

The following expenses are included:

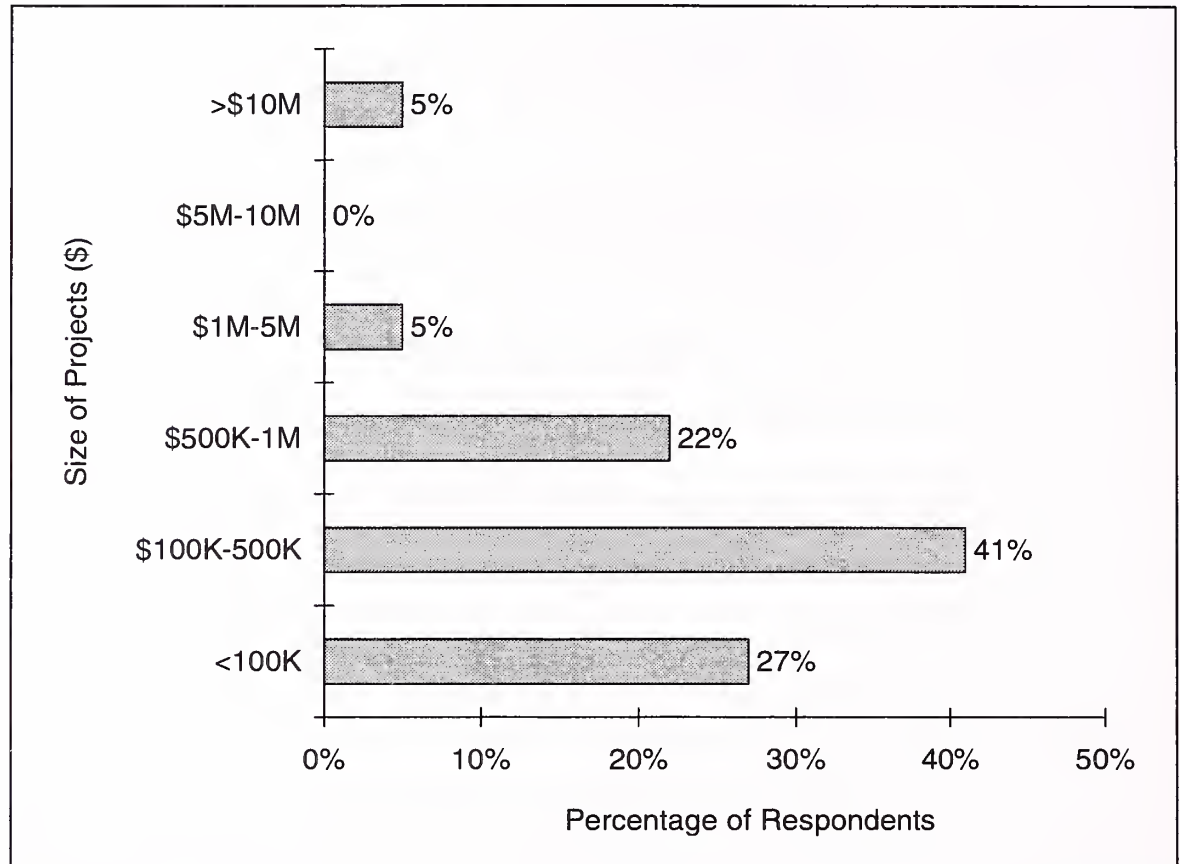
- Software development (internal or external)
- Packaged software (including modifications)
- Systems integration
- Training and education
- Outsourcing

Hardware expenses are excluded for the following reasons:

- It was not always known if a replacement application would involve new hardware
- The hardware costs were often not known
- Hardware requirements are often analyzed across multiple applications
- In some cases, it was assumed there would be little or no hardware expense

Exhibit III-3

Expected Size of New Projects—All Travel and Lodging Industry Respondents



N = 55

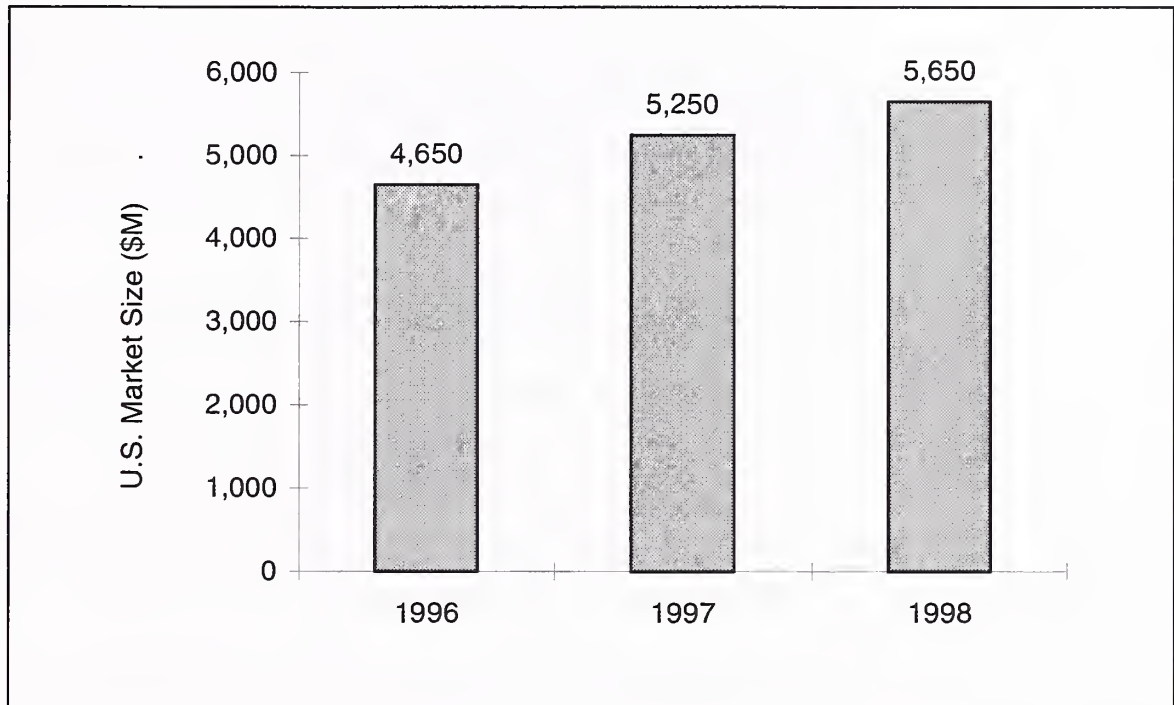
Source: INPUT

A few large projects, over \$1 million, include significant changes to large reservations systems by airlines or major hotel chains.

Ninety percent of the projects are of a more modest scale, below \$1 million. This reflects the demographics of the industry. There are many small travel agencies and hotels that are investing in new applications.

From this survey data and information from INPUT's annual U.S. Information Services market forecast, the forecast spending over the next three years in the U.S. travel and lodging industry will total \$15 million, as shown in Exhibit III-4.

Exhibit III-4

**Travel and Lodging Industry Information Services Market,
1996-1998**

Source: INPUT

- Spending will increase 11% in 1997, and 10% in 1998.
- Nearly 62% of the industry spending is for airlines central reservations systems. This is highly concentrated in just a few vendors worldwide: Sabre, Amadeus, Worldspan, Galileo, Abacus, Infini, and Axess. These revenues are essentially not available to other information services vendors at this time.
- Industry growth rates are parallel to growth rates forecast for the entire U.S. Information services market, as forecast annually by INPUT.
- If equipment spending had been included, INPUT estimates that these figures would be increased by 35% to 40%.

D**Sources of Future Travel and Lodging Applications**

In most cases, respondents do not plan to use classic systems integration companies (90% said no) or outsourcing firms (95% said no) for these projects. But INPUT believes these negative responses may be overstated. In some cases, the necessity of using outside vendors will not become apparent until the project is closer at hand, and available in-house resources have been better evaluated.

It is difficult to identify outsourcing intentions in such a survey, because:

- Even when it is identified as a likely source, dollar amounts are usually not known
- Outsourcing by nature is “aperiodic”—that is, not often planned or known about far in advance, but arising because of a particular set of circumstances within the customer organization
- The knowledge of outsourcing plans and decisions, when it exists, is often limited to a small set of key executives

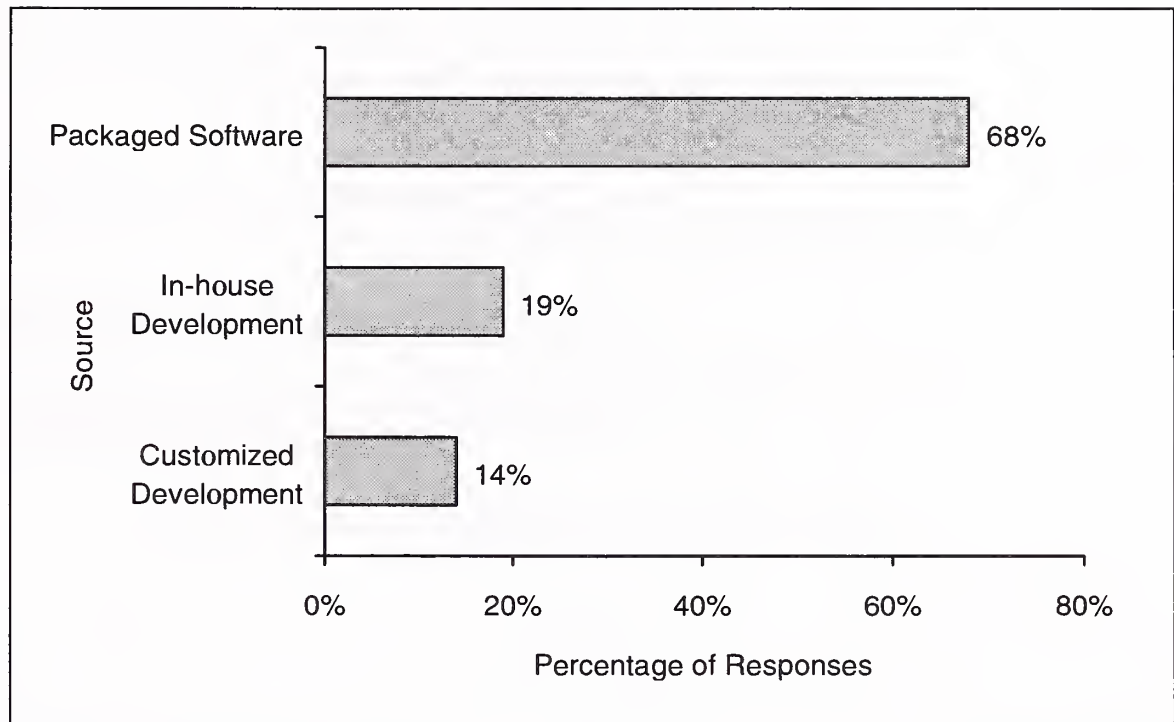
In many cases, the exact nature of vendor assistance is not yet known. The assistance may take several forms:

- Vendors may provide purely professional services, where the vendor works alongside in-house staff or under customer direction
- In a minority of cases, primarily the larger, more complex projects, vendors will supply a fully integrated solution
- In many cases, services vendors will build on software packages or modules. In these situations, the services component will overlap the software package component

Sources of planned new applications are shown in Exhibit III-5.

Exhibit III-5

Sources of Planned New Applications—Travel and Lodging Industry



N = 81

Source: INPUT

The vast majority of projects, two thirds of them, will utilize packaged software with little or no modification.

About one fifth of the projects are intended to be performed by in-house staff. INPUT expects that some of these will in fact be diverted to outside vendors as the realities of time pressure and internal expertise become more apparent.

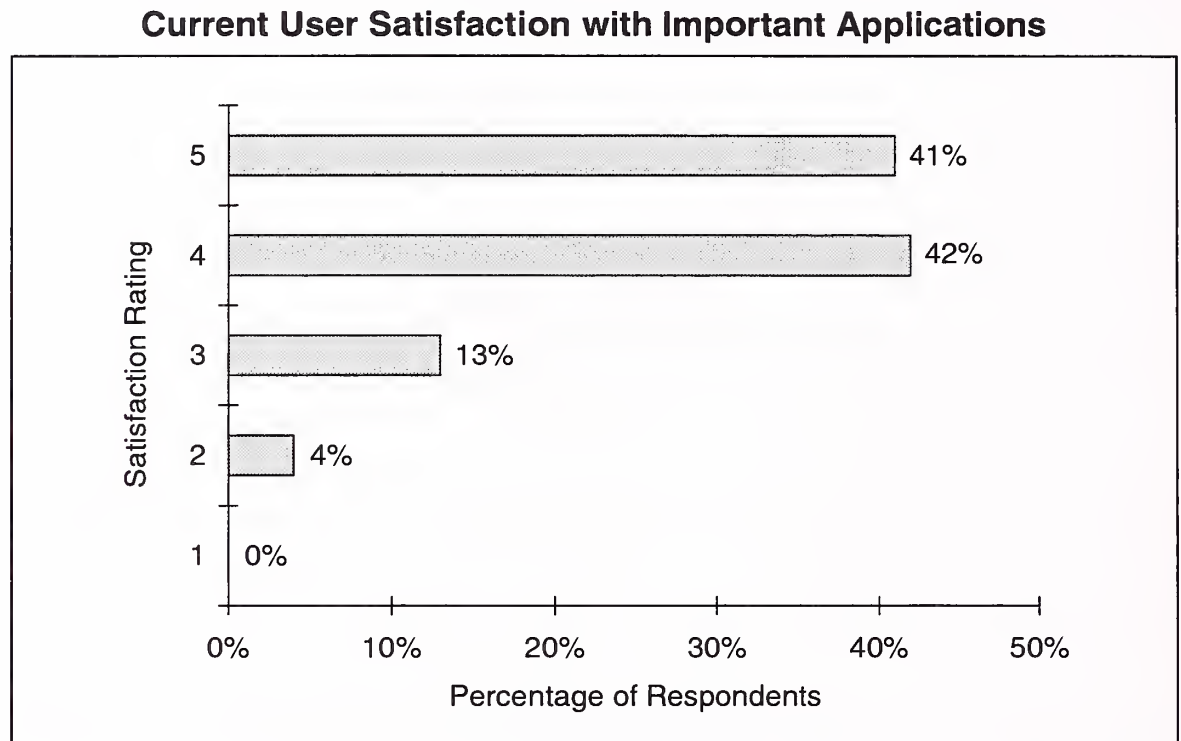
About one in seven projects is seen as purely customized developments performed by outside vendors. This number could increase, as stated above, especially if vendors are aware of in-house development plans and can present realistic and credible alternatives to clients.

E

User Satisfaction with Current Applications

Survey respondents stated a high degree of satisfaction with their current applications, as shown in Exhibits III-6 and III-7.

Exhibit III-6



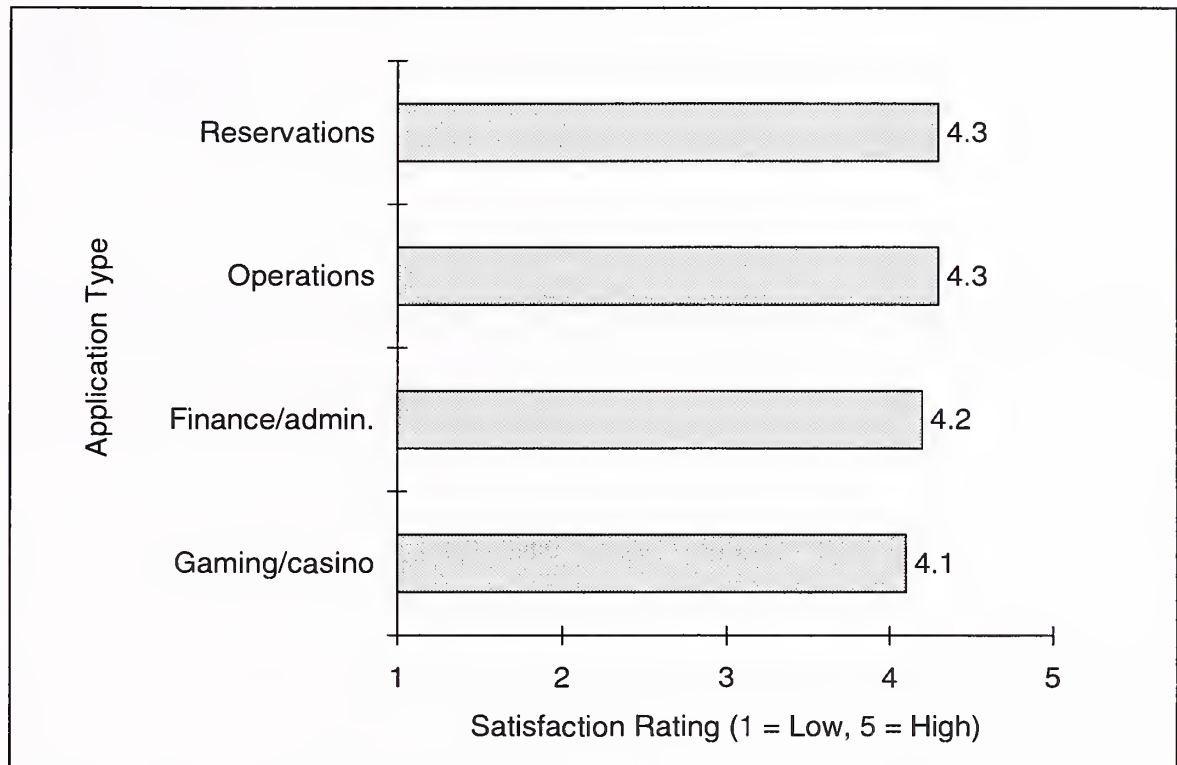
Source: INPUT

Average response was 4.2, an excellent rating of satisfaction.

Eighty-three percent of respondents were strongly satisfied with their current applications, responding with a “4” or “5” rating. Among other factors, this ranking is driven by the relative inexperience of many knowledge workers in the industry, and the existing “legacy” systems for operations and reservations, which have been optimized over the years to provide the highest possible levels of customer (consumer) satisfaction.

Exhibit III-7 shows satisfaction levels with each of the four application types in the survey.

Exhibit III-7

Current User Satisfaction Ratings by Application Type

N = 71

Source: INPUT

Ratings were very high for the limited number of applications identified in the casino and gaming functions. Because profits and revenue from gambling operations are huge for the involved enterprise, it is not surprising that the information systems to track those functions are also highly developed.

Central reservation systems, though rated lowest of the four categories of applications, still have a high rating. Again, performance of that application is critical to enterprise survival; it must perform effectively.

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IV

Analysis of Critical Applications in Four Categories

A

Analytic Overview

As described in Chapter I, respondents were asked to identify the most important applications and their plans for replacement. In the course of its analysis, INPUT placed the applications into the following groups:

- **Finance/administration:** All and financial applications, human resources, payroll, hotel back-office systems, order processing
- **Gaming/casino:** Slot machine tracking, casino cage, player tracking, integrated casino systems
- **Operations:** Hotel front office systems, materiel allocation, purchasing, quality control, enterprise or division-level database systems, flight tracking and scheduling, customer service
- **Reservations, sales and marketing:** Centralized reservation systems for airlines, hotels and rental cars; yield management, telemarketing, cruise probing

For each application type shown above, INPUT has performed the following analyses:

- The percent of travel and lodging companies planning to replace the application
- The reasons for the replacement

In the research for this study, respondents were given the opportunity to give open-ended reasons for replacing applications. Later in the analysis, these reasons were classified into the following groups:

- Changing business requirements
 - The need for better information or integration of information
 - Need for improved connectivity
 - The impact of technological advances
 - Cost-efficiency of the application
- The expected size (in dollars) of application replacement costs

The costs include identified personnel costs (both in-house and external) as well as costs for packaged software, systems integration and/or outsourcing. Although some replacement costs will also involve additional costs for hardware, these hardware costs were not considered because in many cases they were not yet identified or it was believed that no substantial hardware costs would be involved.

Projects have been classified into the following size groups:

- Under \$100K
 - \$100-500K
 - \$500K-1 million
 - \$1-5 million
 - Over \$5 million
- Total spending for Travel & Lodging Industry IT Applications, and for the five application groups

This is INPUT's estimate for total Travel & Lodging Industry spending, and for the five sub-sets described above, for the years 1996, 1997 and 1998.

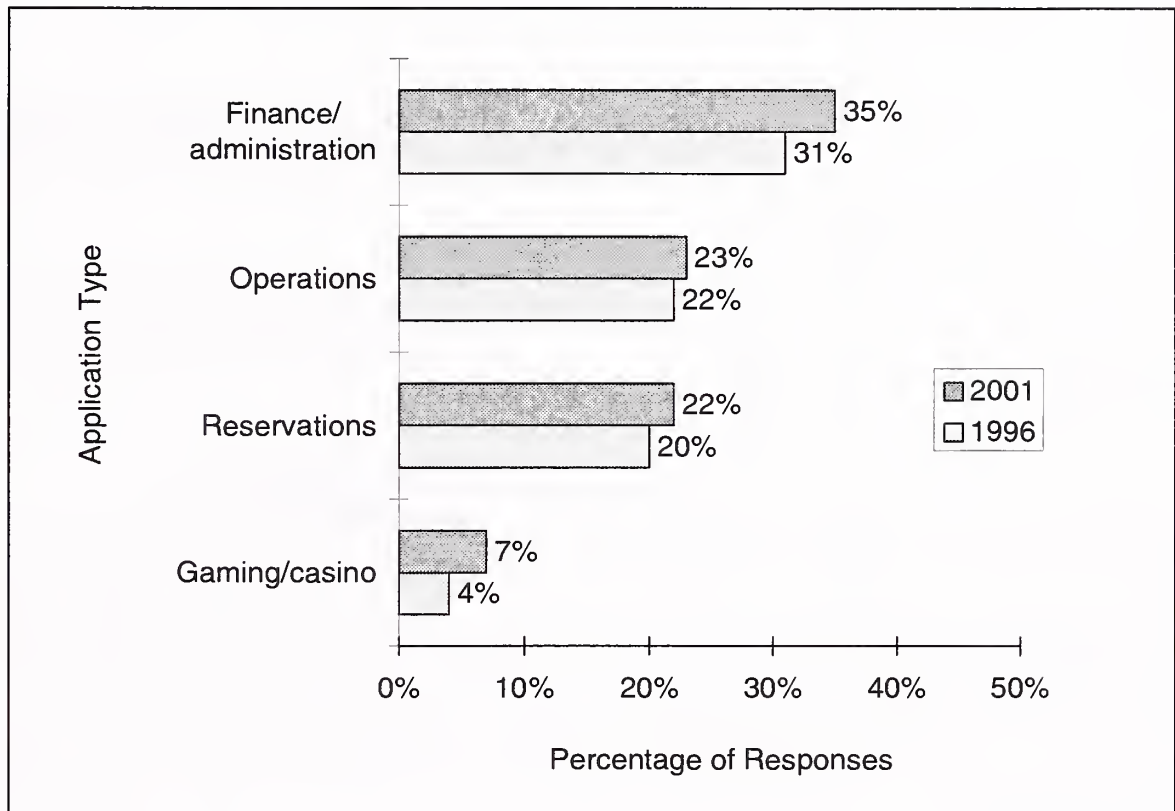
- Expected Sources for the replacement systems: packaged software, heavily modified packages, or customized applications
- User satisfaction with currently installed applications.

B
Critical Application Types, 1996 Versus 2001

Respondents were asked to identify their most important IT applications today, and then to identify the applications they expected to be most important over the next five years. The results, shown in Exhibit IV-1, show considerable consistency.

Exhibit IV-1

Most Important Application Types—1996 Versus 2001



N = 267

Source: INPUT

Finance and administrative applications are most frequently mentioned in 1996, as well as 2001. One-third of critical applications fall into this category, in both time frames.

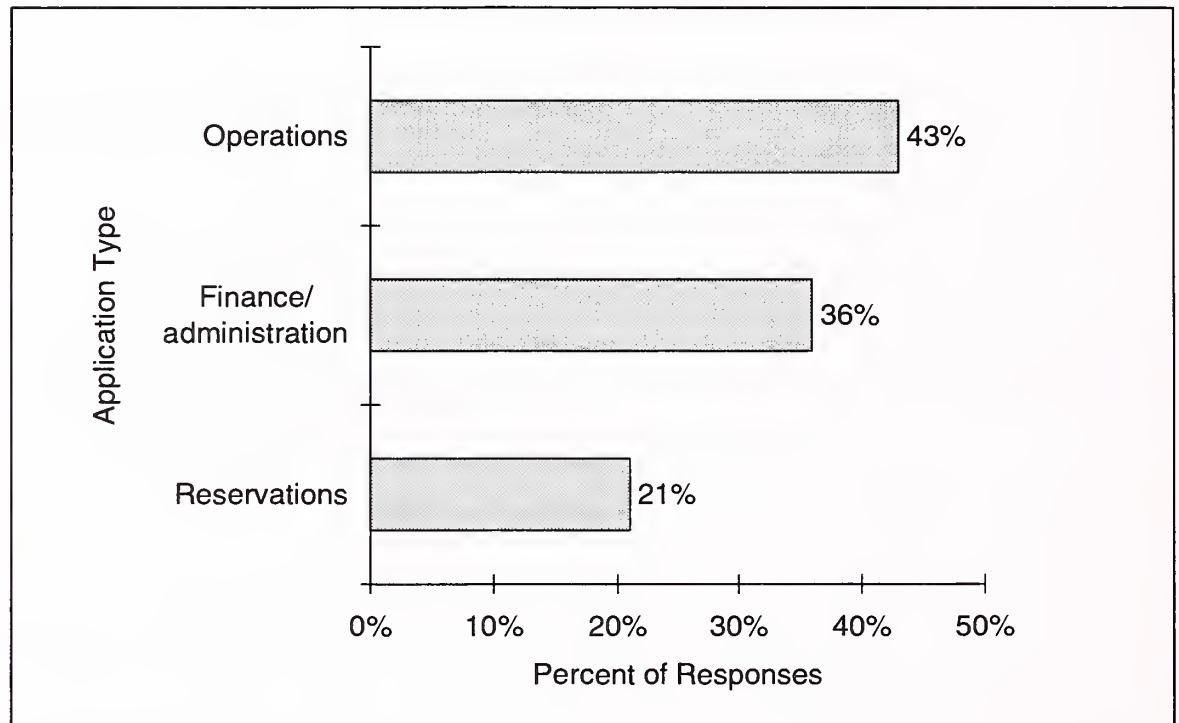
Only a 4% difference separates percent of responses in 1996 from percent of responses in 2001, indicating that respondents' views of what is "important" are not changing materially from the present to the future.

C

Most Important Application Types by Line of Business

As part of INPUT's data analysis, survey responses were grouped by respondents line of business, making it possible to identify the most important application types for airlines, travel agencies, and hotels, as displayed Exhibits IV-2 through IV-4.

Exhibit IV-2

Most Important Applications for Airlines

N = 14

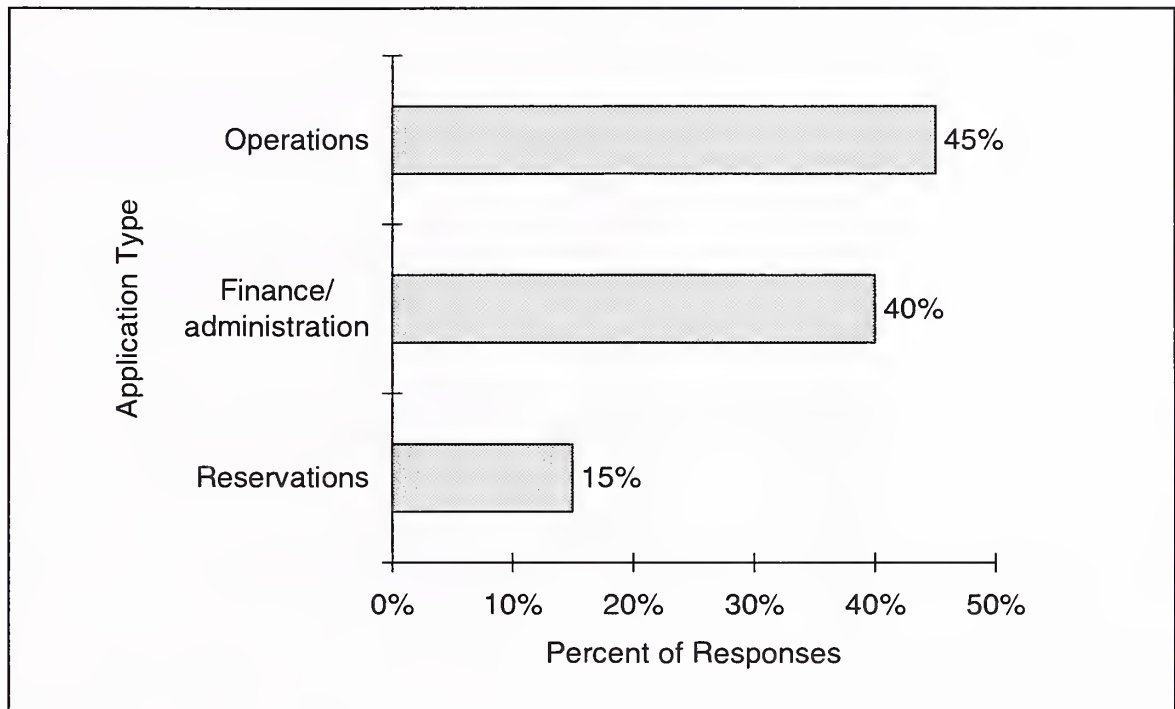
Source: INPUT

Operational applications are most frequent, reflecting the demand for scheduling, maintenance, and flight tracking and material control systems vital to airline success, even survival.

Finance applications rank second; airlines have significant legacy systems in place that require upgrading or even replacement.

Airline reservation systems are critical for sales and marketing activities, and must be maintained to deliver effective information in a real-time, fail safe mode. These systems are indeed "mission critical" and must be improved and upgraded regularly, with significant cost.

Exhibit IV-3

Most Important Applications for Travel Agencies

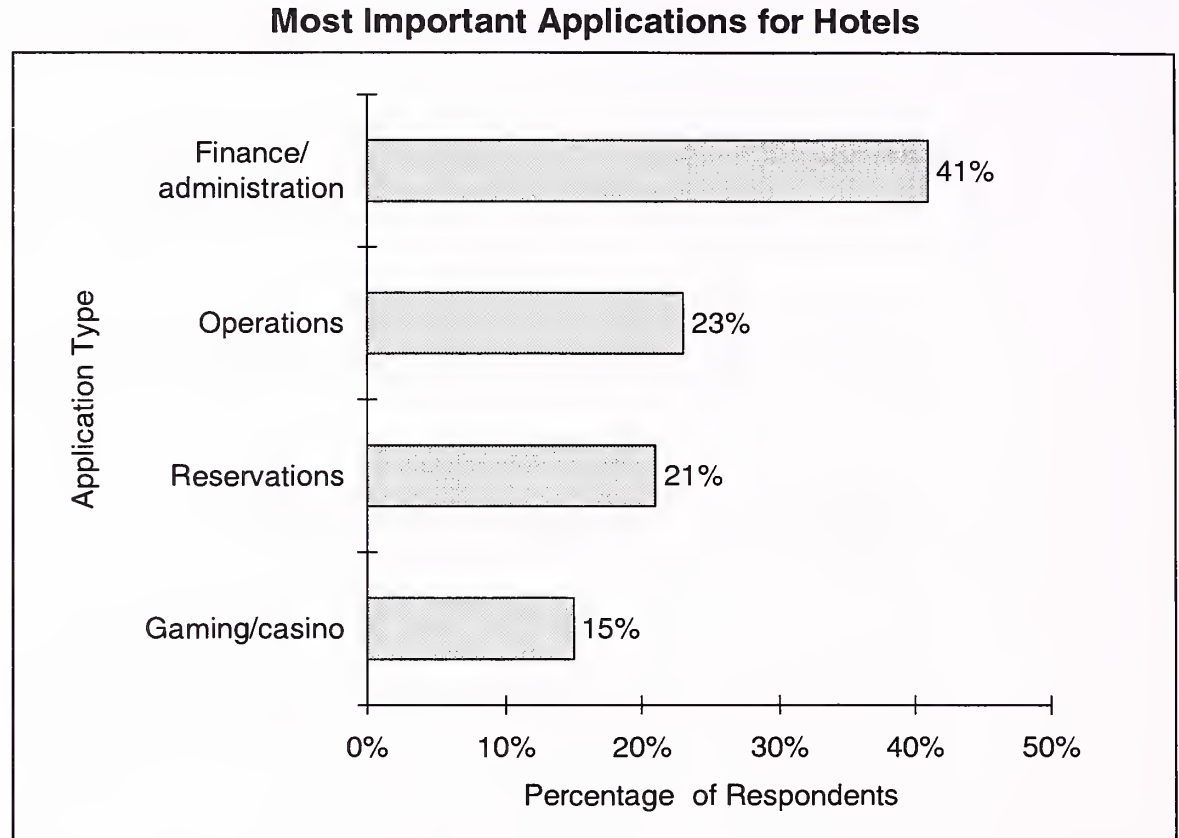
N = 20

Source: INPUT

Naturally, travel agencies list reservation systems most frequently, as those systems are in fact their life blood.

Given cost pressures being applied to travel agencies from airlines applying commission "caps" earlier in 1996, and potential threats from the Internet as an alternate booking channel, affiliations with the most effective reservation systems are a survival issue for many travel agencies.

Exhibit IV-4



N = 39

Source: INPUT

Finance and administration applications are most frequently mentioned by hotels. This includes the “back-office systems” that monitor and report on hotel personnel, plant, and equipment costs. Though hotels are experiencing a rebound from the difficult early 1990s in terms of occupancy rates and daily room rates, significant cost pressures still threaten to limit profits for the industry. Hotel managers look aggressively for any financial edge they can gain.

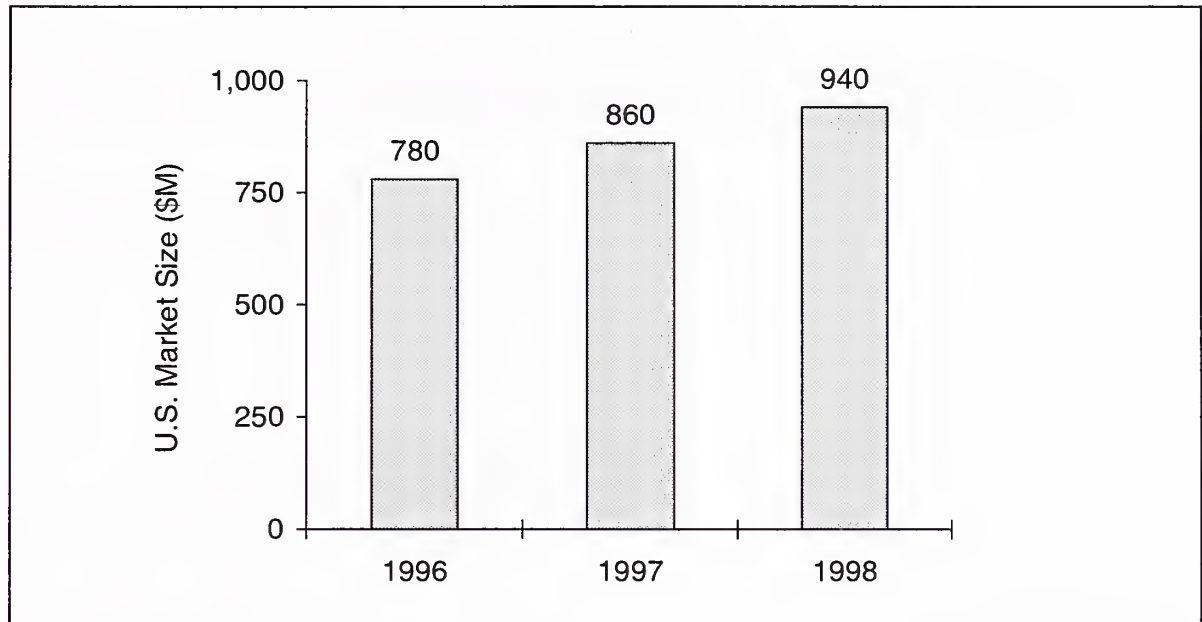
Operations and reservation applications are less frequently mentioned, but are still significant. Front-office systems that control the front desk and local reservation functions remain critical to good customer service. Connection to an efficient centralized reservation system is an absolute necessity to remain competitive and to market any hotel effectively.

D

Finance and Administration Applications

Finance and administration applications will constitute 17% of projected travel and lodging industry spending in 1998. INPUT’s U.S. forecast for this market segment is shown in Exhibit IV-5.

Exhibit IV-5

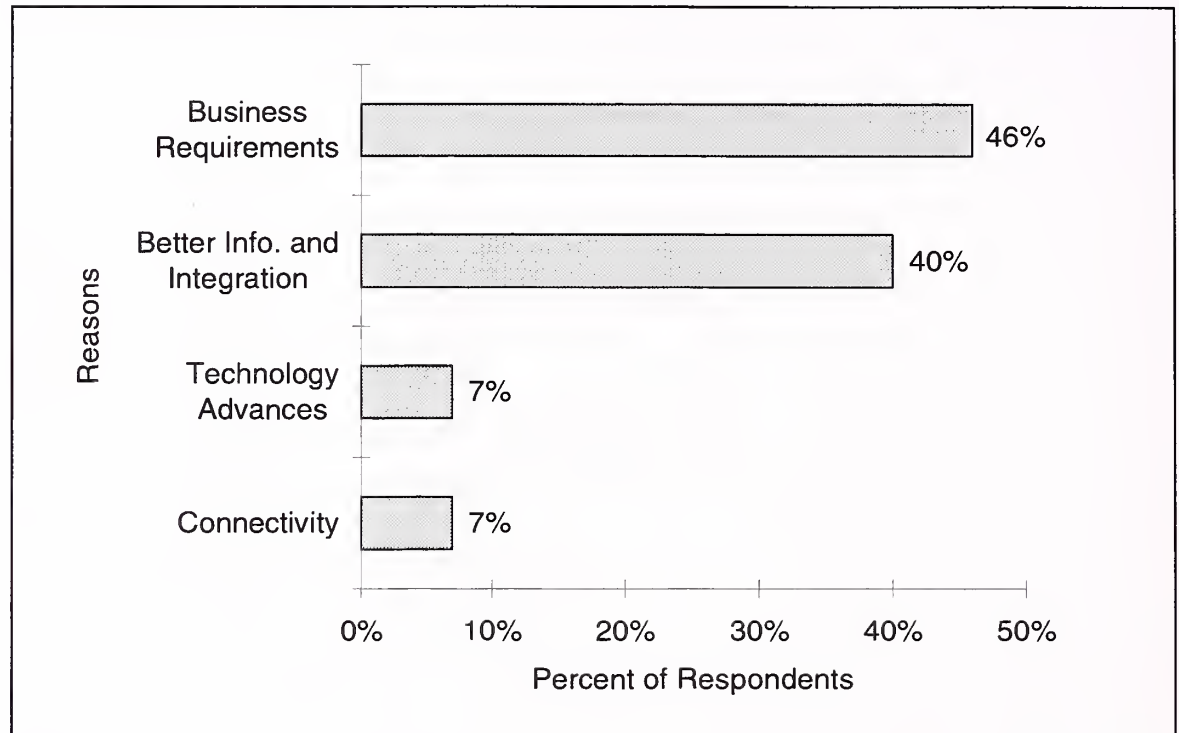
**Finance and Administration Application Software
Products and Services Market, 1996-1998**

Source: INPUT

- INPUT projects growth in this segment to be at 10% for both 1997 and 1998.
- Growth will come primarily from continuing pressures in hotels and travel agencies to meet changing business requirements and contain costs to the maximum extent possible.

INPUT has put reasons for replacing applications four categories. The results of that categorization for the travel industry's finance and administration needs are shown below in Exhibit IV-6.

Exhibit IV-6

Reasons for Replacing Finance and Administration Applications

N = 15

Source: INPUT

Business requirements are primarily driving these replacements. The need for more information and integration of information across the enterprise is a close second. In this context, business requirements include integrating information across multiple hotel departments—for example, for comprehensive daily reporting.

Replacement of technology for its own sake is a non factor here.

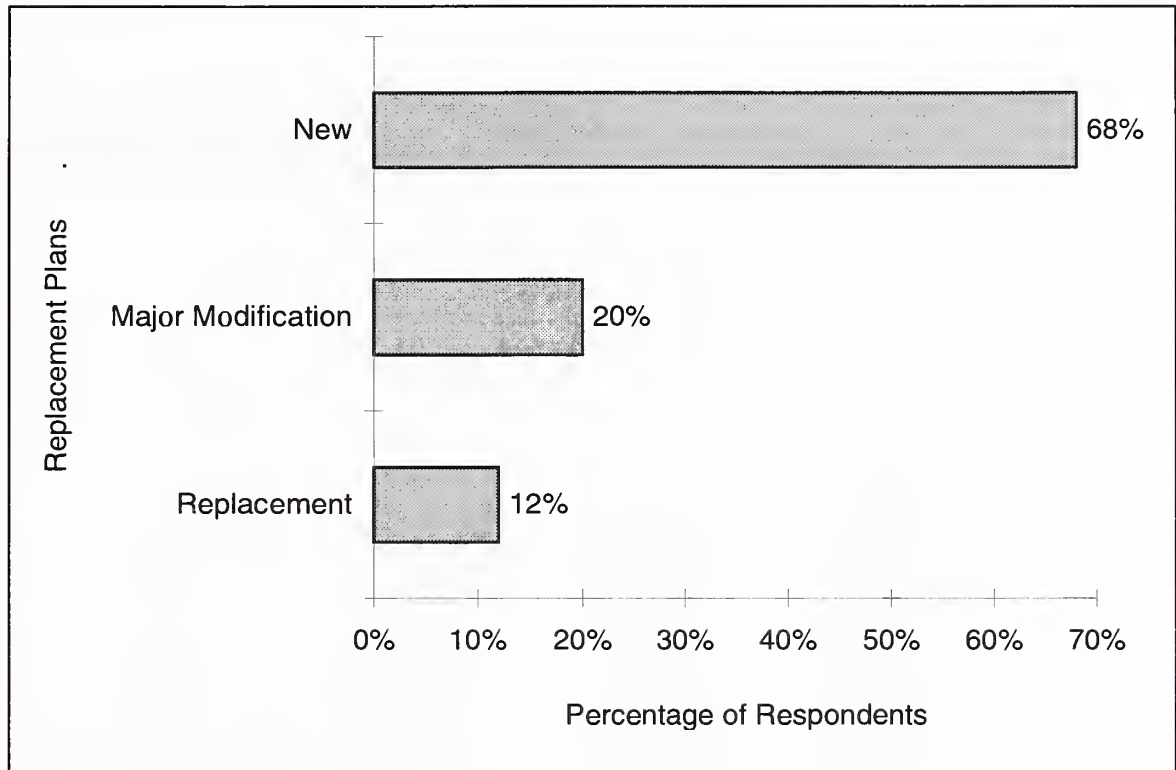
Somewhat surprisingly, cost efficiency was not a factor, either. But INPUT interprets this to mean that many of the business requirements cited prominently as reasons also include a cost benefit as part of the requirement.

Connectivity is not an issue in this segment, as most requirements are within a single enterprise, not outside it.

In studying replacement plans and replacement rates, INPUT asked respondents to indicate whether each important application would be built or purchased new, or if an existing application would be replaced or heavily modified to achieve the desired result. The results are displayed for finance/administration applications in Exhibit IV-7.

Exhibit IV-7

Replacement Rate for Finance and Administration Applications



N = 25

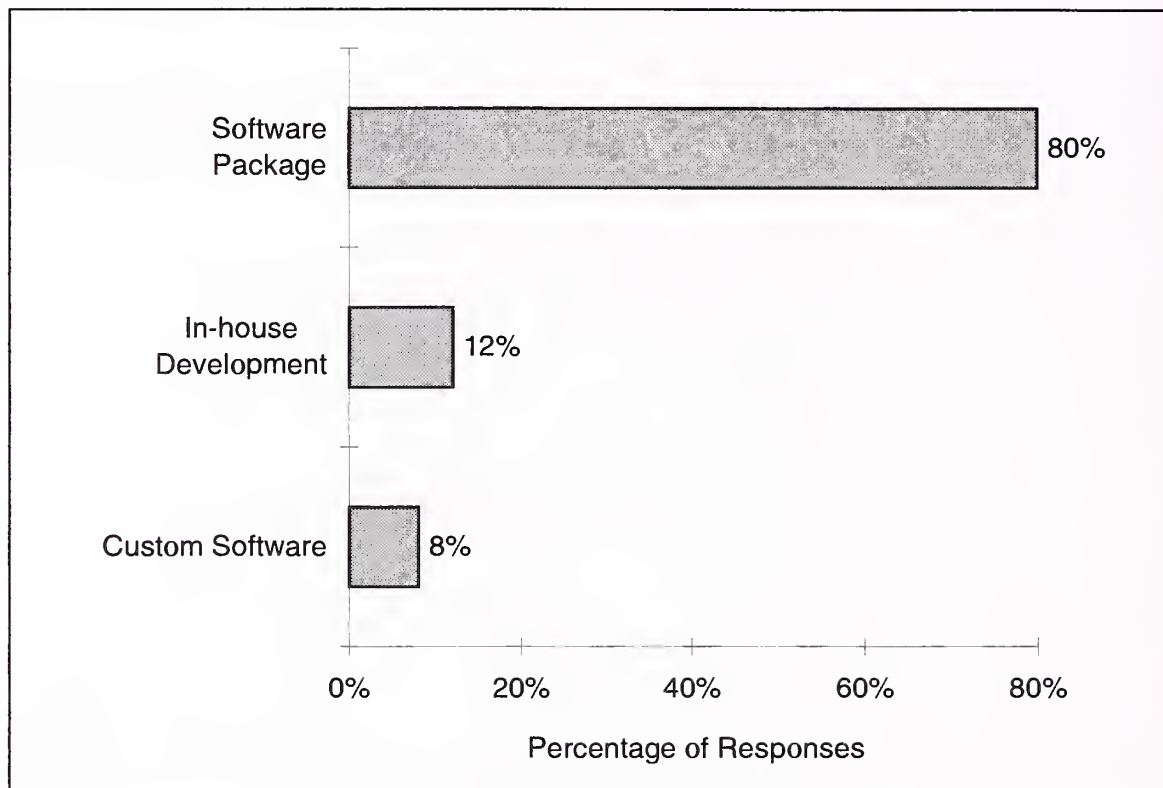
Source: INPUT

Sixty-eight percent of important applications will be non replacements, being purchased as off-the-shelf software or built new. Only 32% of these applications will involve replacing or modifying an existing system.

Most of the important projects being carried out in the next five years will address new information system needs. This indicates a market segment with considerable dynamism.

Sources of new applications may be (1) a software package purchased off the shelf, and possibly modified slightly, (2) a system developed in-house, or (3) custom software written by an outside vendor. Results of this analysis are shown in Exhibit IV-8.

Exhibit IV-8

Sources of New Finance and Administration Applications

N = 25

Source: INPUT

The vast majority of these applications will be purchased off the shelf, since so many finance applications have been developed by IT vendors to meet the needs of this sector.

Only 20% of responses indicate a plan for customized development using internal or external resources. Except for the airlines and larger hotel chains, companies will be hard pressed to find in-house resources to implement systems. Professional services vendors should find willing buyers for their services in many industry firms with unique requirements.

E**Gaming and Casino Applications**

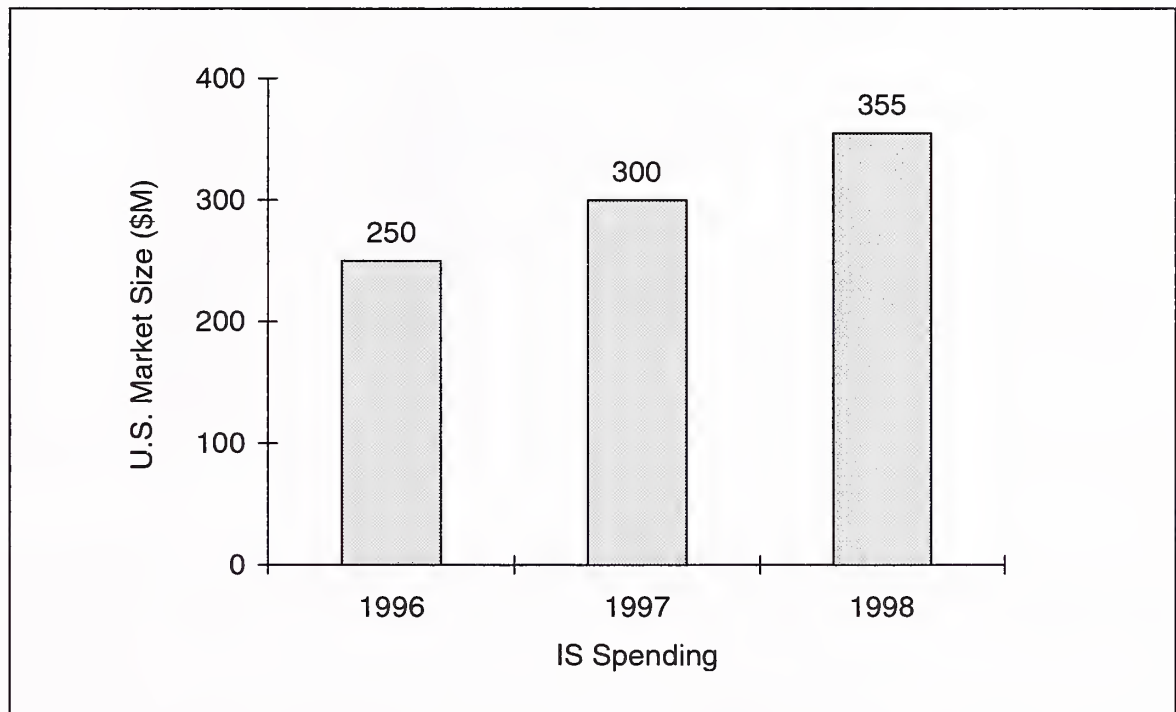
These applications represent only a small percentage (7%) of the important applications named in the full survey. But INPUT feels this is an interesting segment that deserves attention, especially with the continuing interest in legalized gambling now being exhibited by a number of states and cities where it is not allowed today. This may well be a growth industry. It is already immensely profitable for many hotels and casinos.

Examples of applications in this segment include slot machine tracking, casino cage control, player tracking and history, and integrated casino systems.

INPUT's forecast for information services spending in the gaming and casino industry segment is shown in Exhibit IV-9.

Exhibit IV-9

New Gaming and Casino Application Software Products and Services Market, 1996-1998



Source: INPUT

This is the fastest-growth segment of the travel and lodging industry, growing at 18-20% over the next three years.

Spending for gaming applications represents only 6% of total information services spending for travel and lodging as a whole.

A significant upside may exist as gambling is adopted as a revenue-producing strategy by more states and local governments.

F

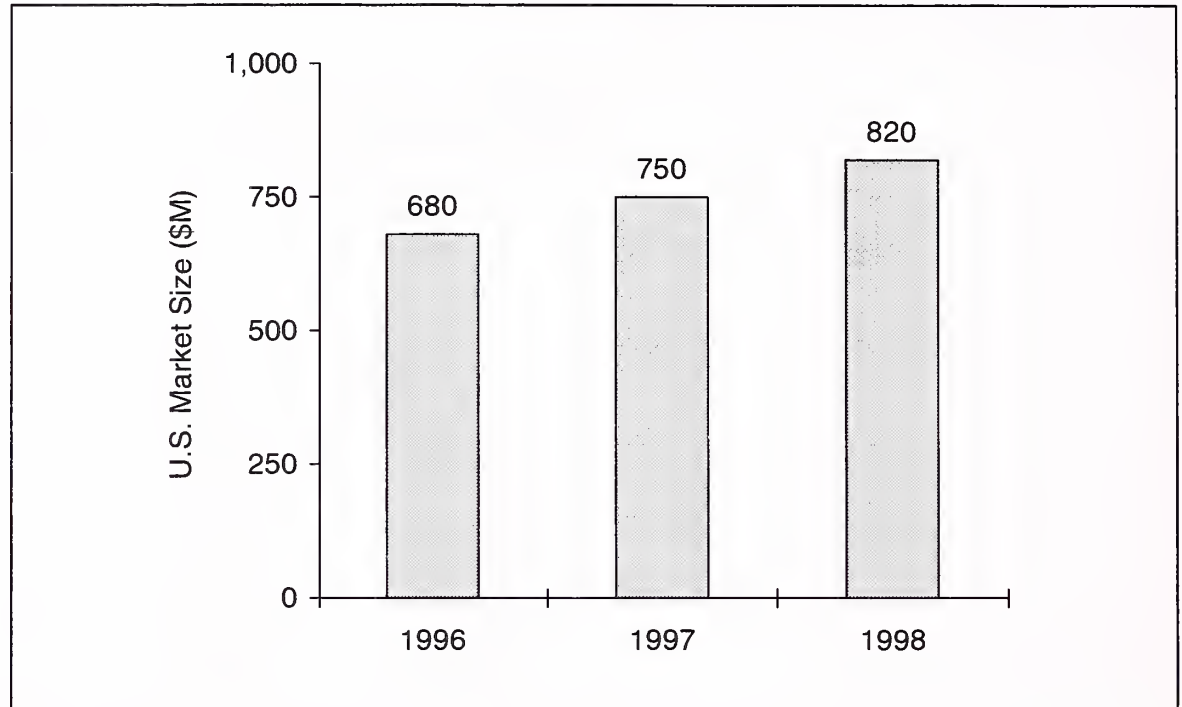
Operations Applications

Operational applications include hotel front-office systems, customer histories, sales and catering, and yield management systems. For airlines, these include scheduling, maintenance, inventory, flight dispatch, and tracking. Rental car operations include car tracking and maintenance,

customer history, and sales and marketing activities. The information services spending forecast for this sector is shown in Exhibit IV-10.

Exhibit IV-10

Finance and Administration Application Software Products and Services Market, 1996-1998



Source: INPUT

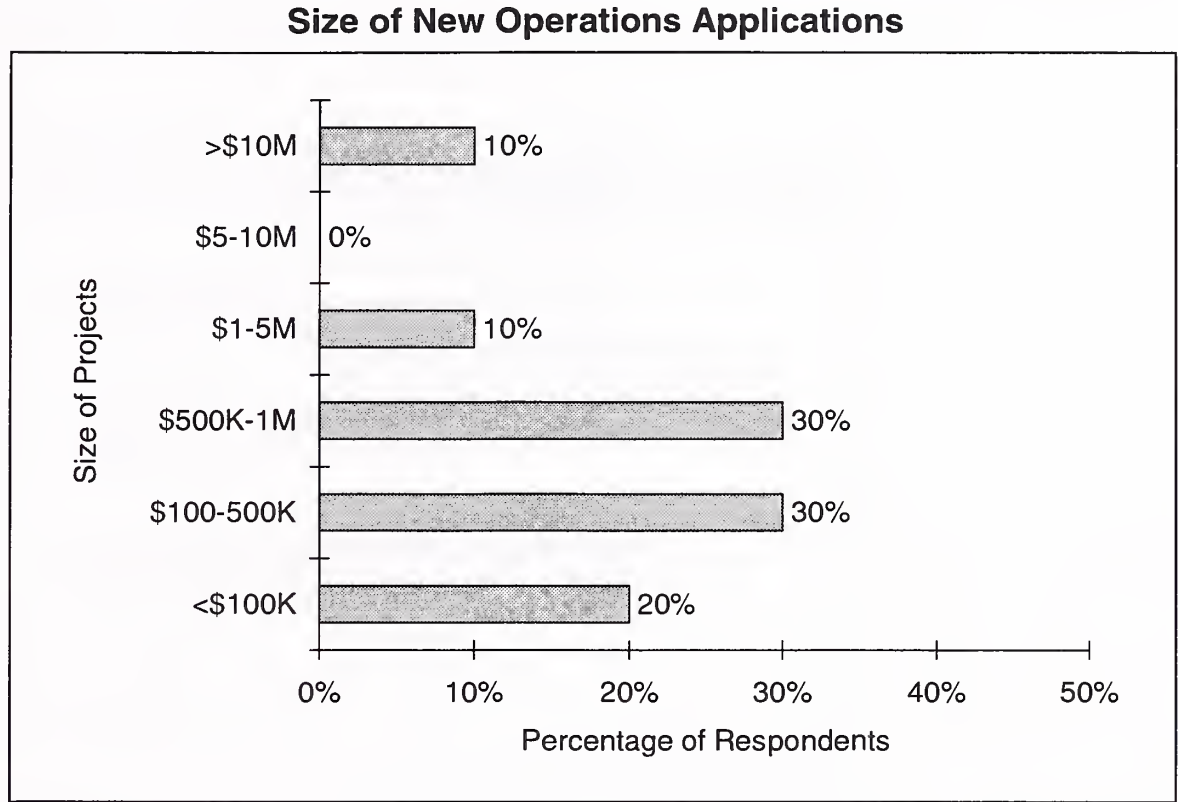
This segment comprises 15% of total travel & lodging IS spending during the forecast period.

Growth rates are equal to the average for the industry—11% in 1997, 9% in 1998.

Vendor opportunities exist here for hotel and rental car front-office operations, customer history databases in all segments, efficient tracking of materials and inventory, and revenue (yield) management systems that allow dynamic pricing of available rooms, seats, and rental cars

The size of individual projects identified as operational applications by survey respondents is shown in Exhibit IV-11.

Exhibit IV-11



N = 10

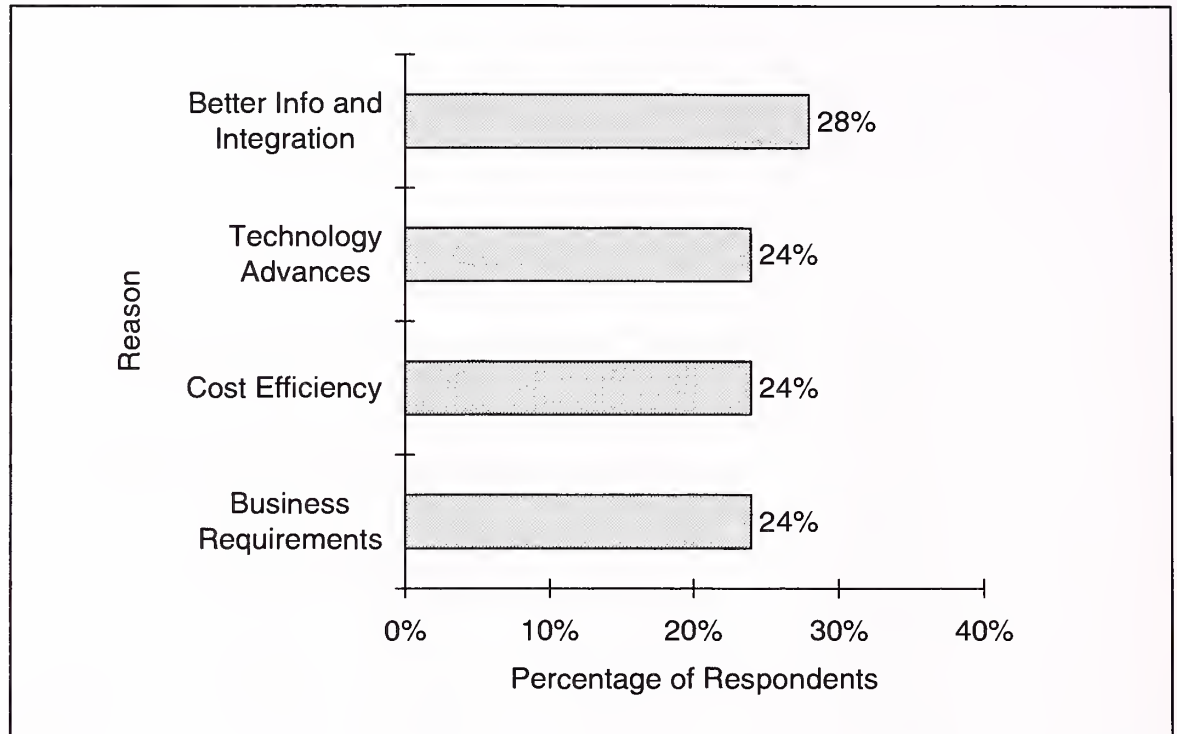
Source: INPUT

The bulk of responses, 80%, are for small- and medium-sized applications, under \$1 million. These are for individual units within hotel chains or travel agencies.

A few larger projects, over \$1 million each, relate to upgrades or modifications to enterprise-wide applications.

Reasons why respondents plan to replace operations applications are shown in Exhibit IV-12.

Exhibit IV-12

Reasons Given for Replacement of Operations Applications

N = 17

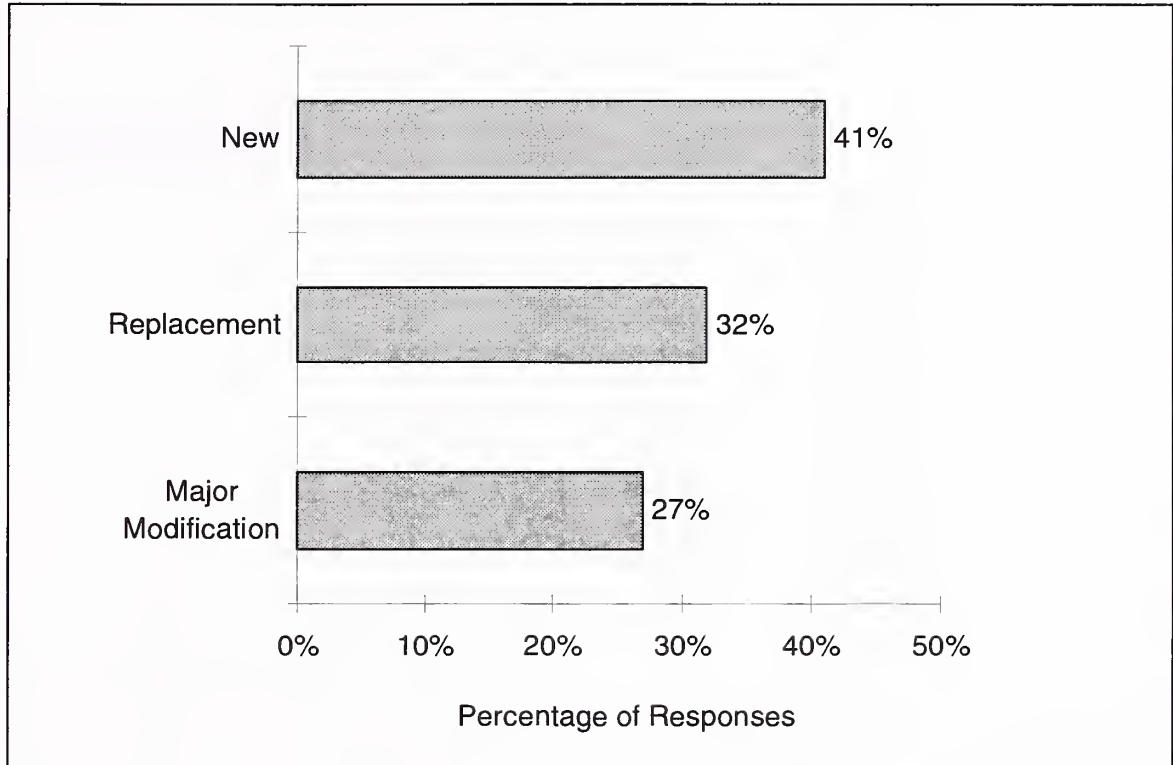
Source: INPUT

Cost efficiency emerges as the most significant reason. This underscores significant cost pressures on hotels, car rental agencies, and travel agencies to control operational costs while remaining highly responsive in customer service.

Reasons are well distributed across these four categories. One reason, connectivity, was not given by any respondent. Because so many of these operational units are already closely linked within their enterprises, the primary connectivity need is for reservation systems.

Exhibit IV-13

Replacement Rate for Operations Applications

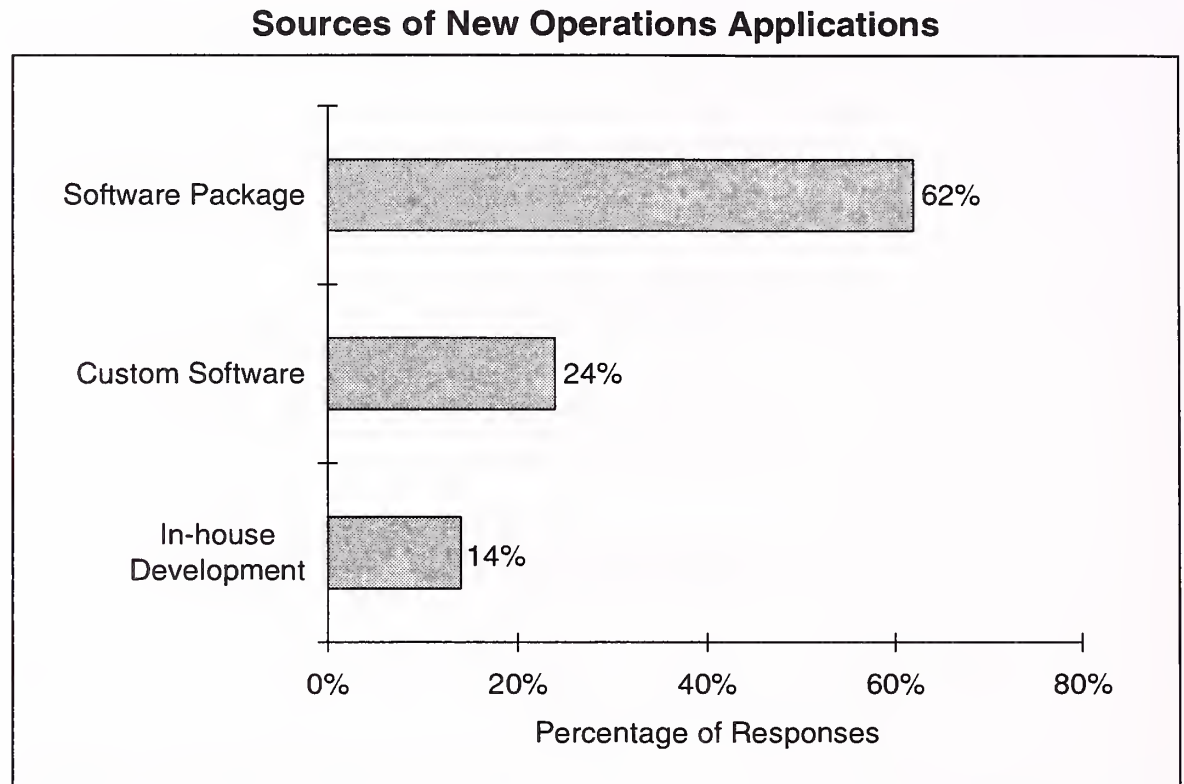


N = 22

Source: INPUT

Nearly 60% of important applications will be replacements or modifications. Existing systems like hotel front-office systems are moving from proprietary to open systems architectures, allowing introduction of improved functionality and reduced cost.

Exhibit IV-14



N = 32

Source: INPUT

Off-the-shelf software products for hotel and travel agency operations are available from a number of reputable suppliers, and are marketed competitively.

Opportunities are strong for providers of mid-range application software products in this sector, especially on open systems platforms and in client/server configurations.

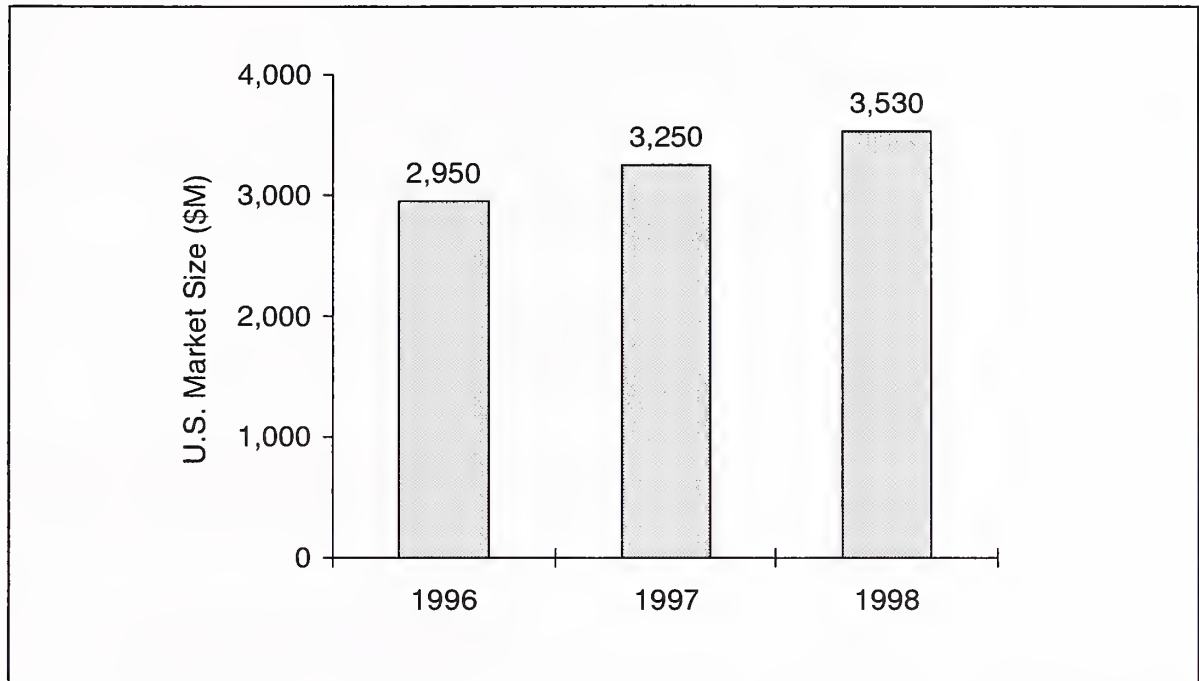
G

Centralized Reservation Systems

This specialized market segment is by far the largest of the four studied in this report, in terms of information services revenue. The 1996-1998 forecast of spending is shown in Exhibit IV-15, and includes airlines, hotel chains, and rental car enterprises in its scope.

Exhibit IV-15

Centralized Reservation Systems Software and Services Market, 1996-1998



Source: INPUT

This segment constitutes 62% of the total travel and lodging industry spending, though its growth rate is lower than the industry as a whole, at 9% in each of the next two years.

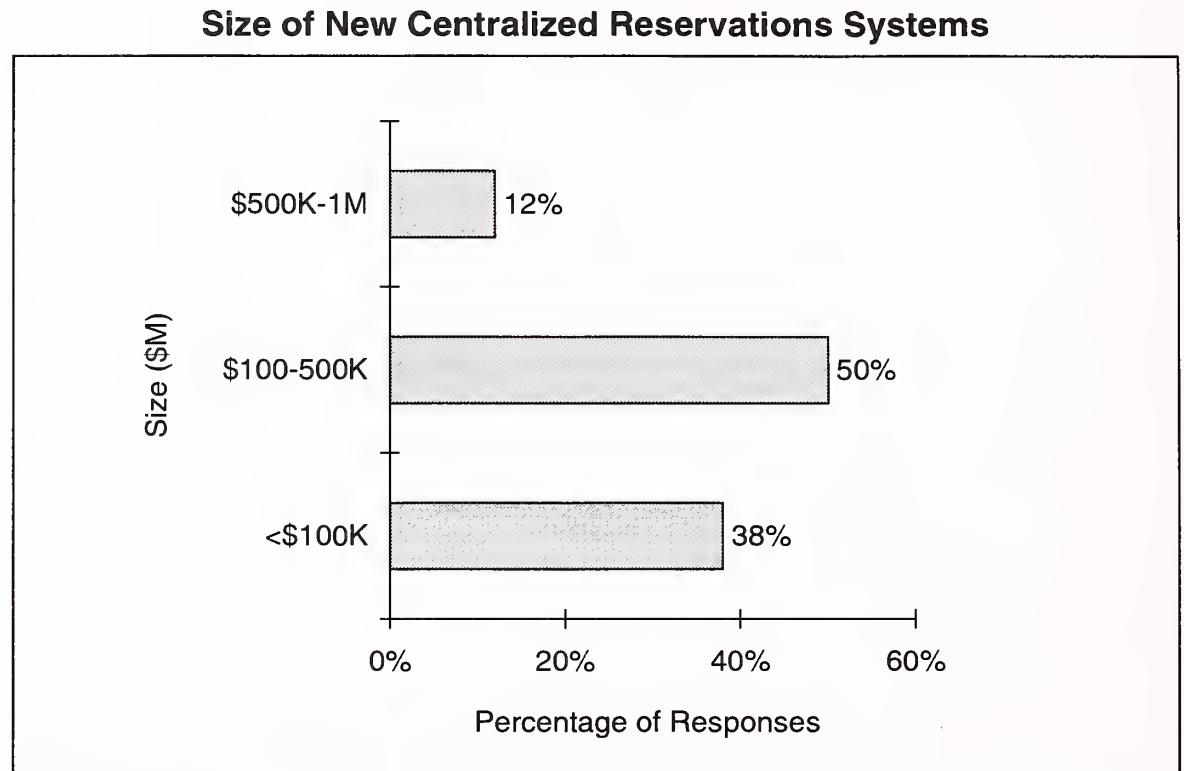
This is a “captive” market, in that (1) revenues are not easily available to vendors not already in the industry with an established product and customer base, (2) airline consortia own several of the largest reservation systems outright, and (3) there are only a few current vendors. For example, U.S. travel agent location market share figures, according to the 1996 Business Travel Survey, are:

Amadeus/System One	32.5%
Galileo	27.4%
Sabre	26.5%
Worldspan	13.6%

Three other reservation services, Abacus, Axxess, and Infini, are primarily involved in overseas bookings. These seven have a virtual lock on all airline reservation revenues.

These reservation systems are very large, costing tens or hundreds of millions of dollars to create and maintain. But there are smaller systems designed for use in mid-size hotels, for example, as shown in Exhibit IV-16, which analyzes the size of planned new reservation systems.

Exhibit IV-16



N = 8

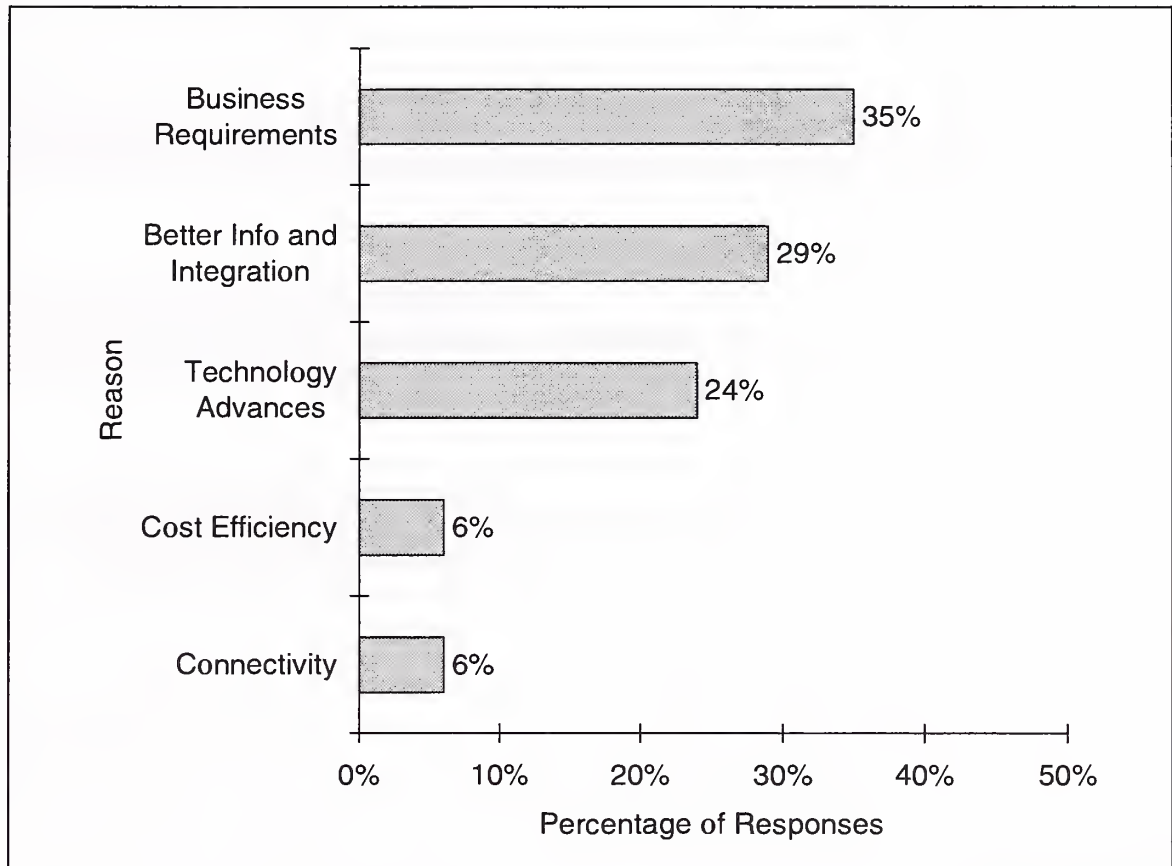
Source: INPUT

A small percentage of these projects are multi million-dollar contracts to revise large airline or hotel chain reservation systems.

The majority of the projects cost less than \$500,000, and are designed for use in small or mid-sized hotel chains.

Exhibit IV-17 shows the reasons for system replacement.

Exhibit IV-17

Reasons for Replacement of Centralized Reservation Systems

N = 17

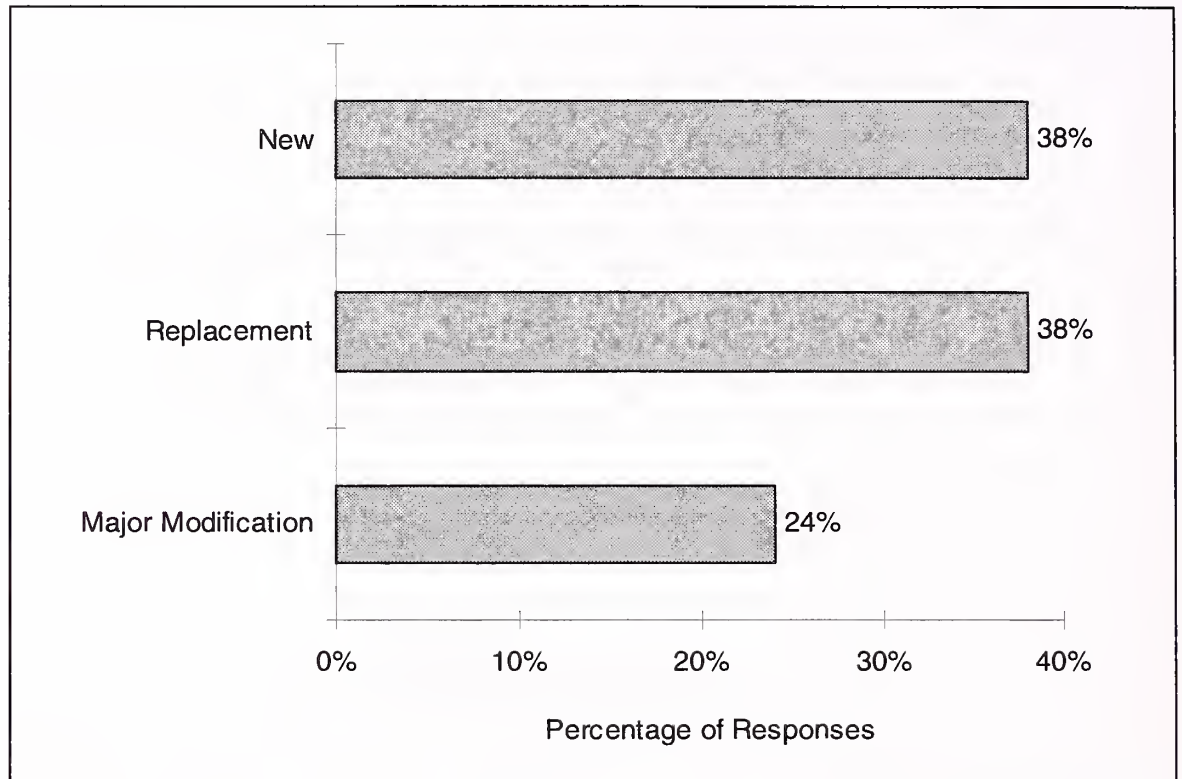
Source: INPUT

Changing business requirements are driving this market, including expanding networks to accommodate new partners, need for faster response time, and more comprehensive customer histories.

Integration of information emerges as an important factor also, as enterprises continue to expand their reservation coverage and add new partners and locations.

Major reservation systems operators are incorporating the latest processor, network, and database technologies for more effective systems performance.

Exhibit IV-18

Replacement Rate for Centralized Reservation Systems

N = 22

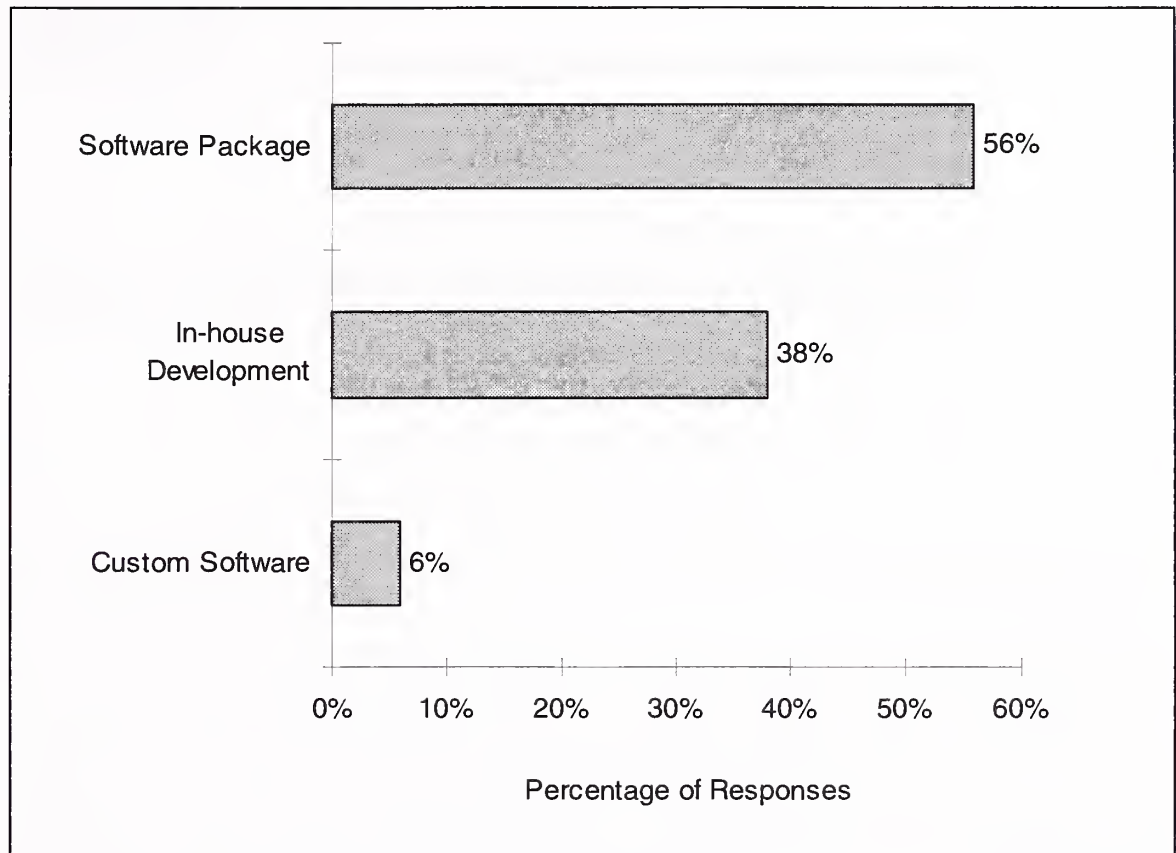
Source: INPUT

Over 60% of projects involve replacement or major modifications to existing systems.

Legacy systems have been in place for leading providers for some time. For the reasons mentioned in Exhibit IV-17, many of these are now in need of upgrading.

The new systems, those not part of a replacement project, will probably be implemented by the newest airline reservations systems, or by small or mid-range hotel chains or hotel reservation consortia.

Exhibit IV-19

Sources of New Centralized Reservation Systems

N = 21

Source: INPUT

Over half of these very complex systems will be implemented with software packages; these are the smaller, less complex versions.

The larger, more complex reservation systems tend to be built and maintained by in-house staff, although EDS has played a unique role in investment, development, and operation of System One, now a part of Amadeus.

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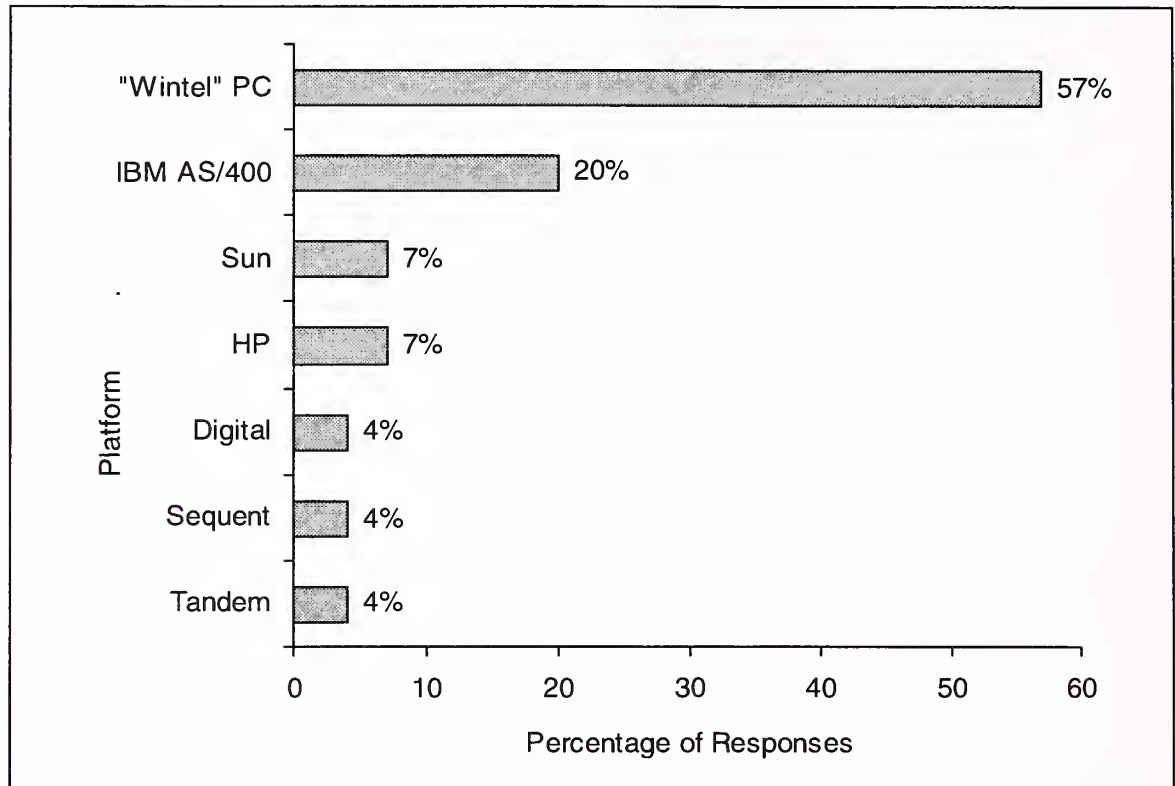
Technology—Related Issues

A

Hardware Platform Selection Plans

The INPUT survey asked respondents to identify the type of hardware they expected to use for each of their important applications. Some respondents would/could not answer this question, or similar queries about software and communications systems, as the projects were too far in the future for clear visibility. But two-thirds of the respondents did answer these questions, and the resulting tabulations begin with Exhibit V-1.

Exhibit V-1

Computer Platforms Expected to be Used for New Applications

N = 36

Source: INPUT

Intel-based, IBM-compatible PCs are the dominant platform. This reflects the industry demographics, consistent with this survey population, of large numbers of small and medium-sized travel agencies and hotels (hence likely to implement PC-based, lower cost systems), and a few very large companies, the leading airlines, hotel chains, and rental car agencies. Even within the large hotel chains, many decisions to purchase operational and financial applications are made by individual hotel properties, rather than the corporate office.

The IBM AS/400 continues to be a favorite choice for mid-range hotel solutions, despite the lingering fear of proprietary architectures in this industry.

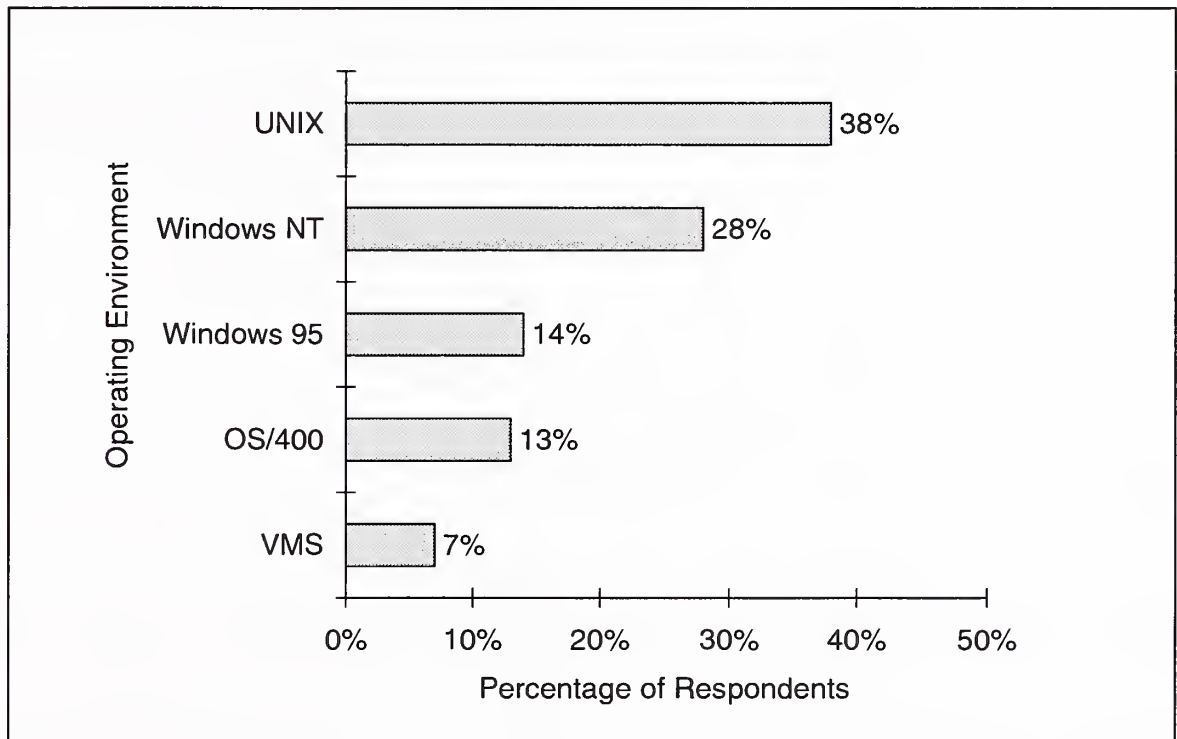
Client/server solutions are becoming popular for hotels and travel agencies with multi-departmental IT needs.

B**Software Environment Selection Plans**

Operating system choices for planned new applications are shown in Exhibit V-2.

Exhibit V-2

Expected Software Environment for New Travel & Lodging Applications



N = 40

Source: INPUT

UNIX and Windows make a strong showing, reflecting the growing popularity of distributed systems.

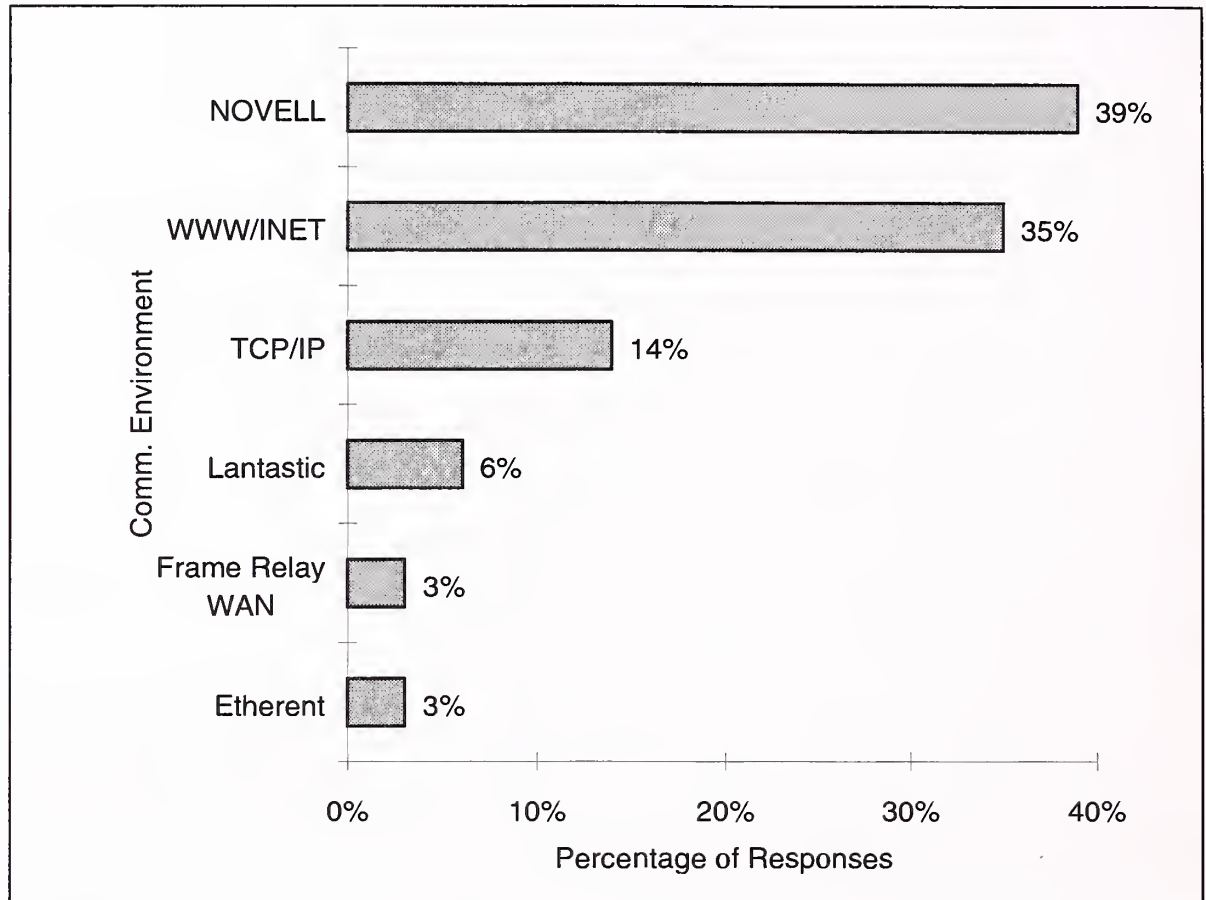
Not all respondents who named the AS/400 as their preferred hardware platform named OS/400 as their preferred operating system. This may be a result of unfamiliarity with the standard AS/400 architecture, or a desire to use the AS/400 in a UNIX-oriented solution.

C

Communications Network Environment Selection Plans

Exhibit V-3

Expected Communications/Network Environments for Travel and Lodging Applications



N = 31

Source: INPUT

An interesting new development is the identification of the Internet and/or World Wide Web by 35% of the respondents. This underscores high levels of interest in this industry in the Internet as a reservation and travel information channel.

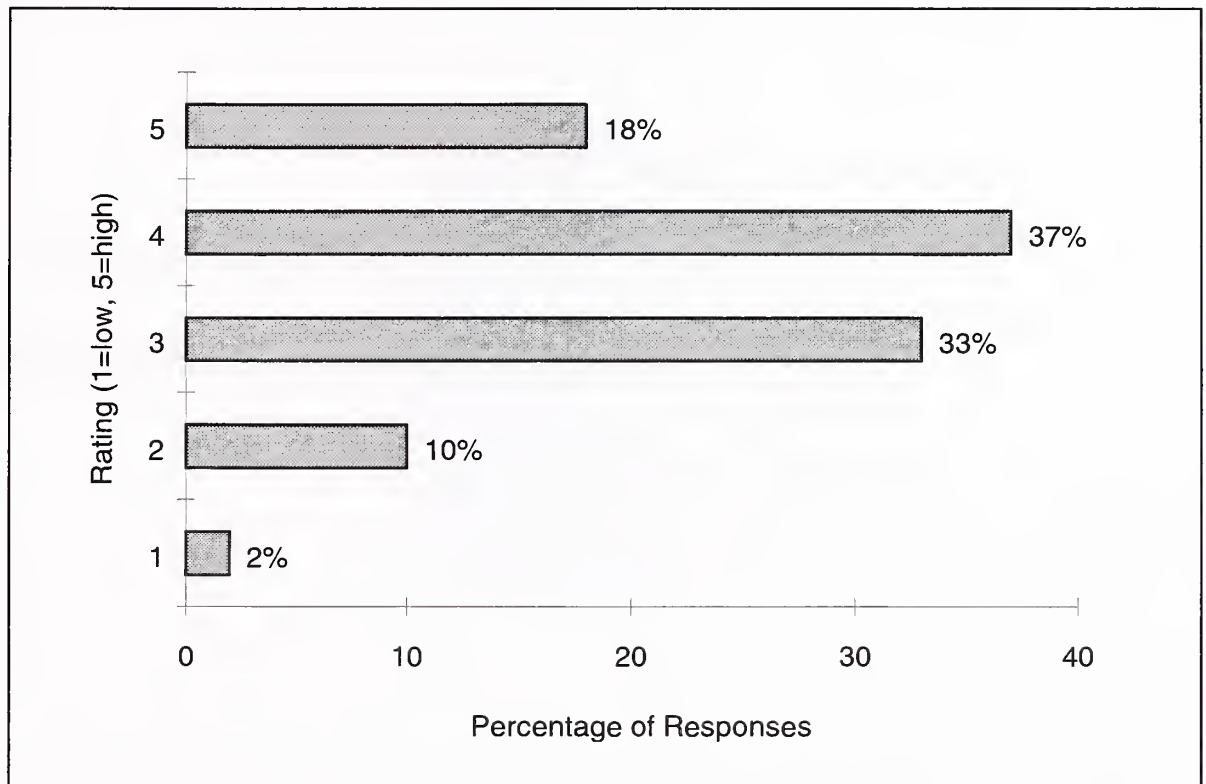
D

Planned Usage of Internet and Intranets in New Applications

INPUT asked respondents how large an impact on their business they expect from the Internet. Results are shown in Exhibit V-4.

Exhibit V-4

Impact of the Internet on Business



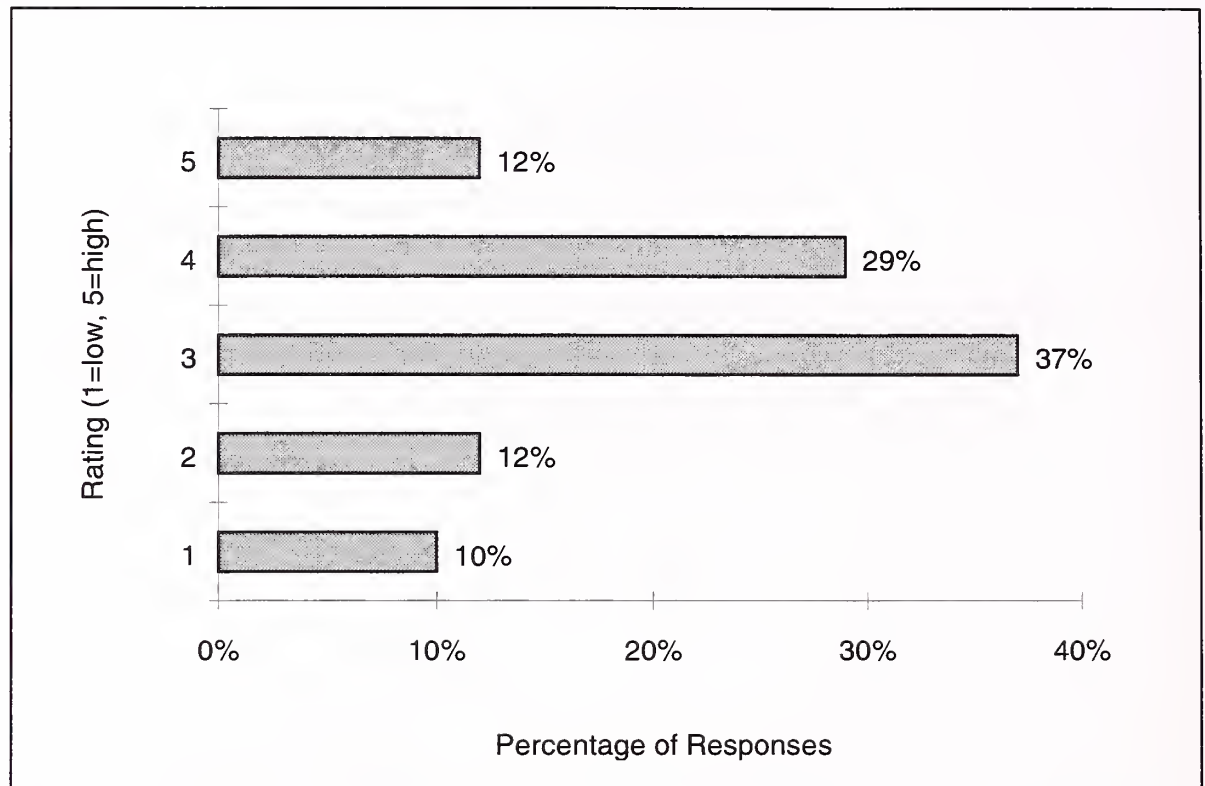
N = 52; (Mean= 3.62)

Source: INPUT

- An overall rating of 3.62 indicates reasonably strong expectations for the Internet.
- More than 50% of respondents have a strong interest, with a rating of 4 or 5. This population segment will drive many new Internet applications in the travel and lodging industry.
- There is considerable concern in the industry about the Internet becoming a new, possibly competitive channel for consumers and businesses to research travel destinations and make their own travel arrangements, independently.

Another survey question was about respondent's plans to use intranets in their business. Results are displayed in Exhibit V-5.

Exhibit V-5

Firms Expecting to Use Intranets in Their Business

N = 41; (Mean=3.2)

Source: INPUT

A relatively lukewarm response, 3.2 indicates that many respondents have not closely focused on these opportunities. Ratings of intranet value will be higher in many other industries.

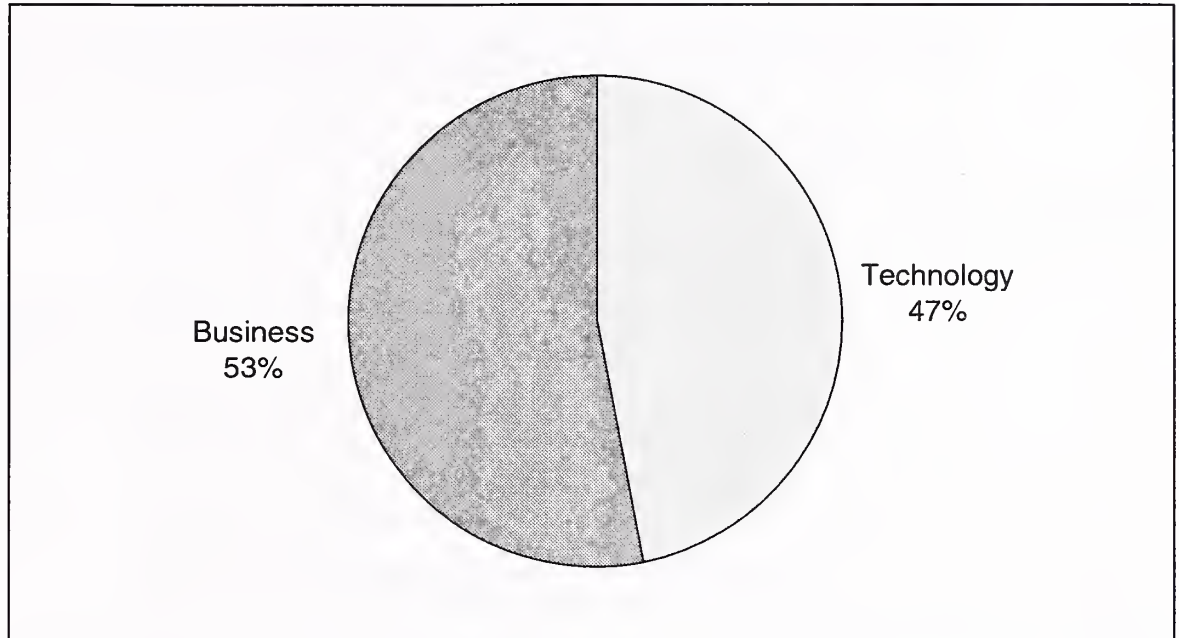
One factor in this mediocre rating is that most of the industry is already tightly linked through centralized reservations systems, and may therefore see intranets as redundant in their own environments.

E**Decision-Making Authority in Application Selection**

INPUT asked respondents to assign relative weight to decision-making authority for purchasing or changing software applications. Results are shown in the following two exhibits.

Exhibit V-6

Relative Weight of Software Application Decision Making Technology Factors versus Business Factors



N = 66

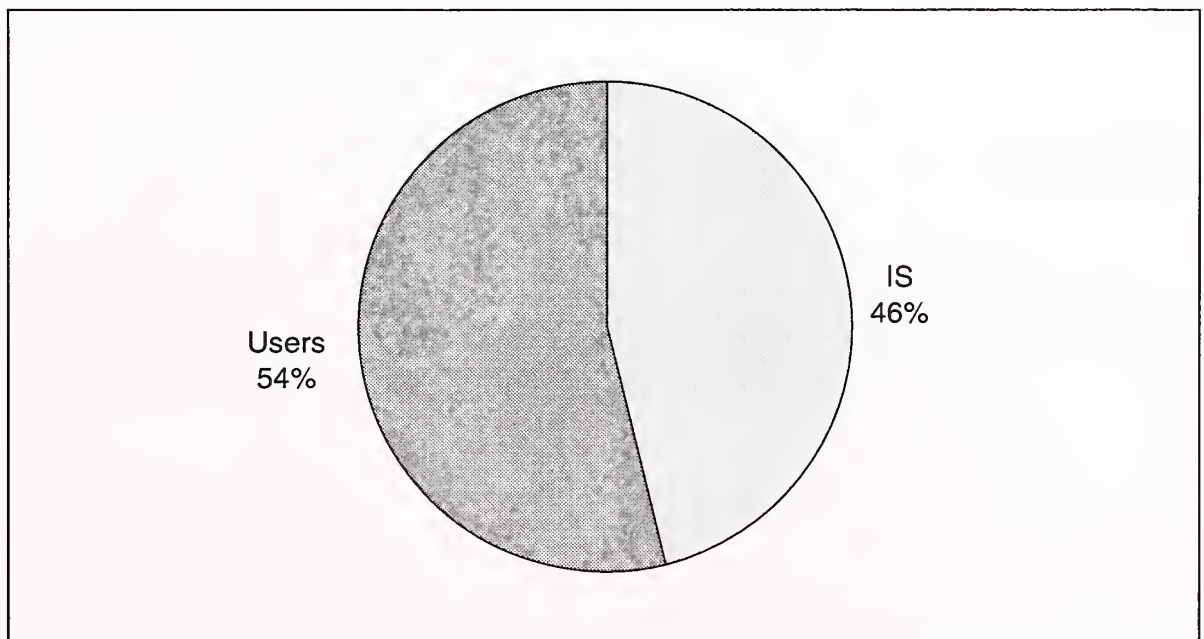
Source: INPUT

Evenly divided responses indicate the perception of need for a good balance between these two factors.

Business and financial pressures are likely to prevent too much investment in technology for its own sake.

Exhibit V-7

Users versus IS Departments: Relative Weight of Decision-Making Authority



N = 66

Source: INPUT

An evenly divided response indicated reasonable balance between these business units.

In many small and mid-sized hotels and travel agencies, in-house technical staff is not affordable, and is contracted out. So the classic in-house information systems presence is often weak or non-existent.

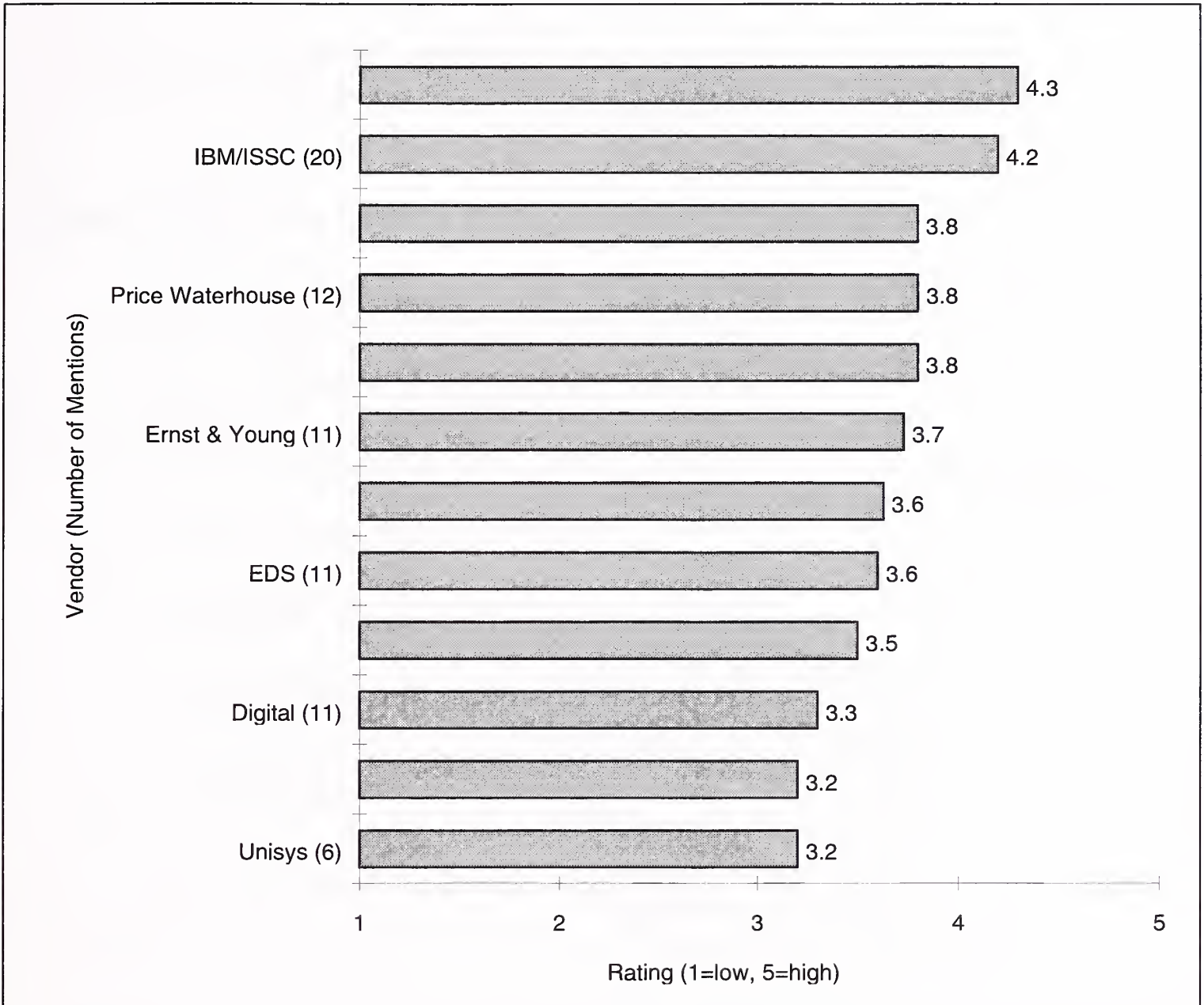
F

Ratings of Information Technology Services Vendors

INPUT asked respondents to identify IT services vendors that would be able to complete a project for them successfully, and to rate that capability on a scale of 1 to 5. Summary ratings for the most frequently mentioned vendors are displayed in Exhibit V-8.

Exhibit V-8

User Ratings of Information Technology Services Vendor Ability



N = 121

Source: INPUT

IBM/ISSC, and Price Waterhouse had the highest visibility in the sample. The mean rating, 3.7, displays a good confidence level in the overall capabilities of these vendors. IBM/ISSC and CSC were very well regarded by respondents, with average ratings exceeding 4.0.

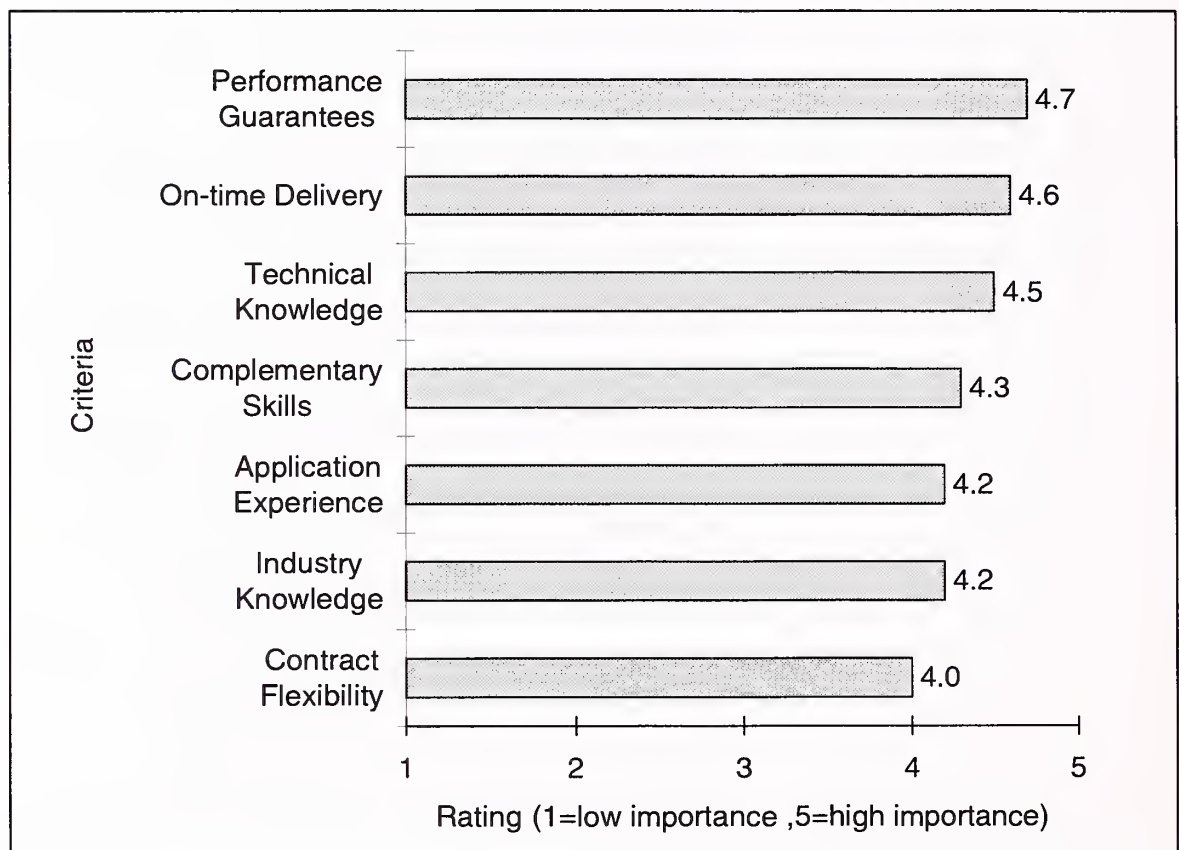
G

Criteria for Selection of Outside IT Services Vendors

INPUT also asked respondents to rate the importance of seven specific criteria for selecting an outside vendor. Average mean scores for each criterion are shown in Exhibit V-9.

Exhibit V-9

Leading Criteria in Selecting Outside Vendors for IT Projects



N = 80

Source: INPUT

The average rating for all criteria was 4.3. Survey respondents considered all of these criteria important.

Three criteria (performance guarantees, on-time delivery, and technical knowledge) were especially important, with ratings of 4.5 or over.

Performance guarantees (4.7) are clearly critical to the travel and lodging industry; vendors who are willing to provide them may attain competitive advantage.

On-time delivery (4.6) is very important to an industry that needs central reservation and hotel front-office systems to operate continuously, without downtime.

Vendor's technical knowledge (4.5) is highly valued in an industry where many mid-range companies cannot afford full-time technical staff.

For those who responded, with a plan to utilize off-the-shelf software for new projects, the follow-on question was about plans to use the product with few modifications or with many. Analysis of responses is shown in Exhibit V-11.

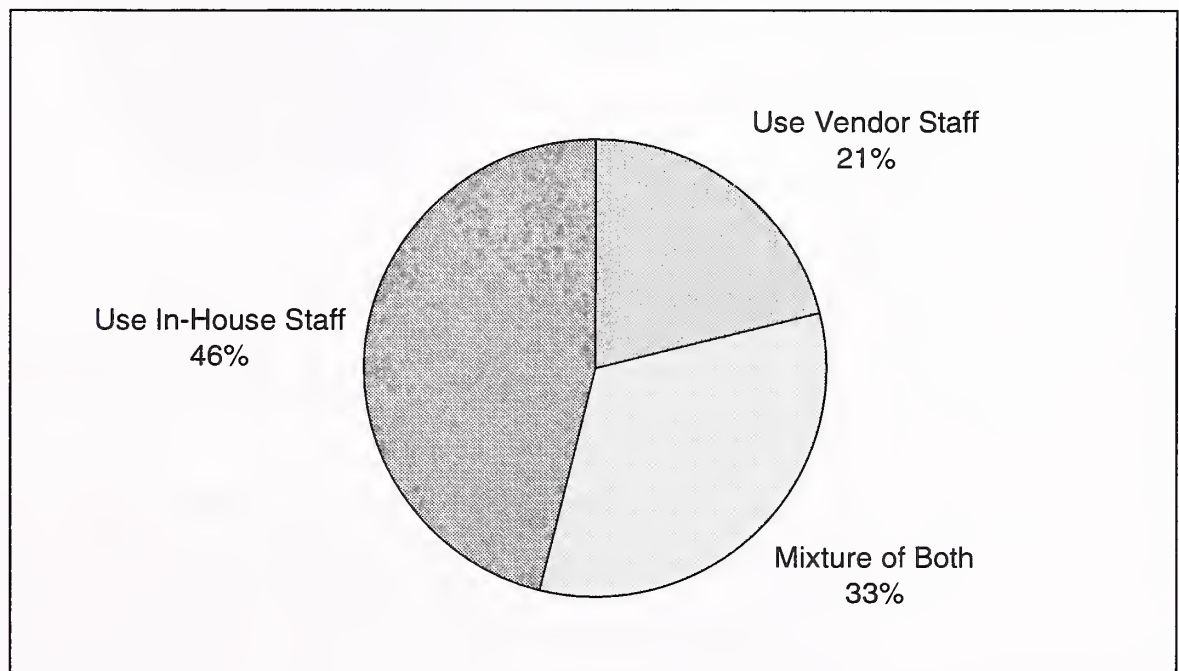
H

Internal Versus External Resources in Building New Applications

For those who preferred the customized solution, INPUT then asked a follow-on question: Would the respondent use in-house development staff, contract with an outside vendor, or use a mixture of the two? Results are shown in Exhibit V-10.

Exhibit V-10

Internal versus External Resources in Building New Applications



N = 25

Source: INPUT

Surprisingly, 46% stated a preference for in-house staff. This result is strongly skewed toward the largest projects identified in the survey. But it should also be remembered that many of these projects may not be implemented for two or more years, and this response percent may well decline as project implementation gets closer and users look at internal resources and required time-lines for delivery.

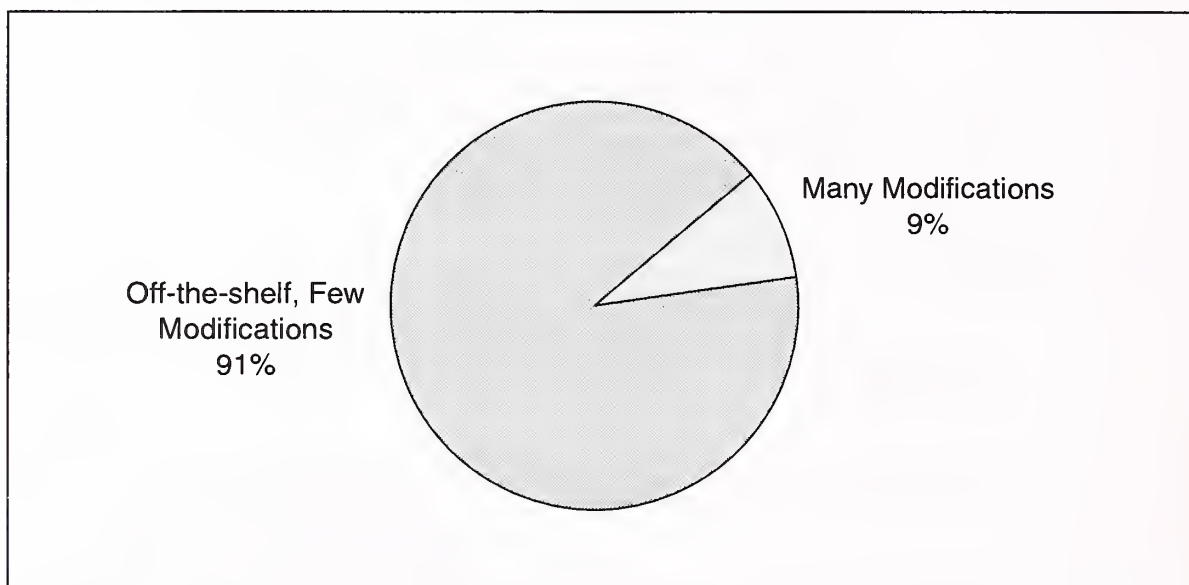
While only 21% indicated an intention to use vendor staff, another 33% would use both internal and internal resources. So at least 54% of cases would involve some sort of vendor opportunity.

Planned Modifications to Software Packages

The survey asked respondents to state whether they would purchase off-the-shelf software for each new application, or develop a customized solution.

Exhibit V-11

Planned Modifications to Software Projects by Travel and Lodging Firms



N = 18

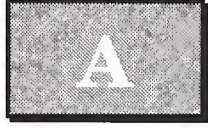
Source: INPUT

The overwhelming majority of responses favored little or no modification to the package.

This is not surprising, given the wide variety of application packages available for systems like hotel front-office operation, from well-established firms such as Fidelio, Hotel Information Systems, Computerized Lodging Systems, Sulcus, and Encore. The same condition applies to hotel-back office systems, sales and catering systems, and travel agency management systems.

Similarly, there are only seven major airline reservation systems, and all offer off-the-shelf solutions that are not tailored for small or mid-range hotels or travel agents.

The demographics of the industry also work toward use of standard software packages by the many small and medium-sized enterprises that cannot afford extensive modification, do not have internal resources for it, and are not sure of the value of customization, given the rich functionality in many well-known products.



Questionnaire

MAJOR CRITICAL APPLICATIONS STUDY

My name is _____. I'm with INPUT, a research and consulting firm in Teaneck, New Jersey. We are conducting a study on why and on what cycle companies replace their major applications. All the information you provide will be kept confidential, as well as your name and your company's name. In return for your assistance, we will send you a summary of the completed study at no charge.

- 1a. First of all, what are your five most important applications today? (in order of importance)
- 1b. How will this list change in five years, either in terms of their order on the list, or by the adding of new applications?

	<u>1996</u>	<u>2001</u>
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

- 1c. What are the reasons for these changes?
- 2. Next, I would like to understand more about four of these applications. (Select the top four in 2001.)

Use one of the attached "Applications, Questions Attachment" for each application.

- 3. Now I would like to ask a few more general questions.
- 3a. What would you say is the relative weight of the decision-making authority between IS and users when replacing or changing applications software?

IS	%
Users	%

3b. What do you see as the relative weight of technology requirements versus business needs when replacing or changing applications software?

Technology %

Business %

4. What would you say are the major trends or issues in the IT marketplace today and over the next few years?

5. Do you have any other comments on the trends of major applications, either in your organization or generally?

5a. What is the source of this application?

In-house developed _____

Custom developed _____

A commercial software package _____

(Name - _____)

Other (e.g., combination of above, developed by parent company)

5b. What year was it installed?

5c. Approximately how much were the implementation costs?

Under \$100,000 \$1M - \$5M

\$100K - \$500K \$5M- \$10M

\$500 - \$1M Over \$10M

Does this amount include/exclude hardware? If included, about what percent was for hardware? %

5d. How well were initial expectations for this application met? (Use a scale of 1 to 5, with 5 being highest) Why? How would you rate the performance of the application now? _____ Why?

5e. Do you expect to replace or make major modifications to this application in the next five years?

No (end questionnaire)

Yes

- Will this be a replacement or a major modification _____?
- When do you expect or want to make this change?

5f. Why are you making the change?

5g. What type of hardware, software and communications environments do you expect to use?

- - Hardware environment[s] (e.g., Intel, Sun, Alpha, etc.):
- - Software environment[s] (e.g., UNIX, NT OS/2):
- - Communications/network environment[s] (e.g., Novell, DCE, World Wide Web, etc.):
- Do you plan to use object technology? If yes, in what way?
- What other new technologies do you expect to use?

5h. How do you expect to implement this application change, that is, will you use:

- - Custom software development
 - Using in-house staff
 - Using vendor staff
 - Using a mixture of in-house and vendor staff _____
- - Software package
 - Off the shelf, with few modifications
 - With many modifications

Which packages are being considered?

- Systems integration (i.e., where an outside supplier supplies a full business solution)
- Outsourcing
- Other

5i. Approximately how much do you expect this new/revised application to cost? [Use ranges below as prompts, of necessary.]

Under \$100,000

\$1 - \$5M

\$100K - \$500K

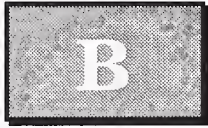
\$5 - \$10M

\$500 - \$1M

Over \$10M

Does this amount include/exclude hardware? If included, about what percent would be for hardware? _____%

(Blank)

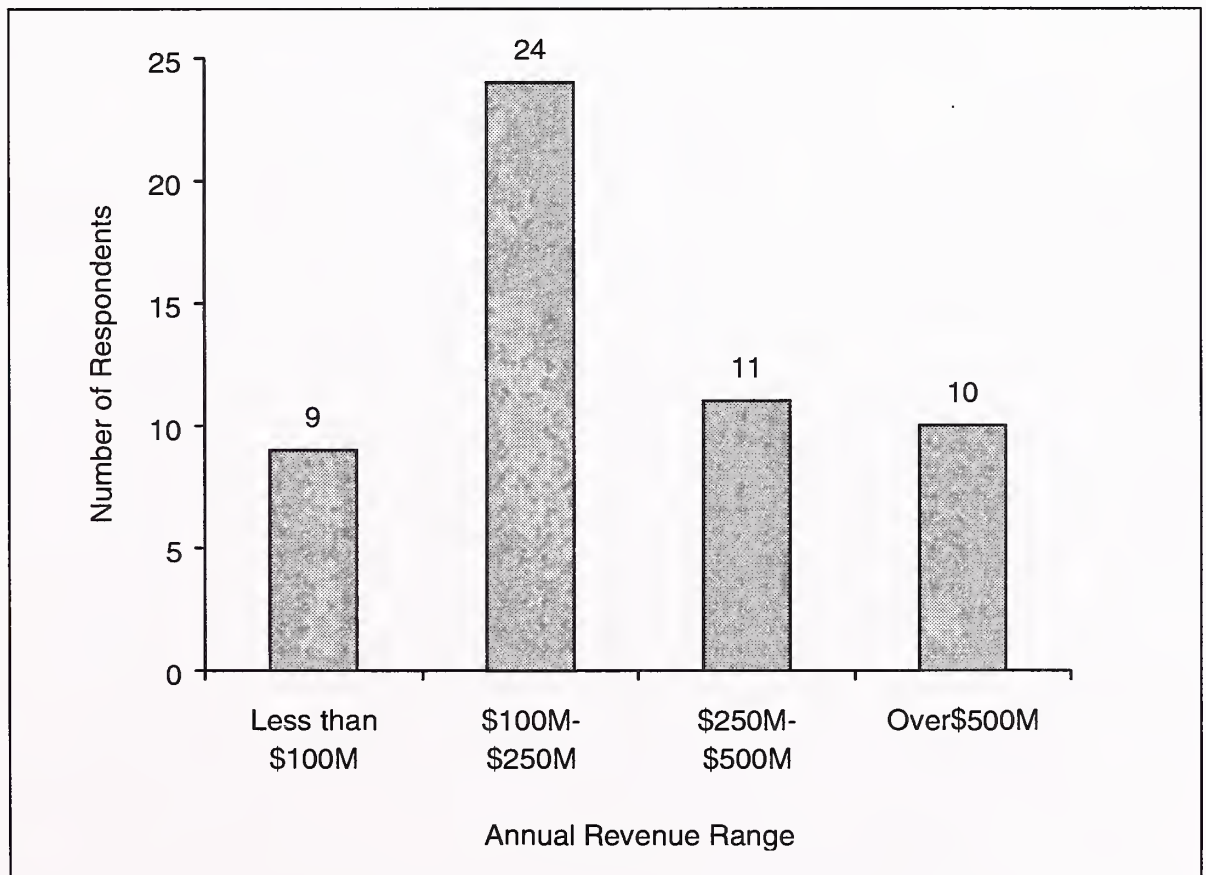


Appendix B

Respondent Demographics

Exhibit B-1

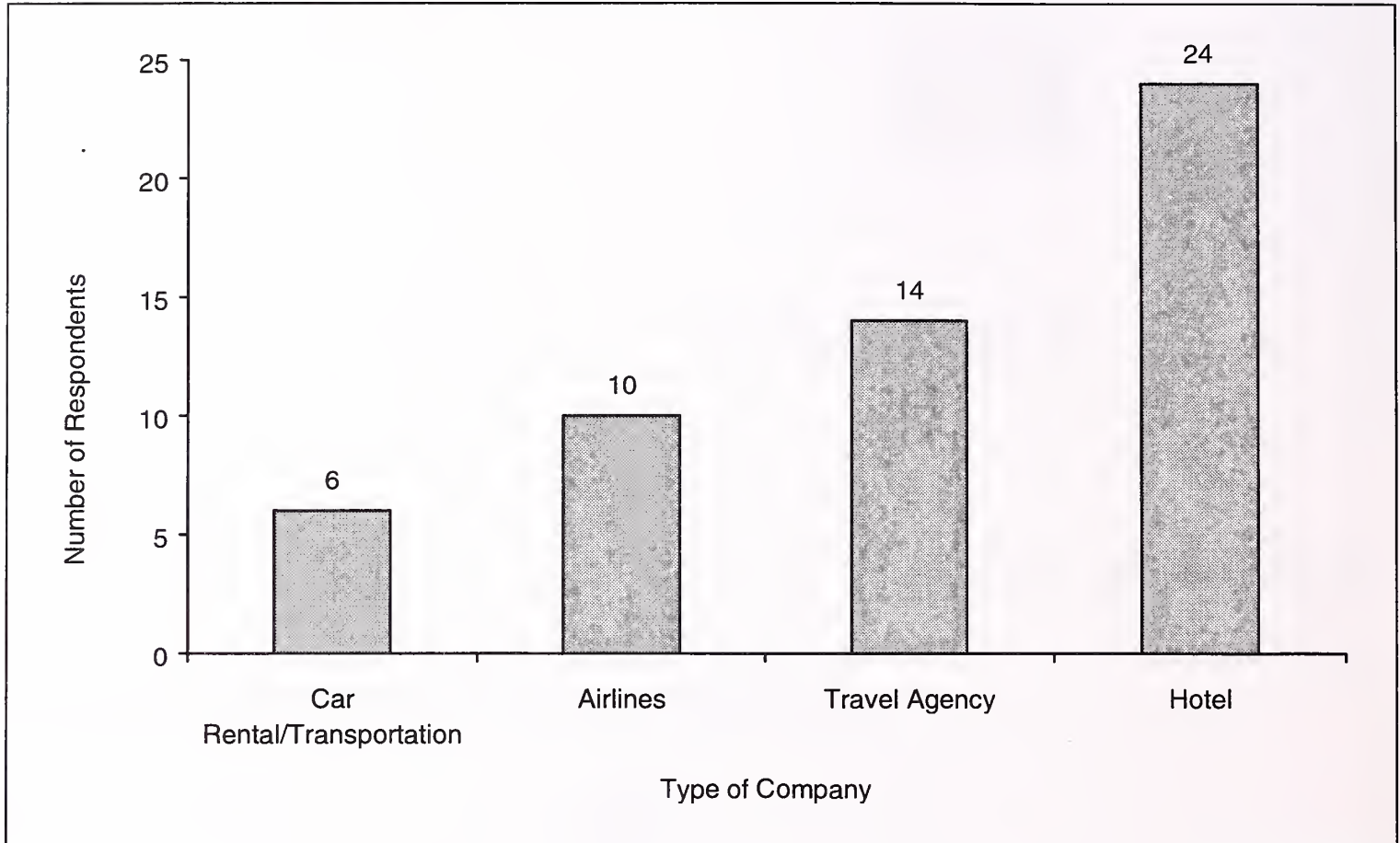
Survey Respondents by Size of Company



Source: INPUT

Exhibit B-2

Survey Respondents by Type of Business



Source: INPUT

