CANADIAN INFORMATION SERVICES MARKET

1990 - 1995

INPUT

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Canadian Information Services Market, 1990-1995

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Abstract

This report provides a comprehensive look at the Canadian information services market in 1989, with growth rate projections for the period 1990 through 1995. Performance is analyzed for companies that offer processing services, software products, turnkey systems, systems integration, systems operations, professional services, and network services.

Research for this report included gathering extensive data about key reasons that users buy information services and contains vendor selection criteria. Results of the research indicate that Canadian companies are at a somewhat different point in the information technology evolution cycle than are their counterparts in the United States and Europe.

Research results indicate that the Canadian information services market is being impacted somewhat earlier by the softening economy, but that the market is poised to make significant growth as the economy improves.

The report also provides an assessment of the interest of Canadian companies and vendors in having U.S. vendors participate in the market and a number of recommendations to minimize the effect of the economic situation.

This report contains 92 pages, including 68 exhibits.

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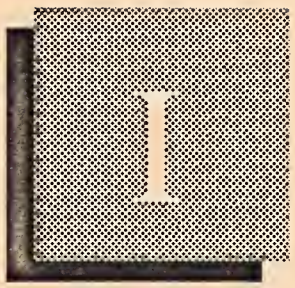
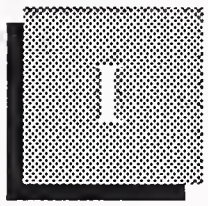


Introduction



Introduction

A

Purpose and Scope

Canada is unique in its information services market structure and needs.

- Geographically the second largest country in the world, Canada's enormity requires creative approaches to services delivery to distant areas. However, the bulk of Canada's population and industrial base are concentrated in a handful of regions, thus limiting the number of branch offices necessary to have a local presence.

- An economic machine that is less than 10% the size of the U.S.'s requires vendors to maintain account control to reduce the need to dip into a modest prospect pool. This situation, without the benefit of any major hardware vendor and most software vendors, requires Canadian companies to constantly cross borders to meet technological needs.

- The Canadian political climate can be unkind. Free-trade agreements with would-be competitor countries only smoothes the way for additional encroachment. Personal taxes, which encourage independent contractors (e.g., programmers and analysts), make leaving Canada an attractive alternative. Personal taxes also require a salary structure that threatens a delicate price-value relationship.

It is in this setting that information services have begun to flourish. Although the user expenditure base for services is still small, there are signs that Canada is an opportunity waiting to happen. Previous research by INPUT suggested an information service market growth rate averaging 20% per year. Although this research resulted in a somewhat less aggressive growth rate, the market is poised to grow significantly over the next five years.

In this latest effort, INPUT took a closer look at the Canadian information services market. The report provides insight into driving forces and inhibiting factors to market growth, emerging technologies and their role in moving the services market, and competitive factors that promise to

change the market structure. The impacts of these events were gauged within each of seven service delivery modes and, within each, the respective delivery submodes. The result is a comprehensive picture of the Canadian marketplace.

B

Methodology

1. Research/Analysis Methodology

The research conducted for this report included extensive primary and secondary research.

- Secondary research included an extensive review of background data about the economics and service environment, contacts with trade association representatives and knowledgeable third parties, and an exhaustive trade press literature search that was specific to information services in Canada.

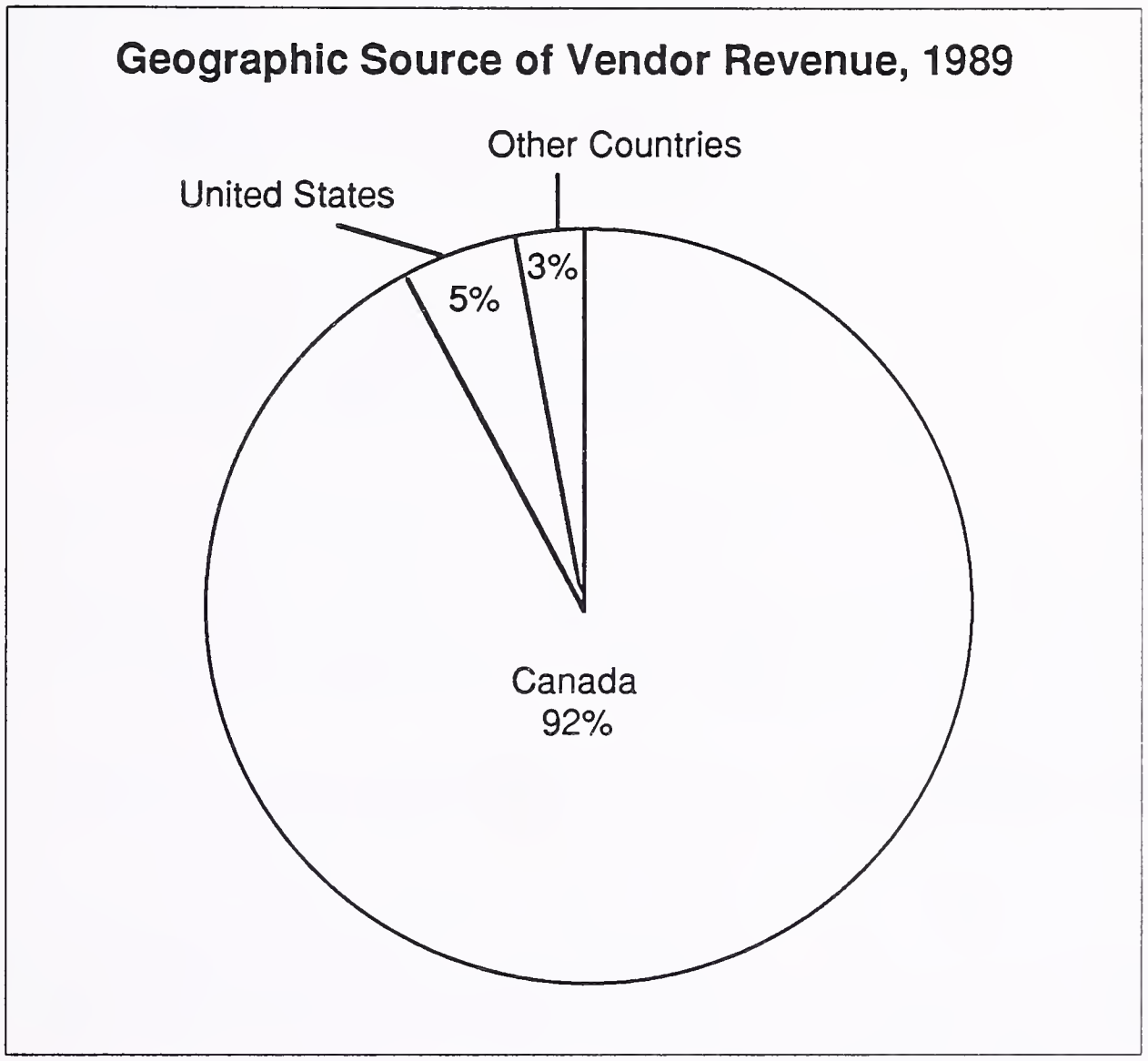
- Primary research included telephone interviews with executives at 50 representative companies, and telephone and on-site interviews with representatives of 27 of the leading information services vendors. All participants received an executive overview of the report as an incentive for participating.

  - The user interview respondents were solicited from a pool of companies composed from public directories and proprietary customer lists supplied by the study sponsors. This pool contained a wide range of companies by revenue size: from the $2-million company that was interviewed, to the $2-billion company that shared its information. In fact, the pool included over 200 companies representing an estimated one-third of the major users. Complete demographics on the user respondents are available in Appendix B.

  - The vendor interviews were completed from a pool composed of the largest information services vendors and vendors that were revenue leaders in one or more service delivery modes but not a leader by overall revenue size. In this way, vendor information was captured from the large and the small, as well as the single-mode vendor and the full-service vendor.

  - No discrimination was made between vendors with corporate headquarters in Canada versus other countries—so long as the foreign vendor had revenue from Canadian customers. Exhibit I-1 indicates the dominance of the Canadian marketplace as the source of revenue for each of the vendors interviewed. Interview demographics are available in Appendix B.

EXHIBIT I-1



Users and vendors were asked to provide information about the delivery modes in which stay back information services expenditures (users) and from which stay delivered revenues (vendors). The resulting responses are shown in Exhibit I-2. From this coverage INPUT extended the findings from the sample to the majority of the Canadian market.

EXHIBIT I-2

Respondent Coverage by Delivery Mode

	Users	Vendors
Processing services	54	33
Network services	71	33
Systems software	85	24
Application software	79	52
Turnkey systems	40	38
Systems integration	31	48
Professional services	81	90
Systems operations	31	48

2. Forecasts and Inflation

Financial data for this report were collected and are presented in Canadian dollars. A currency conversion rate of 1.20 would yield a comparable amount in U.S. dollars in 1989.

Forecast data are presented in current dollars. They are not inflation adjusted. Efforts to identify GNP and inflationary data that could be applied for 1989 and 1990 resulted in numbers that were highly contradictory. INPUT did not believe that the data were sufficiently reliable to include specific figures in the report.

Note that some revenue figures have been rounded for display purposes in the exhibits. As a result, calculation of a CAGR based on exhibit revenue data could vary from the data base shown in Appendix C. Appendix C provides expanded revenue data and the correctly calculated CAGRs (compound annual growth rates).

C

Report Organization

Following the Introduction, the report is organized into five major parts.

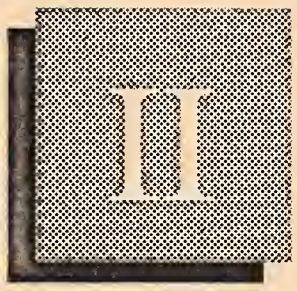
- Chapter II is an Executive Overview of the report.
- Chapter III is a summary of the Canadian information services market, including the economic/political setting, environmental drivers and inhibitors, market forecast, and market entry/expansion considerations.
- Chapters IV-X provide specific details on each service delivery mode and include discussions of the topics addressed in Chapter III as they pertain to the specific delivery mode.
- Chapter XI provides conclusions about the Canadian market for information services and recommendations for being successful in the marketplace.
- Appendixes provide the reader with detailed information regarding the definition of terms, respondent demographic data, the industry forecast data base, and the forecast comparison.

D

Related INPUT Reports

Other INPUT reports related to the Canadian market forecast include:

- *Information Services Worldwide Market Forecast, 1989-1994*
- *U.S. Information Services Industry Analysis and Forecast, 1990-1995*
- *European Information Services Industry Analysis and Forecast, 1990-1995*



Executive Overview

Executive Overview

The overview provides a general assessment of the business environment as it relates to information services and a summary of the key driving forces and inhibiting factors to growth.

The overview includes narrative data and a summary of the market by delivery mode. The complete forecast data base is included as Appendix C.

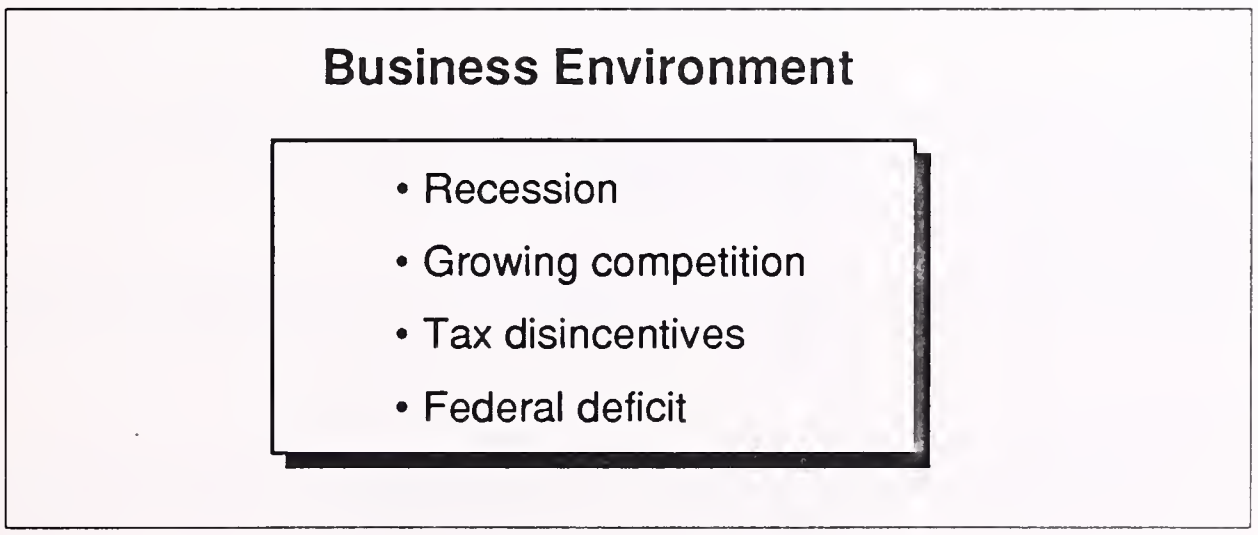
A

Business Environment

In the third quarter of 1990, Canada officially slipped into a broad-based recession that promises to last until mid-1991 if not the entire year, according to Canadian economists.

On top of this recession have come a growing federal deficit, a new tax on nearly all goods and services (including software), a tax structure that encourages independent contractors, and a free-trade agreement that makes market entry easier for foreign firms. See Exhibit II-1.

EXHIBIT II-1



These factors have contributed to an environment that plays against growth for the information services firm, both directly and indirectly.

- Directly, firms struggle with cash flow and investment resources during the downturn. Other threats are increasing competition from foreign entrants and cheap labor from independents.

- Indirectly, vendors face a squeeze on information services expenditures as corporations tighten their own belts and reduce or eliminate discretionary expenditures.

Perhaps the most critical issue is the growing number of U.S. vendors that are entering the Canadian market. In and of itself, more competition would be tolerated, even valued, but the playing field may not be level.

On the one hand, the Canadian vendor typically is entrenched in a geographic niche where multiple services are offered by the same vendor. To maintain business, the vendor frequently relies more on relationships with customers than on marketing and selling skills. A conservative management style and limited financial resources seem to ensure continuity without rapid and abrupt changes in company direction or style.

U.S. vendors, on the other hand, tend to have a very focused view that covers only one or two delivery modes. Sales and marketing skills are well-honed through the competitive battles within the U.S. market. Features and benefits, not relationships, are the U.S. vendors' approach. U.S. vendors' sheer size in terms of financial resources or personnel seem to permit the vendor more latitude with respect to product, service, or market investments.

B

Services Forecast Summary

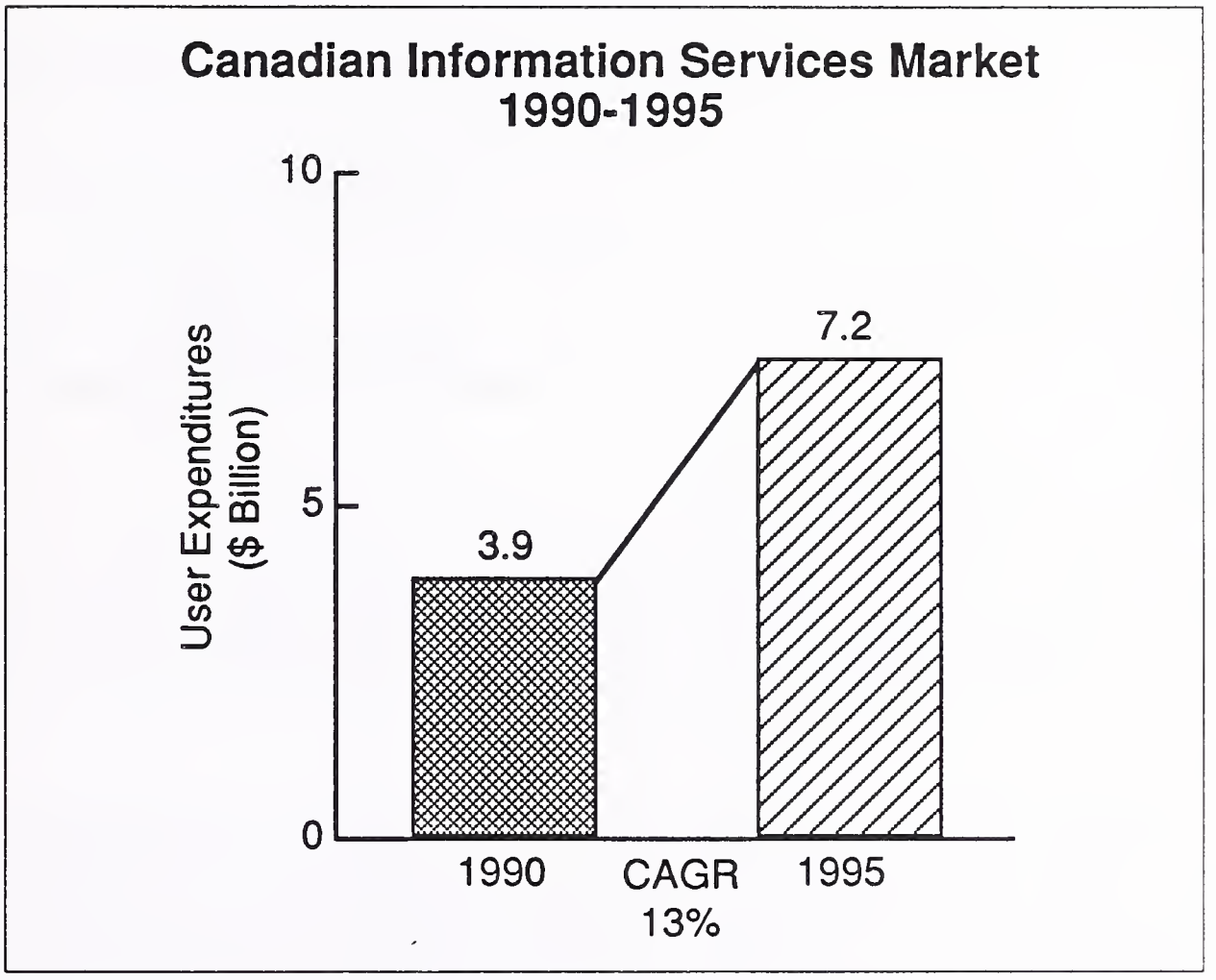
Exhibit II-2 presents INPUT's information services market forecast by delivery mode. INPUT forecasts an overall annual growth rate of 13%, from $3.9 billion in 1990 to $7.2 billion in 1995.

Over the next five years, much of the growth will turn from the packaged approaches of processing services, software products, and turnkey systems to more custom approaches delivered through systems integration and professional services.

Network services will grow at a rapid pace as demand for connectivity and value-added services continues. EDI and electronic mail applications are expected to lead the way.

Systems operations, the delivery mode whereby the vendor assumes some or all responsibility and control of a customer's data center, will also grow rapidly. Customers increasingly realize that they have not been able to enjoy the promise of technology. They feel that these advantages may be had if outside vendors have more of a role in the corporation's data processing operations.

EXHIBIT II-2



C

Technology Trends

As in other developed countries, there is high interest in technologies that will enhance a company's competitive position and maximize the use of corporate assets. However, unlike United States companies, Canadian companies are, as yet, not in a position to make significant use of technologies such as electronic imaging and high-speed (150 Mbps) local- and wide-area networking.

Many Canadian companies are at a transition. They are unsatisfied with the cost-benefit ratios that they have seen to date. They recognize that technology investment is necessary, but want to establish a stable environment before moving forward.

In the short term, Canadian companies report that they are placing their attention on gaining control of what they believe has become a somewhat fragmented technology environment. Once they have gained control of what exists today, they will be ready to move forward. Vendors providing services and products that contribute to establishing control, in the short term, are in the best position to provide solutions for growth.

Exhibit II-3 provides a summary of technology trends that will be key for the next two to three years, or at least until the economy begins to rebound.

EXHIBIT II-3

Key Technology Trends

- Productivity tools growth
- Continued downsizing
- More technology integration

- Tools that contribute to greater productivity and control of the existing environment will be in high demand for the next two to three years. CASE, network management, and data center automation tools are the most frequently mentioned products cited by the companies interviewed.

- Most companies believe there are significant opportunities to make greater use of workstations and PCs to perform essential processing tasks, but note that there is a lack of software available to meet needs. Many companies indicate that, in the future, they will focus on mainframes as large repositories, with workstations and PCs performing much of the departmental work. But these companies believe that the transition will be difficult due to a lack of industry-specific software for smaller systems.

- Although there are questions about the technology benefits received to date, companies recognize that there must be greater integration of products and services to realize competitive benefit.

Control and productivity are the short-term technology trends. Investments in integration will follow. The timing is dependent on two factors. The first is the time needed to gain control of the current environment. The second is the speed at which the economy rebounds.

D

Leading Vendors

The leading vendors in terms of revenue are indicated in Exhibit II-4. Except for hardware vendors and their dominance in the software market, the vendors are Canadian.

Although Canadian vendors in well-defined niches may continue to flourish, they will likely face strong competition from a multitude of vendors that will be able to use their limited-services perspective or their full-service capability as the weapon. Most of these competitors will be U.S. vendors unless existing Canadian vendors begin an offensive in one or more product/service areas.

EXHIBIT II-4

Leading Vendors of Information Services

Company	Primary IS Area
DMR	Professional services
Digital Equipment	Software
IBM	Software
SHL Systemhouse	Professional services
STM Systems	Processing services
Westbridge Computer	Professional services

E

Recommendations

Exhibit II-5 provides a number of recommendations designed to minimize effects of the recession and capitalize on shaping events to the vendor's advantage. For example, some customers are disillusioned with technology. The promise of a competitive advantage has eluded them. But these customers would be inclined to rearrange financial priorities and make expenditures if the vendor could demonstrate that investments will help in the long term and could have a positive short-term impact as well. EDI, for example, is a technology that has demonstrable benefits for a number of industries.

EXHIBIT II-5

Recommendations

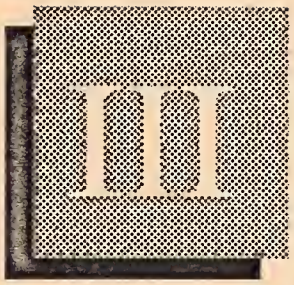
- Take offensive position
- Initial focus on control
- Develop integration strategies
- Improve quality & support
- Stimulate customer

In some cases the problem is not so much disbelief as it is an inability to pay. In these cases vendors can solidify their relationships with customers and offer creative deals to reduce short-term expenditures in favor of commitments for future business. Creative deals are particularly suited to vendors that can limit current revenues to covering direct costs and can delay profits to a later date.

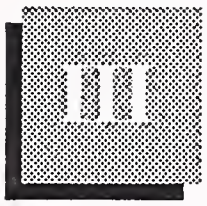
These ideas suggest competitive positions, the kind that will be required to compete effectively in the marketplace of the 1990s. This marketplace will include competitors that have extensive skills and experience in marketing and sales. Vendors should reassess their current capabilities and invest to exploit strengths and shore up weaknesses. Progressive companies acknowledge that business downturns can be highly beneficial when used to evaluate and reposition products and services.

A strong market position is enhanced when a vendor captures a significant opportunity. Capturing that opportunity during a recessionary period may be required if vendors are to maintain their positions against advancing competition. Opportunities are available from emerging technologies and the unmet needs of existing technologies. Products and services designed to reposition information systems within the restructured corporation are required. Opportunities may include distributed data base systems, EDI, electronic mail, or other forms of intra- and intercompany communications, productivity tools (including CASE), and electronic imaging systems.

Customers also are eager to see improvements in the quality of products/services and in customer support. In essence, customers seek different arrangements with vendors that are partner-oriented, not adversarial. For the relationship-oriented Canadian vendor, this attitude represents a golden opportunity to leverage relationships that may have lasted many years.



Market Summary



Market Summary

The Canadian economy has tumbled into a recession that may prove to be as severe as in the early 1980s but perhaps not as long. This environment is fraught with peril for the information services provider that must choose carefully between investing and belt-tightening. Although there are no easy answers, there is a knowledge base of the marketplace that could prove insightful in decision making.

A Economic/Political Setting

The Canadian economy officially slipped into a recession during the third quarter of 1990, according to Canadian economists. Major banks, primarily the Bank of Canada, started stepping on the monetary brakes as early as 1989 and pushed short-term interest rates as high as 13%. The downturn has resulted from the determination of the monetary authorities to cool an overheated economy and calm inflationary pressures. By the second quarter of 1990, the economy was declining at a 1.6% annual rate.

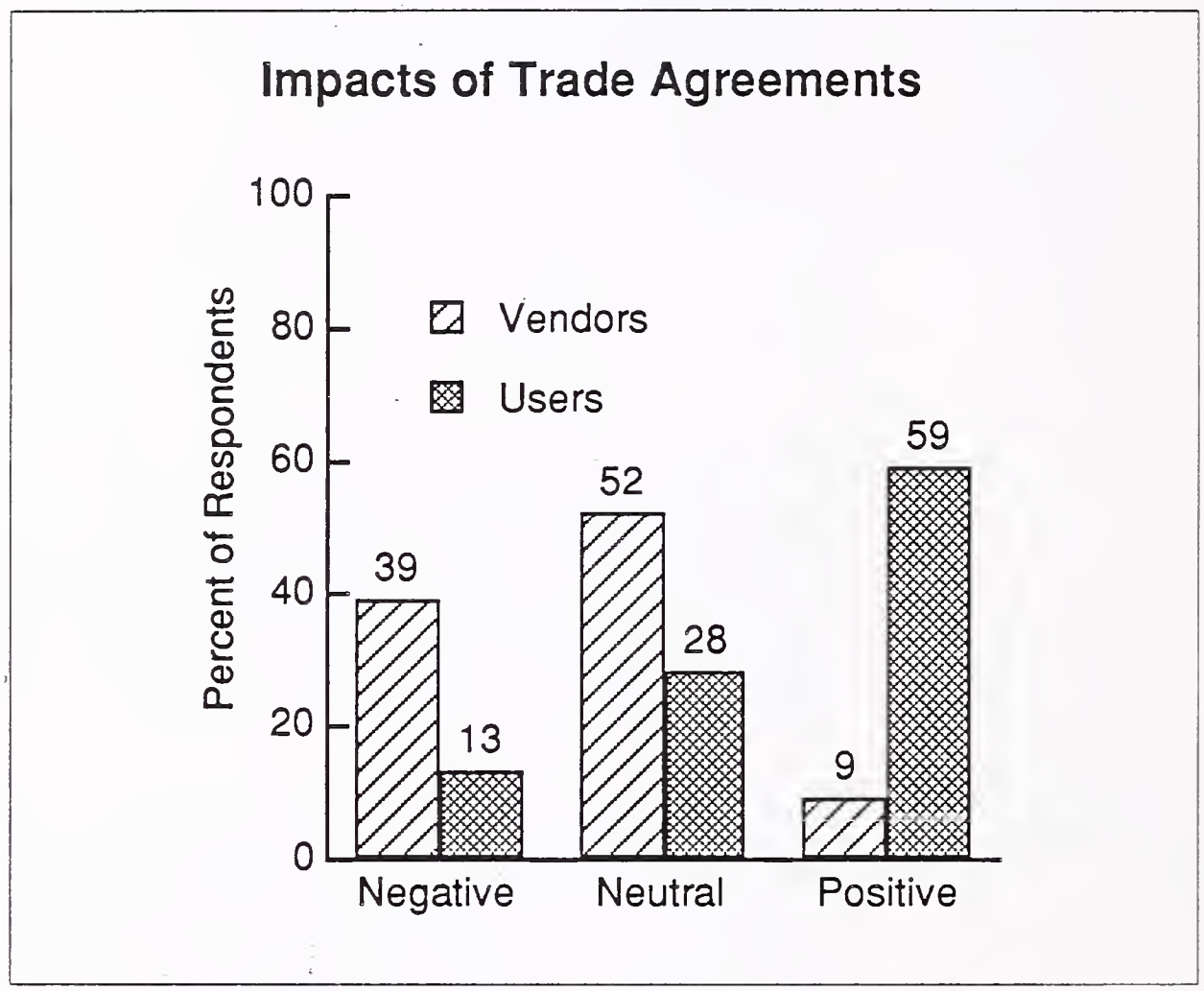
The decline has been broad-based, involving major components of industrial demand (e.g., according to a *Business Week* report (10/15/90), machinery fell 18% and residential construction 15%) as well as curtailing consumer demand. With leading indicators falling, bankruptcies on the rise, and unemployment climbing (8.3% in August, 1990), the climate is not conducive to growth.

In the information services industry, debate continues over the impact of the goods and services tax (GST) and its nine-percent levy.

For the period 1988-89, vendor-reported revenues reflected a more healthy economy. Vendors reported that 74% of their change was due to sales growth, 11% to acquisitions/divestitures, and 15% to price increases. In all, 22% of the vendors interviewed had acquisition/divestiture activity, 67% raised prices, and 100% saw real sales growth. With the current economic environment, days like these are not expected to return until at least mid-to-late 1991.

It was in this healthy economy that the border walls were lowered by an agreement between Canada and the U.S. The agreement allowed, among other things, more easy access to the other country's marketplace.

EXHIBIT III-1



Reaction to the trade agreement has been mixed, as noted in Exhibit III-1. Differences of opinion exist within each group surveyed and between groups. In general, users are neutral to positive; they hope that free trade will make more technology available and result in better quality and lower prices due to more-intense competition. Vendors, however, are neutral to negative in their view; they acknowledge only that there could be better links between Canadian and U.S. firms and easier entrée to the U.S. market by Canadian vendors.

Vendors see more of the downside, primarily lower prices due to more competition from U.S. vendors. Andersen Consulting and EDS are frequently cited as the up-and-coming foreign competition. Users agree, adding that the competitive pressure could lead to a decline in services available from Canadian vendors.

Perhaps the biggest concern, expressed only by vendors, is that customers will go to the U.S. because of cheaper labor and a more-favorable economic climate. One of the things that the free-trade agreement does

is make it easier to locate a data center anywhere. But, in all likelihood, the vendor that controls the center before it moves will control it after it moves.

The issue of U.S. competition in the Canadian marketplace is explored in Exhibits III-2 and III-3. In rating the dominance of U.S. vendors from low to high, users rated U.S. vendors' presence and impact significantly higher than vendors did. Sixty-four percent of the users, but only 22% of the vendors, rated U.S. vendor dominance at a high level (i.e., 4 or 5).

EXHIBIT III-2

Market Position of U.S. Companies, 1990

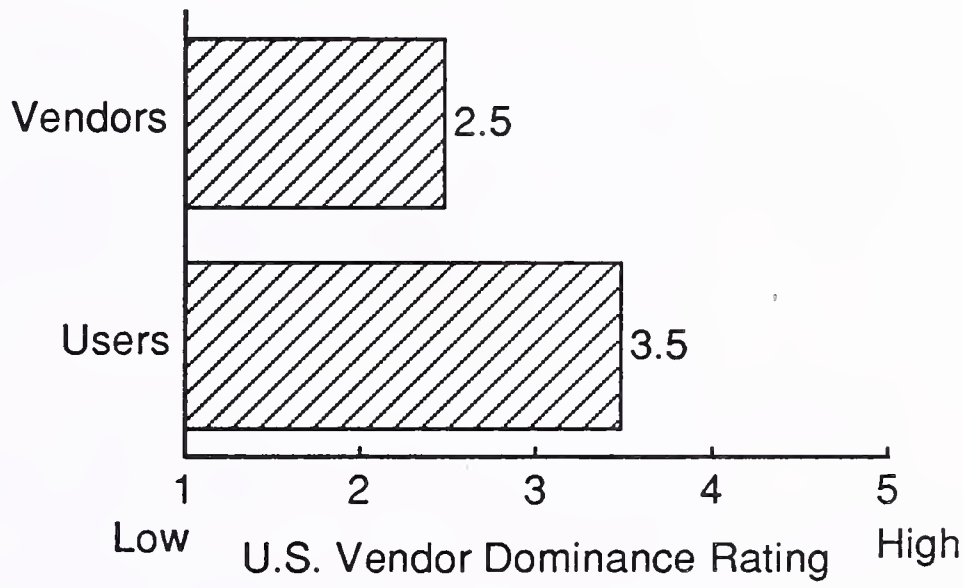


EXHIBIT III-3

Reasons for Low Market Position of U.S. Firms, 1990

Factor	User Rank	Vendor Rank
U.S. is hardware and software, not services	1	1
"Buy Canadian"	2	
Some segments taken	2	2
Local presence needed	4	
Lack of U.S. interest		2

One reason for the differences is that users do not make a sharp distinction between products and services under the information services umbrella. Ratings tend to be higher for the U.S. position because of a belief that a majority of hardware and packaged software comes from the U.S. Vendors, on the other hand, pointed out that although most of the products come from the U.S., most of the services come from Canadian vendors.

Exhibit III-3 shows this distinction: the frequency of mention of reasons for lower (less than 4) ratings is explained by the respondents; the distinction between Canadian services and U.S. products is the number-one reason for ratings of three or less. Some users also noted that the U.S. presence was not higher because some service segments were already taken by major Canadian vendors.

Users added a local spirit to these factors, suggesting that Canadian companies may prefer to buy Canadian or to require a local presence for the people-oriented services businesses. Vendors believe that a low profile of U.S. services companies is not only the result of segments occupied by Canadian vendors, but also because U.S. vendors had not focused on Canada as a new market of opportunity. With large U.S. service companies increasing their presence, this low profile could change.

The reasons offered for higher ratings are presented in Exhibit III-4. This listing reflects respondents' views that U.S. vendors dominate the market just because they're U.S. vendors. The size of these vendors with respect to the Canadian vendor, and a marketplace that is approximately ten times that of Canada, affords an opportunity to make significant investments for growth (e.g., R&D, quality personnel, first-rate technical tools, etc.).

EXHIBIT III-4

Reasons for High Market Position of U.S. Firms, 1990

Factor	User Rank	Vendor Rank
U.S. is hardware and software, not services	1	3
Critical mass	2	1
U.S. competitiveness	3	
Superior capability	4	
Lack of competition		1
Ability to invest		3

Beyond a stronger set of capabilities, so the view goes, U.S. vendors have had the advantage of constantly facing stiff competition. Products and services are targeted at well-defined segments, and sales and marketing skills are honed. By comparison, the Canadian vendor has had less competition and has developed a larger, broader, and perhaps thinner portfolio of services. In this view, the Canadian vendors are no match for the U.S. vendors in the Canadian marketplace.

Although there is little agreement on the position of U.S. vendors in the marketplace, there is some agreement regarding the attractiveness of the market as viewed from the forces that drive expenditures. These forces are discussed in the next section.

B

Environmental Factors

1. Driving Forces

Exhibit III-5 lists and ranks the driving forces reported by users and vendors. In general, the user and vendor rankings are reversed—users focus on the economic forces and vendors view specific shortcomings of the information systems organization.

EXHIBIT III-5

Forces Driving Service Expenditures

Factor	User Rank	Vendor Rank
Search for cost-effective solutions	1	7
Company growth	1	
Requirement for excellence	3	
Reduced headcount	4	5
Pervasiveness of computing	4	
Competitive company environment	6	1
Lack of in-house skills		2
Technological complexity		3
Resource optimization	7	5
Work volume increases	8	3

User comments reflected the following:

- Above all, users believe that outside services expenditures are driven by a continuing search for cost-effective approaches to information systems operations. Users suggest a sense of frustration that information technology has not led to the touted competitive advantage. Worse, costs seem to soar while benefits languish. The dispersion of computing throughout the corporation—made possible by workstation/PC technology—has fueled an even larger base of users, each with demands for support systems that can be met only by outside assistance to an overloaded information systems organization.

- For companies that have settled on a comfortable business role for information technology, expenditures are integral to the fortunes of the company; expenditures increase as demand increases. Sometimes, however, expenditures increase regardless of the company's financial health. Users report that stiff competition in certain industries calls for an increase in quality as a means to beat—or equal—the competition.

- Reduced head counts within information systems also force a turn to outside services vendors for development and support. This and a need for effective utilization of all available resources, in-house and vendor, in a time of economic uncertainty, are other significant drivers.

Vendor comments reflected a somewhat different view:

- Vendors believe that the key issues involve a demand for information systems to maximize the competitive advantage that technology affords. Outside expenditures are required because of the lack of available in-house staff.

- Some vendors suggest that not only is there a competitive requirement and a lack of resources to meet the requirement, but also that these forces play out in an ever-increasing technological complexity. This complexity is brought on by the number of alternative solutions to a problem and the fact that none exactly fits the corporation in transition from a single-layered hub-and-spoke arrangement to a multilayered matrix.

It's clear that information technology is itself a driver of transformations in organizations. IT enables corporations to downsize; to form workgroups by skill, not geography; to focus on profit centers and quality; to make middle managers knowledgeable and accountable; and to base rewards on performance. As technology is implemented, its rewards will not only be stronger companies, but a desire for more technology.

As part of the research, users were asked to rate the importance of a number of technologies to their organizations. In a related question, vendors were asked to rank the importance of the same technologies to users. As shown in Exhibit III-6, there are a number of areas where users and vendors seem to view the world differently.

EXHIBIT III-6

Ranking of Technology Importance

Factor	Users' Ranking	Vendor Ranking
Relational data base systems	1	8
Local- /wide-area networking	2	5
Network management	3	7
Electronic data interchange	4	6
Electronic mail	5	9
Distributed data base systems	6	1
CASE	7	3
Data center automation	8	9
Electronic imaging systems	9	2
Open systems	10	3

User ranking supports a number of narrative responses that suggest users are focused on centralization, although not necessarily in a purely physical sense. Users are strongly interested in technologies that will permit greater control over their environment. Their opinions reflect a need to integrate the organization and gain control over an environment that has gotten away from them. Vendor views of the importance of the same technologies suggest that vendors may be more technology driven than organization driven.

- Users rated relational systems and networking technology at the top of their list. The ranking reflects a need to provide a way to integrate an organization's data and better control the environment.

- Vendors ranked distributed systems as the highest priority. Since distributed architectures are based increasingly on relational systems, user and vendor importance could be considered the same. However, vendors generally rated data center and control technologies very low. Users rated these items comparatively high. Because relational systems can relate, equally, to mainframe systems, it is not clear that vendors and users have the same interests.

- Conversely, vendors rated technologies such as CASE tools and electronic imaging systems high. Users rated these technologies near the bottom of their list, suggesting that users are not ready to take on the latest technologies.

The differences in ratings reflect a substantial difference in information systems perspective between vendors and users. Vendors are focused on the application of the latest technologies. Users are working, sometimes struggling, to gain control of the environment that has grown up around them. In light of many of the narrative comments, INPUT believes that vendors may be ahead of users in understanding technology, but that users will not readily accept the new technology unless clear linkage can be established by vendors between the technology and their interest in consolidation and control.

2. Inhibiting Factors

Exhibit III-7 shows that users and vendors ranked a number of factors that could inhibit growth of outside expenditures. The two groups showed more agreement than on the issue of drivers. Both agree that the leading inhibitor is the recessionary economy of the country. The lack of economic growth and vitality has companies looking closely at all expenditures, delaying them when the information service requirement is mandatory, and canceling them when it is not.

EXHIBIT III-7

Forces Inhibiting Outside Service Expenditures

Factor	User Rank	Vendor Rank
Recessionary economy	1	1
Preferences for in-house	2	2
Computing disillusionment	3	
Declining quality of services	4	
Unfavorable political climate		3
Lower IS priority		4

Some companies have a clear preference for the in-house organization because the corporate direction is to build the capability or because it's in place and should be used. When information technology is not viewed as a positive force, there can be disillusionment with all resources—internal and external—and expenditures suffer. Declining quality of service from vendors only adds support to the picture of disillusionment or the view that in-house resources are just as capable.

Although the political climate ranked lower, some vendors suggested that it—specifically, the favorable tax treatment of independent consultants—was potentially a very damaging threat to individual businesses that must compete with consultants willing and able to discount, and to the information service industry as the failures of the independents become widely known. Vendors suggest that the current situation makes it difficult to attract qualified employees because the vendor cannot compete on salary, employee benefits, or life style.

C

Market Forecast

1. Market Forecast

INPUT's Canadian information services market forecast is presented in Exhibit III-8. Overall, the market will grow at a 13% annual rate, from $3.9 billion in 1990 to $7.2 billion in 1995. This rate is comparable to forecasted rates in the U.S., where INPUT forecasts a 14% growth rate. Each delivery mode is discussed in following chapters. Observations related to the overall forecast are:

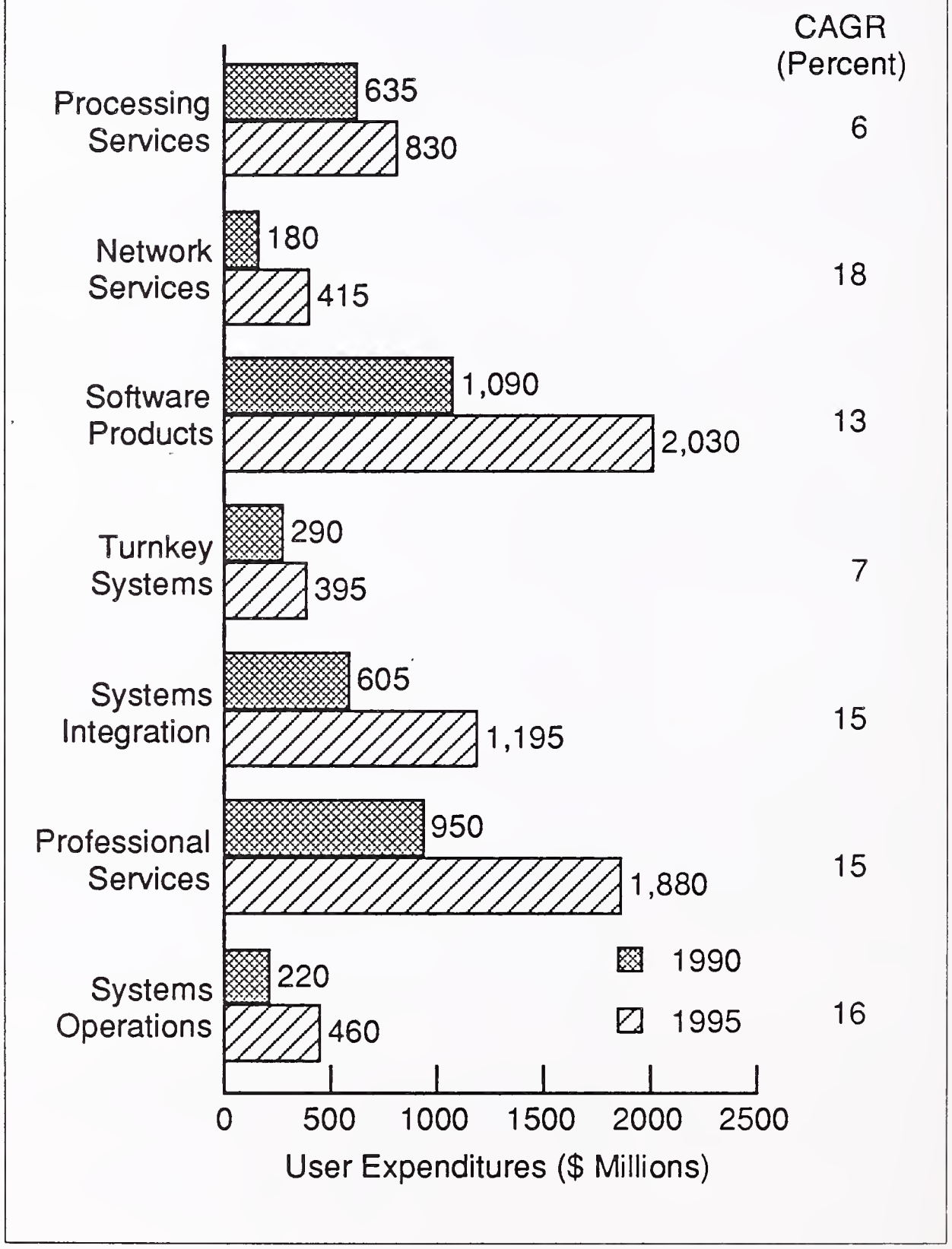
- Packaged products will give way to more custom solutions; application software, systems software, and turnkey systems will each be under or near the market growth rate. Custom approaches, delivered as systems integration or professional services, will continue to exceed average and are expected to significantly exceed the overall average with improvements in the economy.

- Processing services are expected to grow at a rate lower than the market as companies place greater emphasis on having vendors perform all of a company's processing activities, rather than just selected applications. As a result of this shift, systems operations are expected to grow at 16%, as compared to processing services' growth rate of 6%.

- Network services are expected to show significant growth as companies place emphasis on intracompany communications using services such as E-mail. In addition, intercompany communications, using services such as electronic data interchange (EDI), are expected to be a substantial contributor to growth. Value-added networks are becoming increasingly rich in their capabilities. Virtual network and open system offerings will contribute to substantial growth as an alternative to private networks.

EXHIBIT III-8

Information Services Industry by Delivery Mode 1990-1995



- Software products will continue to grow at the overall market rate, driven primarily by demands for application software. Research indicates that there is latent demand for application-specific software. Users indicate that increased availability of applications software is one of their greatest needs. Growth of workstation and PC software will continue to exceed the overall market. The growth rate for system software is lower than for the overall market, primarily because of softening of the market for large mainframe systems.

- Professional services and systems integration growth will exceed the market due to shifting emphasis from packaged software to custom solutions. However, it is important to note that Canadian companies are placing short-term emphasis on business consulting. Their short-term interests are to more fully understand how information technology can be better applied to meet business needs. This understanding will be followed by increases in system development activities in the systems integration and professional services delivery modes.

2. Comparison to Worldwide Forecast

In 1989, INPUT prepared a forecast of the worldwide information services market. The forecast included Canada among 30 countries and geographic areas studied. This year's more-in-depth research into the Canadian market resulted in a number of differences from previous data.

As a basis for understanding the differences in market sizings, it's important to recognize that the *Worldwide Market Forecast* report was prepared using U.S. dollars, which were converted from Canadian dollars at a rate of 1.20 Canadian dollars to the U.S. dollar. As a basis for comparison, the same conversion rate has been used to compare the previous forecast with the current forecast. (Note that the *Wall Street Journal* reported a conversion rate of 1.16 Canadian dollars to the U.S. dollar on 3 December 1990.)

- In the *Worldwide Market Forecast* report, the 1989 market was projected to be $4.2 billion. As noted above, the market for 1989 has been reported to be $3.5 billion, a difference of approximately $700 million. However, much of the difference results from the growth rates previously used.

- In the worldwide forecast, market growth from 1988 to 1989 was projected to be 20% overall and 30% in some delivery submodes. The previous growth rate was based primarily on vendor-provided data and did not accurately reflect user projections of expenditure growth. Greater analysis of user spending indicates that growth was closer to the 13% currently projected.

- Assuming that a growth rate of approximately 13% had been used, the 1989 market would have been projected to be $3.9 billion, a difference of $600 million from this year's forecast for the same period.

- In addition to the difference in growth rates, there are a number of areas where expenditures have been somewhat lower than projected.

  - Systems integration has, as yet, not become as prominent a method of accomplishing development as it has in the U.S. The majority of systems integration has been in the federal government. The commercial market has begun to use systems integration, but significant market growth is just beginning and is being impacted by economic conditions. As a result, the market for systems integration has been reduced.

  - Professional services have also been reduced—due, primarily, to users' spending on business consulting rather than systems development. Systems development is expected to be equal to or exceed business consulting within a couple of years, but is being impacted by economic conditions. In the short term, Canadian companies are continuing to place emphasis on analysis of integrating technology with the business rather than developing systems.

Appendix D provides a comparison of this report's market forecast with the Canadian forecast included in the *Worldwide Market Forecast* report.

3. External versus Internal Expenditures

Exhibit III-9 shows that, as a group, users are not bullish on external information services expenditures. A first reading might suggest that users' predictions are being influenced by the current recessionary economy. Fifty percent of the respondents report a likely decline in expenditures (averaging 26%), 19% see no change, and 31% believe their expenditures will increase by at least 9%.

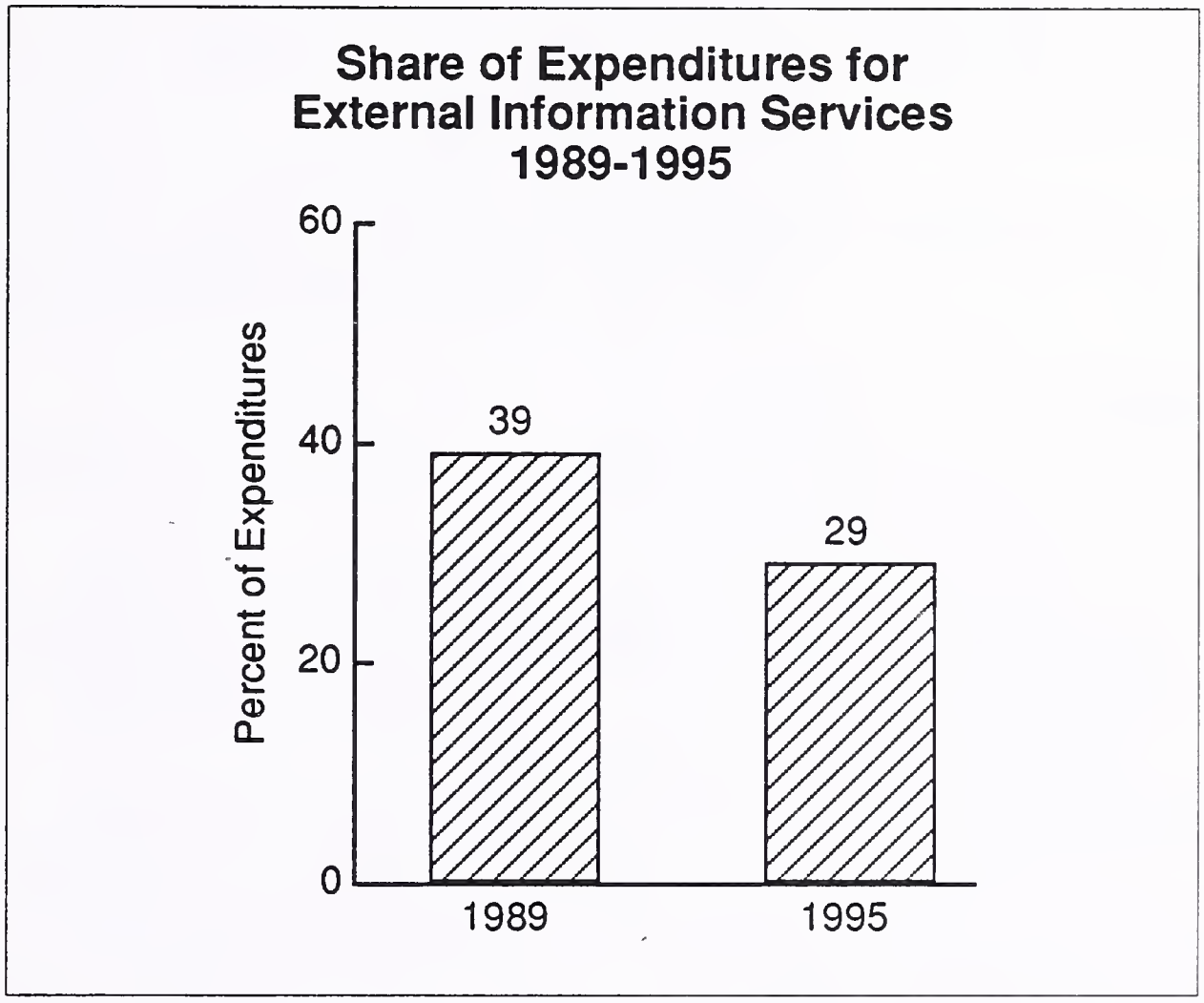
A second reading suggests that these results reflect different company approaches to technological implementation.

- At the outset, users favor processing services as an approach to meeting needs. Use of processing services precludes the need for operational support services.

- At some point, companies desire more control over outcomes or expenditures and begin to move information processing capabilities in-house, first as turnkey systems and then as software products.

- As the company grows, connectivity through network services is required—as are professional services to guide, build, train, or offer other forms of assistance and support to the in-house organization.

EXHIBIT III-9



- At some point the company bogs down in its application of technology and requires a massive effort to achieve a desired solution. Systems integration becomes the favored approach.

- Without a systems integration effort or, in some cases, in spite of it, management realizes that the in-house effort has not been as productive and beneficial as planned. Management decides to find a better information systems solution. If part of information systems goes outside, it usually goes to a processing services vendor and the cycle begins to repeat.

- Recognition that information systems are an anomaly to the core business requirements of most companies, coupled with growing needs to stabilize costs and conserve capital, is leading many companies to seriously consider having vendors take over their operations. In addition, as operations management becomes accepted, companies will look to vendors to provide systems maintenance and development services.

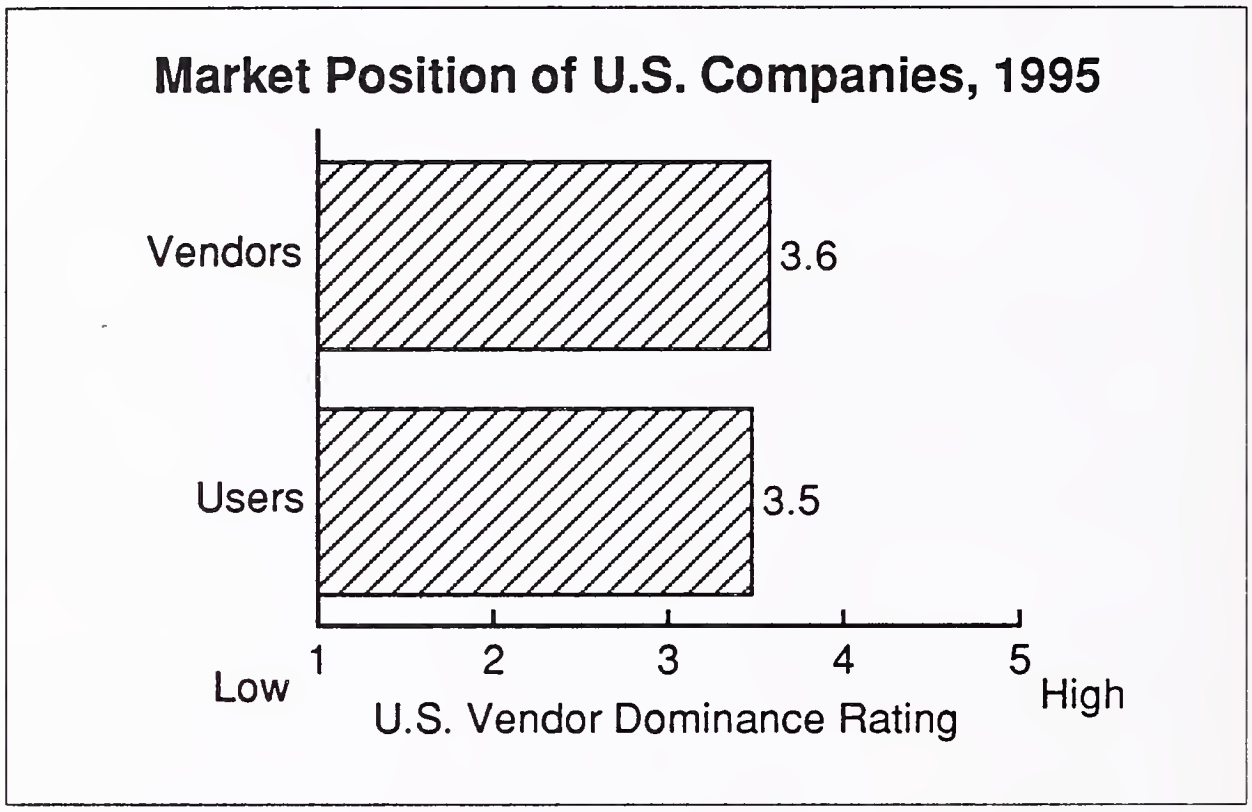
INPUT believes that, although many Canadian companies are currently focused on gaining control of their environments, they will increasingly look outside for assistance. The assistance will be for operations and development. The responses shown in Exhibit III-9 reflect today's perspective. With the shift to outside services, the percent of external expenditures should grow, not decline.

D

Market Entry/ Expansion Considerations

A key issue in the marketplace is the position of U.S. vendors with respect to Canadian vendors. As discussed earlier, users felt Canadian and U.S. vendors shared equally in the market, but vendors indicated that the market was more dominated by Canadian vendors, primarily on the strength of services companies. The envisioned positions of these two groups in 1995 stay the same according to users, as shown in Exhibit III-10. Exhibit III-2 shows that vendors predict a significant jump in the position of U.S. vendors between 1990 and 1995.

EXHIBIT III-10



Fifty-eight percent of users and 61% of vendors rated U.S. dominance of the market in 1995 as a 4 or 5 (5 equals "very dominant"). There was little change between the users' views of 1990 and 1995 (actually a slight decline from the 64% who rated U.S. vendors at 4 or 5). In the same two years, 1990 and 1995, the percentage of vendor ratings of U.S. dominance (a 4 or 5) increased from 22% to 61%.

Factors underlying respondents' changes in ratings are presented in Exhibit III-11 for declines in the market position of U.S. firms over 1990-1995. Responses indicating an increase in the position of U.S. firms are shown in Exhibit III-12.

In some circles, users and vendors are bullish on the ability of Canadian vendors to rise to the challenge and maintain, and even increase, their market dominance. Users suggest a sense of pride and a determination to be self-sufficient as drivers for more-competitive technical output.

Vendors add that the geographic, vertical, or application niches of Canadian vendors are resilient bunkers and that the influence of the vendor and the loyalty of the users in these niches will not easily be unseated.

EXHIBIT III-11

Reasons for Decline of Market Position of U.S. Firms, 1995

Factor	User Rank	Vendor Rank
Canadian vendors more technologically oriented	1	
Competition from third-world vendors	2	1
Hardware influence declines	3	
Favorable cost structure	3	
Niche vendors grow		1
Economy declines		1

EXHIBIT III-12

Reasons for Increase of Market Position of U.S. Firms, 1995

Factor	User Rank	Vendor Rank
More U.S. vendors	1	
Ability to invest	2	2
Superior capabilities	3	4
No Canadian competition	4	2
Market recognition		4
Aggressive vendors		1

Respondents also suggested that a decline of U.S. influence would not favor the Canadian vendor. In one scenario, competition from other countries (e.g., Europe, Japan, Australia, etc.) would take market share from both Canadian and U.S. vendors. In another, the economic decline would blur the vision of opportunity held by U.S. vendors and force a retreat.

When respondents anticipated an increase in the role of U.S. vendors in the market, both users and vendors spoke of the superiority of U.S. vendors in terms of their sheer number, or their size and ability to invest in superior offerings and market development.

Respondents also suggested that the U.S. would become more of a player due to the lack of competition from Canadian firms. Vendors, in particular, see U.S. vendors as formidable competitors. Vendors cite, in addition to items mentioned above, U.S. vendors' market recognition (e.g., EDS and Andersen Consulting) and the aggressiveness of U.S. vendors that is the antithesis of the style of the Canadian firm.

What should be the role of the U.S. vendor in the Canadian marketplace? That question, posed to respondents and tabulated in Exhibit III-13, shows users and vendors split: approximately 50% of the respondents want more participation, one-third want less, and the remainder want the status quo.

EXHIBIT III-13

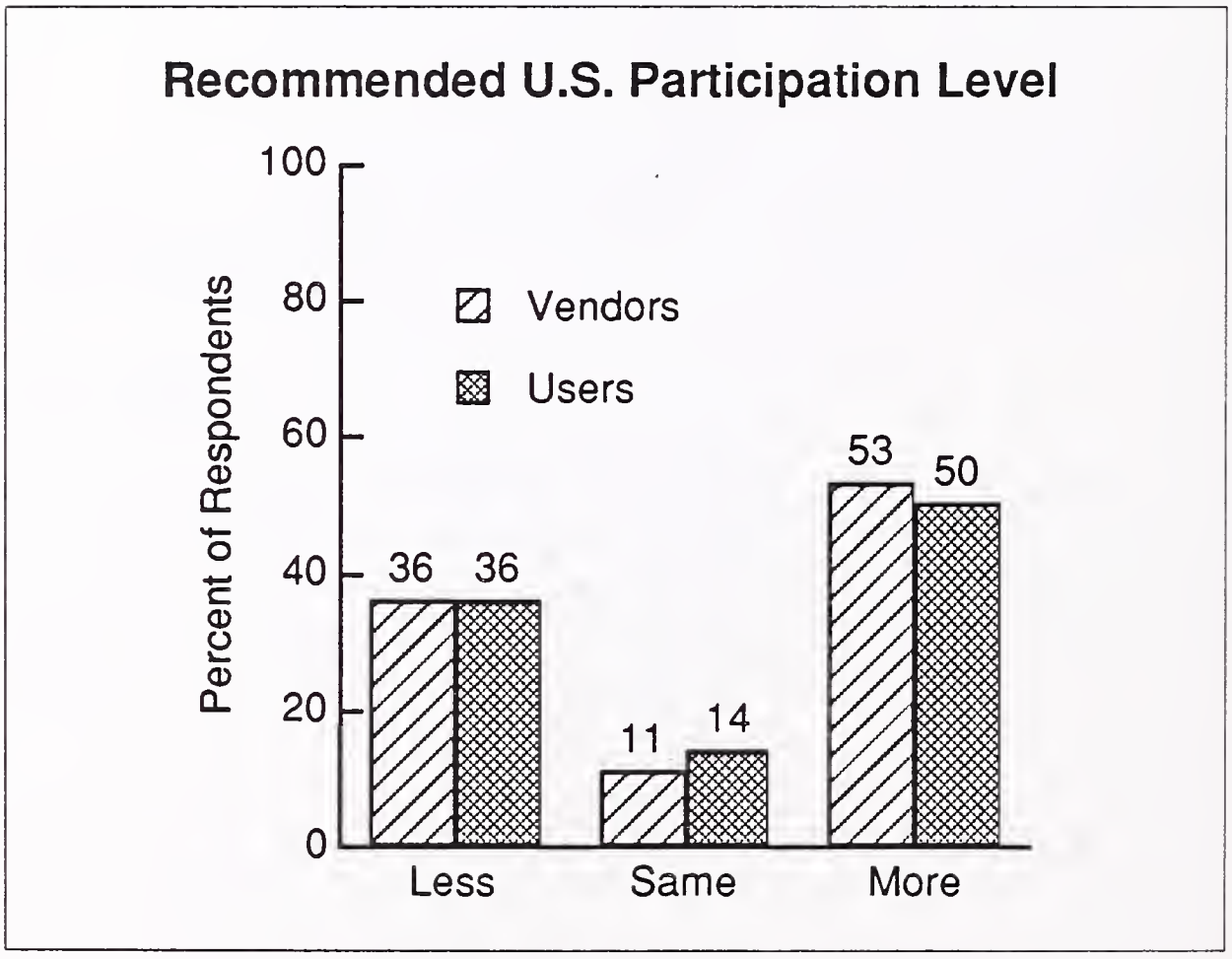


Exhibit III-14 shows that users who want more U.S. participation believe that their access to U.S. vendors improves the availability of more quality products and services. It doesn't hurt that the competition stemming from more vendors in the marketplace creates quality improvements and price declines. Finally, as some users suggested, "Better the U.S. than countries such as Japan or Australia."

EXHIBIT III-14

Market Participation Level Factors—More U.S. Participation Desired

Factor	User Rank	Vendor Rank
Increased availability	1	
Quality improves	2	3
Prices decline	2	
Market develops	6	1
Better U.S. products	2	
Close out third-world	2	
Vendor size and stability		2

Vendors believe that more participation is desirable because U.S. vendors are more able to develop the market; they add credibility to the business importance of information services and have the size and stability to ensure market expansion.

U.S. participation is not always viewed as a positive influence. As indicated in Exhibit III-15, it threatens loyalty to Canada and, by comparison, lowers the status of the Canadian vendor. With regard to loyalty, 94% of user respondents suggested that a sense of nationalism was a key driver in a preference to "buy Canadian." Another reason is better geographic coverage—that is, a local presence not available from U.S. vendors without a branch structure.

EXHIBIT III-15

Market Participation Level Factors—Less U.S. Participation Desired

Factor	User Rank	Vendor Rank
"Buy Canadian"	1	4
Lack of sensitivity	2	3
Lowers status of Canadian vendor	3	4
Greater market share		1
No investment in Canada		1
Reduced quality		4

Respondents also claim there is a certain lack of sensitivity in the products and services of U.S. vendors to the political and cultural essences of Canadian companies. Products are decidedly U.S. oriented and services tend to overlook the subtleties of Canadian businesses. Vendors claim that not only will U.S. firms take market share, but U.S. companies will also precipitate a reduction in quality as vendors scrape to remain competitive in a tough economy.

Perhaps more serious, however, is the view that U.S. vendors make no significant investments in the Canadian economy; senior management may be U.S., R&D is done in the U.S., processing may be done there as well, and the financial structure dictates that profits are not retained and reinvested locally, but go to headquarters for redistribution. As one user said, "we've given away all the advantages of the market, while retaining all the disadvantages."

Although the preference may be for Canadian suppliers, the reality is that some needs are not being met. Most users were in the middle on this issue (the average rating on a 1-5 scale was 3.4), but fewer than one-half (45%) rated above a 3 the ability of Canadian suppliers to meet needs. Specific needs not being met are indicated in Exhibit III-16.

EXHIBIT III-16

Products and Services Not Readily Available

- Packaged software
- Specific service delivery modes
- Specialized technical skills
- Networking capabilities

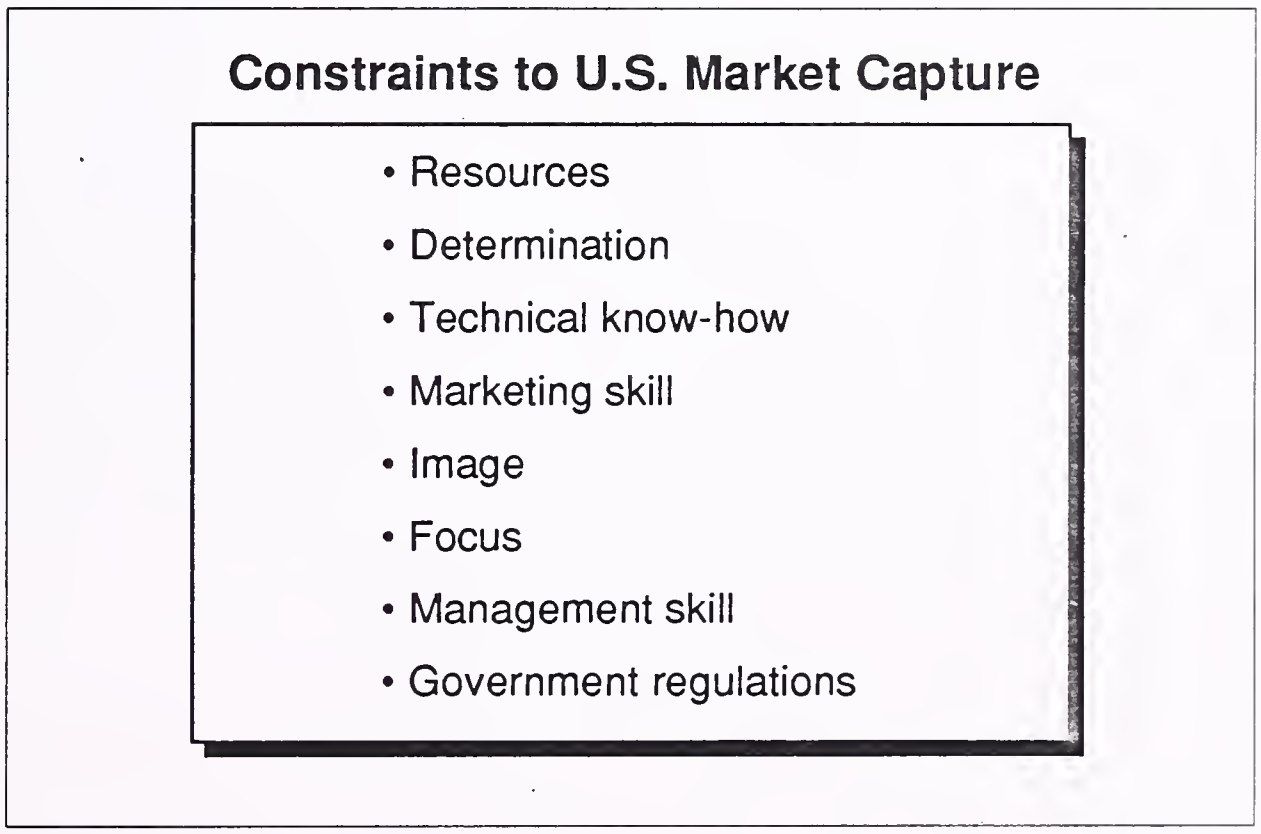
Users most frequently pointed to specific application packages (e.g., CASE and brokerage processing), but occasionally to other specific delivery modes, including processing services, professional services, systems integration, and systems operations. Since Canadian vendors provide all of these services, something is amiss in that users don't know of these services. It may be that U.S. vendors are finding new customers in addition to threatening Canadian vendors' existing customer base.

Additional areas of opportunity for Canadian vendors appear in the move from generalist roles to specialist roles—such as in networking, where a user need was indicated.

Finally, users and vendors were asked if Canadian vendors had an opportunity in the U.S. market that was equal to that for U.S. vendors in the Canadian market. Few respondents, and only users at that, said there was not equality. Reasons included U.S. Department of Defense requirements for U.S. vendors on some security projects; a "buy American" attitude; and, because of different cultures, that Canadians are "not taken seriously" in the U.S.

This question was, however, phrased incorrectly. Most agree that the opportunity is there; the real issue is the Canadian vendors' ability to capture it because of the constraints listed in Exhibit III-17. Following many of the same themes noted above, respondents frequently cited the size of Canadian vendors as a limiting factor. Market entry, especially in the competitive U.S. arena, requires a level of investment in product development, staffing, distribution, infrastructure, etc. that tends to be prohibitive.

EXHIBIT III-17



Other respondents hold a view that Canadian vendors can't (or won't) capitalize on the opportunity because of "soft" issues. Frequently cited as a shortcoming of vendors is a lack of determination, an unwillingness to commit to the struggle, and an inability to stay the course.

Specific skill limitations are also mentioned. For example, some respondents feel that Canadian vendors do not have the technical know-how to compete with U.S. firms on U.S. soil. One difference seems to be the lack of focus frequently seen in the Canadian marketplace. For geographic, cultural, and political reasons, vendors have sometimes broad-

ened their portfolio of offerings without deepening the richness of each. The intensity of the U.S. market requires a depth that may not be as prevalent within the Canadian firm.

Marketing and management skill deficiencies are cited nearly as frequently. With respect to marketing, the view is that Canadian vendors frequently assign marketing responsibility to individuals who have only limited experience in markets with such high competitiveness as can be found in the U.S. It appears better for Canadian firms to hire U.S. marketing skills instead. This situation may be true for management positions as well. Employees from the U.S. may be more able to exactly flavor the entry effort with the right cultural ingredients.

IV

Processing Services Market

IV

Processing Services Market

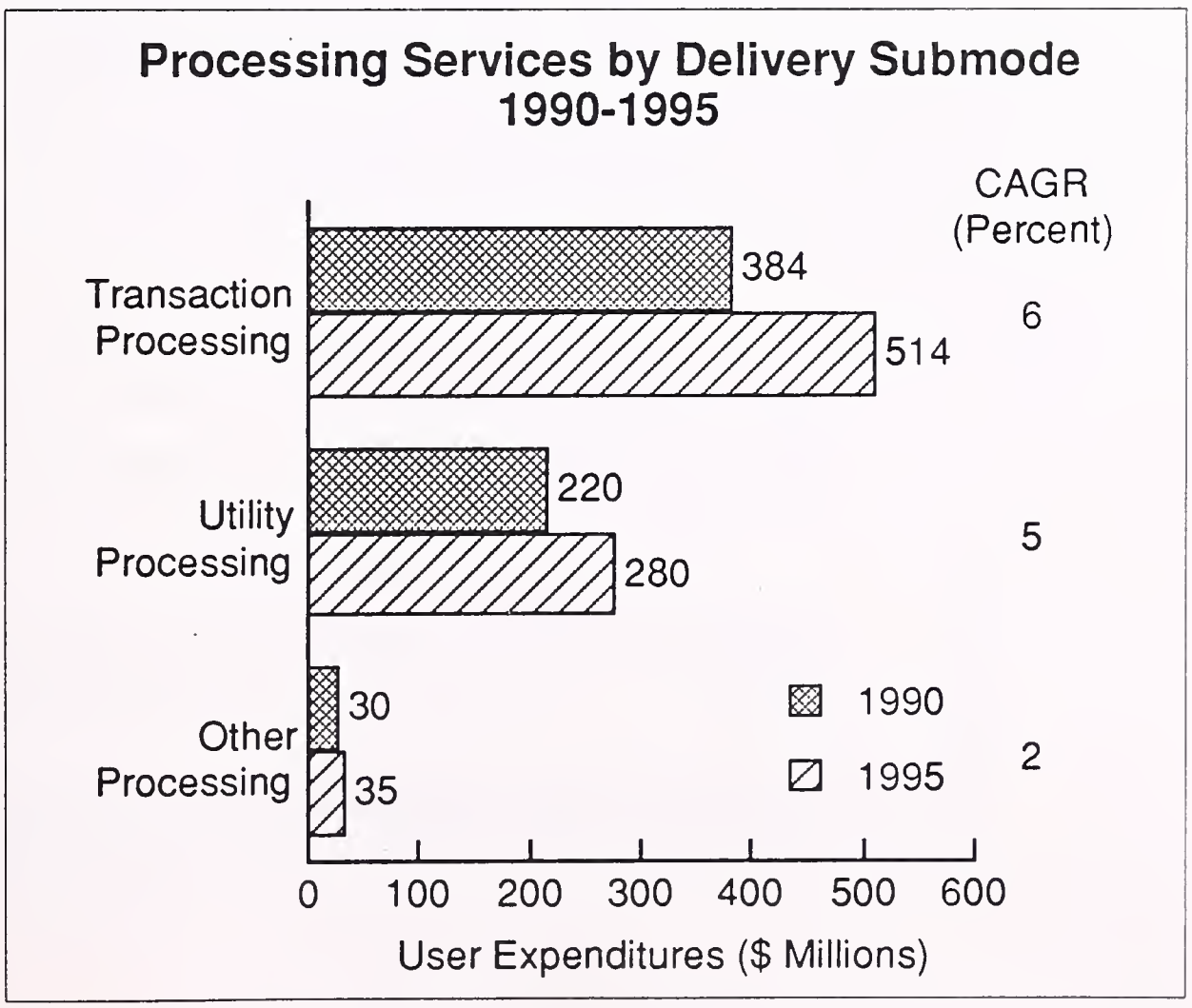
A

Processing Services Market, 1990-1995

The market for processing services continued to show a declining growth rate in 1989 under the dual pressures of economic uncertainty and the availability of alternative, cost-effective computing power; the latter is enhanced by falling hardware prices and increased capability, especially at the desktop level.

As the forecast in Exhibit IV-1 suggests, users are likely to remain in a period of shrinking or stable outside processing services expenditures through the forecast period. INPUT projects a 6% CAGR for processing services. Transaction processing will equal the overall growth rate, whereas utility and other processing services will grow at only 5% and 2%, respectively.

EXHIBIT IV-1



This real-dollar decline is indicative of the position in the cycle in which vendors find themselves: "service bureau" growth due to rising user demand; reassessment of service expenditures in light of technological advances and resulting movement to in-house resources; and, finally, increased outside expenditures after disillusionment with in-house capabilities. Although a user's position in this cycle is dependent on the user's unique characteristics and needs, it is clear that a majority of users are in the middle portion of the cycle.

Clearly, the objectives of processing services vendors must be to hold existing customers by offering enhanced services and more-attractive pricing and to use existing relationships to guide defectors to other services (e.g., professional services, systems integration, or systems operations) offered by the vendor. If this cycle continues, and INPUT believes it will, it will be very important for vendors to follow their customers, if only to ensure that customers return to the vendor fold in the third cycle (increased outside expenditures).

B

Major Processing Services Vendors

The leading processing services vendors are listed alphabetically in Exhibit IV-2. ADP is the only strong horizontal player; all the others operate in niche geographies or vertical industries.

EXHIBIT IV-2

Leading Vendors of Processing Services

- Automatic Data Processing
- Geac Computer Corporation
- HTS Hi-Tech Systems
- IST
- STM Systems Corporation
- Westbridge Computer Corporation

STM Systems continues its dominance in terms of size. STM recent acquisition of Manitoba Data Services extends STM reach across the country.

Perhaps illustrating the plight of processing services vendors, most processing vendors have turned to additional services as well. Geac, for

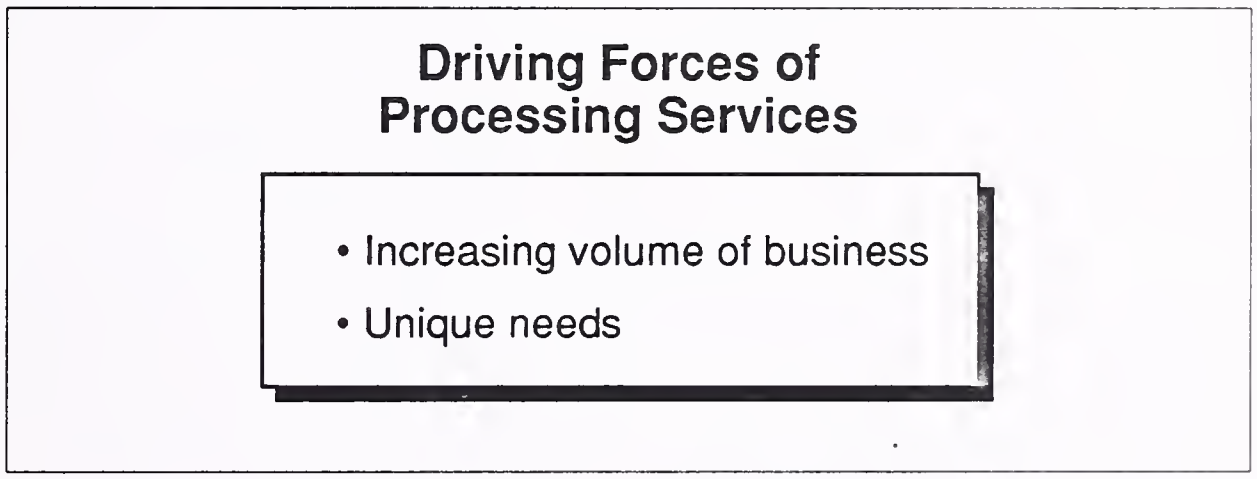
example, recently acquired a software company specializing in the financial area.

C

Processing Services Market and Trends

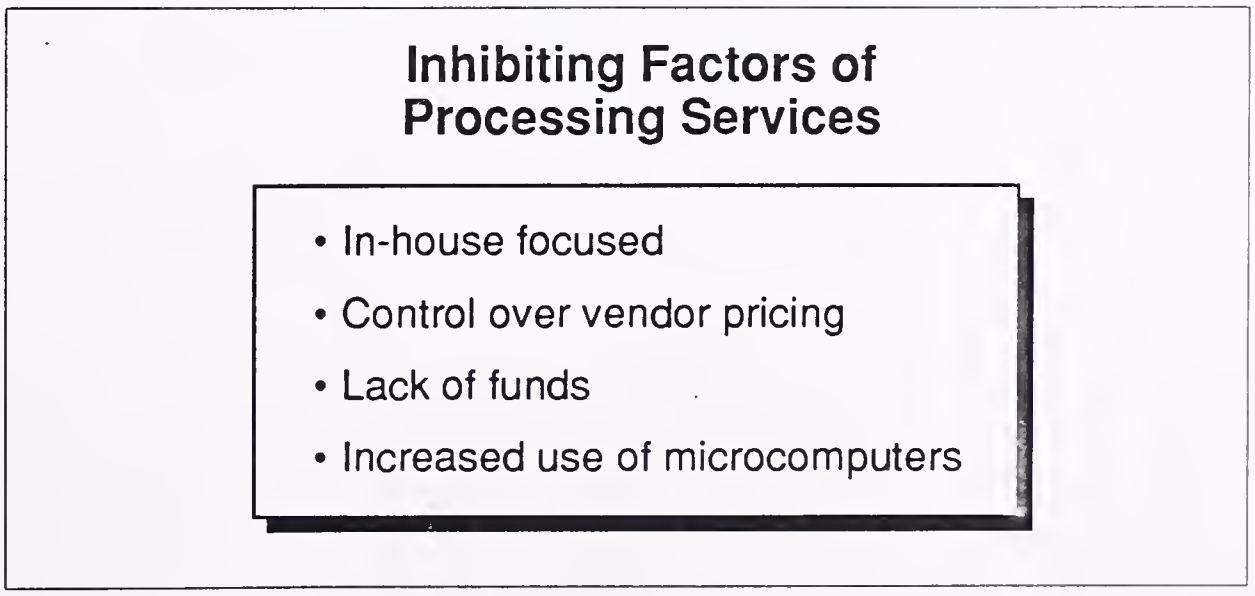
As indicated in Exhibit IV-3, users who anticipate increases in outside processing services expenditures believe that any increases will be due to an increased volume of business within the users' companies, either directly as a result of sales or indirectly as a result of the dispersion of computing power within the organization. These users envision, for example, increased workloads due to the addition of more applications by PC-oriented end users with a capability for connectivity to the processing service. There may also be more application needs, and thus more volume, as information systems look to providers to handle overloads in processing or storage or provide for other unique needs such as access to emerging technologies.

EXHIBIT IV-3



On the downside, users affirm the movement in-house, as shown in Exhibit IV-4. Users also note that, in some instances, this threat of lost business provides users with leverage to control vendor pricing through discounts or long-term fixed-price arrangements. This leverage assumes that users have the funds for outside processing services, an assumption that some users were unwilling to make due to the current economy.

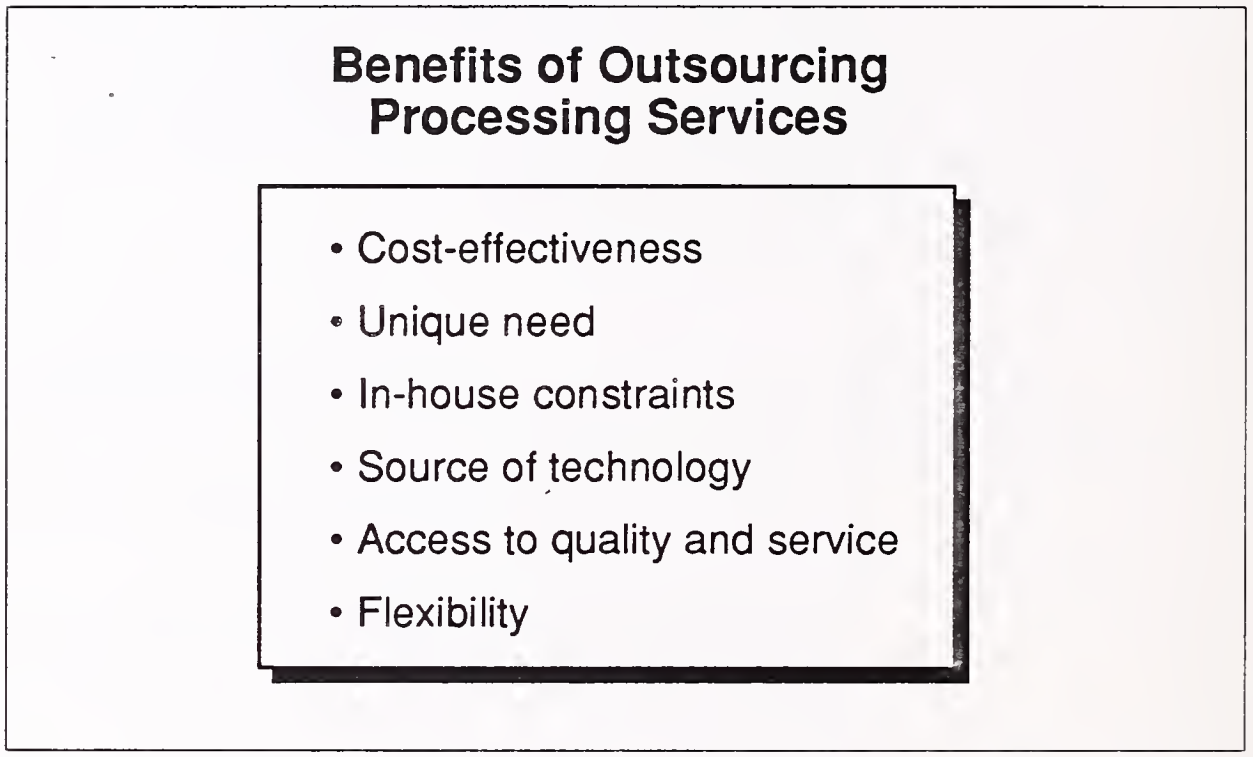
EXHIBIT IV-4



A second, negative scenario involving microcomputers is suggested by users as well. In this scenario, the dispersion of computing power and new capabilities on the desktop satisfy the need. Very local processing reduces demand for processing services from outside sources. In this view there would be a breaking of the cycle because the end users' needs would not outgrow advances in desktop tools.

Although the above might be cause for concern in provider circles, there are alternatives. Exhibit IV-5 clearly suggests powerful benefits of processing services as relayed by users during this research.

EXHIBIT IV-5

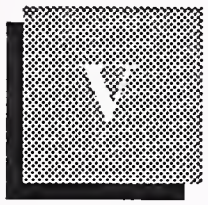


Some users suggest that external processing services expenditures are cost justifiable. These users argue that there may be no payback to in-house expenditures for comparable services. Besides, in a period when cost control is important, outside expenditures contain users' outlays for hardware and software. For small organizations, this containment is critical to business survival, but all organizations are affected by constraints on in-house personnel and capacity. Add the flexibility to acquire only the needed resources on an as-needed basis, and outside processing services become very attractive.

Service providers also offer flexibility in providing access to the latest technology, or access from remote locations, without outlays for products that would not be justifiable by the lower volume demands in these situations.

Finally, citing what may be vendors' biggest benefit in the long run, users spoke of the importance of access to quality service and support. As one user said, "The information systems organization does not see me as a real customer, and when it doesn't, service and support are nonexistent."

Network Services Market



Network Services Market

A Network Services Market, 1990-1995

Connectivity among locations within a company and between companies continued to be among the most up-and-coming services areas in 1989. From the simplest of needs (e.g., electronic mail) to the most sophisticated (e.g., EDI), user demand increased.

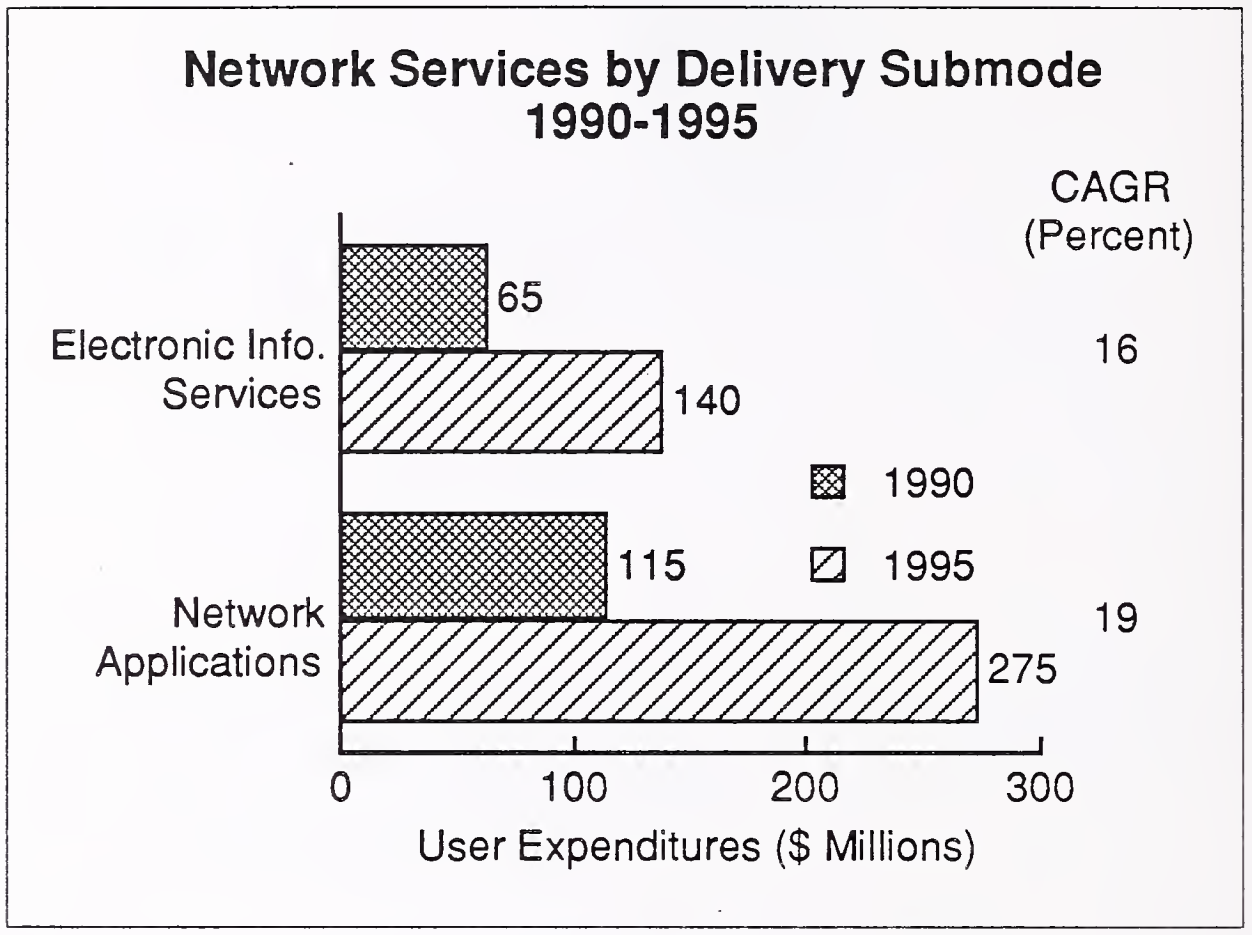
Canada's immense geography and expansion of companies throughout the region, coupled with a growing drive for economic globalization, fuel the demand. The changing architectural perspective of computing also plays a part in the growth of network/electronic information services. The desire is to process at or near the site of the transaction, while maintaining a corporate view supported by information systems. For some users, network services provide the means.

Network services will be among the fastest growing delivery modes through the forecast period. Exhibit V-1 indicates a forecasted growth rate of 16% for electronic information services and 19% for network applications. The overall growth rate for the network services market will be 18%.

- Electronic information services, primarily access to vendor-maintained data bases, will continue to attract increasing expenditures as users face an increasing need for quality information. Vendor and third-party data bases provide ready access to information on everything from biographical backgrounds to chemical compounds, providing a repository supporting the adage that information is becoming the competitive advantage.

- Network applications, the larger of the two delivery submodes, provides a more direct solution to issues of connectivity and globalization. Value-added networks, for example, provide transmission and switching features not generally available in the public network. EDI, as another example, supports new forms of relationships among and between trading partners—whether the partners are down the block or around the world.

EXHIBIT V-1



B

Major Network Services Vendors

Exhibit V-2 shows that a number of vendors offer network services; some as adjuncts to a processing services business (e.g., IBM and STM), but more typically as a network provider.

EXHIBIT V-2

Leading Vendors of Network Information Services

- GE Information Services
- IBM
- Infonet
- Star Data Systems
- STM Systems
- Telerate

The on-line information retrieval market continues to develop as new first-name entrants emerge. First was GEnie, the General Electric Network for Information Exchange. Alex, Bell Canada's interactive communications service, came next. Then came Suzy, an on-line information retrieval service from Stratford Software.

The recent acquisition of Dataline by Star Data Systems positions Dataline as a strong competitor to Telerate Canada in the information services market. Star Data has offices in London, England and cities in Europe, allowing Star Data to offer a global VSAT network.

C

Network Services Market Trends

Users who believe services expenditures will increase most frequently point to a growing volume of business over the network, as shown in Exhibit V-3. In some cases this additional volume is reflective of a new approach to business. One user, for example, noted that customers had asked for and received access to data held by the supplier. This information will now be moved from a corporate center to a services vendor and customer access will be provided over a packet-switched network. In some instances the growth stems from anticipated applications, including imaging technologies.

EXHIBIT V-3

Driving Forces of Network Information Services

- Volume of business
- Geographic expansion
- Unique needs

The geography of Canada continues to play a part in network services growth as companies expand their own service areas and look to network service vendors to support these expansions.

Respondents envisioning flat or declining expenditures for network services typically pointed to pricing issues. Most felt that, although service volume would increase, total expenditures would decline for a number of reasons shown in Exhibit V-4. Two reasons are pressure on rates from growing competition, and in some instances the availability of in-house alternatives (e.g., private networks).

An additional inhibitor mentioned was the likelihood that the recession would force consolidations and, in essence, shrink the corporation's geography.

EXHIBIT V-4

Inhibiting Factors of Network Information Services

- Vendor discounts
- Alternatives available
- Corporate consolidations

Although not mentioned, an additional scenario seems possible. Users, in an attempt to avoid high carrier tariffs in Canada, reroute to the U.S. and through a U.S. network services provider that, in turn, travels across the U.S. and connects the Canadian user to a cross-continent node.

Use of network services as a means of addressing in-house constraints is a frequently mentioned benefit, as shown in Exhibit V-5. Access to expertise that may not be available in-house—and, if it were, most likely would not be as current as vendors' expertise—is another frequently mentioned benefit.

EXHIBIT V-5

Benefits of Outsourcing Network Services

- In-house constraints
- Access to expertise
- Source of technology
- Cost-effectiveness
- Flexibility
- Unique need
- Access to quality and service

As with other delivery services, network services provide flexibility in terms of resources utilization; network services are there all the time but paid for only when needed. And, when network services are used, users find vendor support and network reliability to be superior to in-house alternatives.

Benefits noted fall into two generally distinct categories. The first is management issues, the second technology issues. In-house constraints and cost-effectiveness all reflect a company's need to preserve its ability to respond to changing conditions.

Constraints generally refer to financial constraints and to a consequent restriction on funds to invest in expensive networking technology. Cost-effectiveness and flexibility also reflect a need to minimize costs while preserving the ability to meet changing business conditions. Companies believe that network services obtain improved quality without making substantial investments.

Technology benefits refers to the ability to have access to technology and expertise that are not currently available. Whether the need is unique or for overall business improvement, network services are believed to be a more cost-effective solution than making major investments by companies that are using network services.

Software Products Market

VI

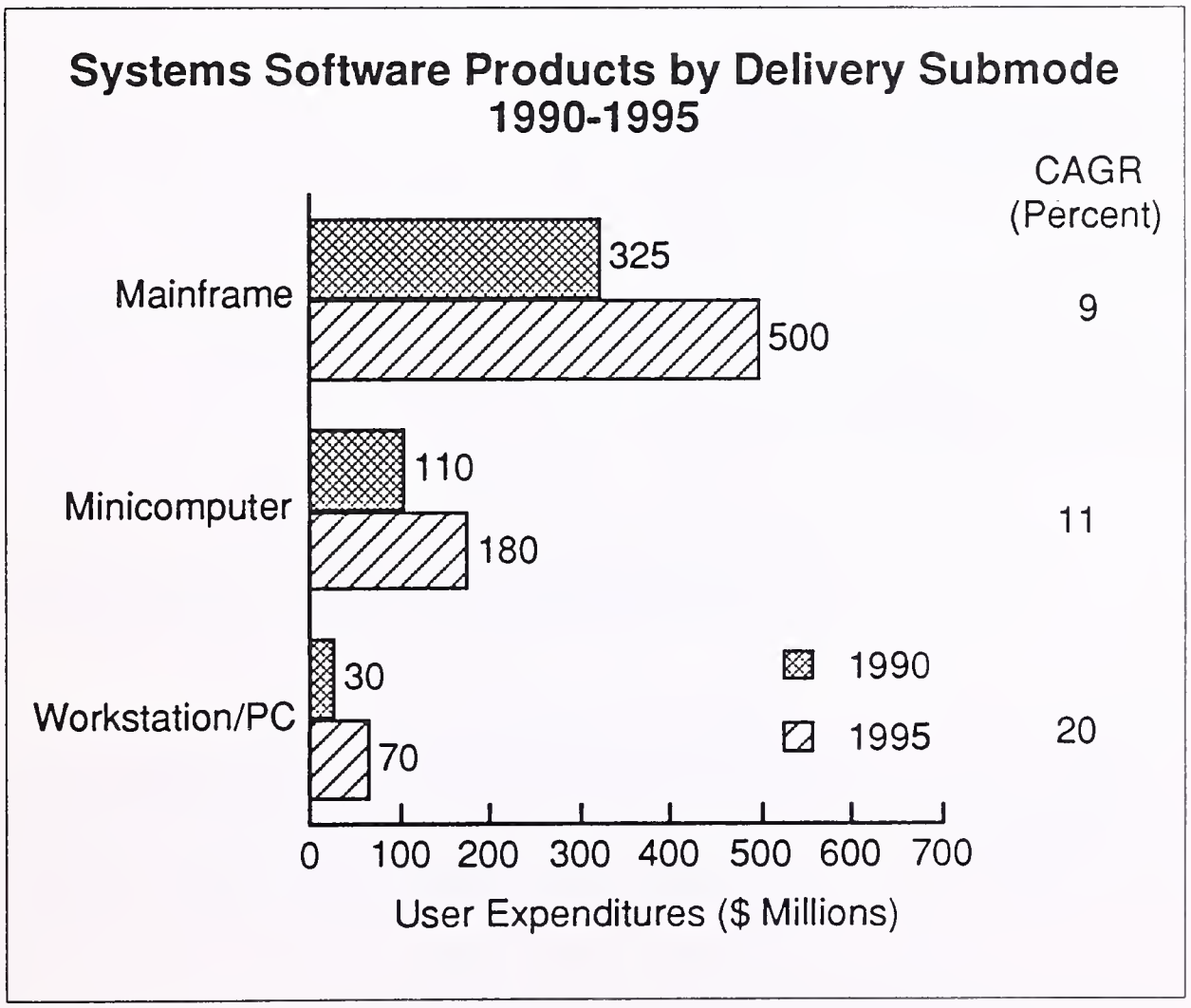
Software Products Market

A

Software Products Market, 1990-1995

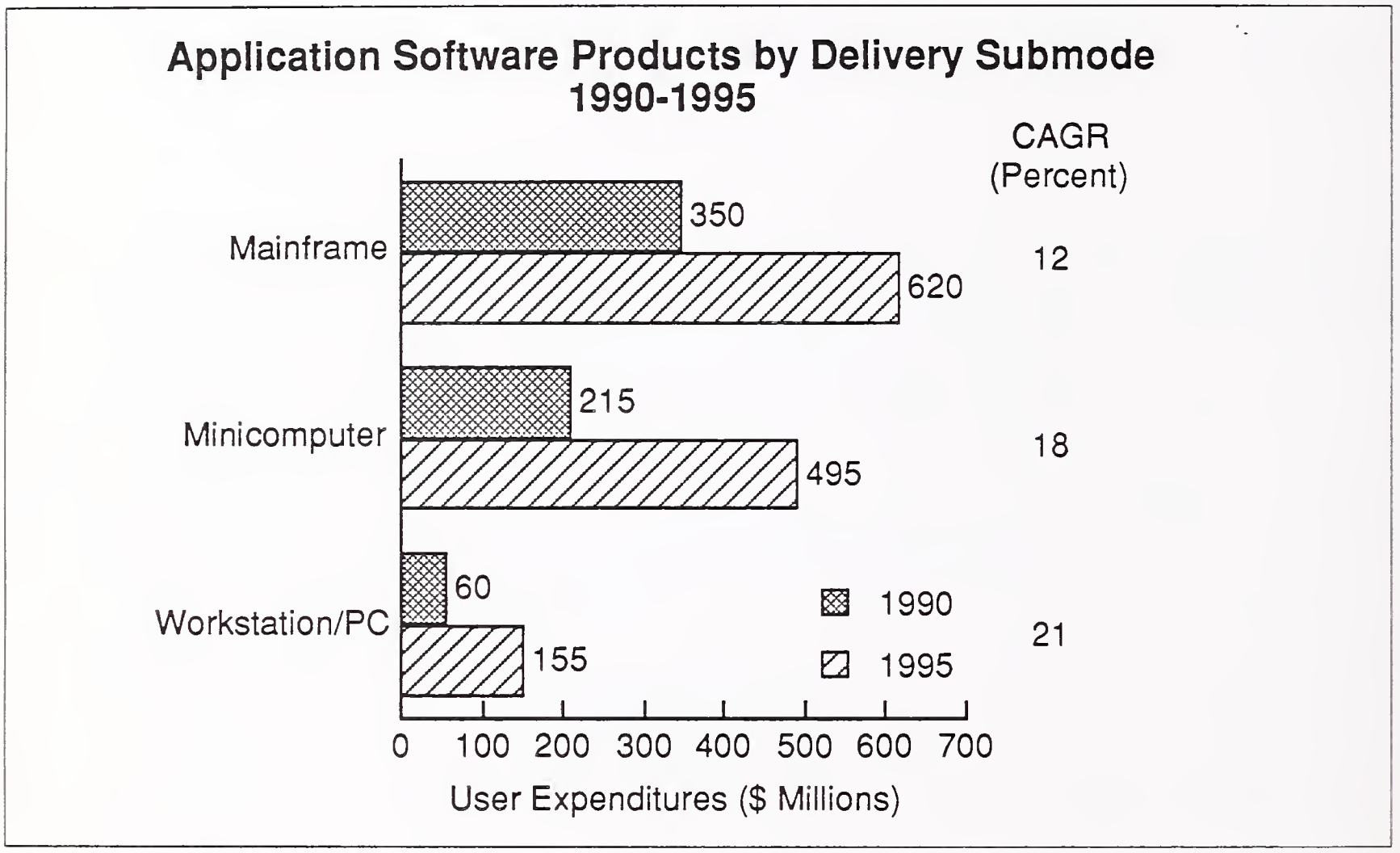
Systems software, closely coupled to the fortunes (or failures) of hardware, will experience only moderate growth through the forecast period, as shown in Exhibit VI-1. Overall, the system software market is expected to grow at a 10% annual rate, from $465 million in 1990 to $760 million in 1995.

EXHIBIT VI-1



The application software market will offset this result for software vendors as growth continues at a 15% growth rate for the next five years. The application software market is expected to grow from $625 million in 1990 to $1.2 billion by 1995. Exhibit VI-2 provides a breakdown of the application software market.

EXHIBIT VI-2



The size of the workstation/PC market appears to be somewhat small when compared to the relationship to the mainframe market. In the U.S., the workstation/PC portion of the application software market is approximately 30%. In Canada, the percentage is closer to 10%.

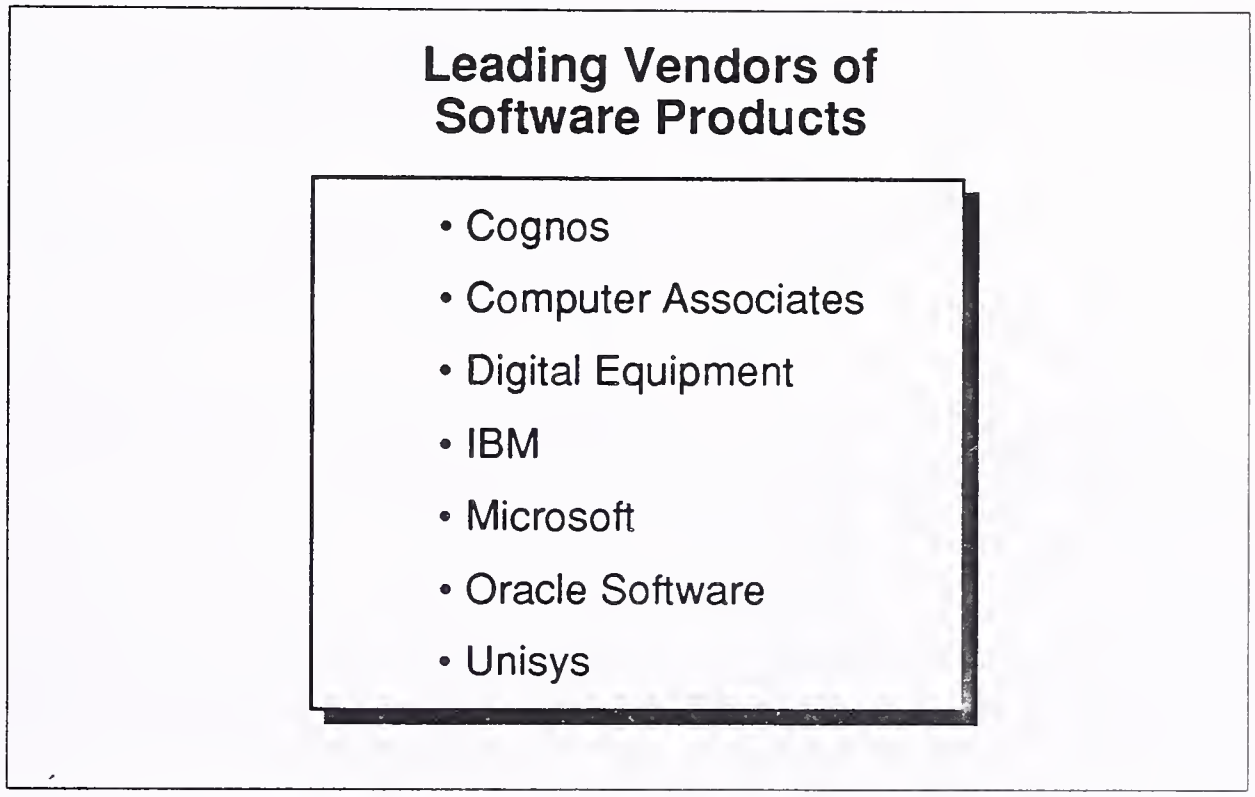
Although the workstation/PC market has grown and will continue to grow, at a high rate, Canadian companies report a lack of the wide variety of workstation and PC software that is available in the U.S. This lack of variety has retarded growth and kept the proportional share down. Many expect the situation to change and have high interest in a greater variety of workstation/PC application software, particularly software that is more industry oriented.

B

Major Software Products Vendors

As previously discussed and shown in Exhibit VI-3, much of the software market is controlled by hardware vendors. However, significant software-only vendors are Computer Associates, Microsoft, and Oracle.

EXHIBIT VI-3



Cognos is one of the few large software companies in Canada, but others are noteworthy—Kinburn and Jonas & Erickson among them. IST also does a sizable software business along with its service offerings.

The recent purchase of Management Science America, when combined with the earlier purchase of McCormack & Dodge, gives Dun & Bradstreet Software Services a solid foundation on which to expand its business. D&B's commitment to the (IBM) SAA umbrella, and plans to supply customers with tools to assist in migration to D&B's line of SAA products, could be a factor in growth.

Other rising stars may include Andersen Consulting, EDS, Ernst & Young, and Policy Management Systems.

C

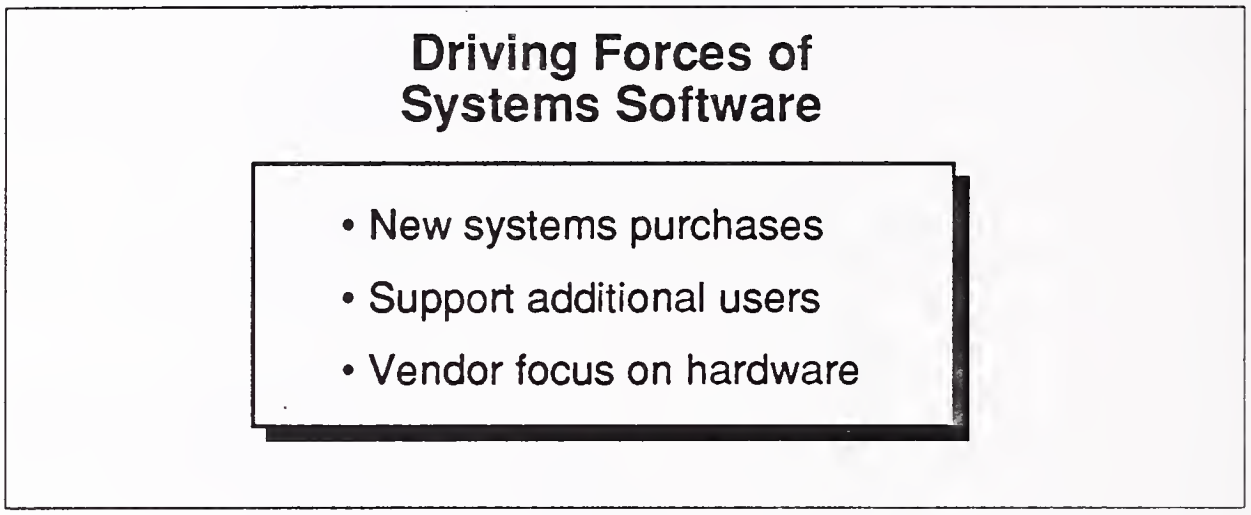
Systems Software Products Market Trends

As indicated earlier, a major driving force in systems software involves new systems purchases or platform improvements. The latter are generally required to support additional user activity or the implementation of complex systems. Key driving forces for systems software are shown in Exhibit VI-4.

An interesting alternate scenario was offered as well and is shown in Exhibit VI-5. In this scenario users suggested that falling hardware prices would free money for a refocus on systems software purchases.

The implication seems to be that users have a pent-up demand for systems software that is secondary to purchasing the hardware platform on which to run the software. Lower hardware prices might move this demand to the fore.

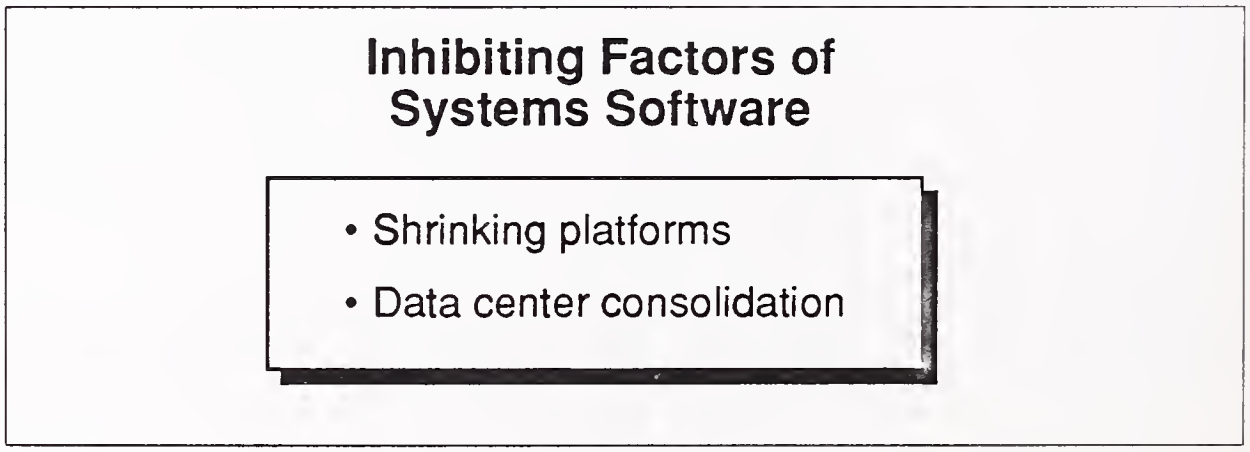
EXHIBIT VI-4



The main concern for systems software vendors seems to be downsizing. Shrinking technology, especially at the workstation/PC level, provides an alternative to the would-be mainframe user and replaces the need for large-ticket mainframe systems software with relatively inexpensive workstation/PC systems software.

Downsizing through consolidation is also a threat to the packaged systems software vendor. Merging systems, eliminating data centers, or even reductions in the work force all choke demand.

EXHIBIT VI-5

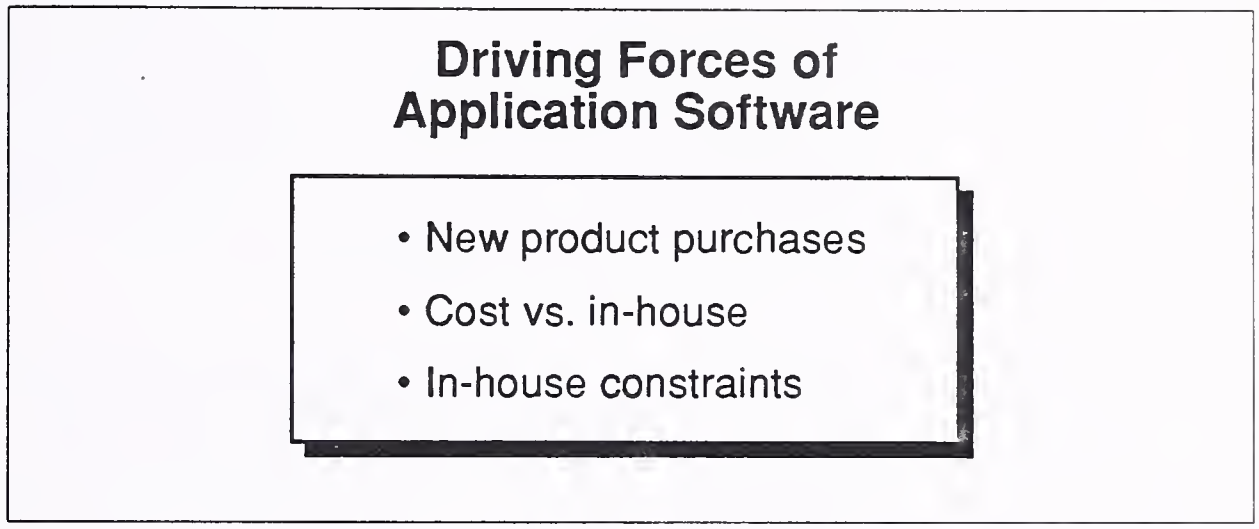


D

Application Software Products Market Trends

Users are bullish on the need for new application software purchases to accommodate a greater number of users and new application and functionality. Key driving forces in growth of the applications software are shown in Exhibit VI-6.

EXHIBIT VI-6



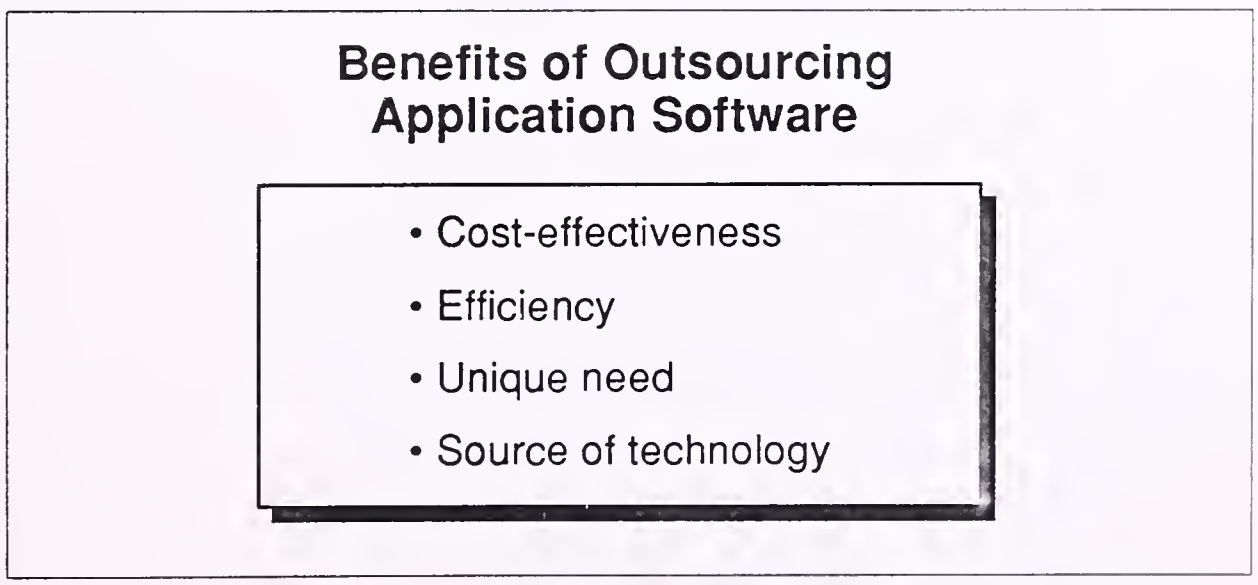
Users believe that in-house development costs are increasingly prohibitive. Users lack the expertise that software vendors can provide and face a software maintenance backlog that further constrains consideration of new efforts.

Most importantly, users do not have the financial resources to invest. Perhaps the inability to spread R&D expenditures over a number of users, as software vendors do, prohibits in-house development of software that is otherwise available.

Users will, however, weigh the cost-effectiveness and efficiency issues carefully in the face of price increases that users expect from vendors. This issue of pricing was the only inhibitor mentioned.

The cost savings realized from packaged software purchases is a leading benefit of outsourcing this need. As indicated in Exhibit VI-7, these savings and the efficiency factor (i.e., having software available off the shelf when it's required rather than having to wait through a long development cycle) are the two most important benefits. Packages are a low-risk approach—if they work.

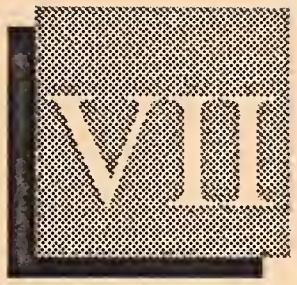
EXHIBIT VI-7



Users also stress the importance of packages that solve needs that are important and unique but do not warrant an in-house development effort. Application packages, for the most part, also offer comprehensiveness and functionality that are difficult to achieve in-house. Further, users believe packages are a source for vendors' technological expertise in such areas as standardization and portability.

Note must also be made that, although the market is still comparatively small, much of the growth for application software products is for workstations and PCs. As applications move from central systems to user departments, there is a growing needs for applications that address the needs of the department.

Although general-purpose applications such as spreadsheets will continue to be in demand, users are increasingly interested in applications that address specific needs—such as human resources, inventory control, etc.



Professional Services Market

VII

Professional Services Market

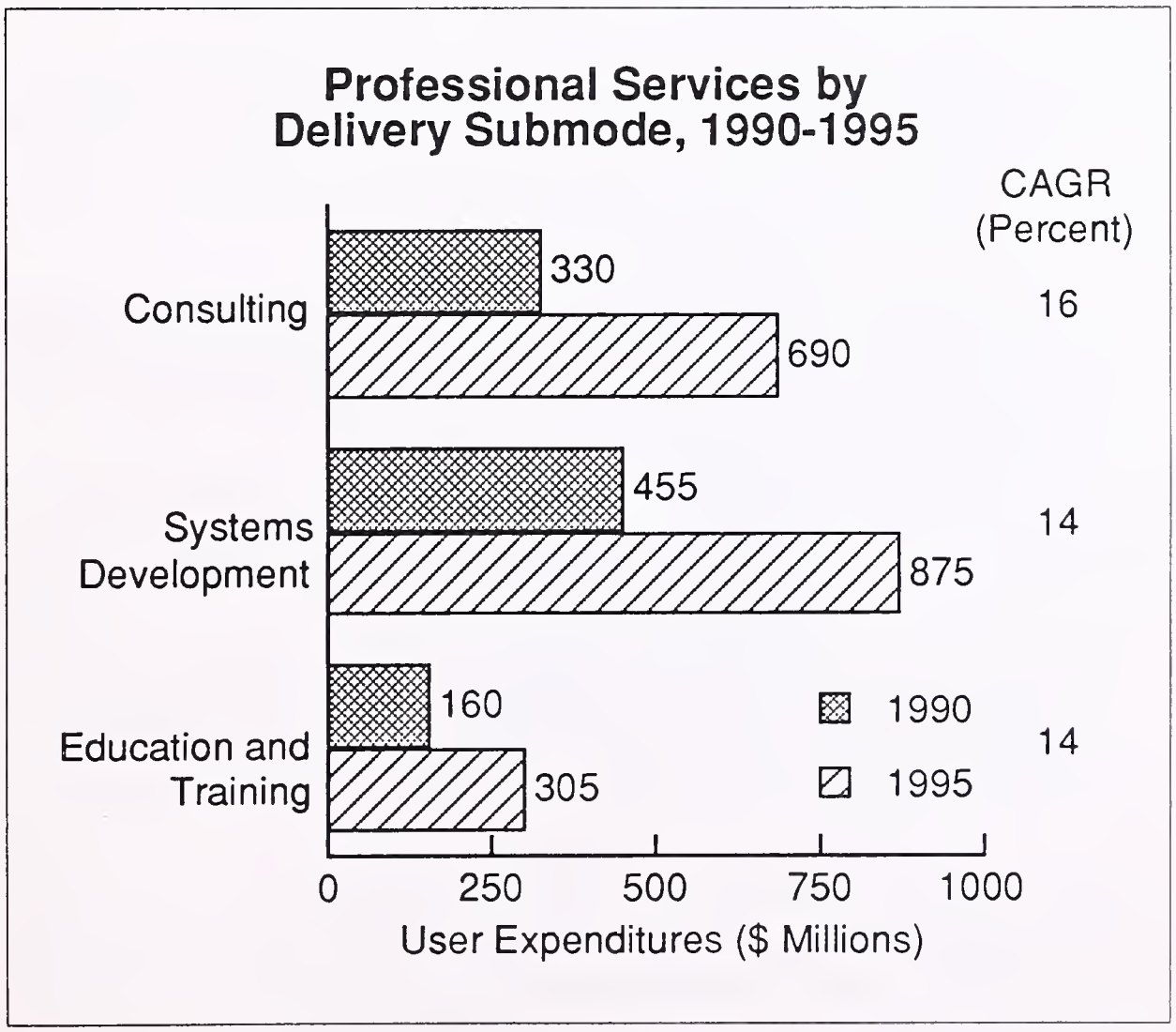
A

Professional Services Market, 1990-1995

Professional services represent the largest single delivery mode. Its importance to defining the marketplace for users and vendors cannot be underestimated.

These services provide the ability to create technology for a company and fit imported technology (e.g., hardware and software) to the unique technical and cultural needs of the user. So it will remain throughout the forecast period as professional services grow at an overall 15% rate, as shown in Exhibit VII-1.

EXHIBIT VII-1



Of the three delivery submodes, consulting, which relates to business analysis and the application of information systems to the business, will show the greatest growth.

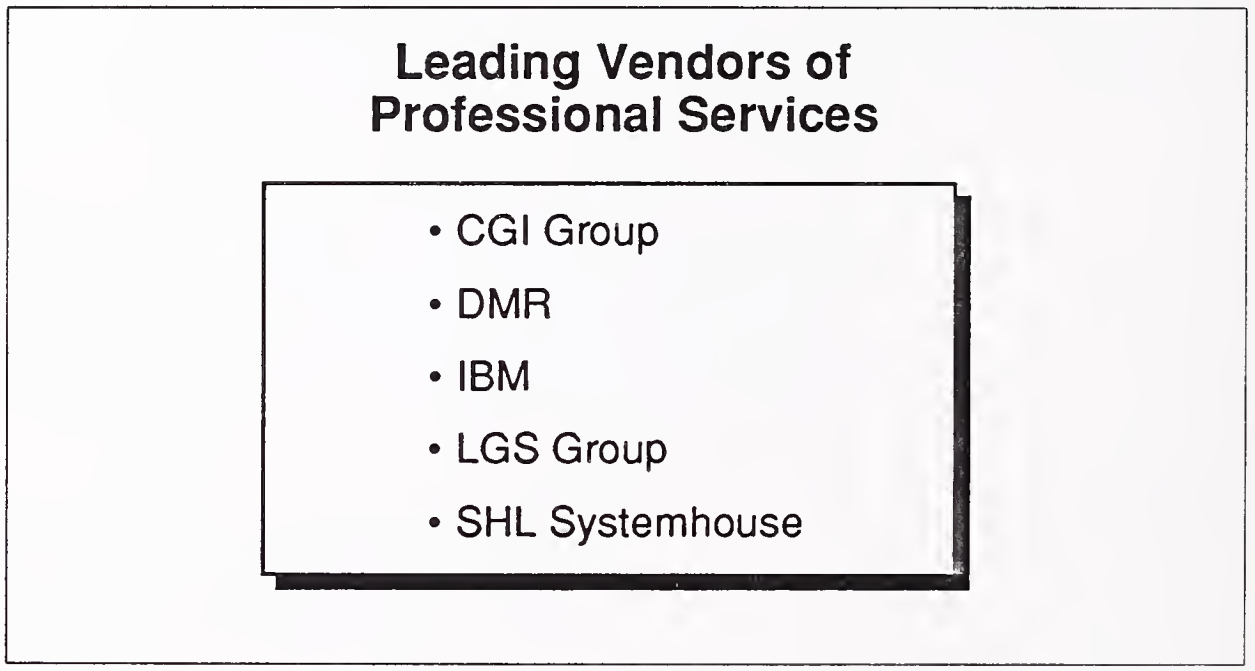
INPUT believes that growth in consulting is consistent with users' comments that their short-term interests are more oriented to gaining greater control over information systems and better understanding how information systems can contribute to the business.

B

Major Professional Services Vendors

Exhibit VII-2 supports the view that the largest professional services companies are Canadian vendors. The only U.S. vendor among the leaders is IBM.

EXHIBIT VII-2



Other Canadian vendors that dominate professional services in Canada include Atkinson Tremblay (owned by AGS/NYNEX), British Columbia Information Systems, Gellman Hayward, HTS Hi-Tech Systems, IST, and Sierra Systems Consultants.

The landscape could change as any number of U.S. vendors push into Canada. Andersen Consulting and EDS may be the most noted, but the group should also include Computer Task Group, Digital Equipment, Polaris Consulting (owned by Deloitte & Touche), and Price Waterhouse. All have indicated that there are significant opportunities in Canada and are enhancing their local presence.

C

Professional Services Market Trends

As shown in Exhibit VII-3, users report that increased expenditures for professional services are most likely to stem from additional automation requirements within the user organizations. Exposure to automated solutions and a growing computer literacy among users generally gives rise to the identification and feeling of urgency for applications.

EXHIBIT VII-3

Driving Forces of Professional Services

- Growing software needs
- Need for expertise
- Desire for resource flexibility
- Savings over in-house

This demand cannot be met with existing resources that are not available, not qualified, or both. Professional services vendors provide not only the human resources, but also the skills and capabilities to match the requirements.

This need for a level of expertise not frequently found in-house is likely to increase. The complexities of automated business processes are increasing at a dramatic rate and information systems are undergoing upheaval as a result of business-oriented consolidations and the growing use of multilayered systems that are generally also multivendor.

The use of vendors also plays well to the new corporate philosophy regarding optimization of resources. Management is realizing that the cost per unit of outside resources may not be more than the fully burdened internal rate and that, even if it is, the differential is more than offset by the flexibility of engaging the outside resource only when needed. This flexibility is not possible with internal staff, which, by employment agreement, are usually paid whether or not they are productive.

Although most users believe that the drivers overshadow the inhibitors, some disrupting factors are visible. Exhibit VII-4 indicates that the number-one constraint is likely to be the economy. INPUT believes that professional services may be the hardest hit by a recession.

There also is a debate over the proper use of in-house resources versus external ones. On the one hand, external resources offer expertise, resource flexibility, and some comparable costs. On the other, use of

external resources reduces the development of experience in the in-house staff and, in turn, fuels a continuing reliance on external support. Some information systems organizations have solved this dilemma by reversing responsibilities: giving maintenance chores to vendors and keeping new development in-house, supplemented by outside expertise as necessary.

EXHIBIT VII-4

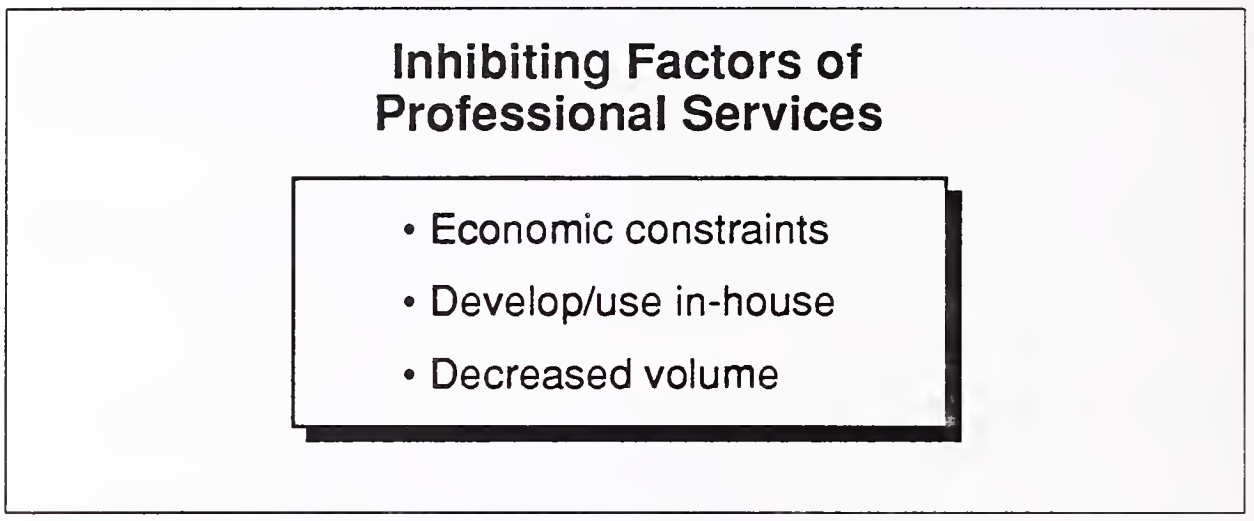
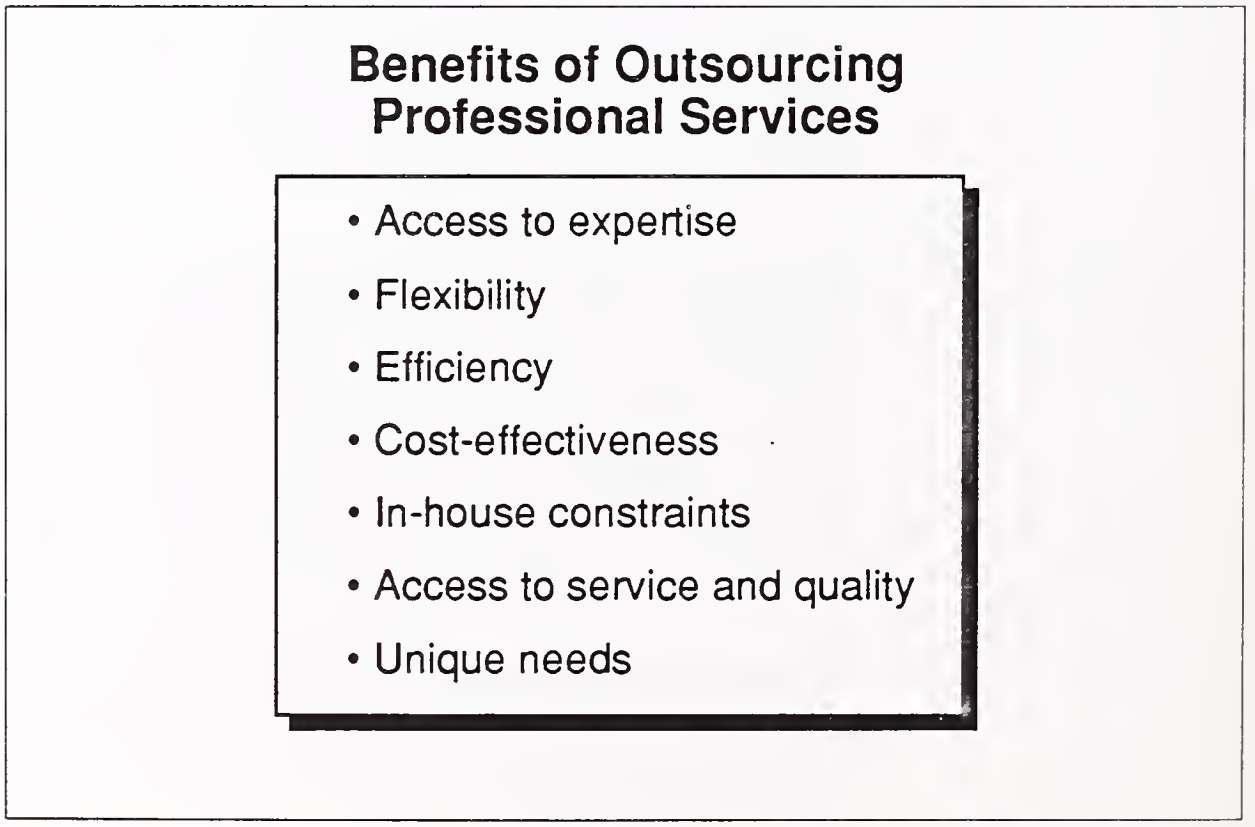


Exhibit VII-5 lists key benefits to outsourcing professional services. Access to expertise, as has been noted, is the most important need, but is closely followed by the flexibility that use of outside professional services vendors affords. Used to replace staffing that is not needed on a full-time basis or to level resource requirements during peak periods, the vendor plays a key role in resource optimization.

EXHIBIT VII-5



Users also laud professional services vendors for their efficiency, as compared to in-house development, and for vendors' quality and service. One user respondent was quick to point out that the latter issue is the primary difference between support from the vendor and support from the information systems organization.

As vendors have been discovering, there is a whole new set of potential customers among users. Users' resource needs may be smaller than those of the information systems department on an individual-request basis, but the sheer number of potential customers seems to more than offset this limitation. Vendors will need to closely manage their efforts in terms of finding, selling, and fulfillment so that profitability targets are maintained.

To more fully explore vendor selection issues, respondents were requested to indicate specific selection criteria. As listed in Exhibit VII-6, these criteria tend to parallel the driving forces noted above. Users believe that use of professional services vendors provides access to expertise that is non-existent in-house, a cost-value ratio that is competitive with the in-house resource, and a certain level of quality and service.

EXHIBIT VII-6

Vendor Selection Criteria for Professional Services

- Expertise
- Cost
- Reputation
- Industry knowledge
- Availability
- Quality
- Service
- Reliability
- Total solution offering

There are subtleties within these criteria, however. Expertise, for example, means more than having an intimate knowledge of a technology. It means experience in allying that technology within the customer's industry, perhaps even as a total-solution offering (see Chapter VIII for a discussion of systems integration).

The cost-value issue also has a related component. Some users want vendors to have established methodologies for efficient, productive work. A CASE product, although not a requirement, is a desirable asset. An even better asset is a staff that is knowledgeable enough to adopt the methodologies of the customer.

Quality and service mean more than the literal terms. Users look for a sense of assurance that the vendor will deliver on time and within budget. Users gauge reliability by looking at the vendor's track record, its general reputation, its reliability, and its sense of commitment. Users are sensitive to the problem of bait and switch—that is, selling the user with one set of personnel and then switching personnel midproject.

Finally—and this is good news for some vendors—users indicate a preference for vendors with a local presence. Although the importance of this issue was not quantified, INPUT believes that local presence is a sufficiently powerful force to be considered mandatory. Active vendors who have not done so may want to establish beachheads in other geographic markets before the U.S. invasion hits full stride.

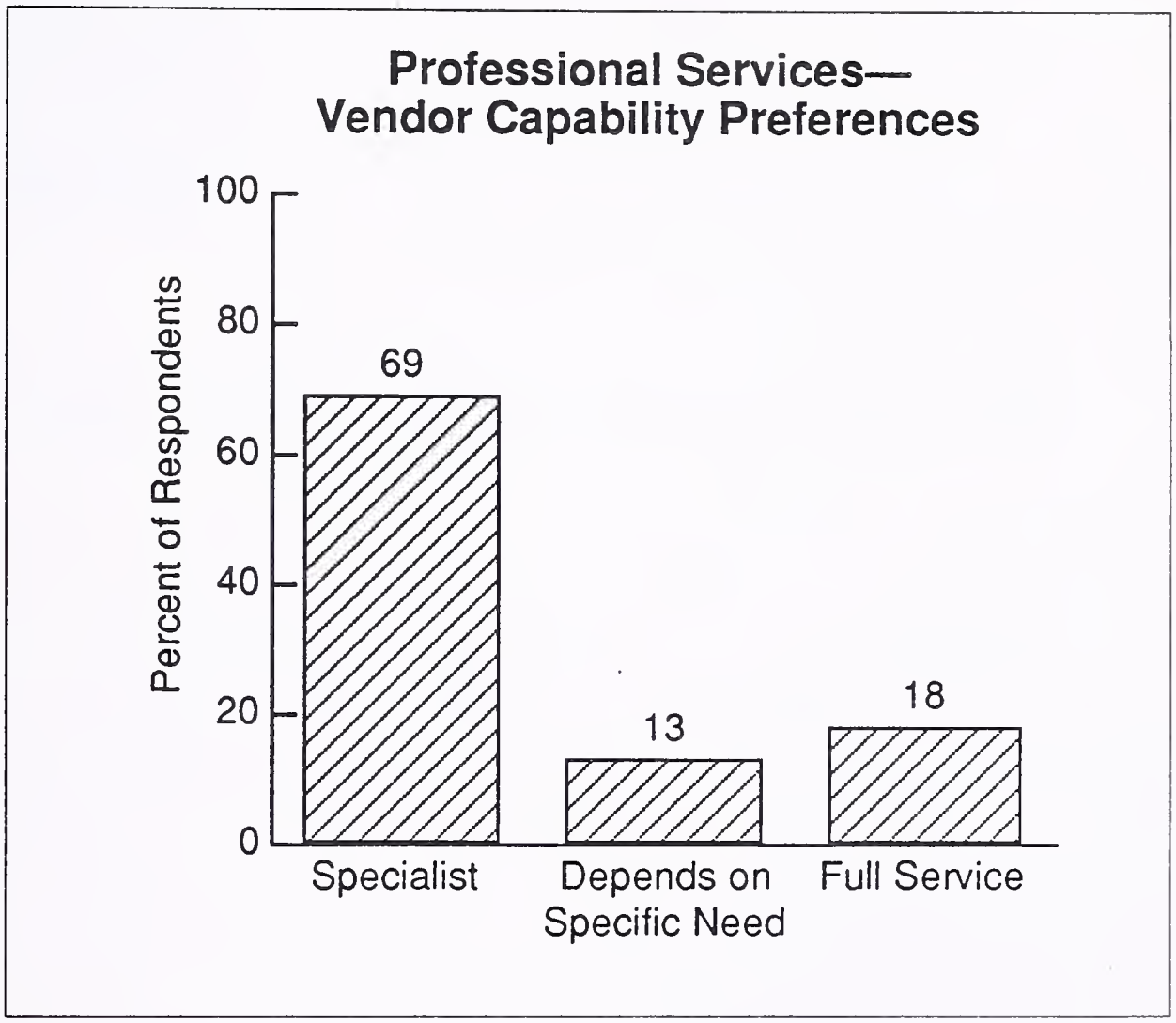
As a follow-up to the issue of an expert versus a total solutions provider, users were asked to clarify their preferences and the roles of each type of vendor. The preference of users for specific types of vendors is summarized in Exhibit VII-7.

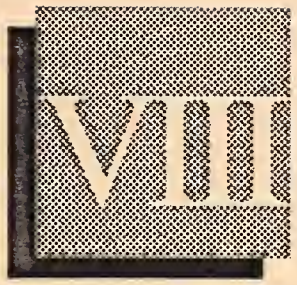
Most users point out that they go outside when a specific specialist is required. The generalists are in-house. Some users who use specialists suggest that no vendor is a true full-service provider. These users believe that no vendor can do it all.

Those who believe the decision depends on the specific need suggest a rule of thumb: software development requires specialists; systems operations requires generalists. The sole reason that some prefer full service is one-stop shopping and, as one user pointed out, "to cut down on the finger pointing" when things go wrong.

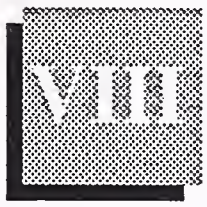
Although vendors might argue that the full-service-specialist preference is dependent upon geography, INPUT found no evidence; in fact, the distribution of preferences paralleled the geographic distribution of respondents.

EXHIBIT VII-7





Systems Integration Market



Systems Integration Market

A Systems Integration Market, 1990-1995

As in many other countries, systems integration is just now moving out of the federal government market into provincial government and commercial sectors. Users and vendors are struggling to appropriately define and position development efforts so that the proper set of resources may be applied.

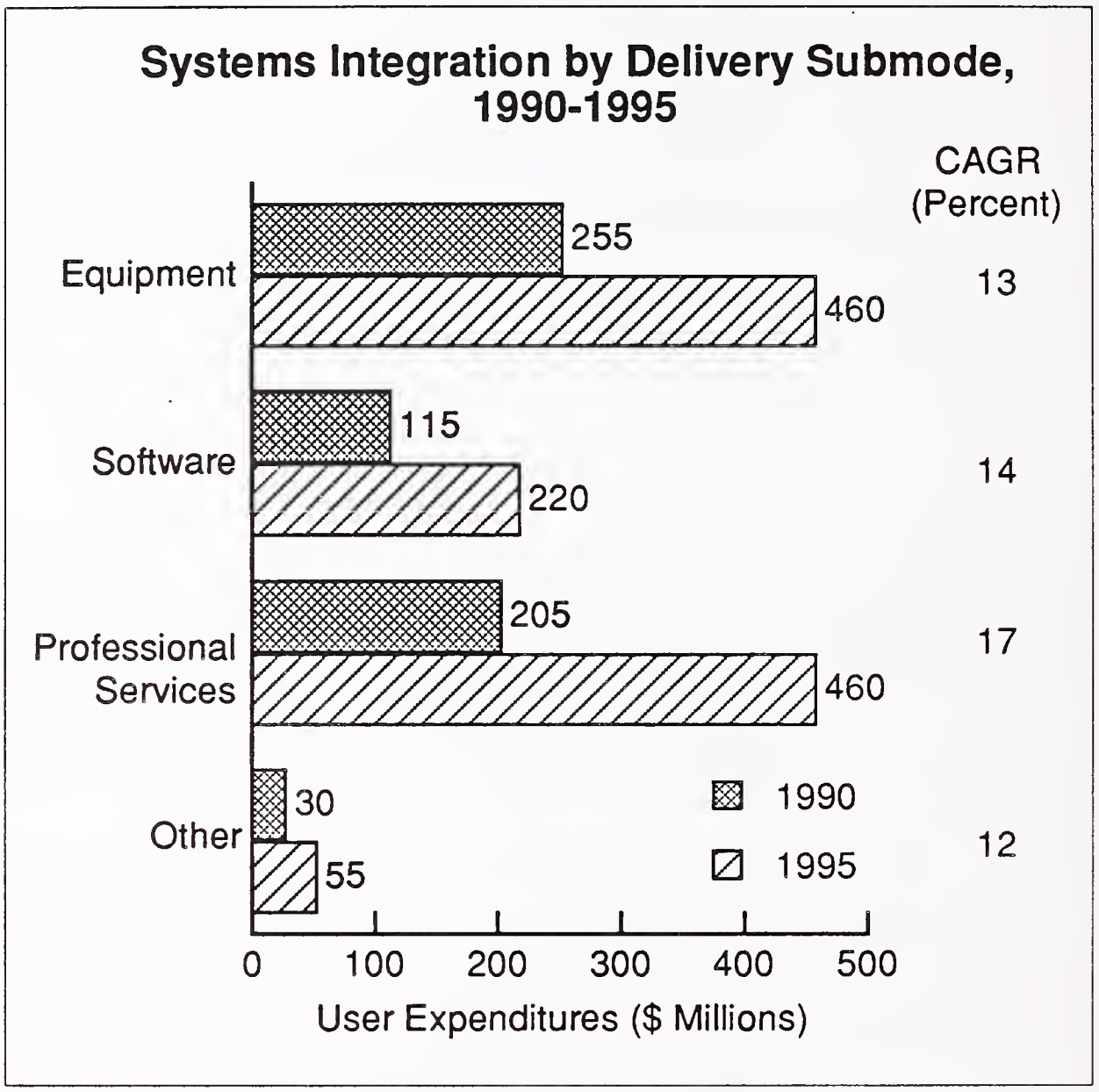
This positioning in a period of recession results in a forecast of moderate growth for the five-year period, as shown in Exhibit VIII-1. Overall, the market is expected to grow at an annual rate of 15%, from $600 million to $1.2 billion by 1995.

Although much of the moderation is due to a recessionary economy, INPUT believes that the Canadian market for (commercial) systems integration has been somewhat slower to develop than in the U.S. With this relative slowness in mind, INPUT expects market growth to be as high as 20% for the professional services submode during the *latter* part of the forecast period.

Equipment delivered through the systems integration submode will be at a pace in the range of that for hardware shipments overall. Packaged software, both systems and applications, will grow slightly faster than the respective standalone modes.

Requirements for unique applications to meet a growing competitive environment will stimulate the growth in professional services in the latter part of the forecast period. Unique applications require expertise from vendors, custom software development, and eventually training. As the total solution approach to systems is adopted, professional services will be increasingly used to develop unique solutions and will become the dominant submode of systems integration.

EXHIBIT VIII-1



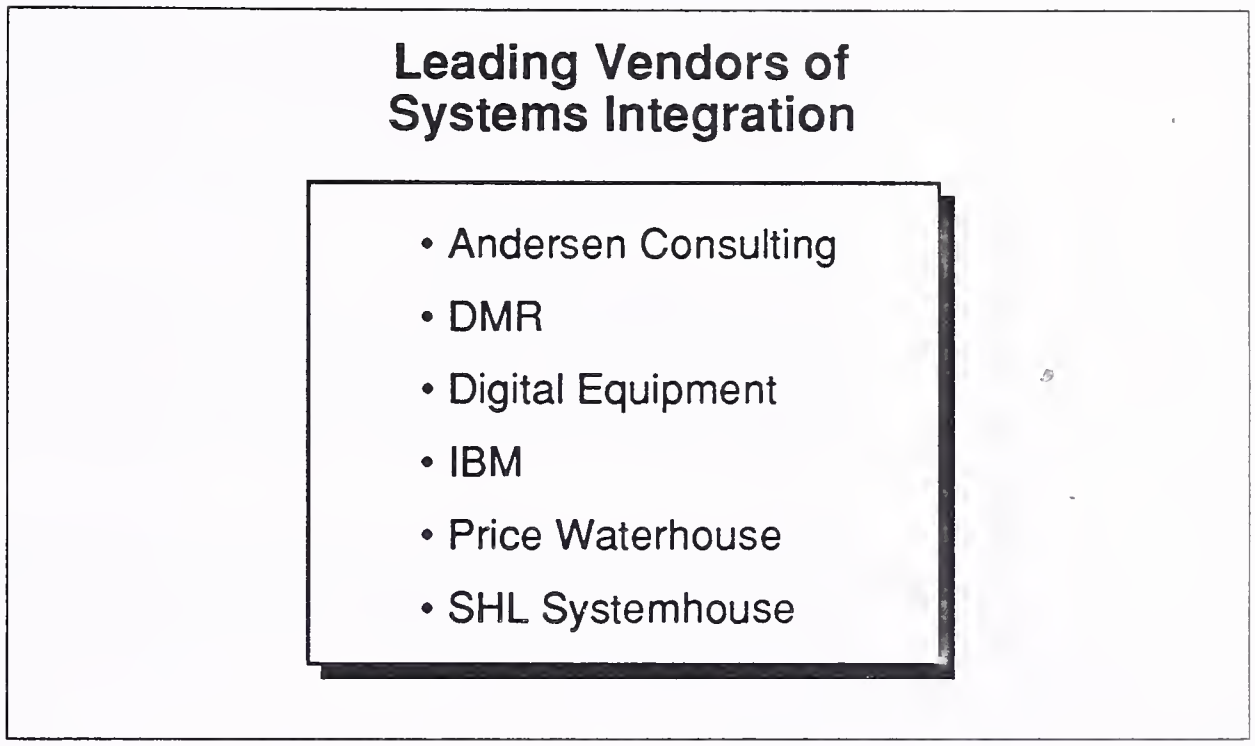
B

Major Systems Integration Vendors

Although it is popular for many vendors to claim integrator status, only a few are up to the challenge in terms of offerings and capabilities. The leading systems integrators in Canada are listed in Exhibit VIII-2.

Other vendors that have positioned to be leading integrators in Canada include EDS, Computer Task Group, and STM Systems. Hughes Aircraft, after its recent acquisition of the $325 million contract for the Canadian Automated Air Traffic System (CAATS), also promises to be a powerhouse in some segments. Hughes' new base of business centers in the west could be a launching pad for more commercial work as well.

EXHIBIT VIII-2

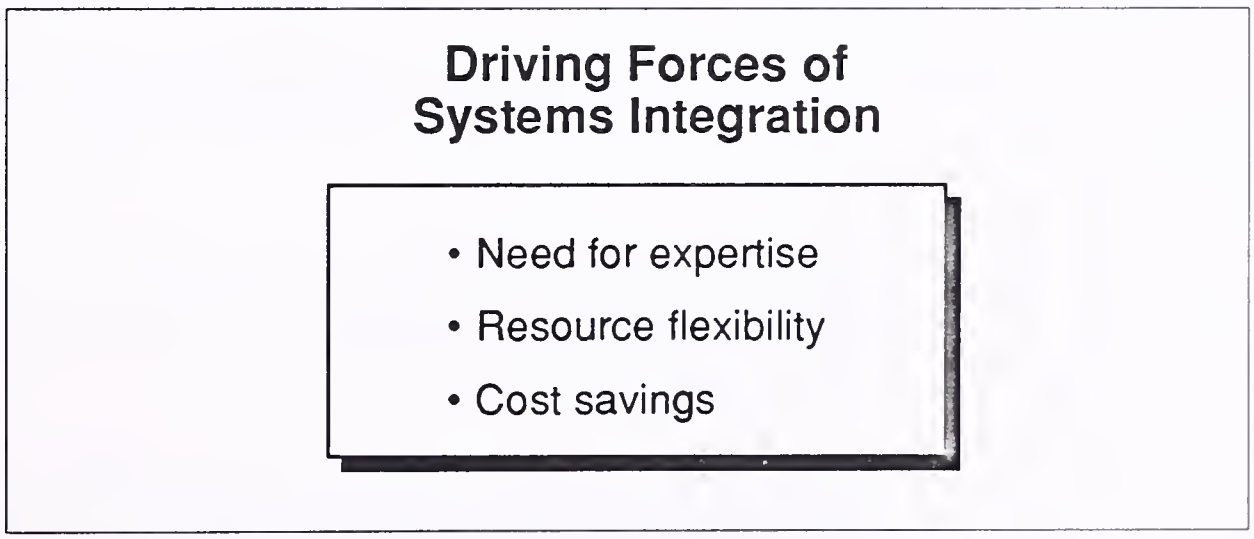


C

Systems Integration Market Trends

As with professional services, systems integration is driven by a strong need for expertise. Expertise is needed in the application of technology to specific requirements and in the application of industry knowledge to individual customer environments. Key driving forces behind systems integration are shown in Exhibit VIII-3.

EXHIBIT VIII-3



As an adjunct to resource flexibility, systems integration provides the user with an approach to a solution when the existing in-house staff is otherwise engaged. Efforts that would consume resources and involve extensive risk may now be passed to vendors with the proviso that the vendor assumes or at least shares the risk.

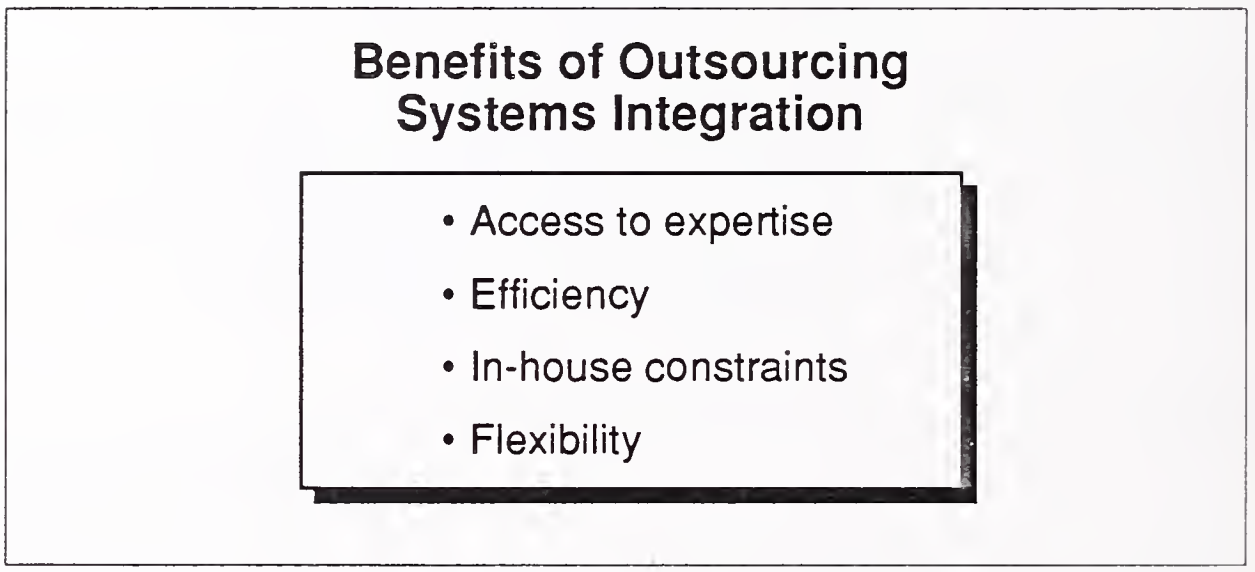
In the long run, users believe that systems integration will provide cost savings over in-house efforts that traditionally have resulted in systems that were less than expected in performance and greater than hoped in costs.

Systems integration is not without its distractions. For one, there is a net additional cost that may not be entirely palatable to users. For another, most projects consume significant amounts of in-house resources for project management and oversight that were not counted (nor realized) when the project was completed totally in-house.

Other inhibitors include the extent to which the integrator owns the DP/MIS shop as the mother of the new application (vendors speak of account control) and the growing inability to find a bias-reduced vendor who will ensure that the best solution will be developed, not the solution that uses the most products or services of the integrator.

Exhibit VIII-4 summarizes users' stated reasons for using systems integrators. The predominance of the professional services submode is visible in the areas of expertise and flexibility.

EXHIBIT VIII-4



Interestingly, users also see systems integration as a more productive approach to systems development. Some users go so far as to call systems integration easier.

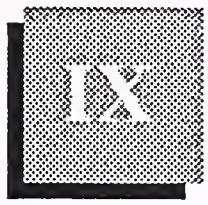
As with professional services, users were asked to indicate their preferred vendor selection criteria for systems integrators. As indicated in Exhibit VII-5, recession-sensitive vendors rated cost as the most important factor, followed by reputation for professionalism. Financial stability, the blunt issue of whether the vendor will be around at the completion of the project, is also highly rated.

EXHIBIT VIII-5

Vendor Selection Criteria for Systems Integration

- Cost
- Reputation
- Vendor character
- Financial stability
- Knowledge

Systems Operations Market



Systems Operations Market

A Systems Operations Market, 1990-1995

Management, from the information systems organization to the executive offices, is taking a close look at the effectiveness and benefits of information systems, with particular attention to the benefits of operations.

Nowhere is the concern more visible than in the systems operations delivery mode—when a customer opts for outside help, he/she is generally saying that information systems are important, that the company has not done a good job with leveraging these systems, and it's time to turn the effort over to professionals.

These statements will be frequently repeated as corporate management struggles to find the most advantageous and cost-effective approach to computing.

Growth in systems operations will average 16% annually—from $220 million in 1990 to $460 million in 1995. Exhibit IX-1 provides a breakdown of the systems operations delivery mode.

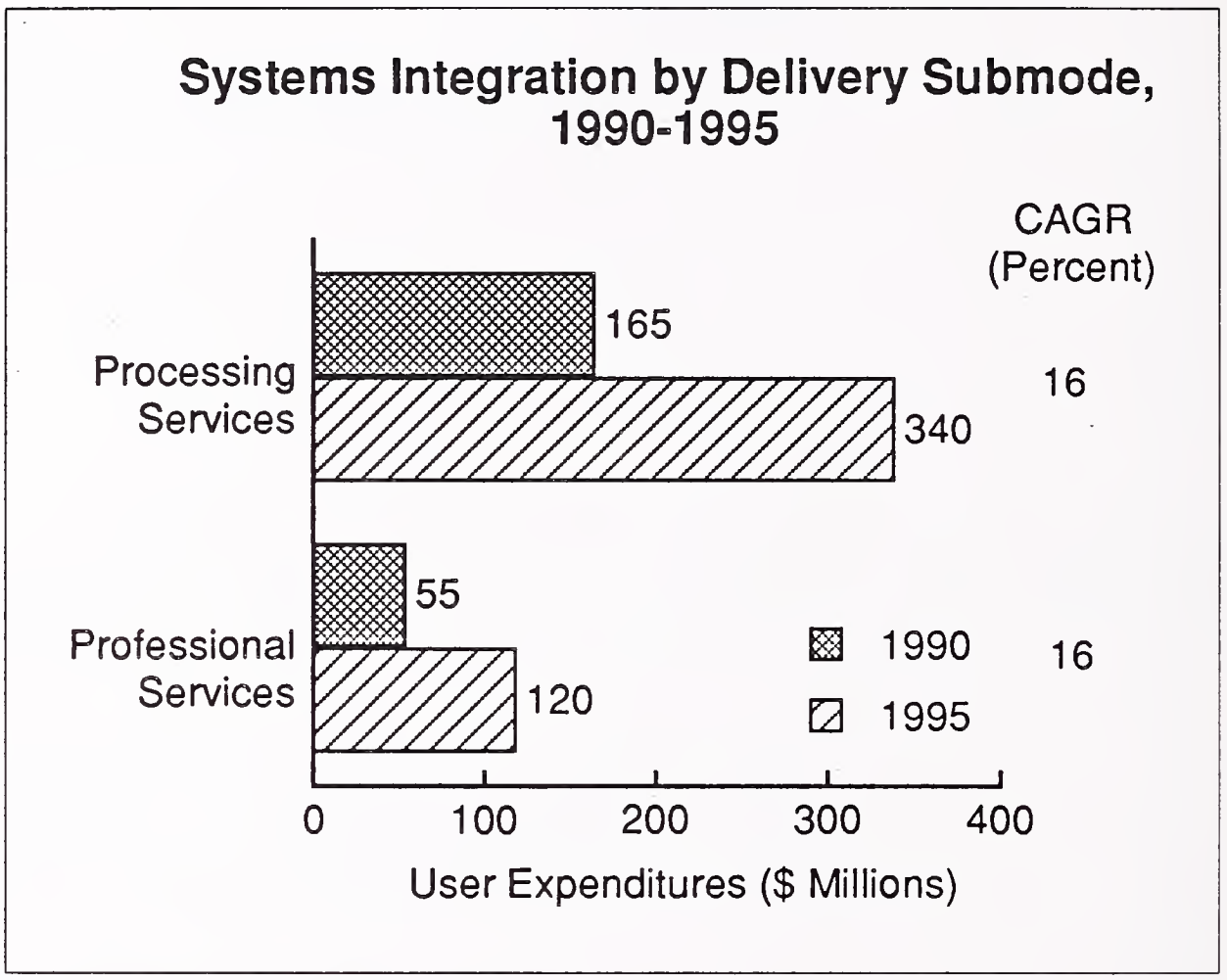
As is true of professional services and systems integration, systems operations are expected to be affected by a recession and will pick up momentum near the end of the forecast period.

Although the processing services component of systems operations is a perfect solution for growth companies wanting to avoid the capital investments and risks of establishing a large information systems organization, they are perceived as less advantageous for users who have had an information systems shop.

In established systems operations markets, ridding an organization of its hardware investment is an advantage, as is establishing long-term, fixed-priced contracts. INPUT believes that Canadian users that are reluctant to scrap their hardware investments or are concerned about loss of control reflect the same concerns seen in markets where systems operations have

not begun to take hold. This reluctance will change as the market becomes more established.

EXHIBIT IX-1



As noted in INPUT's study of systems operations in the U.S. and Europe, companies opposing systems operations cite the same reasons as companies that have converted. The difference is that the cost-efficiency analysis is performed without prejudice by companies using systems operations.

B

Major Systems Operations Vendors

Major systems operations providers are noted in Exhibit IX-2. The advances of U.S. firms, most notably Andersen Consulting and EDS, could put additional pressure on Canadian vendors to hold customers. The importance of a local presence and relationship marketing will be tested by these new entrants.

EXHIBIT IX-2

Leading Vendors of Systems Operations

- Andersen Consulting
- British Columbia Systems
- EDS
- HTS Hi-Tech Systems
- IBM
- IST
- STM Systems
- Westbridge Computer

C

Systems Operations Market Trends

Exhibit IX-3 lists the driving forces for systems operations. First, the volume of user business may be so great as to press existing systems to capacity and require outside operations support, generally from processing services vendors. As management compares in-house and external operations costs, the vendor frequently wins, making the need all the more urgent.

EXHIBIT IX-3

Driving Forces of Systems Operations

- Volume of business
- Cost-effectiveness
- Availability of support
- Competitive pressure

Frequently, qualitative issues emerge as well. Many of the in-house information systems organizations' customers are not pleased with the level of service and support they receive. They believe that quality will more likely approach the expected level if vendors (professionals) are involved—the vendor realizes that future business depends on a satisfied customer.

Finally, relating to these other forces, users note an urgency for more-effective systems that will allow users to remain competitive in the marketplace. Information is a competitive advantage and users sometimes find themselves at a disadvantage because of old, inefficient, or off-target systems. A quick fix is generally required and the in-house organization rarely has the time or expertise to provide it.

As shown in Exhibit IX-4, the information systems side can also emerge as the point of focus for reasons of cost, organizational restructuring, and the like. These factors tend to inhibit growth of systems operations.

EXHIBIT IX-4

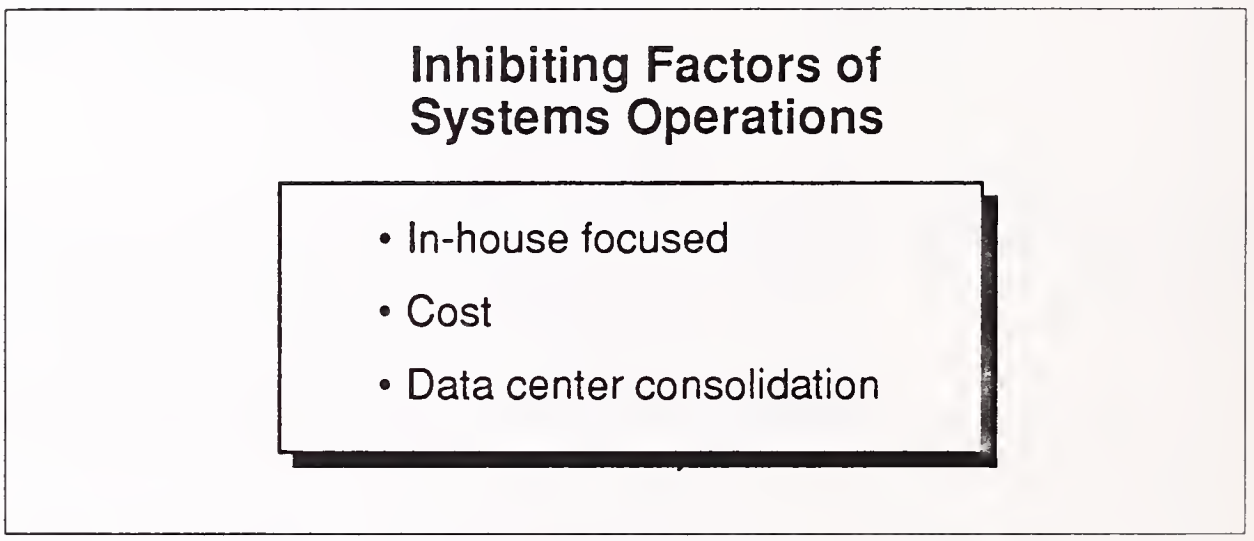
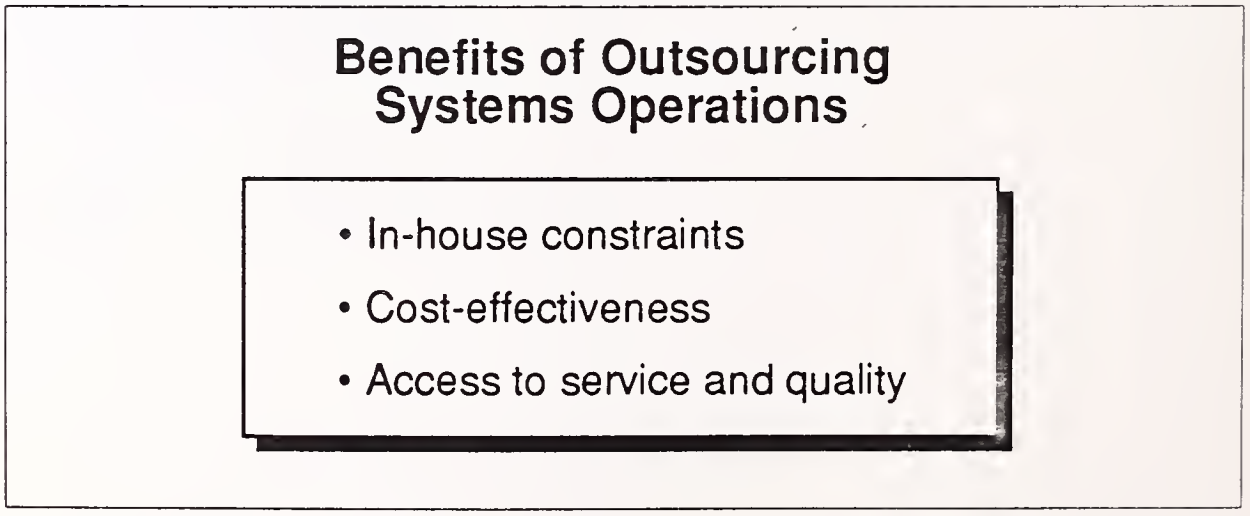


Exhibit IX-5 reaffirms many of the above statements that systems operations services are able to overcome in-house constraints on resources or talent and generally do so in a cost-effective manner. Besides, the hungry vendor whose future business is at stake is more likely to provide the level and quality of support expected.

EXHIBIT IX-5



Turnkey Systems Market

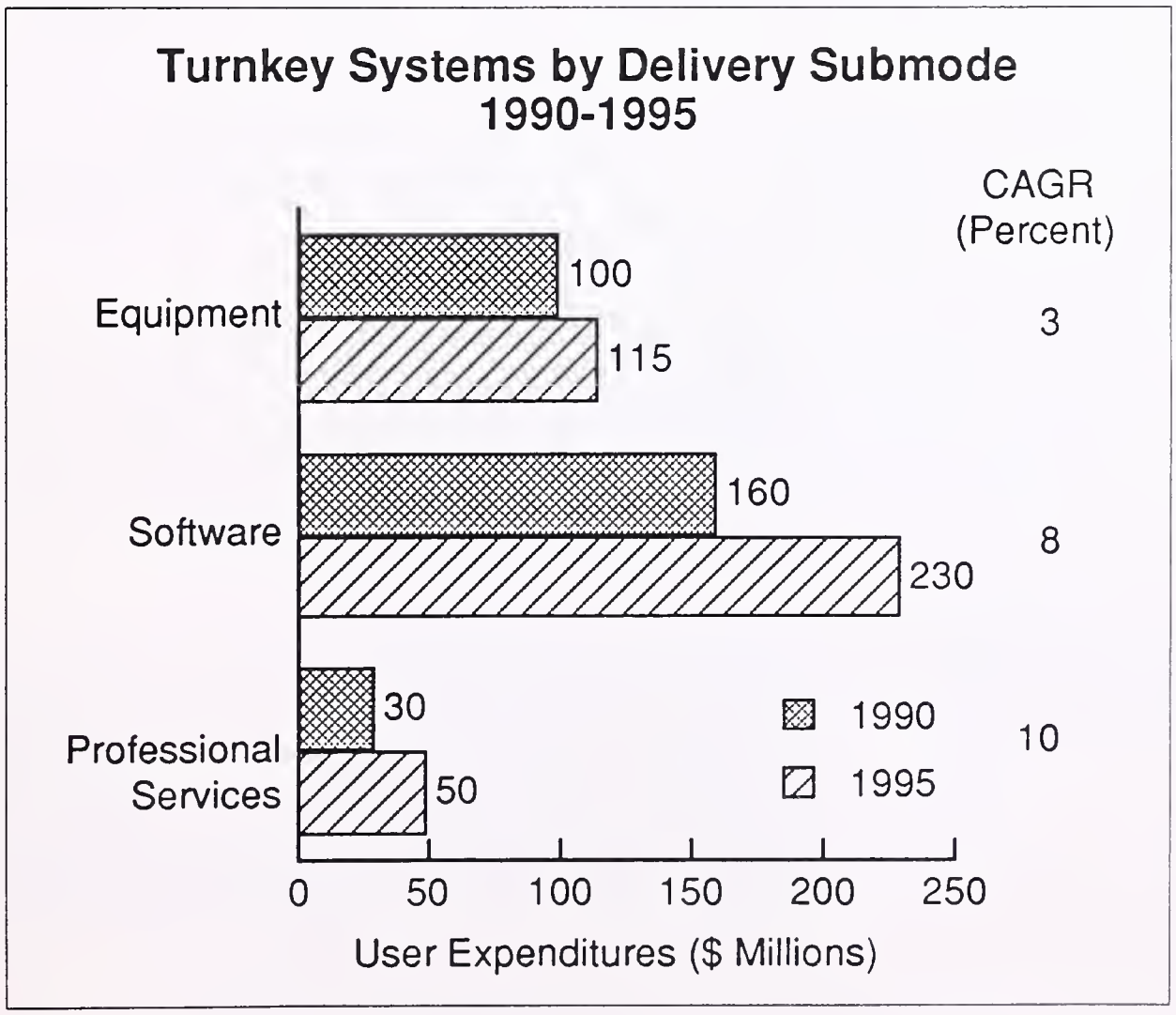
Turnkey Systems Market

A Turnkey Systems Market, 1990-1995

Turnkey systems continue a down cycle as the niche where less-flexible solutions come under increasing pressure. On the one hand, hardware is relatively inexpensive and the proliferation of feature-rich software packages makes it possible to find applications that suit most needs. On the other hand, there is a growing belief that the user's organization is unique and no packaged solution will do.

Exhibit X-1 reflects the results of these pressures with a forecasted growth rate for turnkey systems of no greater than 7% through the period. Overall, the turnkey market is expected to grow from $290 million in 1990 to $395 million in 1995.

EXHIBIT X-1



The equipment component of turnkey systems will decline in real dollars as the price of hardware falls. As software, especially for workstation/ PC platforms, becomes more of a commodity, this trend will be noted, as well, in the packaged software portion of the system.

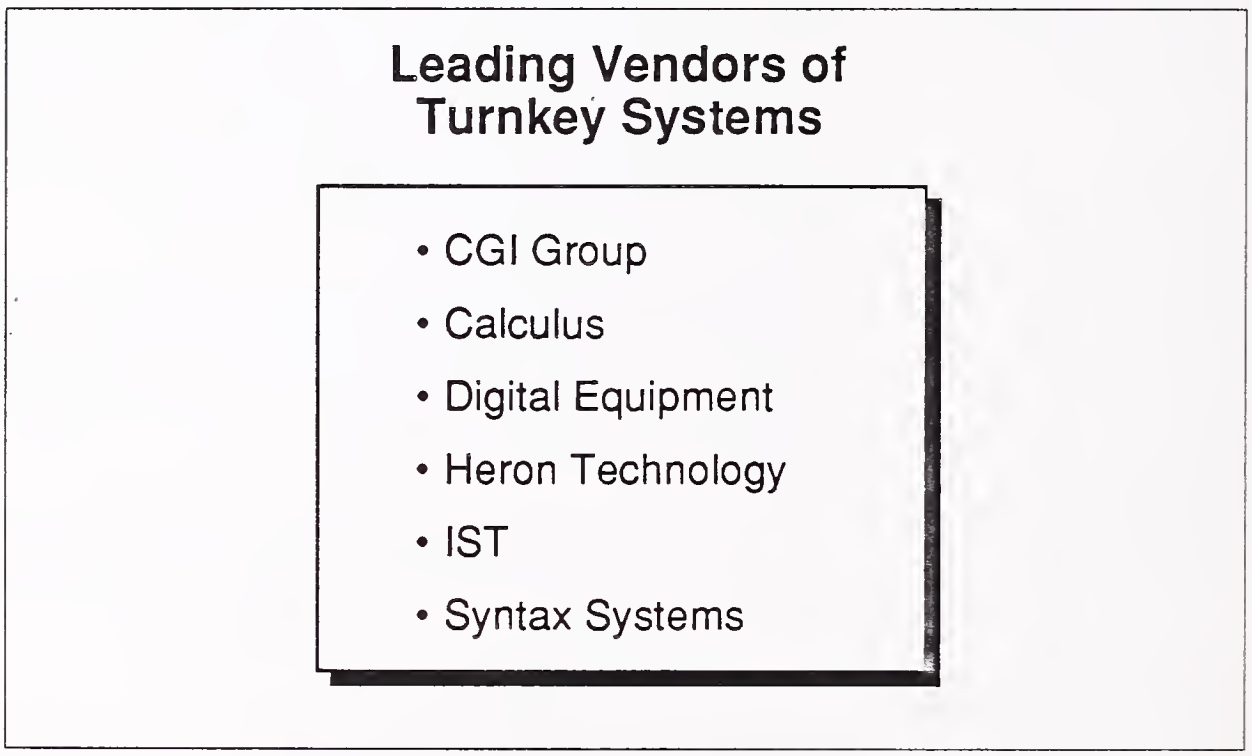
Only professional services will grow at an attractive rate, 15% CAGR. The growth will be primarily for customizing off-the-shelf systems to meet individual customer requirements.

B

Major Turnkey Systems Vendors

The turnkey systems arena is also dominated by Canadian players, as noted in Exhibit X-2. Although some vendors (e.g., Calculus and Syntax Systems) are primarily turnkey vendors, most turnkey products come from multiple-service vendors who see turnkey systems as another vehicle for packaging a full complement of capabilities.

EXHIBIT X-2



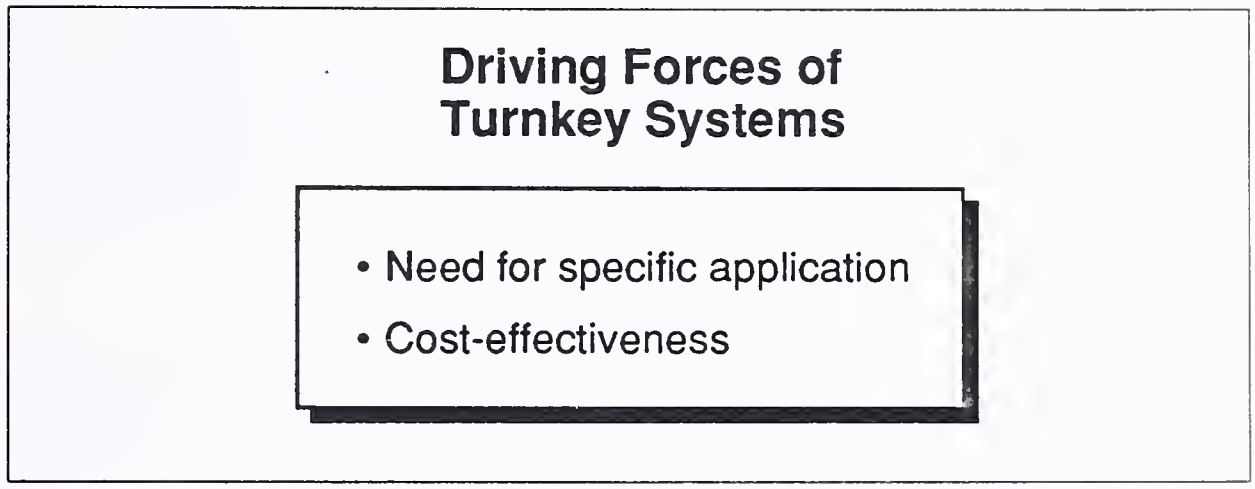
Other vendors may enter this market in the coming years. EDS and Ernst & Young both have a small base of business from which to launch a larger effort. Hewlett-Packard, never a significant player in systems integration, may try to meet smaller custom needs via a package of turnkey systems and professional services. Look for other hardware vendors to follow this strategy as well.

C

Turnkey Systems Market Trends

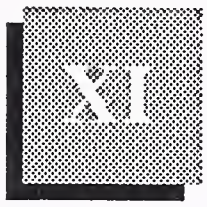
There are few forces that will drive the turnkey market through 1995, as shown in Exhibit X-3. The primary forces will be unique and specific, such as where dedicated systems are preferred to general-purpose ones. These needs may occur in such vertical niches as professional offices or utilities (e.g., power grid management) or such cross-industry applications as call processing or geoprocessing (in utilities, government, mining, etc.).

EXHIBIT X-3



In these focused areas, the cost-effectiveness of turnkey systems continues to be a major point of attractiveness. The value achieved by a turnkey solution is highest in a niche where the need is perceived to be great and the solution is powerful and simple. When turnkey systems achieve this benefit, the major inhibitor of limited capability is negated.

Conclusions and Recommendations



Conclusions and Recommendations

The research and preparation of this report revealed a number of elements impacting the Canadian information services markets.

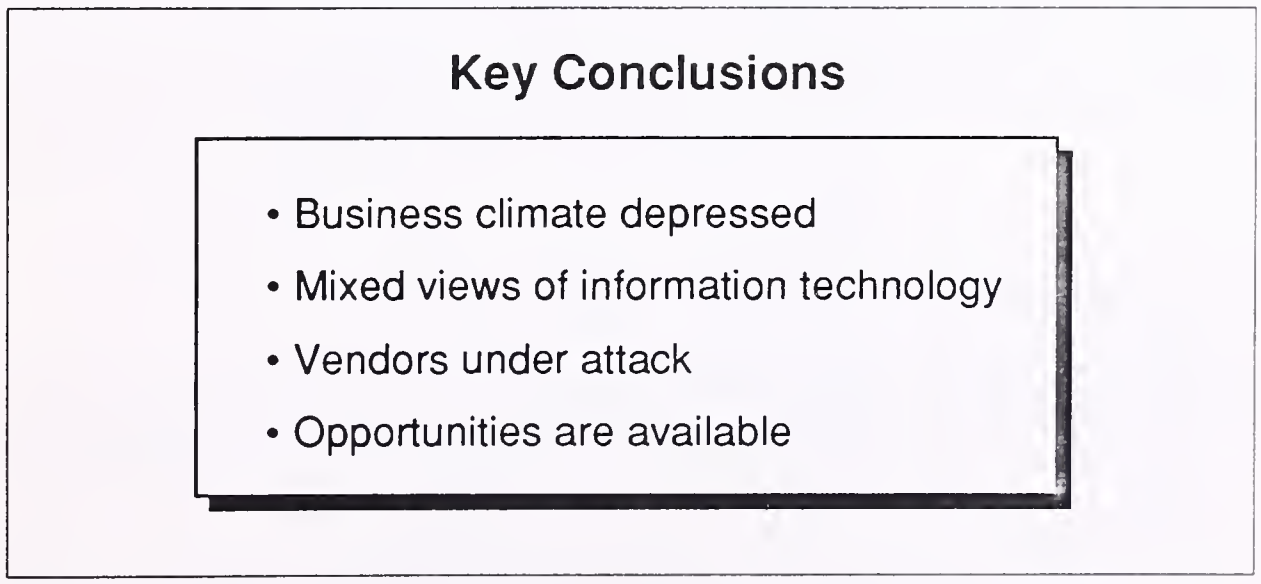
Some of these elements are currently impacting the market, but others are latent and are awaiting the proper mix of conditions that will make them come to the fore. In all cases, the market is dynamic and responsive to these forces.

This section provides the key conclusions and a number of recommendations intended to maximize the vendors' control over these forces.

A Conclusions

Exhibit XI-1 lists key conclusions from this research. No order of importance is intended since each has a greater or lesser role in any individual circumstance.

EXHIBIT XI-1



The economic and political climates have created an uncertain business climate. The recently begun recession promises to drag into 1991 and perhaps beyond, making customers' long-range planning efforts nearly impossible. The political climate is also creating doubts. As a result, company strategies about provincial, federal, and international participation come into conflict.

Within this climate are mixed views in Canadian corporations as to whether information technology is a blessing or a curse. For most companies, the issue is not whether information technology is important, but how important it is. One set of customers seems to be disillusioned that the promise of technology has not been realized within their companies. For these customers, nearly all aspects of information technology are under scrutiny: in-house vs. outside expenses, upgrades vs. maintenance, centralization vs. decentralization, etc.

For others, however, the advantage of information technology is clearly seen. For these companies, the only question is how to deploy information technology effectively. Interestingly, the aspects of scrutiny are the same, but the different reasons for the scrutiny require vastly different marketing approaches.

Not only are vendors under attack from customers, but also from a continuing U.S. invasion. At one time it was almost as if the Canadian vendors each had a safe niche and the size to defend it—a posture that was not typically necessary because the U.S. vendors had not focused on the opportunities of the Canadian market. Recently, however, U.S. vendors have started to play more of a role in the marketplace and to influence its direction, capture revenues, and threaten even the most entrenched players.

The good news is that there are opportunities for both Canadian and U.S. vendors. Customers show a willingness to respond to innovation and quality. Vendors that can provide unique products and services that meet specific application needs and are able to provide information services at a level of quality that meets rather high customer expectations are likely to be winners. In this view, the uncertainties of the climate and the disillusionment of information technology can be turned to the vendor's advantage.

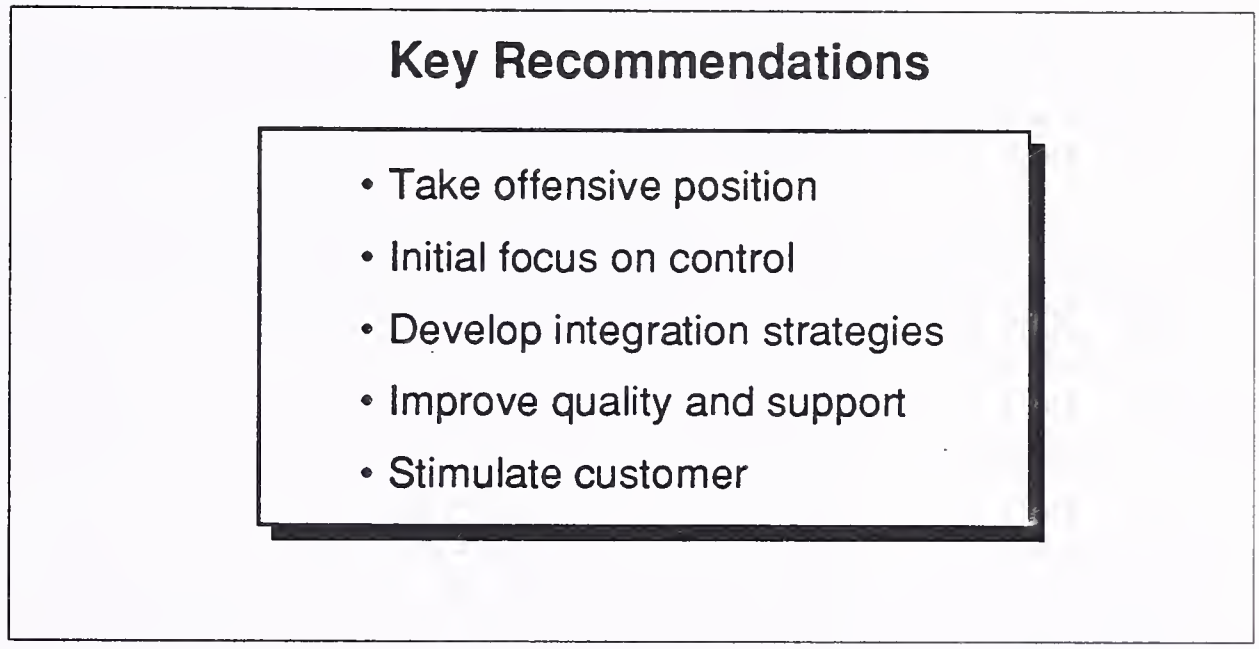
B

Recommendations

The recommendations in Exhibit XI-2 are intended as a general guide to maintaining and building a successful information services business within the current marketplace.

An uncertain climate creates a conservatism that generally leads to little or no growth through innovation throughout a down period.

EXHIBIT XI-2



However, it is during these periods that values are high relative to price. To invest now is a bold move but a move that could allow a vendor to steal a march on the competition. Customers, although short of dollars, have unmet needs and may be waiting for a vendor to work with them in unique arrangements. These arrangements may include discounts or even barter, but can lead to long-term commitments from customers who appreciate the vendor's sensitivity.

With many of the dollars for hardware and software leaving Canada, the impact on a trade deficit is significant. Canada, through government-sponsored programs, must renew its exploitation of technology by changing tax laws, increasing R&D expenditures, and increasing incentives for entrepreneurship.

The $1 billion technology fund through the Premier's Council is a start at supporting the necessary R&D effort. But vendors must also participate in improving their lot by fostering a knowledge and sensitivity within the investment community. The Phoenix Program also appears to be a viable plan. Vendors should encourage public and private sources to make these investments.

Because many of the country's businesses are concerned about the economic and political climate, now is the time to step forward with new solutions. To demonstrate the rewards of technology, vendors need to become more finely attuned to the business processes employed by customers and the aspects of these processes that might be improved by technology. It is this type of innovation that will be the key to competitive advantage rather than technology for its own sake. That is, vendors must first understand customers' business needs and then apply technology to those needs. Too often vendors seek to do just the opposite.

Senior management will be a key to growth through an aggressive strategy in all sectors. Short life cycles and growing competition require vendors to be constantly aware of customer requirements and changing marketing and distribution strategies. The growing presence of U.S. vendors brings into focus the style of Canadian vendors versus that of U.S. vendors. Canadians are relationship-oriented in their marketing whereas U.S. vendors take a more features-and-benefits stance.

There are indications that Canadian corporations are moving to a position where these latter issues may outweigh relationships. With many vendors seeking greater control over their accounts, notions of partnerships, alliances, and the like are frequent in U.S. companies. The net effect may be a better alignment of both the Canadian company's needs and the U.S. vendor's approaches to providing the solutions. Management of Canadian vendors must be sensitive to these changes and must plan and implement countermeasures.

One such change that represents an opportunity is the shift from a hardware-driven to a software-driven market. Although many vendors read this shift as an endorsement of open systems, it may be that proprietary systems will remain in place, leading to multitiered, multivendor environments. These environments will, in turn, give rise to a demand for products with interoperability and services that create or extend this connectivity across corporate departments and across hardware and software platforms. Vendors that are positioned to participate in multivendor environments will likely see significant opportunities.

There are other opportunities as well. Industry- and application-specific requirements were noted by the customers interviewed. Markets should be explored to develop a greater understanding of image processing, network management, and resource optimization.

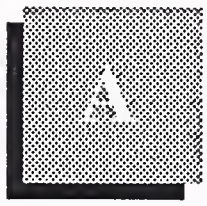
Above all, the market invites new approaches to vendor-customer and vendor-vendor relationships. Systems integration, for example, emerged as a delivery mode in recognition of company needs for new types of vendor-customer relationships. In the process, systems integration changed vendor-vendor relationships as well.

Now, some customers seem anxious to move to a new set of relationships that call for partnerships or alliances with vendors, even the merger of vendor and corporate information systems departments for strategic business thrusts. It is these relationships, rather than pure technology, that will likely win in the marketplace, both in the current tough times and in the long term.

The recession will impose a burden on vendors and users. Users, strapped for finances, will be increasingly interested in reducing short-term expenses. At the same time, vendors are interested in continuing growth during a down cycle.

The recession not withstanding, the Canadian market is poised for growth. Vendors that can assist companies in realizing documentable benefits can expect to realize significant growth of their own over the next five years.

Appendixes



Definition of Terms

A
Overall Definitions and Analytical Framework

Information Services - Computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Processing of specific applications using vendor-provided systems (called **Processing Services**)

- A combination of hardware, packaged software and associated support services which will meet a specific application processing need (called **Turnkey Systems**)

- Packaged software (called **Software Products**)

- People services that support users in developing and operating their own information systems (called **Professional Services**)

- Bundled combinations of products and services where the vendor assumes responsibility for the development of a custom solution to an information system problem (called **Systems Integration**)

- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called **Systems Operations**)

- Services associated with the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange, on-line data bases, on-line news and data feeds, videotex, etc. (called **Network Services**)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is bundled as part of an overall service offering such as a turnkey system, a systems operations contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., EDI or VAN services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the **Information Services Industry** consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels, and competitive issues.

All **Information Services Market** forecasts are estimates of **User Expenditures** for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)

- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

Market Sectors or markets, are groupings or categories of the users who purchase information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc.

- *Functional Application* markets, such as Human Resources, Accounting, etc. These are also called "Cross-Industry" markets.

- *Generic* markets, which are neither industry- nor application-specific, such as the market for systems software.

Specific market sectors used by INPUT are defined in Section D, below.

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Non-captive Information Services User Expenditures are expenditures that go to vendors which have a different parent corporation than the user. It is these expenditures which constitute the information services market.

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the eight delivery modes defined by INPUT, five are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*

The remaining three delivery modes represent combinations of these products and services, bundled together with equipment, management and/or other services:

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

Section B describes the delivery modes and their structure in more detail.

Outsourcing is defined as the contracting of information systems (IS) functions to outside vendors. Outsourcing should be viewed as the opposite of *insourcing*: anything that IS management has considered feasible to do internally (e.g., data center operations, applications development and maintenance, network management, training, etc.) is a potential candidate for outsourcing.

IS has always bought systems software, as it is infeasible for companies to develop it internally. However, all other delivery modes represent functions or products that IS management could choose to perform or develop in-house. Viewed this way, outsourcing is the result of a make-or-buy decision, and the outsourcing market covers any product or service where the vendor must compete against the client firm's own internal resources.

B

Industry Structure and Delivery Modes

1. Service Categories

The following exhibit presents the structure of the information services industry. Several of the delivery modes can be grouped into higher-level **Service Categories**, based on the kind of problem the user needs to solve. These categories are:

- **Business Application Solutions (BAS)** - prepackaged or standard solutions to common business applications. These applications can be either industry-specific (e.g., mortgage loan processing for a bank), cross-industry (e.g., payroll processing), or generic (e.g., utility timesharing). In general, BAS services involve minimal customization by the vendor, and allow the user to handle a specific business application without having to develop or acquire a custom system or system resources. The following delivery modes are included under BAS:

  - *Processing Services*
  - *Applications Software Products*
  - *Turnkey Systems*

- **Systems Management Services (SMS)** - services which assist users in developing systems or operating/managing the information systems function. Two key elements of SMS are the customization of the service to each individual user and/or project, and the potential for the vendor to assume significant responsibility for management of at least a portion of the user's information systems function. The following delivery modes are included under SMS:

  - *Systems Operations*
  - *Systems Integration*

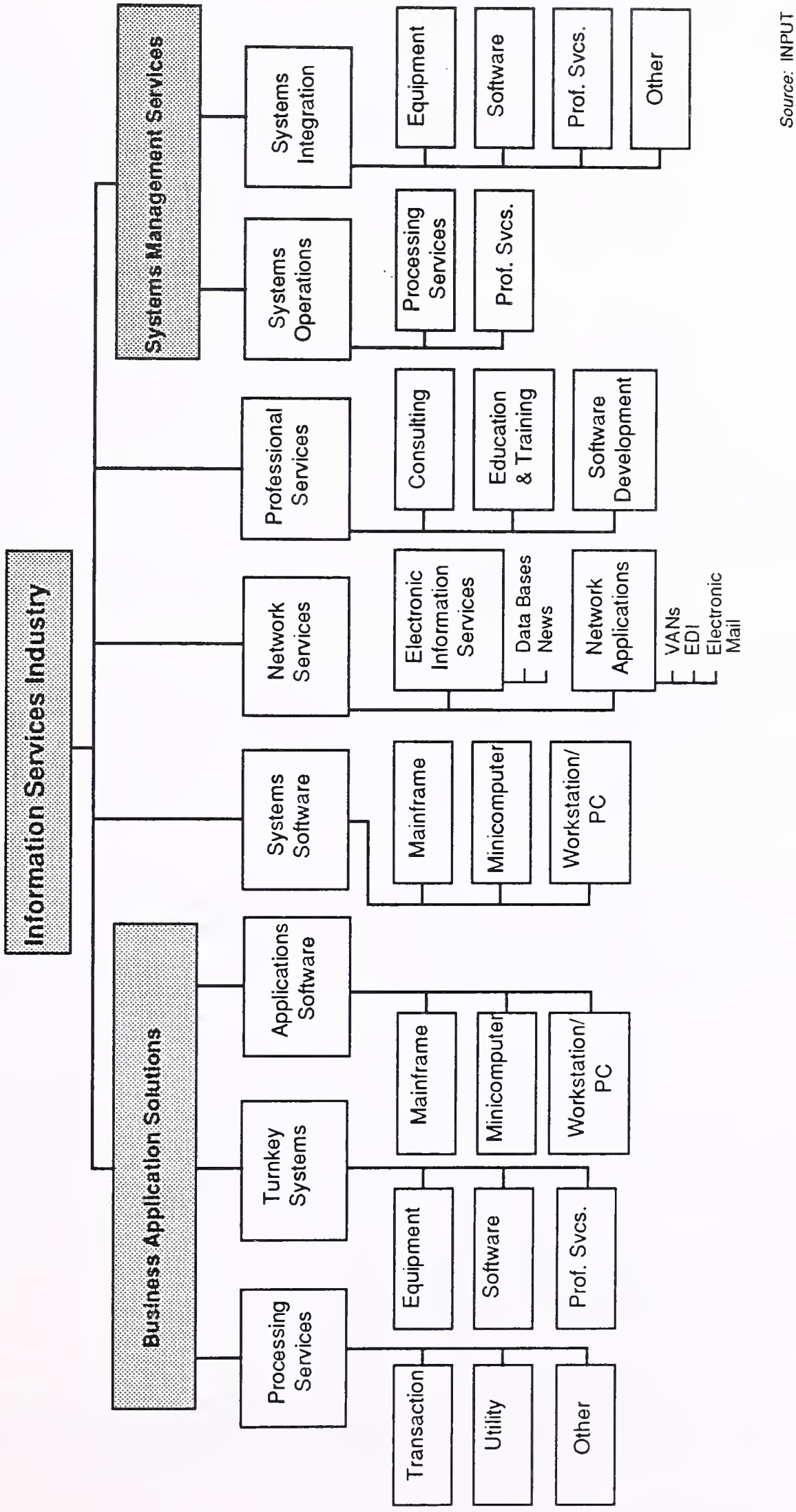
Each of the remaining three delivery modes represents a separate service category:

- *Professional Services*
- *Network Services*
- *System Software Products*

Note: These service categories are a new concept introduced in the 1990 MAP Program. They are purely an aggregation of lower level delivery mode data. They do not change the underlying delivery modes or industry structure.

EXHIBIT A-1

Information Services Industry Structure—1990



Source: INPUT

2. Software Products

There are many similarities between the applications and systems software delivery modes. Both involve user purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if bundled in the software pricing, is also included here.

Expenditures for work performed by organizations other than the package vendor are counted in the category of professional services. Fees for work related to education, consulting, and/or custom modification of software products are counted as professional services, provided such fees are charged separately from the price of the software product itself.

- **Systems Software Products**

  Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. These products include:

  - *Systems Control Products* - Software programs that function during application program execution to manage computer system resources and control the execution of the application program. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

  - *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

  - *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids. Also included are system utilities (e.g., sorts) which are directly invoked by an applications program.

- **Application Software Products**

  - *Industry-Specific Application Software Products* - Software products that perform functions related to solving business or organizational needs unique to a specific vertical market and sold to that market

only. Examples include demand deposit accounting, MRPII, medical recordkeeping, automobile dealer parts inventory, etc.

- *Cross-Industry Application Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Applications include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

3. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged or custom application software into a single system developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and support services provided. Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

Hardware vendors that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers.

- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually application software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such as professional services.

Turnkey systems are divided into two categories.

- *Industry-Specific Systems* - systems that serve a specific function for a given industry sector, such as automobile dealer parts inventory, medical recordkeeping, or discrete manufacturing control systems.

- *Cross-Industry Systems* - systems that provide a specific function that is applicable to a wide range of industry sectors, such as financial planning systems, payroll systems, or personnel management systems.

4. Processing Services

This category includes transaction processing, utility processing, and other processing services.

- *Transaction Processing:* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at vendor site or customer site, to process transactions and update client data bases. Transactions may be entered in one of four modes:

  - *Interactive* - Characterized by the interaction of the user with the system for data entry, transaction processing, problem solving and report preparation: the user is on-line to the programs/files stored on the vendor's system.

  - *Remote Batch* - Where the user transmits batches of transaction data to the vendor's system, allowing the vendor to schedule job execution according to overall client priorities and resource requirements.

  - *Distributed Services* - Where users maintain portions of an application data base and enter or process some transaction data at their own site, while also being connected through communications networks to the vendor's central systems for processing other parts of the application.

  - *Carry-in Batch* - Where users physically deliver work to a processing services vendor.

- *Utility Processing*: Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), generic applications programs and or data bases, enabling clients to develop their own programs or process data on vendor's system.

- *Other Processing Services*: Vendor provides services—usually at vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

5. Systems Operations

Systems operations involves the operation and management of all or a significant part of the user's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes:

- *Professional Services:* The vendor provides personnel to operate client-supplied equipment. Prior to 1990, this was a submode of the Professional Services delivery mode.

- *Processing Services:* The vendor provides personnel, equipment and (optionally) facilities. Prior to 1990, this was a submode of the Processing Services delivery mode.

In the federal government market the processing services submode is called "COCO" (Contractor-Owned, Contractor-Operated), and the professional services mode is referred to as "GOCO" (Government-Owned, Contractor-Operated).

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the user's information systems (equipment, networks, systems and/or application software), either at the client's site or the vendor's site. Systems operations can also be referred to as "resource management" or "facilities management."

There are two general levels of systems operations:

- *Platform/network operations* - where the vendor operates the computer system and/or network without taking responsibility for the applications

- *Application operations* - where the vendor takes responsibility for the complete system, including equipment, associated telecommunications networks, and applications software

Note: Systems Operations is a new delivery mode introduced in the 1990 MAP Program. It was created by taking the Systems Operations submode out of both Processing Services and Professional Services. No other change has been made to the delivery mode definitions, and the total forecast expenditures for these three delivery modes are identical to the total forecast expenditures of the two original modes before the breakout of Systems Operations.

6. Systems Integration (SI)

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

To be included in the information services market, systems integration projects must involve some application processing component. In addition, the majority of cost must be associated with information systems products and/or services.

The systems integrator will perform, or manage others who perform, most or all of the following functions:

- Program management, including subcontractor management
- Needs analysis
- Specification development
- Conceptual and detailed systems design and architecture
- System component selection, modification, integration and customization
- Custom software design and development
- Custom hardware design and development
- Systems implementation, including testing, conversion and post-implementation evaluation and tuning
- Life cycle support, including
  - System documentation and user training
  - Systems operations during development
  - Systems maintenance
- Financing

7. Professional Services

This category includes consulting, education and training, and software development.

- *Consulting:* Services include management consulting (related to information systems), information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of information systems, including equipment, software, networks and systems operations.

- *Education and Training:* Products and services related to information systems and services for the professional and end user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation.

- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

8. Network Services

Network services typically include a wide variety of network-based functions and operations. Their common thread is that most of these functions could not be performed without network involvement. Network services is divided into two major segments: *Electronic Information Services,* which involve selling information to the user, and *Network Applications,* which involve providing some form of enhanced transport service in support of a user's information processing needs.

- *Electronic Information Services*

  Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers. Users typically inquire into and extract information from the data bases. Although users may load extracted data into their own computer systems, the electronic information vendor provides no data processing or manipulation capability and the users cannot update the vendor's data bases.

  The two kinds of electronic information services are:

  - *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

  - *News Services* - Unstructured, primarily textual information on people, companies, events, etc.

  While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

- *Network Applications*

  - *Value-Added Network Services (VAN Services)* - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

    While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Mean-

while, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

INPUT's market definition covers VAN services only, but includes the VAN revenues of all types of carriers.

- *Electronic Data Interchange (EDI)* - Application-to-application exchange of standardized business documents between trade partners or facilitators. This exchange is commonly performed using VAN services. Specialized translation software is typically employed to convert data from organizations' internal file formats to EDI interchange standards; this software may be provided as part of the VAN service, or may be resident on the organization's own computers.

- *Electronic Information Exchange (EIE)* - Also known as Electronic Mail (E-Mail), EIE involves the transmission of messages across an electronic network managed by a services vendor, including facsimile transmission (FAX), voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

- *Other Network Services* - This segment contains videotex and pure network management services. Videotex is actually more a delivery mode than an application. Its prime focus is on the individual as a consumer or in business. These services provide interactive access to data bases and offer the inquirer the capability to send as well as receive information for such purposes as home shopping, home banking, travel reservations, and more.

  Network management services included here must involve the vendor's network and network management systems as well as people. People-only services, or services that involve the management of networks as part of the broader task of managing a user's information processing functions are included in Systems Operations.

B

Respondent Profile

A

User Profile

EXHIBIT B-1

User Respondent Profile

	Percent of Respondents
• Division/Department	
- DP/MIS	82
- User Organization	12
- Unknown	6
• Title	
- Director/Executive	58
- Manager/Supervisor	36
- Unknown	6
• Primary Industry	
- Manufacturing	34
- Insurance	20
- Banking/Finance	10
- Government	10
- Services	8
- Utilities	6
- Other	12

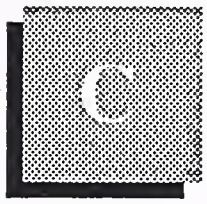
B

Vendor Profile

EXHIBIT B-2

Vendor Respondent Profile

	Percent of Respondents
• Title	
- Executive Officer	67
- Marketing Director/Manager	25
- Strategic Support Manager	8
- Total	100
• Target Industry Segment	
- Government	82
- Banking/Finance	64
- Manufacturing	55
- Insurance	55
- Communications	50
- Cross-Industry	50
- Transportation	45
- Distribution	45
- Utilities	41
- Medical	36
- Education	36
- Services	32



Forecast Data Base

EXHIBIT C-1 **Information Services Industry User Expenditure Forecast by Deliver Mode, 1990-1995**

Delivery Modes	1989	Growth 89-90 (%)	1990	1991	1992	1993	1994	1995	CAGR 90-95 (%)
Total Canada Information Services Market	3,559	11	3,968	4,420	4,939	5,563	6,323	7,199	13
Processing Services	603	5	636	671	707	745	786	830	5
- Transaction Processing Services	362	6	384	407	431	457	484	514	6
- Utility Processing	210	5	221	232	243	255	268	281	5
- Other Processing	31	1	31	32	33	33	34	35	2
Network/Electronic Information Services	150	19	179	210	247	293	348	413	18
- Electronic Information Services	57	16	66	76	88	102	119	138	16
- Network Applications	93	22	113	134	159	191	229	275	19
Application Software Products	545	15	627	722	830	957	1,102	1,270	15
- Mainframe	311	13	351	394	441	494	553	619	12
- Minicomputer	185	17	216	255	301	356	420	495	18
-Workstation/PC	49	23	60	73	88	107	129	156	21
Systems Software	425	9	464	512	565	621	687	759	10
- Mainframe	302	8	326	356	388	422	460	502	9
- Minicomputer	98	10	108	120	133	147	164	182	11
-Workstation/PC	25	21	30	36	44	52	63	75	20
Turnkey Systems	280	3	288	305	325	346	370	396	7
- Equipment	98	1	99	102	105	108	111	115	3
- Software	154	3	159	171	185	200	216	233	8
- Professional Services	28	6	30	32	35	38	43	48	10
Systems Integration	540	12	606	685	778	892	1,033	1,195	15
- Equipment	232	10	255	286	320	362	409	462	13
- Software	103	12	115	130	149	169	193	220	14
- Professional Services	178	16	206	235	271	319	389	460	17
- Other Services	27	12	30	34	38	42	48	53	12
Systems Operations	191	15	219	250	288	333	391	461	16
- Processing Services	143	14	163	186	214	248	290	342	16
- Professional Services	48	16	56	64	74	85	101	119	16
Professional Services	825	15	949	1,065	1,199	1,376	1,606	1,875	15
- Consulting	289	15	332	376	428	497	586	692	16
- Software Development	396	15	455	510	571	651	755	876	14
- Education & Training	140	16	162	179	200	228	265	307	14

D

Forecast Comparison—Canadian to Worldwide Market Forecast

EXHIBIT D-1

Delivery Mode	1988 Mkt.[1]	1988 Mkt.[2]	1989 Fcst.[3]	1989 Mkt.[4]	Diff.
Total Market	2,904	3,485	3,938	3,559	(399)
Processing Services	461	553	586	603	17
Network/EIS	75	90	107	150	43
Application Software	450	540	621	545	(76)
Systems Software	437	524	571	425	(146)
Turnkey Systems	216	259	267	280	13
Systems Integration	496	595	672	540	(132)
Professional Services	769	923	1,061	825	(236)
Systems Operations	N/A	N/A	N/A	191	-

1) 1988 market in U.S. dollars as reported in worldwide report
2) 1988 market data converted to Canadian dollars at 1.20
3) 1989 forecast, revised to reflect reduced growth rates (13% versus 20%)
4) 1989 market, as reported in 1990
5) For purposes of comparison, processing services and professional services submodes of systems operations have been included with their previous delivery modes. In 1990, systems operations was established as a separate delivery mode. As a result, data do not add to total.