WORLDWIDE INFORMATION SERVICES FORECAST

1992 - 1997

INPUT

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Worldwide Information Services Forecast
Latin America—1992-1997

MAW92 • 426 • 1992

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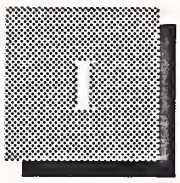


Introduction

This is the fourth worldwide information services forecast published by INPUT. The first covered the period 1989-1994; this fourth version covers 1992-1997.

In 1992, the worldwide information services and software products market approached the $265 billion (U.S. dollars) level. This market continues to outgrow the rate of economic growth in essentially all geographic areas covered by this report. Strong growth and an increasingly international orientation to the information services market suggest that all vendors, large and small, need an appreciation for the worldwide market, as well as for their current geographic areas of emphasis.

As in 1991, 1992 performance was impacted by the general recessionary economic environment. It continued to suppress expenditures in North America and Europe and had a significant impact in Japan as well. There appears to be a slight turnaround in the economic situation as the end of 1992 approaches. However, some effects are bound to linger into 1993.

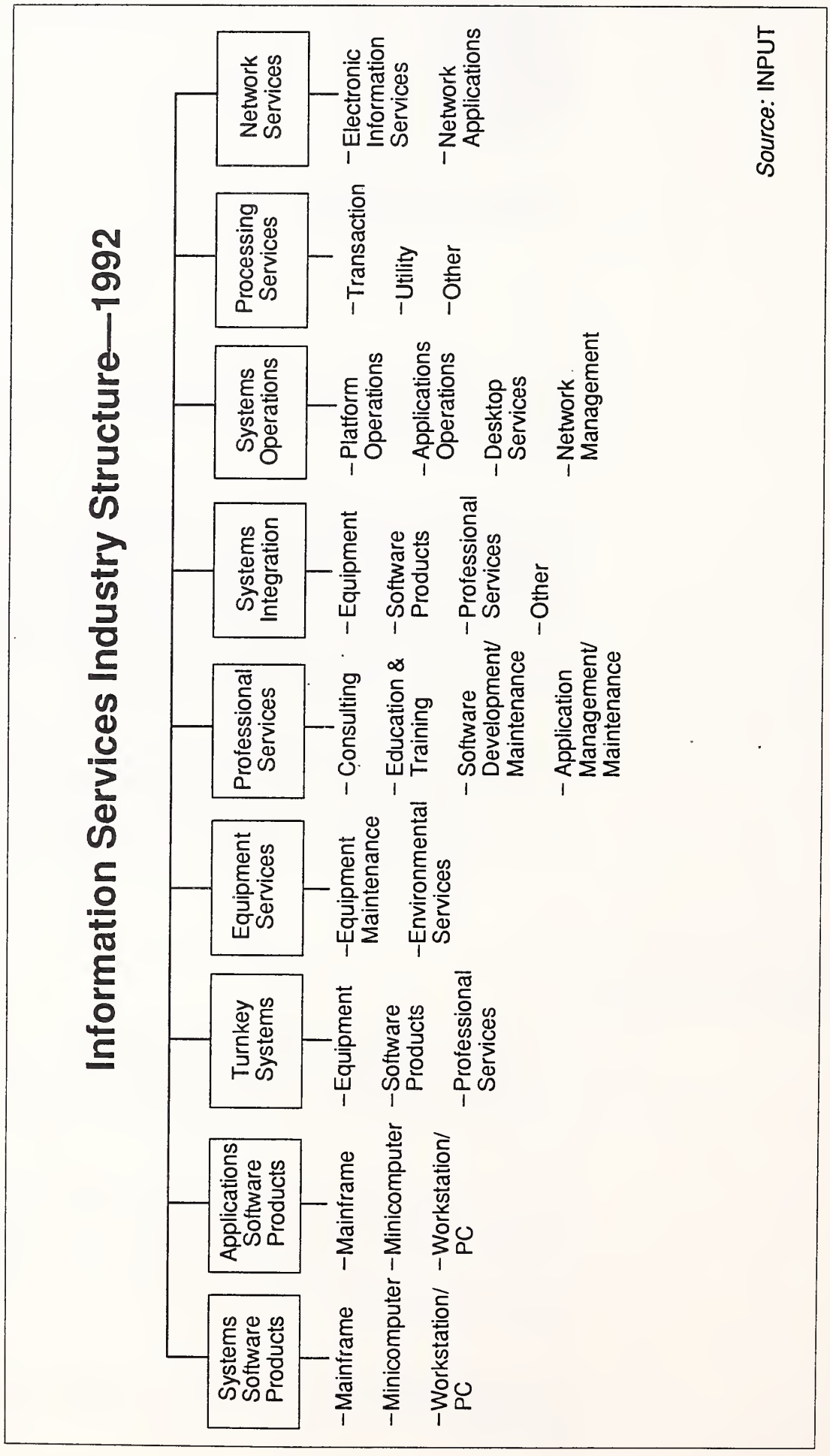
A
Purpose and Scope

The purpose of this report is to identify the global market for information services, key trends that are causing the market to grow, key national developments, and major obstacles to entry or expansion into a foreign market.

The research conducted for this report included extensive primary and secondary research. It draws upon INPUT's 16-year tradition of forecasting the U.S. and European information services markets and its new focus on, and ever-expanding coverage of, worldwide information services market opportunities.

The forecast and analysis contained in this report are based on INPUT's standard information services industry structure as presented in Exhibit I-1.

EXHIBIT I-1



Appendix A provides complete definitions of the delivery modes and submodes used by INPUT as well as other terms.

In 1991 INPUT made one change in the information services industry structure. That was to redefine the submodes of the newest delivery mode and systems operations. Please refer to Appendix A for a more complete description. The new submodes added are as follows:

- Platform systems operations—where the vendor provides only data center operation and network operations services
- Applications systems operations—where the vendor assumes responsibility for applications management in addition to data center operations services and includes either or both applications maintenance and new systems development services on a long-term, contractual basis.

In 1992 additional changes were made to systems operations to reflect a further refinement in that market. They were the addition of two new submodes, desktop services and network management. With the exception of the European and North American markets, systems operations as a market hasn't evolved to the point where it is possible to accurately estimate these new submodes. For purposes of this report, the 1991 submode definitions were applied to all world regions except North America and Europe. This difference in definitions does nothing to impact the totals for the systems operations market by region or country.

In addition, a new submode called applications management was added to the professional services delivery mode. A similar convention was adopted for reporting the new submode in North America and Europe, but ignoring the further refinement on other world regions. Again, there is no impact at the professional services market level.

B
Methodology

Primary and secondary research were conducted for 30 countries and geographic areas of the world, including those in the following list.

- New direct interviews were conducted in Latin America including the second direct research in Chile.
- New direct interviews were conducted in numerous countries in the Asia/Pacific region.
- A more careful assessment was made of the Eastern European market as it undergoes major structural change.
- East and West Germany were combined in the 1990 report.

The countries in which research has been performed for the worldwide forecast include the following:

- Africa
- Australia
- Argentina
- Belgium
- Brazil
- Canada
- Chile
- Denmark
- Eastern Europe
- Finland
- France
- Germany
- Greece
- Hong Kong
- Ireland
- Italy
- Japan
- Korea (South)
- Mexico
- Middle East
- Netherlands
- New Zealand
- Norway
- Other Asia
- Other Latin America
- Other Western Europe
- Portugal
- Singapore
- Spain
- Sweden
- Switzerland
- Taiwan
- United Kingdom
- United States
- Venezuela

1. Research/Analysis Methodology

Research for the report included a review of published data to identify key national and regional activities and trends. The research process also included extensive primary research. Key elements of the research included the following:

- Research drawn from INPUT's U.S. and European market analysis programs

- An in-depth assessment of the Canadian market conducted in 1992
- New primary research from INPUT's affiliates in Japan and South Korea and India
- New direct interviews with active information services vendors in one or more countries outside Europe and North America
- An extensive review of background data about the economic and service environment in countries throughout the world
- Review and assessment of economic and business trends that could affect the growth of the information services business
- In addition to the primary research, the International Trade Administration (ITA) of the U.S. Department of Commerce was contacted to obtain available information about information services markets in countries throughout the world. Data from the ITA was used as a cross-reference for data derived from INPUT's research. ITA information was also used as a means of identifying patterns in development or difficulties in market entry.

2. Forecasts and Inflation

In recognition of the volatility of inflation rates in many areas of the world, and to provide a basis for comparing market share and growth, forecasts have been prepared using current U.S. dollars.

To obtain specific data for local (non-U.S.) markets, currency conversion rates from Appendix C can be applied. Using local currency, information about projected growth in GDP, and changes in consumer prices, local market forecasts can be made.

Note that the availability of economic growth and inflation data varies considerably. Appendix D provides a compendium of economic assumptions used in INPUT market projections during 1992.

Note that some revenue data has been rounded for display in the exhibits. As a result, calculation of a CAGR (compound annual growth rate) based on exhibit revenue data could vary from the market data bases provided for the worldwide, regional, and country or area markets. In addition, the numbers in the detailed forecast tables may not add due to rounding.

C
Report Structure

1. Report Organization

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

- Chapter II is a worldwide summary.

- Chapter III is a regional summary for the Asia/Pacific area. For the purpose of the report, Asia/Pacific includes the geographic area from Japan to New Zealand, and from the Pacific Rim to Pakistan.

- Chapter IV is a regional summary for Europe. The European summary includes information derived from INPUT's annual research into the European information services market. This is supplemented by research into other Western and Eastern European countries. For the purpose of this report, Eastern Europe includes the former countries of the USSR and countries considered part of the "Eastern Bloc."

- Chapter V is a regional summary for Latin America. For the purpose of this report, Latin America includes Mexico and the countries of Central America, South America, and the Caribbean.

- Chapter VI is a regional summary for the Middle East and Africa. The Middle East/Africa region includes all the countries of Africa, and countries generally considered part of the Middle East. For the purpose of this report, Turkey is considered part of the Middle East, and Greece is considered part of Europe. No individual country profiles have been developed to date for this region, which represents less than 1% of the worldwide information services market.

- Chapter VII is a regional summary for North America. The North American summary includes information derived from INPUT's annual research into the U.S. information services industry, combined with research on the Canadian market.

- Chapter VIII comprises brief introductions followed by twenty-nine (29) sections. Each section represents a country or geographic area covered in the research.

  The country/geographic area sections generally include the following information:

  - Introduction
  - Key technology trends
  - Driving and inhibiting forces

- Leading vendors
- Services forecast
- Market entry/expansion considerations

- Chapter IX provides conclusions about the international market for information services and recommendations for being successful in the international marketplace.

- Appendix A contains INPUT definitions.

- Appendix B contains the market forecast data base tables for the worldwide and regional forecasts. The country tables are in Chapter VIII with each country profile.

- Appendix C contains currency conversion factors.

- Appendix D contains economic assumptions.

2. Data Diskette

Included with the bound report is a diskette containing a file for each of the forecast tables in the worldwide information services forecast for 1992-1997.

The names of the files are provided in Exhibit I-2.

The diskette is IBM PC compatible and is formatted in low density. The files are in a standard Lotus 1-2-3 format and do not include any underlying formulas. Each file contains a print range labeled "**PRINT**" and is set up to print in condensed format on a laser printer.

Note that separate files have been provided for Ireland, Greece, and Portugal, which are included in the Other Europe profile and for Western Europe, which excludes the Eastern Europe forecast.

EXHIBIT I-2

Worldwide Information Services Forecast, 1992-1997 Data Diskette Contents

Description	File Name
Worldwide Files	
Worldwide Summary by Region	WWREG1.WK1
Worldwide Summary by Delivery Mode	WWDM1.WK1
Worldwide Processing Services	WWPROC1.WK1
Worldwide Turnkey Systems	WWTURN1.WK1
Worldwide Applications Software Products	WWAPPL1.WK1
Worldwide Systems Operations	WWSO1.WK1
Worldwide Systems Integration	WWSI1.WK1
Worldwide Professional Services	WWPROF1.WK1
Worldwide Network Services	WWNET1.WK1
Worldwide Systems Software Products	WWSYS1.WK1
Region Files	
Asia/Pacific by Delivery Mode	ASIA1.WK1
Europe by Delivery Mode	EUROPE1.WK1
Latin America by Delivery Mode	LATIN1.WK1
Middle East/Africa by Delivery Mode	MEAFR1.WK1
North America by Delivery Mode	NA1.WK1
Country Files	
Argentina	ARGENT1.WK1
Australia	AUSTRA1.WK1
Austria	AUSTRIA1.WK1
Belgium	BELGIUN1.WK1
Brazil	BRAZIL1.WK1
Canada	CANADA1.WK1

EXHIBIT I-2 (CON'T)

Worldwide Information Services Forecast, 1992-1997 Data Diskette Contents

Description	File Name
Country Files (Cont.)	
Denmark	DENMARK1.WK1
Eastern Europe	E-EUROP1.WK1
Finland	FINLAND1.WK1
France	FRANCE1.WK1
Germany	GERMANY1.wk1
Greece	GREECE1.WK1
Hong Kong	HNGKNG1.WK1
India	INDIA1.WK1
Ireland	IRELAND1.WK1
Italy	ITALY1.WK1
Japan	JAPAN1.WK1
Mexico	MEXICO1.WK1
Netherlands	NETHER1.WK1
New Zealand	NEWZEAL1.WK1
Norway	NORWAY1.WK1
Other Asia/Pacific	O-ASIA1.WK1
Other Latin America	O-LATIN1.WK1
Portugal	PORTUG1.Wk1
Singapore	SING1.WK1
South Korea	SKOREA1.WK1
Spain	SPAIN1.WK1
Switzerland	SWITZER1.WK1
Taiwan	TAIWAN1.WK1
United Kingdom	UK1.WK1
United States	US1.WK1
Venezuela	VENE1.WK1
Western Europe	W-EUROP1.WK1

D
Related Reports

Other INPUT reports related to the Worldwide Market Forecast include the following:

- U.S. *Application Solutions Market, 1992-1997*
- *U.S. Processing Services Market, 1992-1997*
- *U.S. Professional Services Market, 1992-1997*
- *U.S. Network Services Market, 1992-1997*
- *U.S. Systems Operations Market, 1992-1997*
- *U.S. Systems Integration Market, 1992-1997*
- *U.S. Systems Software Products Market, 1992-1997*
- *Canadian Services Market, 1992-1997*
- *Western European Application Solutions Market, 1992-1997*
- *Western European Processing Services Market, 1992-1997*
- *Western European Professional Services Market, 1992-1997*
- *Western European Network Services Market, 1992-1997*
- *Western European Systems Operations Market, 1992-1997*
- *Western European Systems Integration Market, 1992-1997*
- *Western European Systems Software Products Market, 1992-1997*

II

Regional Summary—Latin America

A
Regional Overview

After spending the 1980s deeply in debt and largely underdeveloped, Latin America is beginning to modernize and is positioning itself finally as a desirable trading partner for North America and Europe. Through a series of austerity, or "shock", programs and privatization initiatives, many Latin American governments are trimming the fat from their infrastructures, better managing finance and debt issues, and providing appealing inroads for foreign capital investment and technology.

In the 1990s, Latin American countries have renegotiated with their creditors to spread payments on their nearly $400 billion debt into easier terms. With this breathing room, Latin America is considered the United State's fastest growing export market. In 1991, 400 million Latin Americans bought $58 billion worth of American-made goods and services, an 18% increase over 1990. In 1992, this figure reached approximately $68 billion. These figures represent how effectively Latin American leaders have loosened protectivist import regulations and lowered restrictive tariffs. American companies now have more freedom, and are currently shipping Latin Americans capital goods ranging from heavy equipment, like bulldozers, to personal computers.

However, many countries are still burdened by high debt and a low economic base; therefore, prospects for the region over the next several years are cautiously optimistic. A number of countries are continuing to address their debt problems with austerity programs, and a number have begun to structure policies intended to stimulate investment. In addition, there is a general trend toward more open trade regulation, making importation of information technology products somewhat easier. Several of the more developed countries are also proceeding with much needed improvements to their aged and ailing telecommunications infrastructures.

Latin American countries can be divided into two groups:

- The first group includes Argentina, Brazil, Mexico, Panama, Uruguay, Chile and Venezuela, which have the highest per capita GNP in the area and some record of economic development and growth.

- The second group includes the remainder of the countries of the area, which have low income per capita and generally unstable governmental and political environments.

The information services market can also be divided into these groups. Each of the five developing countries has established information services industries with locally-based companies and representation by the leading computer manufacturers. They offer real market opportunities, although not without significant challenge; the second category offers less opportunity.

Even though positive changes are expected in Latin America, they will come slowly throughout the decade. Modest growth will be achieved in a number of countries if the world economy remains stable. This is currently being hampered by the general recessionary economies of the major industrialized countries in Europe, North America and Japan. Severe downturns in the world economy would have adverse effects on many of the Latin American countries, slowing their development of successful information services markets. If Latin America backslides, the economic superpowers can expect the migration, political upheaval, debt default and ecological devastation, which have occurred frequently in these countries in the past, to return with a vengeance.

As occurs in more developed countries, there are information services opportunities, and the IS market generally outgrows the local economy in Latin America. In the long term, there could prove to be major opportunities in the larger countries, given their populations and potential industrialization. These will primarily be software and professional services.

1. Driving Forces

Although the technological base is relatively small in the majority of the countries, there are a number of forces beginning to cause change. Many of them represent opportunities for information services vendors.

- *Training/Education* - Most countries identify the low level of education as a key contributor to the lack of industrial development. As a result, many countries have instituted national education and training programs, with emphasis on the use of technology. This is a significant and long-term opportunity for professional services companies to provide information technology training.

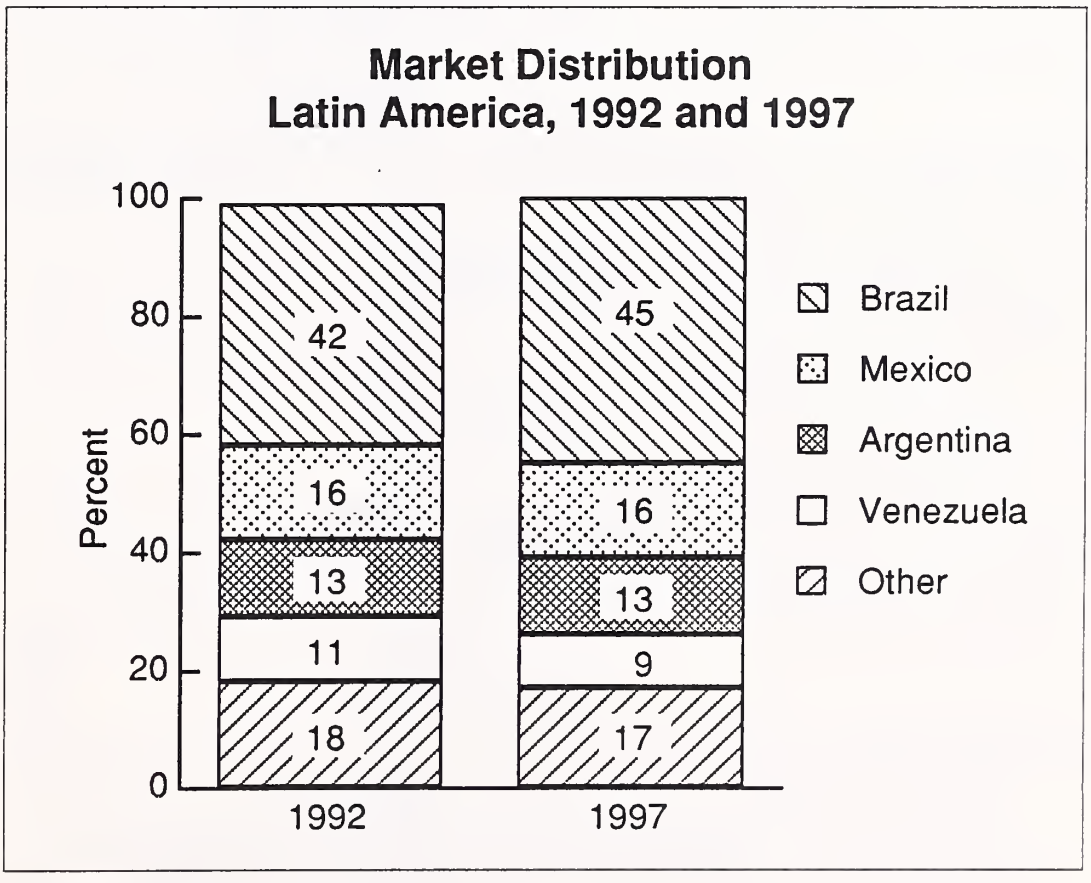
This growth rate, however, is almost twice that in the U.S. and rivals those of Europe and Japan. Although the market is small, economic stabilization should generate a market of adequate size and real interest throughout the 1990s.

Latin America could become a significant fast-growth market by the middle of the decade if the economic situation is finally brought into reasonable balance.

Governments in the key countries (Argentina, Brazil, Mexico and Venezuela) recognize the value of technology, but have been burdened with conflicting financial priorities and have been unable to make necessary investments. Efforts to stabilize the economy include paying dividends and permitting governments of the larger countries to remove regulation and tariffs. INPUT expects the positive direction to continue.

Within the region, the market distribution is not expected to change significantly over the five-year period. Brazil, which currently has an estimated 42% of the market as Exhibit II-2 shows, will maintain its lead.

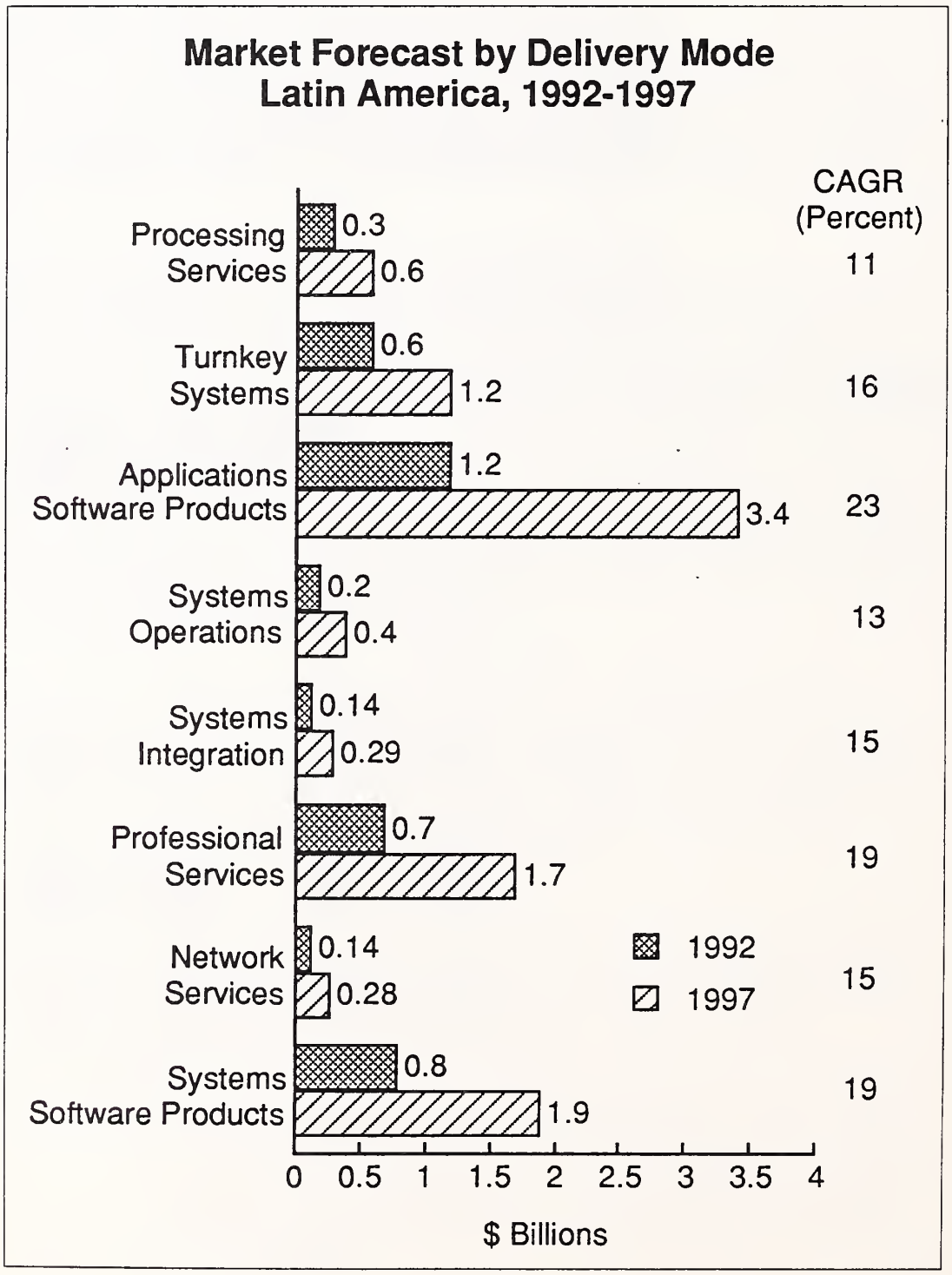
EXHIBIT II-2



Of note in the distribution figures is that the 'other' category represents less than 20% of the market, but nearly 90% of the countries (including the Caribbean). Little is expected to change over the next five years. The only other market that is or will become of attractive size is that of Chile.

A review of the projections by delivery mode in the Latin American market reflects a somewhat different picture than is found in the U.S. or other regions, as illustrated by Exhibit II-3.

EXHIBIT II-3



- *Processing services* - Processing services is less than 8% of the market and is expected to grow just slightly over half as fast as the market in total. Given the economic attractiveness of processing services for specialized applications, there could be some improvement in this situation as the general use of computing increases, and telecommunications facilities improve to the point from which reliable on-line transaction processing services become more viable.

- *Turnkey systems* - Although a small market ($0.6 billion in 1992), turnkey systems are expected to grow at a rate of 16% to $1.2 billion in 1997. The increasing availability of powerful personal computers and full-feature PC- and LAN-based applications provides the tools to expand this market at an even greater rate. In the underdeveloped markets, turnkey solutions in native languages should become very affordable as the economies improve.

- *Applications software products* - The market for applications software products is a bright spot in Latin America. It represents the largest delivery mode, at $1.2 billion in 1992 —almost 30%— and should see the strongest growth (23% CAGR) to reach $3.4 billion in 1997. With an inadequate base of computer professionals, the easiest alternative is to turn to packaged solutions. Of course, they must operate in the native, not English.

- *Systems operations* - Systems operations represent a modest market and opportunity, although it is almost as large as processing services. There are not enough large companies that require the broad, full-service approach represented by systems operations. A market of $0.2 billion should reach $0.4 billion by 1997. In general, the same vendors provide processing and systems operations services, which are less clearly differentiated than in the larger markets of Europe and North America.

- *Systems integration* - The market for systems integration services is expected to remain small for some time. Most countries do not have a large enough industrial base to support a systems integration market, and buyers and vendors may lack the sophistication required to manage the systems integration relationship. The preference for traditional professional services will remain for some time.

- *Professional services* - Growth in professional services is expected to be strong, with a 19% CAGR. The lack of adequately skilled computer professionals places a premium on the services of locally based and internationally affiliated professional services firms. If they can continue the development of qualified staff, then there is reason to believe

that their growth rates can exceed the projected 19% growth rate. The 1992 market of $0.7 billion should reach $1.7 billion in 1997. In many ways, professional services firms offer the best opportunity for these economies to gain through the use of information technology. There is inadequate time and resources to develop skills internally in the immediate term, suggesting that the government and major industrial firms must turn to either locally or internationally based firms.

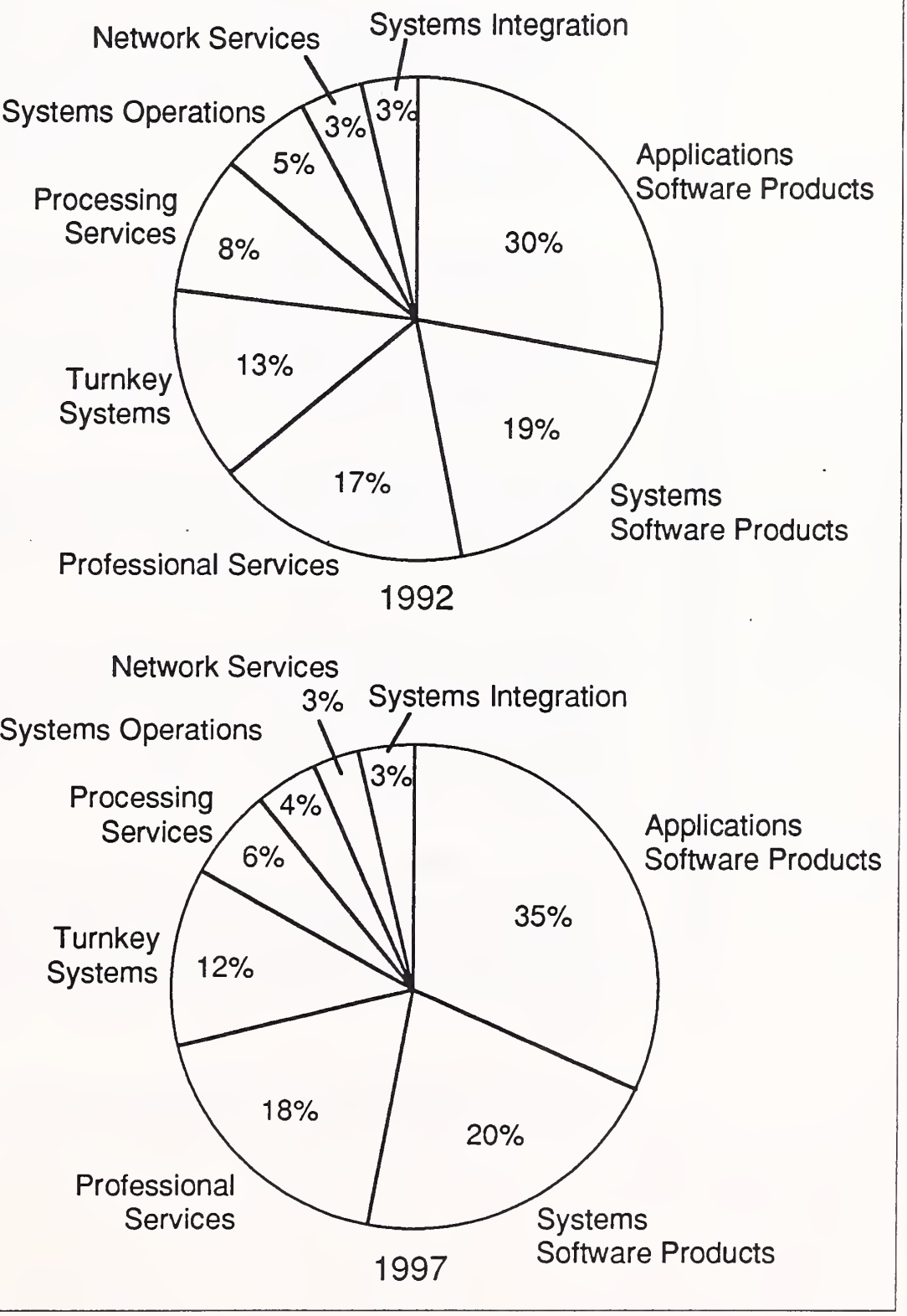
- *Network services* - The market for network services is small and is expected to remain as such. The region continues to suffer from a significant lack of telecommunications infrastructure, a problem that will not be rectified for a number of years, even though some countries have launched major improvement programs or other initiatives (e.g., Argentina, Brazil). Network services are expected to grow from approximately $140 million in 1992 to approximately $280 million in 1997, a growth rate of 15%.

- *Systems software products* - The market for systems software products is another bright spot in Latin America but will see somewhat slower growth than applications software products. Growth of software products is expected to continue at 19%, for at least the next several years, due to the continuing demand for minicomputer- and PC-based systems. With a growth rate of 19%, the market for systems software products will increase from $0.8 billion in 1992 to $1.9 billion in 1997.

Exhibit II-4 provides a comparison of the Latin American market by delivery mode for 1992 and 1997.

EXHIBIT II-4

Delivery Mode Analysis
Information Services Market—Latin America
1992 and 1997



C
Market Considerations

Each of the five more established information services markets have well-developed communities of information services vendors. These communities include numerous locally based companies and leading international firms. The national profiles identify these vendors and the delivery modes in which they are active. Many of the local firms have relationships with one or more international firms, particularly in the professional services and software products areas.

For organizations considering entering or expanding into the Latin American market, cautious optimism is advised. There are indications that a number of countries are beginning to address their financial problems successfully, but time will be needed to assess the effect of the new policies. In addition, there are signs that trade and software protection issues are also being addressed.

Primary opportunities appear to be in the mini and personal computer software product sectors in the fields of education and office productivity, and in certain vertical market areas such as manufacturing and financial services.

As a rule, the professional services segments of the larger markets are experiencing strong growth. Where the economy and specific company situations support investment, there is a need to move quickly. The professional services firms control many of the skilled computer professionals, and thus are equipped to respond more quickly than new market entrants.

In Latin America, use of a distributor/representative is a necessity. The primary reason is that success is highly dependent on the representative's knowledge and contacts within the government. The region should generally be considered on a country-by-country basis, although there are some larger Latin American vendors developing operations in more than one country.

Exhibit II-5 identifies major international information services vendors active in multiple countries within Latin America.

EXHIBIT II-5

International Vendors Active in Latin America, 1992

- ADP
- Andersen Consulting
- Computer Associates
- Coopers & Lybrand
- DEC
- Deloitte Touche
- EDS
- HP
- IBM
- Microsoft
- NCR
- Oracle
- Pansophic
- Peat Marwick
- Price Waterhouse
- Software AG
- Unisys

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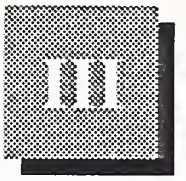


National Profiles—Latin America

A
Argentina

1. National Overview

Once one of the 9 richest countries in the world, Argentina has suffered a series of economic and political shocks over the last fifty years that have resulted in unstable environments for the business community on an ongoing basis. The country has a population of approximately 32.5 million and land area of over a million square miles. The country is self-sufficient in petroleum, but suffers from vast inefficiencies in utilizing this natural resource, as well as other under state-run monopolies. And despite efforts to stimulate the manufacturing elements of the economy, 75% of the country's export earnings are still from the sale of commodities.

In 1992, Argentina continued its quest for economic stability. It has significant natural and human resources, but continues to suffer from inflation and significant swings between economic growth and decline.

During 1992, Argentina's progress in controlling its excessively inflationary economy under new national leadership continued. Inflation ran at approximately 25% in 1992, down significantly from previous years, and is anticipated to be about 16% in 1993.

This trend has helped revive growth. The GDP grew at approximately 6% in 1992, and it appears to continue at that rate during 1993. In addition, Argentina's successes with the privatization of state-run industries have had a positive effect on the business climate. However, the wind down in privatizations in 1993 will place increased pressure on the economy.

During the 1980's it is estimated that some $50 to $60 billion fled the country, seeking refuge from raging inflation. The initial successes of the turnaround in the economy are already having a positive effect. INPUT expects to see substantial amounts of that money flow back into Buenos Aires from Miami and New York.

The forces driving and inhibiting the information services market are primarily related to the fundamental elements of the economic environment.

a. Driving Forces

- *Improved communications systems* - The government continues to invest in the telecommunications infrastructure and business in the development of information networks. Privatization of the telecommunications system has reduced corruption and created a more stable telecommunications environment.

- *Industrial investment and general business climate* - The government is beginning to encourage investment in the industrial sector to stimulate economic growth of the country. However, this must be balanced against the inflationary pressure and a current recessionary climate.

- *Reduced tariffs* - Significant tariffs on manufactured products have proven to be a traditional barrier. However, continued reductions in tariffs initiated under the new government are expected to contribute to increased imports of hardware and software.

- *Economic stabilization* - There have been significant efforts to establish a stable economic base from which to grow.

b. Inhibiting Factors

- *Inflation* - Inflationary pressures that inhibit long-term investment in industry and technology remain a challenge. The solution is long term and the direction is positive, but in the short term it hampers investment from outside the country.

- *Political instability* - The ability of the country to develop a stable political environment remains in question. Many foreign firms are reluctant to make investment commitments without a stable government. Many are waiting to see the outcome of early initiatives. Nevertheless, if he can garner enough support in Argentina's Congress and the economy continues to stabilize, president Carlos Menem could have another opportunity to change the law that would allow him to run again for president in 1995.

- *Limited infrastructure* - With a limited technological base, significant short-term growth prospects are limited. However, significant investment must be made before information services technology will be of benefit.

- *Cost of technology* - Because much information technology (hardware and software products) is imported, internal inflation has often made such products too expensive, thus slowing investment. High import tariffs are also a problem.

2. Information Services Market Forecast

The market for information services in Argentina is small, but with continued stabilization of the economy and the political environment, it can grow at an estimated 19% compound annual growth rate, from $550 million in 1992 to approximately $1.3 billion by 1997, as shown in Exhibit III-1.

EXHIBIT III-1

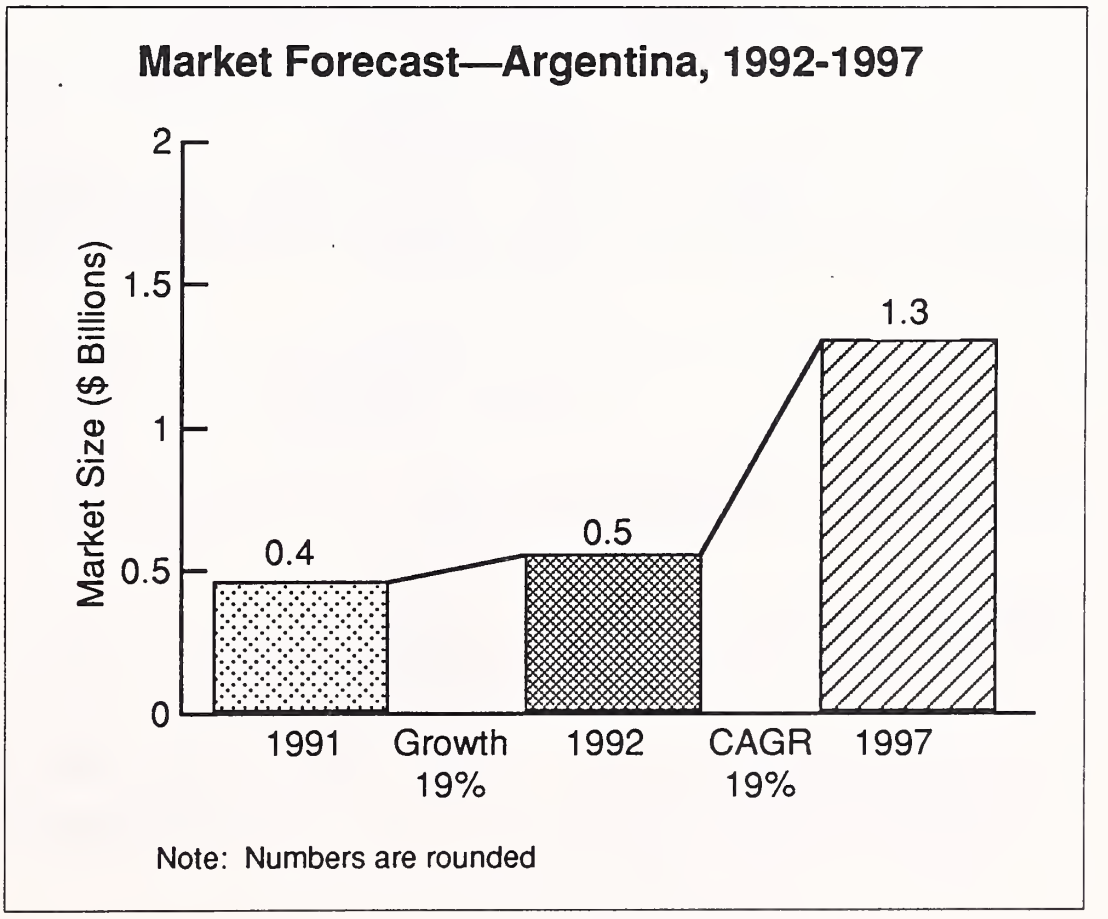
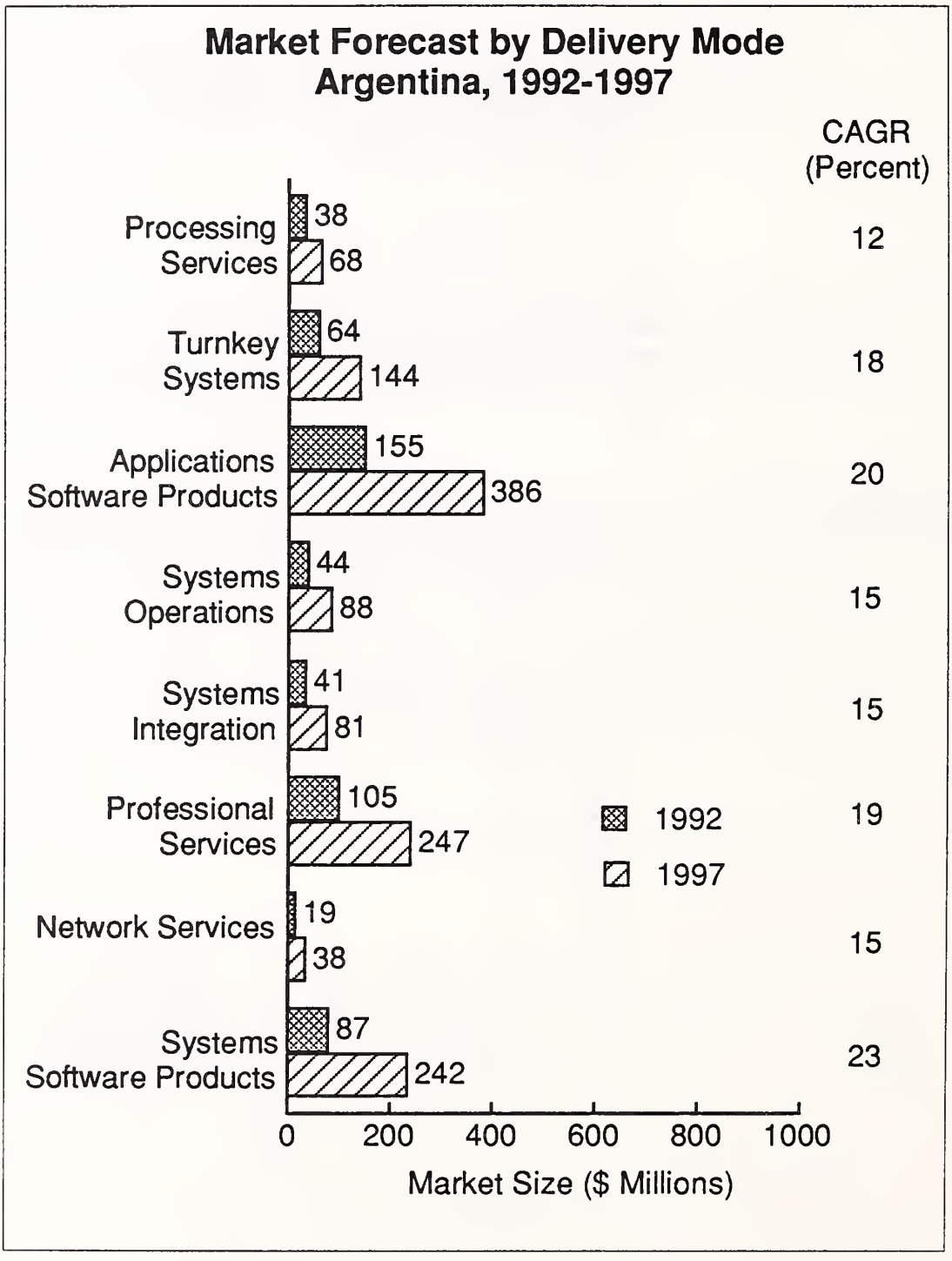


Exhibit III-2 provides the forecast by delivery mode. Exhibit III-4, found at the end of this profile of Argentina, provides the forecast in greater detail.

EXHIBIT III-2



Although revised down from 13% in the 1991 forecast to a 12% CAGR in this year's forecast, Argentina's processing services are expected to show steady growth as companies expand their processing capabilities or seek short-term solutions to meet growth demands. It is a good alternative to in-house processing given the tariff situation on computer equipment. A somewhat higher CAGR of 15% is projected for systems operations.

Because of the cost of larger computers, there is a growing opportunity for processing services companies to offer more economical full systems operations services than internal data centers.

As in other developing economies, turnkey systems are expected to grow at a higher rate (18%) than the U.S. average, due to the need to implement solutions immediately. The focus will be on personal computer- and LAN-based turnkey systems.

The network services sector in Argentina is modest and will remain small for several years at well under 5% of the total market.

- Although significant progress is being made in telecommunications investments, the country has a very poor telecommunications infrastructure and it will take several years of investment before much growth can be expected.

- It should be noted that though Argentina has recently begun major efforts to upgrade its telecommunications infrastructure, the emphasis is on increased quality and quantity of basic services (telephone, telex, etc.) instead of enhanced services.

The fastest-growing area of the industry is still software products (in applications and systems software). There is a sufficiently large installed base to support a growing software market, in particular at the PC/workstation level.

- The market for software products represents about 44% of the total information services market.

- The systems software products sector will remain quite strong with a 23% CAGR, driven by increasing dependence on PCs, workstations and LANs, as well as a growing interest in UNIX.

- Applications software products will see somewhat slower growth (20% CAGR). Investment costs are prohibitive and there is a desire to wait for UNIX and newer client/server products.

- If the planned lowering of duties and tariffs is accomplished, residual demand should result in high-growth rates for applications, systems control and application development software.

- Urgent need exists for systems to be updated. Interview data from Argentina for this year's report indicated that this was one of the strongest motivations for systems investments.

The market for systems integration is expected to grow from $41 million to approximately $81 million by 1997, a growth rate of about 15%. This growth rate is up from 11% last year based on the interview data. Obtaining the new growth rate will be dependent on general growth in the economy, which is lagging somewhat at present.

As industry begins to address lingering productivity problems, the professional services sector is expected to benefit, primarily from the need for consulting to identify solutions and alternatives. The professional services sector is expected to grow from about $105 million in 1992 to $247 million by 1997. Professional services will continue to outpace systems integration over the next five years. Buyers and vendors are more comfortable with the traditional professional services relationship than the more inclusive and higher risk systems integration relationship.

- Even though the need for consulting services is expected to be the greatest in the near term, software development should increase steadily over the five-year period, as work progresses from analysis and definition to the development stage of the growth process.

- Education and training is also a growing need. There is a limited base of trained personnel, and significant effort will be required to improve staff skills, if internal staffs are to be able to handle new systems.

These projections for Argentina should be considered somewhat fragile. They assume a moderately improved economic base and that the political environment will continue to stabilize. Indications are generally positive, but not conclusive.

3. Market Considerations

Exhibit III-3 lists leading Argentina-based vendors and the delivery modes in which they primarily operate. Many international vendors are also active and are identified in Chapter V on Latin America.

EXHIBIT III-3

Selected Vendors by Delivery Mode
Argentina, 1991

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Bairesco	x			
Baiwo	x			
Bergerman		x	x	
Dataproceso	x			
Haltener & Lopez		x		
Logica			x	
Pistelly, Lia & Accox		x		
Proceda	x	x	x	
Sacoma	x			
Sisercom		x		
Sisteco	x		x	
Sistematica		x		
S&M Consultores		x		x

As a general guideline, mainframes and minicomputers, as well as programming languages and operating systems, are imported from the U.S. Applications software and designed by foreign and Argentine firms. An increasing number of micro systems come from the Far East.

There is a local information services infrastructure that includes the following:

- Local professional services firms embody such international accounting and consulting companies as Deloitte,Touche, IBM and Andersen Consulting. Relationships tend to be with the European (Spanish) rather than the U.S. branches of these firms.

- Local processing services firms
- Marketing arms of U.S. computer manufacturers and some software companies

Leading vendors of hardware and software include IBM, Unisys, Computer Associates, Software AG, Microsoft, Borland, and Oracle.

In general, the local vendors look to the U.S. for technology-based product and services relationships.

Whether this is a good time for entering or expanding into the Argentine market is speculative. There are signs that the country will continue to stabilize and that investment opportunities will be attractive. However, previous initiatives have met with limited success.

Many knowledgeable providers in the area suggest that distribution arrangements are the best methods of entry or expansion for the near term. Establishing an equity participation arrangement can stimulate growth without significant up-front investment.

EXHIBIT III-4

Information Services Industry
Market Forecast by Delivery Mode and Submode, 1992-1997
Argentina

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Argentina IS Market	464	19	553	654	774	919	1,090	1,293	19
Processing Services	34	12	38	43	48	54	60	68	12
- Transaction Processing	15	13	17	19	22	25	29	33	14
- Utility Processing	11	18	13	15	16	18	20	23	12
- Other Processing	8	0	8	9	9	10	11	12	8
Turnkey Systems	51	25	64	75	88	104	122	144	18
- Equipment	28	18	33	38	44	50	58	66	15
- Software Products	12	50	18	22	27	33	40	49	22
- Professional Services	11	18	13	15	18	21	24	29	17
Applications Software	130	19	155	186	223	268	321	386	20
Systems Operations	38	16	44	51	58	67	77	88	15
- Platform Operations	22	18	26	30	34	39	44	50	14
- Application Operations	16	13	18	21	24	28	33	38	16
Systems Integration	35	17	41	47	54	62	71	81	15
- Equipment	10	20	12	13	15	17	19	21	12
- Software Products	15	7	16	18	21	24	27	31	14
- Professional Services	9	33	12	14	17	20	23	27	18
- Other	1	0	1	1	1	2	2	2	15
Professional Services	89	18	105	125	148	175	208	247	19
- IS Consulting	24	17	28	33	39	46	54	64	18
- Education & Training	14	7	15	17	19	22	25	29	14
- Custom Software	51	22	62	74	89	107	129	154	20
Network Services	17	12	19	22	25	29	33	38	15
- Electronic Info. Svcs.	14	14	16	18	21	24	28	32	15
- Network Applications	3	0	3	3	4	4	5	6	13
Systems Software	70	24	87	107	131	161	197	242	23
- System Control	42	26	53	65	80	99	121	149	23
- Data Center Management	5	20	6	7	8	9	10	11	13
- Applications Development	23	22	28	35	43	53	66	82	24

B
Brazil

1. National Overview

After spending most of the 1960s and all of the 1970s under military rule, Brazilians had high hopes for the democratic administration that achieved power in the mid-1980s. The last seven years of democratic rule have proved to be a bitter disappointment. Like Sisyphus, Brazil's democratic leadership has pushed the economy to the heights of dynamic growth only to see it roll down hard into deep recession. In 1992, inflation in Brazil reached 984% and averaged 20-25% per month while the GDP only grew 1%. Although GDP should reach 1.7% in 1993, inflation is expected to grow to 1,045%. The industrial sector has been highly successful, exporting natural and manufactured resources that include iron ore, gold, tin, soybeans, coffee, sugar, rubber, automobiles and industrial hardware. But with a foreign debt in excess of $115 billion annually, and the crushing inflation, the substantial foreign exchange trade is sucked away, leaving less and less for the country's coffers.

Brazil's information technology market has suffered along with other segments in the economy. Until Fernando Collor de Mello ascended to the Brazilian presidency in late 1989, the country's markets were highly controlled and protected by price controls and import tariffs. Various Brazilian administrations have enacted policies since the late 1970s to create an indigenous computer industry. In 1984, the Brazilian information technology market all but closed to foreign trade with the enactment of the National Informatics Law. Under this law, all applications for information technology import licenses were considered, and largely rejected, by the Brazilian Science and Technology Secretary. Though this did supply the stimulus for native PC, mid-range and high-end systems development, it also made Brazilian technology twice as expensive and a generation behind foreign technology.

Since 1989, the Informatics Law has gradually been phased out to eliminate market reserve. In April 1992, Fernando Collor effectively nullified the law with a new one that diminishes Brazilian information technology market reserve and raises the limit on foreign investment in the market from 30% to 49%. Collor also pushed through market reforms that have deregulated and privatized Brazil's $3.2 billion telecommunications market. The government estimates that between $5 and $6 billion in investment will be needed to bring the country's outdated communications infrastructure. The hope is that American and other foreign firms will take advantage of these new opportunities to own as much as 49% of non-voting stock in Brazilian information technology and telecommunications companies.

The forces driving and inhibiting growth in the information services/ technology market have shifted somewhat from the previous report, and include the following:

a. Driving Forces

- *Copyright law enforcement* - The government has begun to enforce international copyright protection laws. Software piracy has been somewhat reduced, causing some companies to consider increasing their efforts in the Brazilian market.

- *End of National Informatics Law* - As detailed above, the Informatics Law has been phased out and the way is clearer than ever for foreign entry into the Brazilian information technology market.

- *Relaxed investment policies/procedures* - Government policy has improved in favor of R&D investments. Easing of registration times and product ownership rules are in process and a better information technology industry is expected to develop, particularly if foreign firms take advantage of Brazil's recently relaxed foreign investment quotas.

- *Economic climate* - In spite of continued inflation and recessionary pressures, many industries continue to show growth and sponsor new investment, including in information technology.

b. Inhibiting Factors

- *Political volatility* - After three relatively stable years in office, President Fernando Collor was impeached on corruption charges in September 1992. Collor's vice-president Itamar Franco is now president, but so far has not inspired confidence. The Brazilian business community is not happy that Franco chose a tax attorney to be the finance minister.

- *Inflation and recession* - Franco's administration will make deals with industry to pre-fix prices and wages to avoid inflation, but these tactics have done little to deflate inflation in the past.

- *Complex entry procedures* - Bureaucratic entry procedures are expected to remain. Estimates are that up to 18 months can be required to obtain the necessary approval to conduct business in the country.

- *Entry restriction* - Although there is a general trend toward easing permission to enter the market, the market is expected to remain restricted. The Law of Similars, which forbids the importation of goods similar to those produced in Brazil, still exists.

- *Economic stability* - The overall economic stability of the country remains a significant question for many firms considering entering or expanding in Brazil.

2. Information Services Market Forecast

The market for information services in Brazil is largely untapped. Although its economy is five times larger than Argentina's, the information services market is only two-and-a-half times as large. As a result of technological isolationism, extreme bureaucracy, and a weak economic infrastructure, the market has continued to languish.

The 1992 market for information services is estimated to be approximately $1.7 billion. The market is expected to grow at an annual rate of 20%, to approximately $4.4 billion by 1997, as shown in Exhibit III-5. The five-year CAGR for 1991-1996 was also 20%.

EXHIBIT III-5

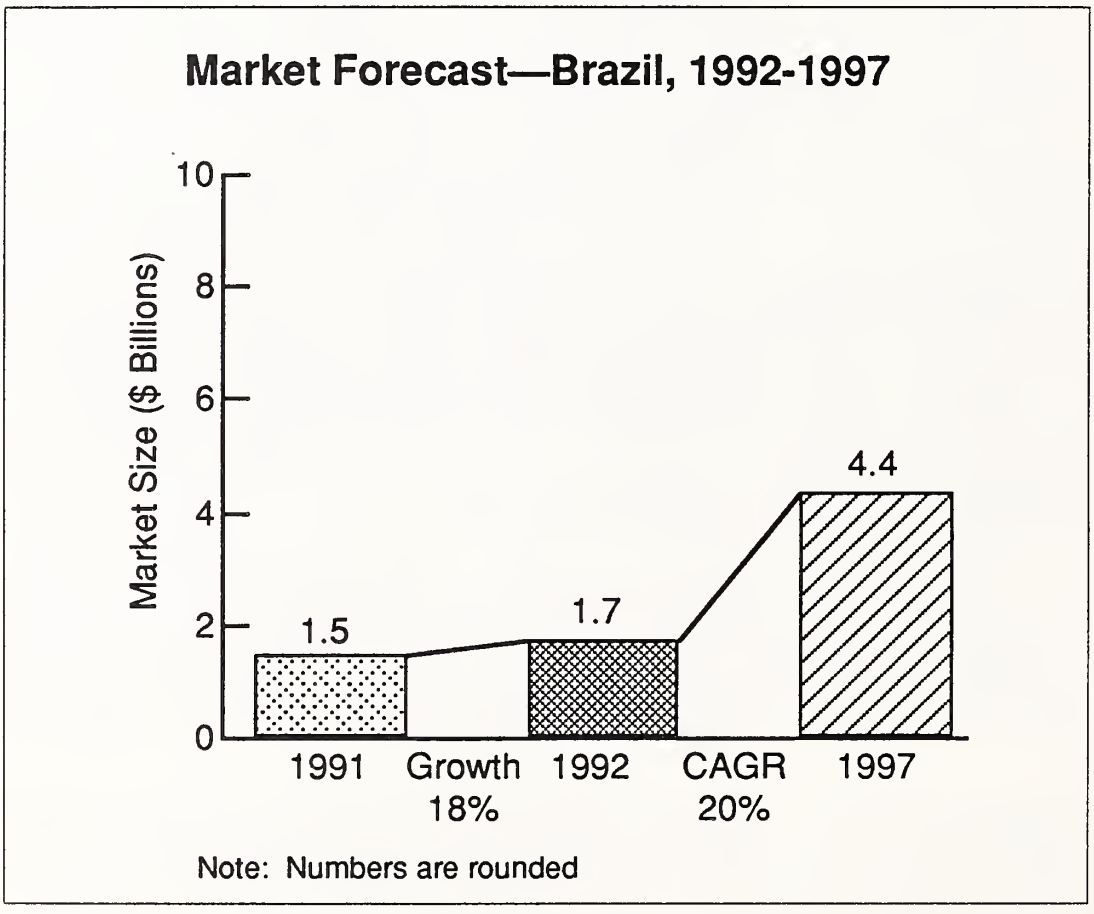
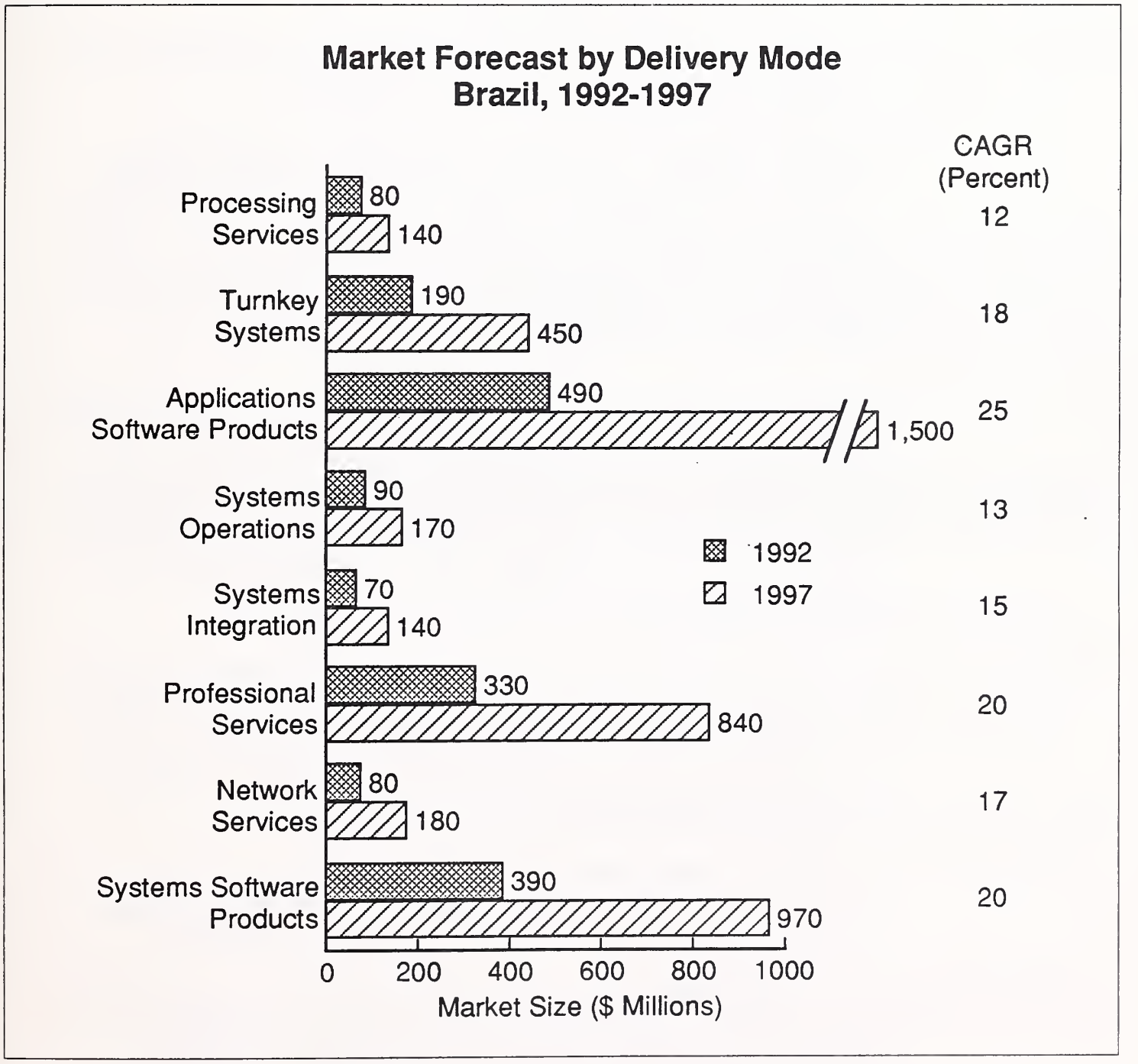


Exhibit III-6 provides the forecast by delivery mode. Exhibit III-7, at the end of this profile, provides the detail behind this forecast.

Key contributors to growth are expected to be software products, turnkey systems and professional services. Over the next several years, professional services will be needed to assist in identifying ways to strengthen the economy's use of information technology. An improved economic climate will permit greater importation of information technology products; however, implementation skills must be developed locally to insure successful deployment.

Growth of software products can be realized if the government takes an aggressive stand on software piracy and alters its policy of requiring that imported products become products of the country. Recent developments, as noted in Section 1 and below, indicate that the government is moving in the right direction.

EXHIBIT III-6



- Efforts to reduce piracy continue with a new law. The federal government has indicated its commitment to alter its position on product ownership.

- Assuming that these efforts are successful and believed by international software products firms, the market for software products is expected to grow from over $880 million in 1992 to approximately $2.5 billion in 1997, an annual growth rate of 23%.

- As in many areas of the world, the key software requirements will be for applications software and application development tools.

As was shown in Exhibit III-6, the market for processing services is expected to exhibit at 12% CAGR as an increasing number of organizations expand their information services requirements to meet the needs of a growing economy. As in many of the Latin American markets, the uses of processing and systems operations-type services are modest in relation to the overall information services market. These vendors need to justify their economies of scale from which significantly higher growth can result.

The market for network services is expected to show modest growth as the country works to develop and expand its national value-added services network. The demand for network services should be driven primarily by the increasing national requirement for electronic information services to improve industrial productivity. Privatization of the telecommunications infrastructure should have a positive effect. But, until a stronger telecommunications infrastructure is in place, this segment will lag behind the industry in growth.

The market for turnkey systems is expected to grow at a rate about double than what is expected in the U.S. This growth is due to residual demand for solutions to address immediate requirements. The market for turnkey systems will be at least $446 million by 1997. There will be a heavy dependence on PC- and LAN-based products, leveraging newer technologies and downsized environments.

The market for systems integration in Brazil is small, as indicated in Exhibit III-6. Professional services remain the favored way to buy systems deployment services in most of the Latin American markets.

As Exhibit III-6 displayed, the market for professional services in Brazil is of moderate size, considering the size of the country. This market is expected to grow at 20% per year for the next several years. Within professional services, the highest growth rates are expected to be in consulting and software development.

- Consulting growth will result from the need for businesses to identify solution alternatives and consider major renovations in internal architecture.

- Software development growth will result from the organizations' needs for custom solutions and the lack of internally trained systems professionals.

- However, education and training may develop into a major opportunity. Should the economy of Brazil go into a period of sustained and balanced growth, the opportunity for the use of information technology will be limited only by the availability of internally trained personnel. Local professional services firms should be looking closely at the training opportunity.

Overall, the market for information services in Brazil has major potential. Recent changes indicate that growth could be sustained for several years and could in fact exceed that forecast by INPUT. However, much will depend on the success of the government in maintaining a balanced course and a demonstrated record in terms of dealing with copyright protection, etc.

3. Market Considerations

Exhibit III-7 lists leading Brazil-based vendors and the delivery modes in which they primarily operate. Many international vendors are also active and are identified in Chapter V on Latin America.

Preferring to stimulate and protect indigenous industry, Brazil has not realized the benefit of foreign products and services. Many of the vendors listed above are of modest size, yet they are well established and many have international relationships. In an improved economic climate with improved laws regarding the importation of information technology products, opportunities for local and international vendors are abound.

If the recent changes in the government's commitment to provide a stable, directed economy and a balanced, open information technology market are successful, then Brazil could become a major market that will experience strong growth throughout the 1990s.

Entry into the Brazilian market is suggested, but still with a high degree of caution. Policies and procedures are lengthy and complex. Ownership of products entering the country can be questioned, although as the new law takes effect, this situation should improve.

The most logical form of entry remains through a local representative. Such a move should follow a comprehensive review to ensure a thorough understanding of the opportunities and risks.

EXHIBIT III-7

Selected Vendors by Delivery Mode
Brazil, 1991

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Cetil	x	x		
Compucenter			x	
CPM Informatica		x	x	
Datalogica			x	
Embratel	x			
Gerden Informatica		x		x
GSI (Gerdan Servicos de Informatica)	x		x	x
Intertec	x		x	x
Methodus			x	
Nantutec			x	
Proceda	x		x	
Proconsult	x	x	x	
Serpro	x			
Villares		x		x

Over the long term, Brazil is expected to take a more prominent role in Latin American development. Cautious entry combined with a long growth cycle could bring long-term rewards.

Any company doing business in Latin America must now look at the Brazilian market. It is the largest and has by far the greatest total potential.

EXHIBIT III-8

Information Services Industry
Market Forecast by Delivery Mode and Submode, 1992-1997
Brazil

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-96 (%)
Brazil IS Market	1,469	18	1,727	2,073	2,493	3,001	3,618	4,367	20
Processing Services	74	9	81	90	101	112	125	140	12
- Transaction Processing	30	13	34	39	45	52	59	68	15
- Utility Processing	28	7	30	32	35	.38	41	44	8
- Other Processing	16	6	17	19	21	23	25	27	10
Turnkey Systems	166	16	192	226	267	317	376	446	18
- Equipment	71	14	81	91	102	114	127	143	12
- Software Products	54	15	62	77	95	118	147	182	24
- Professional Services	41	20	49	59	71	85	102	122	20
Application Software	400	23	490	613	766	957	1,196	1,495	25
Systems Operations	80	13	90	102	116	131	149	169	13
- Platform Operations	45	11	50	56	63	70	79	88	12
- Application Operations	35	14	40	46	53	61	70	80	15
Systems Integration	60	15	69	79	91	105	121	139	15
- Equipment	24	13	27	30	34	38	42	48	12
- Software Products	5	10	6	6	7	8	9	10	13
- Professional Svervices	29	19	35	41	48	57	67	79	18
- Other	2	0	2	2	2	2	2	3	5
Professional Services	279	18	330	397	478	576	695	838	20
- IS Consulting	76	21	92	114	141	175	218	270	24
- Education & Training	38	26	48	57	68	81	96	115	19
-Custom Software	165	15	190	226	269	320	381	453	19
Network Services	70	17	82	95	111	129	151	176	17
- Electronic Info Svcs	58	17	68	80	93	109	127	149	17
- Network Applications	12	15	14	16	18	20	23	27	14
Systems Software	340	16	393	470	563	673	806	965	20
- System Control	210	17	245	294	353	423	508	610	20
- Data Center Management	25	12	28	32	37	43	49	56	15
- Applications Development	105	14	120	144	173	207	249	299	20

C
Mexico

1. National Overview

U.S. and Canadian information technology companies are all but salivating at the prospects offered by the agreement in 1992 to include Mexico in the North American Free Trade Agreement (NAFTA). The country is viewed as the fastest growing computer and information services market in North America, and it presents excellent sales opportunities. Additionally, Mexico is fast becoming an appealing geographic and economic alternative to Asia for the location of manufacturing facilities.

Mexico's decision to seek inclusion in NAFTA surprised many as for it went against the long-standing policies of the Partido Revolucionario Institucional (PRI) party, which has ruled the country in various incarnations for over fifty years. Until recently, the PRI protected Mexico's economy with monolithic foreign investment regulations, tariffs and import barriers (though the tariffs are being phased out, they still boost the cost of U.S. computer hardware imported into Mexico by 10-20%). Since 1988 when PRI candidate Carlos Salinas narrowly captured Mexico's presidency, the government under him has attempted to revive the economy by terminating expensive government subsidies, privatizing banks, selling or closing inefficient state companies and generally trimming the fat from a bulky, overweight government bureaucracy.

President Salinas' solicitation of NAFTA is the latest in a series of precedent-setting steps toward opening and revitalizing Mexico's needy economy. In 1992, the GDP only grew 3%, while inflation reached 16.4%. Although this is significantly lower than the 159% inflation rate reported in 1987, it is still much higher than the U.S. or Canada's. 1993 should be a better year as the GDP is expected to reach 4% while inflation should drop to 10.2%. The country's 91.3 million people have an average per capita income of $4,186/year. Mexico's foreign debt currently stands in excess of $105 billion.

The guiding factors in Mexico's push to develop its information services industry will be improving the telecommunications infrastructure and further developing interconnections with network services in the U.S. and Canada. To become a full trading partner, Mexican companies will have to expand the implementation of electronic data interchange and related technology beyond its existing use in the automotive manufacturing and maritime shipping industry sectors. The privatization in May 1992 of the government-controlled national public telecommunications operating company, TelMex, will greatly assist efforts to upgrade Mexico's networking capabilities and move the country closer to full membership in NAFTA.

Information technology trends in Mexico include the following:

- *Personal computer growth* - There is greater focus on personal computers as the best solution for meeting the needs of small and medium-sized businesses. Mexico currently has installed 1.3 million PC base computers, which is expected to double by mid-1994. The PC growth rate is expected to stay close to 25% per year through the end of 1995.

- *Industry-specific software* - As in many countries, industry-specific applications are preferred over generic solution applications.

- *Network growth* - There is increasing emphasis on the development of nationwide networks to support EDI and E-mail services. Even though TelMex, the national monopoly, has been privatized, the current telecommunications system has significant inadequacies. The company currently manages 7 million lines with diminishing transmission capacity due to increased demand. TelMex intends to have 20 million lines by the end of the decade.

a. Driving Forces

Driving forces positively affecting the development of the information services industry in Mexico include the following:

- *Trade liberalization* - Liberalization of trade policies and the reduction in licensing fees are stimulating a higher rate of importation for information services technology. NAFTA will provide new impetuses to the importation of information technology products.

- *U.S. influence* - Trends and directions in Mexico are strongly influenced by U.S. information services industry trends, which have a stimulating effect on the decisions of Mexican companies. Most of the international relationships of Mexican information services vendors are with U.S.-based companies.

- *Personal computer availability* - Continuing growth of lower-cost personal computer products acts as an encouragement to small- and medium-sized businesses to make greater use of information services solutions.

- *Latin American entree* - Many Latin American countries see an established market in Mexico as further indication of that company's interest in Latin America. A number of South American firms are turning to Mexico as a source of supply and expertise; and Mexican information services vendors are looking toward market opportunities in their neighboring countries to the south.

- *Computer literacy* - Emphasis on education and use of computing capabilities are increasing the computer literacy of the working class. Over time, this will strengthen the resources of the native information services industry, making it more attractive and independent.

b. Inhibiting Factors

Inhibiting factors are listed below:

- *Recognition of IS value* - As in most Latin American countries, the value of information technology remains undervalued in Mexico. However, this will change as its role in international trade continues to grow.

- *Inflation rate* - Closely related to stability is the trend in inflation rates. A resurgence of inflation will slow growth in information services.

- *Weak infrastructure* - Overall, the national infrastructure is weak and unable to support extensive use of technology. A weak infrastructure has a tendency to reduce the use of information services. Changes are under way and by the middle of the 1990s this should no longer be a significant inhibitor.

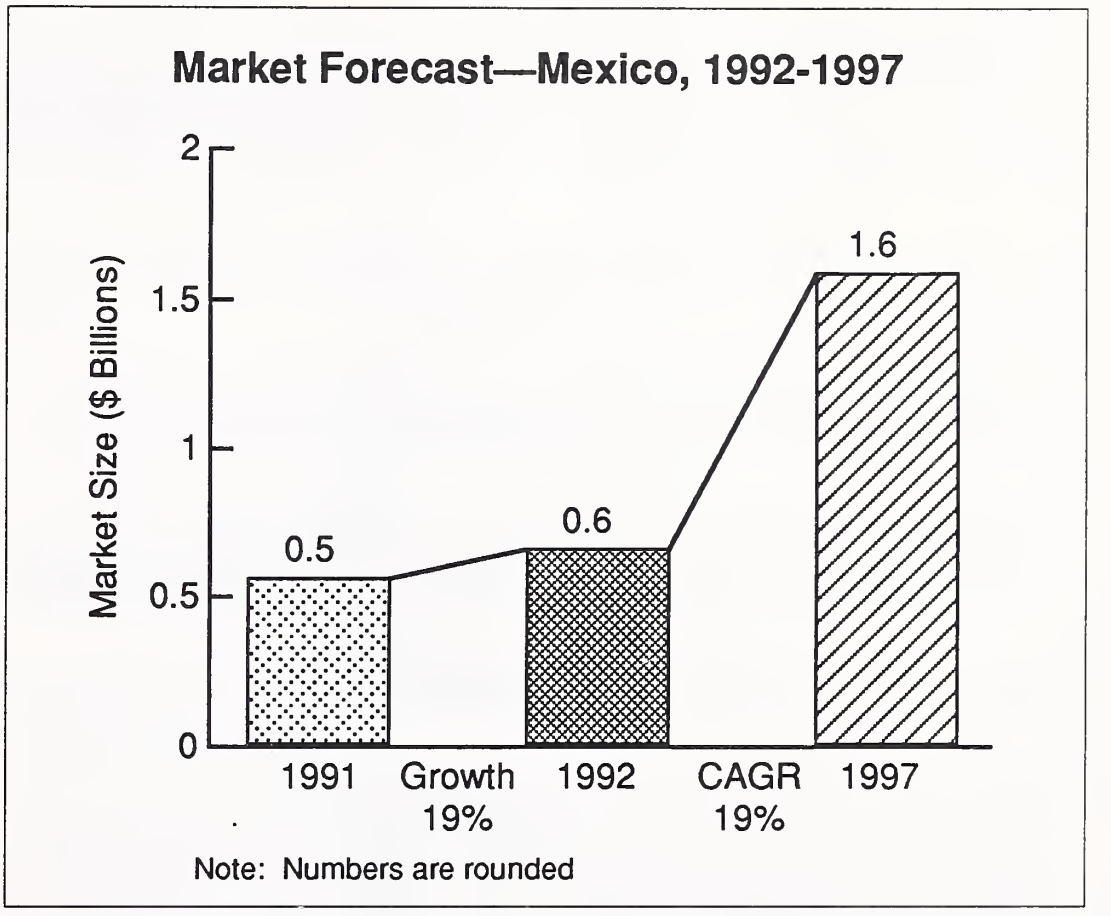
- *Local consultants* - With minimal resources, many companies turn to local, poorly trained consultants who are not knowledgeable about the most up-to-date methods and procedures. There is a significant need for education and training of information services professionals.

2. Information Services Market Forecast

Actual market sizes for 1991 and forecasts for 1992 are down slightly from those made in last year's report. INPUT had originally forecast the total market for Mexico to be $574 million in 1991, and has revised that estimate to $556 million in this report. This downward adjustment, and a comparable adjustment to 1992 are due to the continuation of the general worldwide recession. Nevertheless, the prospects for the market in Mexico look good for the longer term.

Exhibit III-9 shows that the market for information services in Mexico is expected to grow at an annual rate of 19% for the next several years, from an estimated $660 million in 1992 to approximately $1.6 billion by 1997.

EXHIBIT III-9

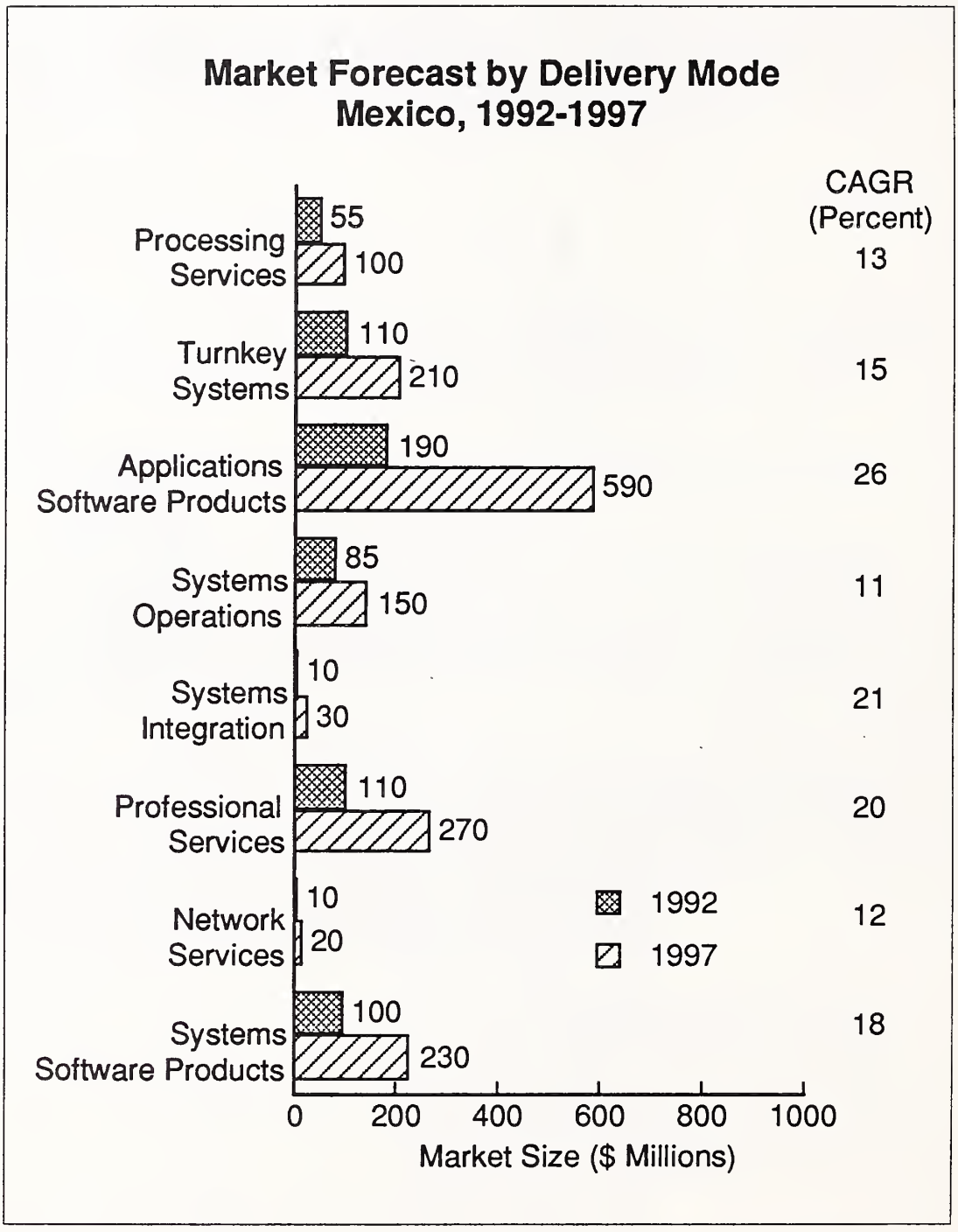


The market is believed to offer significant potential, but as with many Latin American countries, will require a more stable economy for the full potential to be realized over the long term. The level of use of information technology as a percent of the gross national economy remains well below the average, suggesting significantly greater growth potential later in the decade.

Exhibit III-10 provides the forecast by delivery mode. Exhibit III-12, at the end of this profile, provides the detail behind this forecast.

The relatively modest market for processing services (less than 10% of the total market) is expected to grow at a 13% CAGR from $54 million to $99 million over the next five years, as shown in Exhibit III-10.

EXHIBIT III-10



- As in most countries, the key processing services requirement will be increasingly for transaction services, as the country begins to develop and expand its national network services capabilities. Processing services and systems operations should represent long-term potential to speed the use of information technology while minimizing capital investment for companies.

- In Mexico, utility processing is expected to show growth. This growth results to a great extent from efforts of companies to develop in-house systems, frequently in anticipation of the availability of hardware and other support services.

Turnkey systems is also expected to show strong growth because of the number of expanding companies that need short-term solutions. Exhibit III-10 illustrated that the turnkey systems market is expected to grow from $106 million in 1992 to at least $211 million by 1997. This market is also fueled by a growing willingness to accept packaged solutions.

Software products (applications and systems) are in great demand in Mexico.

- The highest demand is for applications software, which is generally in short supply due to high duties and tariffs. Declining tariffs under new trade agreements should increase the demand.

- Applications development products are a growing need as companies begin to develop more comprehensive systems. New systems will be needed to meet the requirements of a growing economy.

- Applications software products are projected to grow at a 26% rate to $588 million in 1997.

- Systems software products will grow at a somewhat slower rate of 18%, to reach about $232 million by 1997. This growth is primarily tied to the availability of computer hardware and the adoption of applications development tools at the minicomputer and personal computer levels.

There is currently little demand for systems integration services. The information services industry remains small and fragmented. However, as the use of professional services grows, some portion of that demand will shift to the systems integration segment.

- There is demand for systems integration services in the governmental sector.

The professional services market is expected to show strong growth as companies search for alternatives to modernize their industries. Overall, growth is expected to be from approximately $107 million in 1992 to about $270 million in 1997, a growth rate of 20%.

- The key requirement for professional services is for consulting. The consulting market in Mexico is considered to be quiet and underdeveloped. Local consultants have little training and frequently provide poor information. They need relationships with U.S. firms to gain access to the required expertise.

- The need for quality consulting service is expected to be greater as companies seek to modernize. Following years of neglect, major changes are needed in most firms, and as these companies seek membership in the international community, they will require significant advice on establishing supporting information infrastructures.

The network services market is very small and will remain small for at least the next several years. The telecommunications infrastructure lacks in support for the development of this delivery mode. Increasing interaction with U.S. manufacturing corporations may speed this growth somewhat.

- There is a high degree of interest in Mexico for network-based services. Foreign firms have an interest in E-mail and EDI services and there is interest in data base and other on-line services, as well as transaction processing services.

- Network services could grow at a higher rate near the end of the five-year period if the telecommunications infrastructure is improved.

- INPUT expects EDI capabilities to become a key ingredient in future information systems activities of all larger Mexican companies as they expand their international trading activities.

Growth of markets in Mexico is highly dependent on a stable political environment and economic development. The reasonably stable business environment now being experienced is expected to continue through the middle of the decade. If this happens, the information services industry could experience growth above that already projected by INPUT.

3. Market Considerations

Exhibit III-11 lists leading Mexico-based vendors and the delivery modes in which they primarily operate. Many of them have well-established relationships with U.S.-based information services companies. Many international vendors are also active and are identified in Chapter V on Latin America.

The key opportunities for companies entering or expanding in Mexico are in the personal computer, workstation and LAN product areas.

- Opportunities also exist in consulting and after-sales support for companies willing to invest in development of qualified local staff. Providing local education and training is essential to any market entry in Mexico, and is fundamental to establishing a long-term business.

- If progress continues to be made in economic stability, investment in establishing a well-trained local staff is expected to be of significant benefit within the next three to five years.

- The leading vendors of information services hardware are IBM, Hewlett-Packard, and Unisys. DEC, NCR, Honeywell, Olivetti, and Wang are also represented but have limited market shares. There are few relationships with Japanese IT vendors.

- Leading providers of software include Ashton-Tate, Computer Associates, and Microsoft.
- Nearly all the largest accounting firms are represented and have information services practices.

EXHIBIT III-11

Selected Vendors by Delivery Mode
Mexico, 1991

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Bertex	x			
Casas Alatristes		x		
CCS	x	x	x	
Dicom	x		x	
Execuplan		x	x	
Gama	x	x		x
Grupo Tea		x	x	
Intertec de Mexico	x			
Kronos	x		x	
Lanix	x	x		x
Mancera Hermanas		x		
Megaplan			x	
MPS	x			
Sistemas Erickson			x	
Tecnovision	x		x	
Zylog			x	

EXHIBIT III-12

Information Services Industry
Market Forecast by Delivery Mode and Submode, 1992-1997
Mexico

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Mexico IS Market	556	19	660	783	932	1,111	1,329	1,594	19
Processing Services	47	15	54	61	69	78	87	99	13
- Transaction Processing	25	16	29	33	38	43	49	56	14
- Utility Processing	18	17	21	24	26	30	33	37	12
- Other Processing	4	0	4	4	5	5	5	6	8
Turnkey Systems	92	15	106	121	139	160	183	211	15
- Equipment	42	12	47	52	57	63	69	76	10
- Software Products	21	14	24	28	32	37	42	48	15
- Professional Services	29	21	35	42	50	60	73	87	20
Application Software	145	28	185	233	294	370	466	588	26
Systems Operations	79	9	86	96	106	118	132	146	11
- Platform Operations	48	8	52	58	65	73	82	92	12
- Application Operations	31	10	34	37	41	45	50	55	10
Systems Integration	9	22	11	13	16	19	24	29	21
- Equipment	3	33	4	5	5	6	7	7	13
- Software Products	1	0	1	1	2	2	2	3	25
- Professional Svervices	5	20	6	8	9	12	15	18	25
Professional Services	89	20	107	128	154	186	224	270	20
- IS Consulting	36	19	43	53	65	80	98	121	23
- Education & Training	11	9	12	13	15	16	18	19	10
-Custom Software	42	24	52	62	75	90	108	129	20
Network Services	10	13	11	12	13	15	17	19	12
- Electronic Info Svcs	8	13	9	10	11	12	13	14	10
- Network Applications	2	13	2	2	3	3	4	5	22
Systems Software	85	18	100	118	140	166	196	232	18
- System Control	34	18	40	47	56	66	78	92	18
- Data Center Management	16	13	18	21	24	27	31	36	15
- Applications Development	35	20	42	50	60	73	87	105	20

D
Other Latin America

1. Regional Overview

The remainder of Latin America's region consists of many smaller countries and economies such as Panama, El Salvador, Peru, and Columbia. Although each country has some information services activity, each is relatively modest on its own. Only Chile might be considered a market of some size and stability.

Most, if not all of these countries, suffer from economic instability, some level of civil unrest and inflationary problems of significant magnitude. All of these are inhibiting factors in the development of the local information services industry and the entry by international vendors.

Some improvement in stability was recorded in some of these countries in 1992. If it proves lasting, then these countries will develop into attractive secondary markets for the information services vendors, gaining success in the larger Latin American countries.

2. Information Services Market Forecast

Taken in total, the Other Latin America region represents revenues of $743 million in 1992, which will grow at 17% to approximately $1.7 billion in 1997, as shown in Exhibit III-13. This growth rate presumes continued progress in the creation of stable, balanced economies and improved conditions that will attract international vendors.

Exhibit III-14 provides the forecast by delivery mode. Exhibit III-16, at the end of this profile, provides the detail behind this forecast.

Chile, while still a small market, does have a number of well-established vendors. They are listed in Exhibit III-15.

EXHIBIT III-13

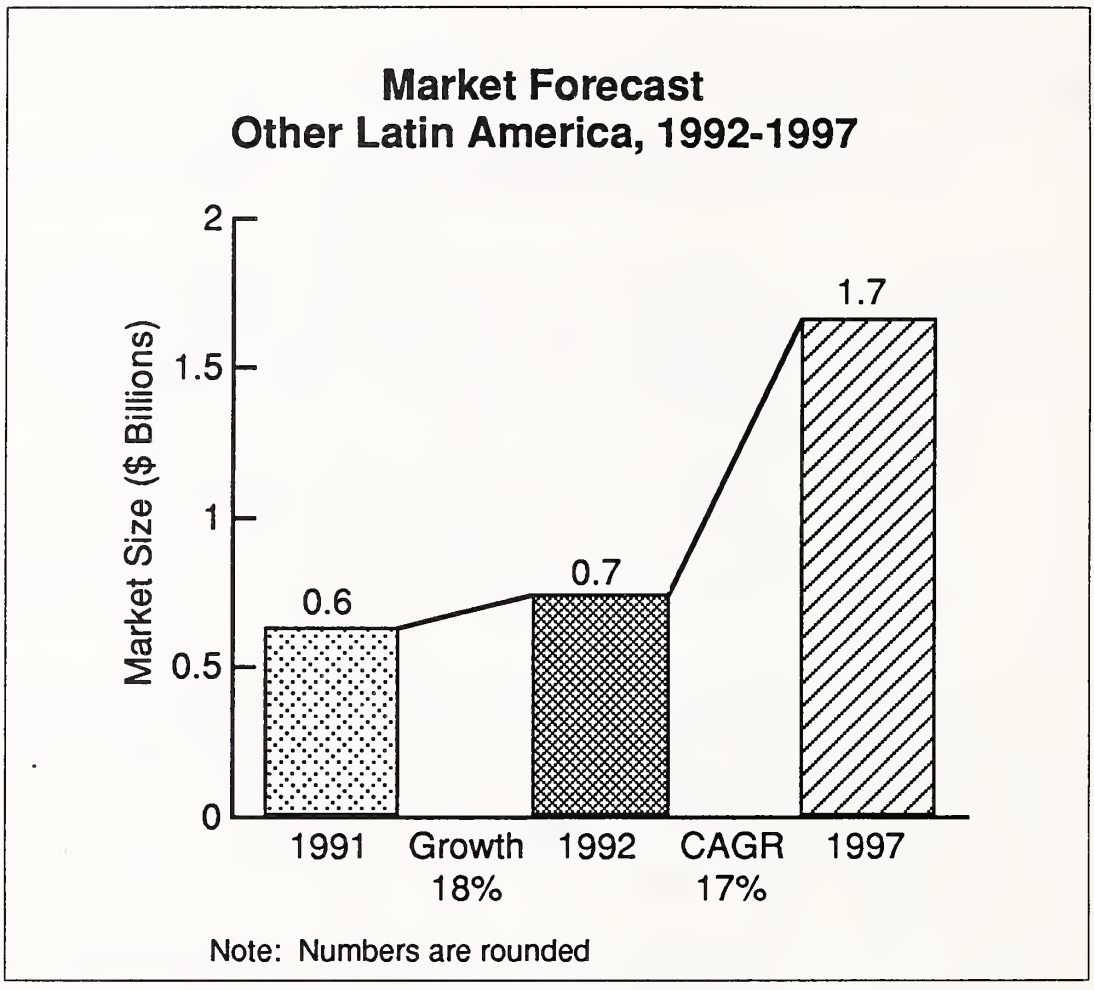


EXHIBIT III-14

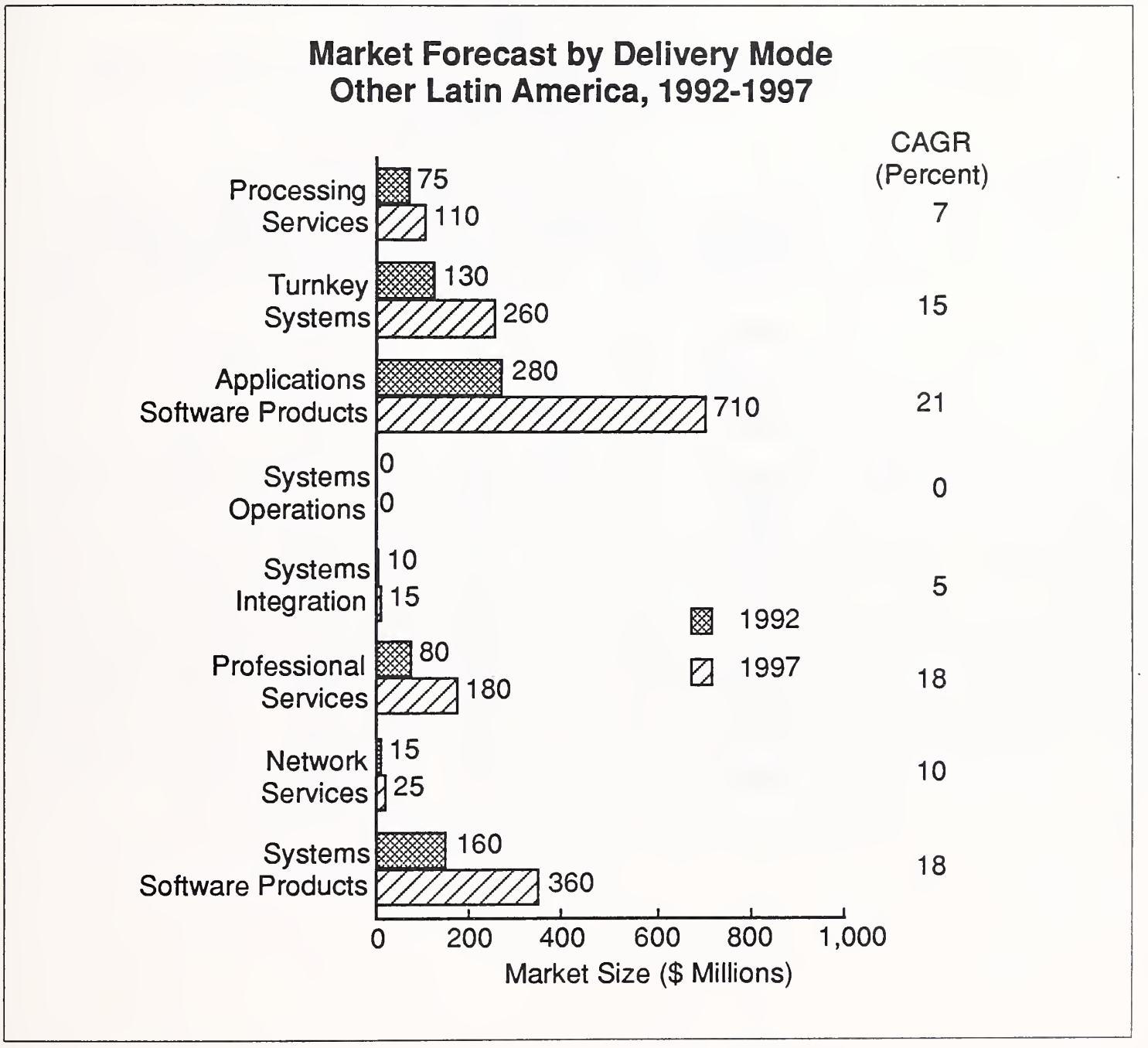


EXHIBIT III-15

Selected Vendors by Delivery Mode
Chile, 1991

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
Abesco	x	x		
Asicom		x	x	
Edicon	x			
Entel	x			
Logica	x	x		
Orden	x		x	
Sinapsis	x		x	
Siscom			x	
Sisteco			x	x
Sonda	x	x	x	x
Tecnos	x			

EXHIBIT III-16

Information Services
Market Forecast by Delivery Mode and Submode, 1992-1997
Other Latin America

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Other Latin American Markets	629	18	743	870	1,020	1,198	1,409	1,659	17
Processing Services	74	4	77	82	88	94	101	108	7
Turnkey Systems	115	13	130	150	172	198	227	261	15
Application Software	220	25	275	333	403	487	589	713	21
Systems Operations	0	N/A	0	0	0	0	0	0	0
Systems Integration	10	0	10	11	11	12	12	13	5
Professional Services	65	23	80	94	111	131	155	183	18
Network Services	15	7	16	18	19	21	23	26	10
Systems Software	130	19	155	183	216	255	301	355	18

E
Venezuela

1. National Overview

The discovery of petroleum changed Venezuela from just another poor agricultural country into the most prosperous nation in South America. Oil money has underwritten government, social programs, and business. When international oil prices deflated in the 1980s, Venezuela was still able to live well by drawing from its foreign exchange reserves. However, with oil prices still low and its reserves depleted, Venezuela has had to take a different approach to support itself. Luckily, oil profits in the 1970s were used to diversify the economy. Substantial resources were and are being used to further develop the industries that produce aluminum, steel, iron, pulp and paper, industrial glass, hydroelectric power, and cement.

Since he took office in 1989, Venezuelan President Carlos Andres Perez has attempted to implement austere measures to boost his country's economy. These measures have included trade liberalization, loosening price controls and interest rates, and increasing prices for government-supplied goods and services. The country's 21.2 million people have consistently resisted these measures, sometimes violently. They rioted immediately after Perez put his economic plan into place, and the country has been plagued by recession and inflation ever since. The inflation rate, however, has been steadily decreasing, falling from 36% in 1990 to 30.6% in 1992. It is expected to further decrease to 26.9% by 1993. Per capita income in 1992 was $3,110, and the GDP rate is expected to grow from 4.2% in 1992 to 4.3-4.5% in 1993.

Whether these figures improve or not depends primarily upon if President Perez's economic policies stay in place. In 1992, Perez was the target of at least two coup attempts launched by angered military officers. In nationwide elections held in December 6, 1992, nine days after one coup attempt, the president's Democratic Action party lost badly to the opposing Social Christian Party.

However, the Perez government continues to work toward a better economy. The country has traded multiple currency exchange rates for a single standard that is expected to improve Venezuela's ability to export non-petroleum products and make it more attractive to multinational firms. The government has also emphasized the development and adoption of information technology, focusing on UNIX, LANs, computer education, and locally developed applications software products. (See Exhibit III-19 in the Market Considerations section of this profile.) The forces driving and inhibiting Venezuela's drive for information technology development are listed below.

a. Driving Forces

The primary driving forces include the following:

- *IT emphasis* - Venezuela has a strong record of utilizing current and leading-edge information technology.
- *Computer literacy* - The exposure to computing at all levels of the education system is a government priority.
- *Local IT industry* - There is a large local community of vendors developing and deploying IT successfully.
- *Economic reform* - Focus on the stimulation of a free-enterprise market is expected to increase the demands for technology-based products and services.
- *Telecommunications system* - Although 10,000 of Venezuela's 80,000 trunk lines are inoperable due to government neglect, the country is pushing hard to modernize the telecommunications infrastructure. In February 1992, the Ministry of Transport and Communications awarded MCI a concession to provide full-satellite telecommunications services to Venezuela. Several other companies are currently providing cellular phone services.

b. Inhibiting Forces

Key inhibiting forces include the following:

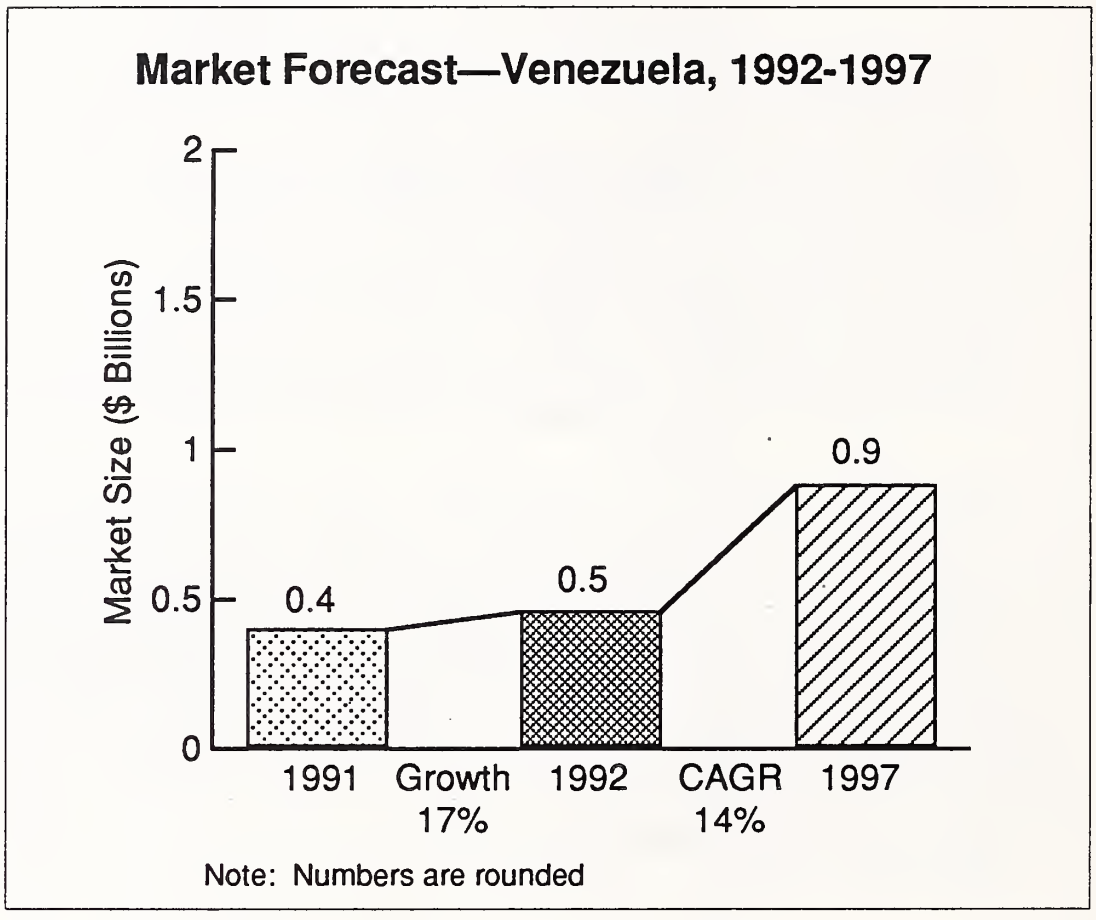
- *Political unrest* - The Perez government is making firm strides, but more coup attempts and further recrimination from voters against the Democratic Action party loom large.
- *Software piracy* - The lack of effective action against software piracy reduces the ability of international firms to import products profitably.
- *Competition* - The large number of local and international information services firms increases competition and reduces profitability, which decreases investment by vendors.

2. Information Services Market Forecast

INPUT's 1991 forecast for Venezuela estimated the 1992 market size at $482 million. In this forecast INPUT has somewhat downsized that estimate by $20 million to $462 million to reflect the on-going recession in the worldwide economy. On the other hand, field research indicates that growth rates over the next five years in several market segments may have been underestimated.

Exhibit III-17 shows the market for information services to be about $460 million in 1992, with a projected five-year compound growth rate of 14%, resulting in a market exceeding $880 million in 1997.

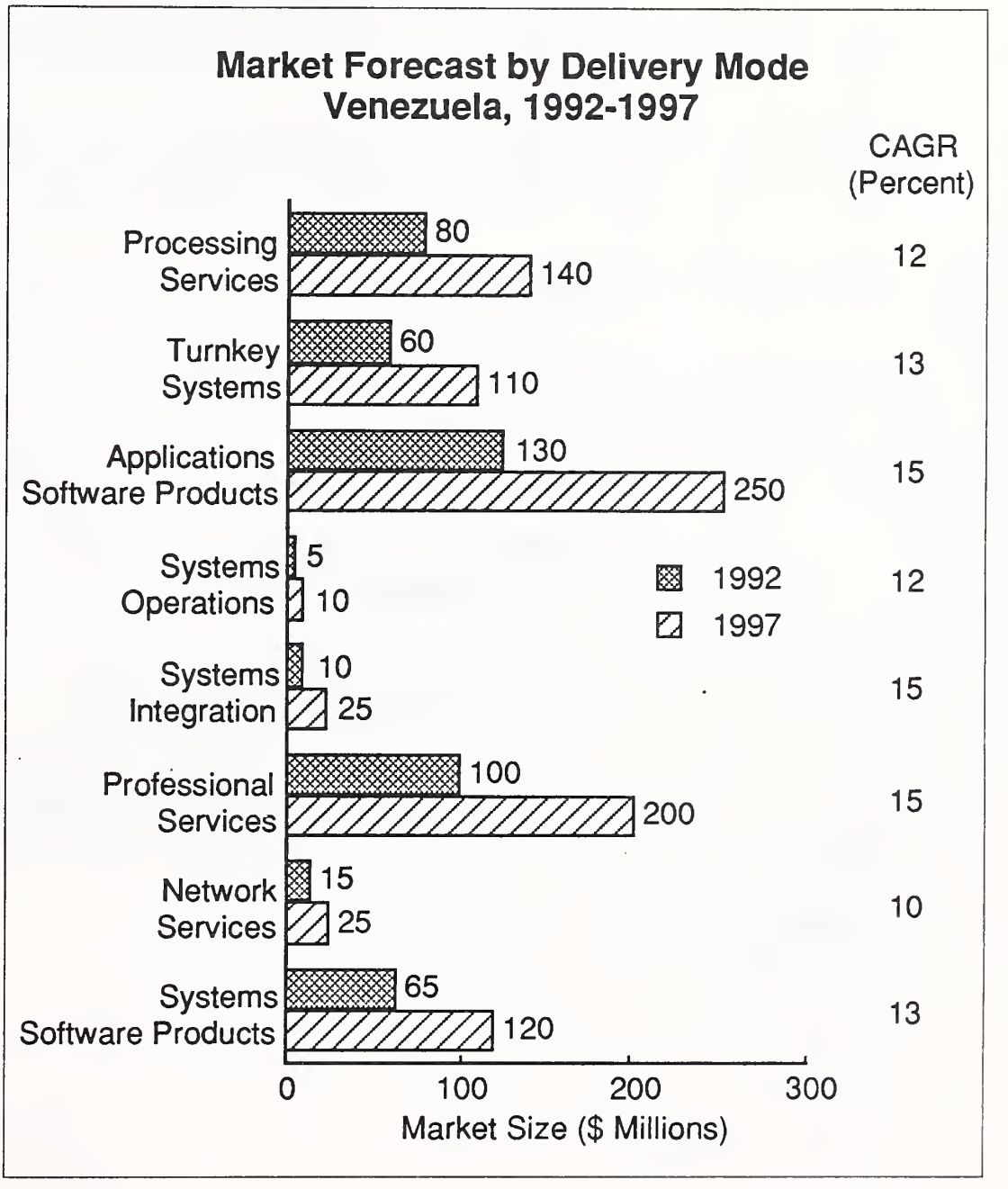
EXHIBIT III-17



INPUT has increased its forecast for Venezuela from a 13% CAGR to 14%. The increase is attributable to positive responses from the surveys, particularly for the latter three years of the forecast period, even though the slowdown in the economy continues and signs of instability remain in the government. There is a presidential election set for 1993 that will be critical to continued stability.

Exhibit III-18 provides the forecast by delivery mode, and Exhibit III-20, at the end of this profile, provides the delivery mode forecast in more detail.

EXHIBIT III-18



The processing services market in Venezuela is better established than in the other major Latin American markets, representing approximately 17% of the total information services industry. Systems operations, on the other hand, is just getting established as a delivery mode.

Software products is the biggest sector. Applications and systems software products combine to be over 40% of the industry. The applications software market is quite well established and will exceed $250 million by 1997.

Professional services is the other well-developed sector. There are a large number of firms, primarily local to Venezuela, offering these services.

As with other Latin America markets, the turnkey systems segment is reasonably large and strong. The emphasis is on PC- and LAN-based applications.

The network services market is modest, but growing and suffers from many of the same infrastructure problems as other Latin American countries.

3. Market Considerations

Exhibit III-19 lists leading Venezuela-based vendors and the delivery modes in which they primarily operate.

EXHIBIT III-19

Selected Vendors by Delivery Mode
Venezuela, 1991

Vendor	Processing/ Network Services/ Systems Operations	Professional Services/ Systems Integration	Software Products	Turnkey Systems
BDT		x		x
Caracas Dataclub	x			
Contadata	x			
Consis Int.			x	
Datamax			x	
Grupo Tea (Mexico)			x	
Infogesa		x		x
Infotec		x	x	
Kriegier, Mentilla & Assoc.	x	x		
Manapro		x	x	
Perez, Mena & Assoc. (E&Y)		x	x	
Spineira, Sheldon (Price Waterhouse)	x			
T&G Int.			x	
Telares Maracay	x			
Tercer Medio		x	x	

Many international vendors are also active and are identified in Chapter V on Latin America.

Entering the Venezuelan market can be difficult. There are a number of local regulations that protect the local companies; and there are import exposures, including software piracy.

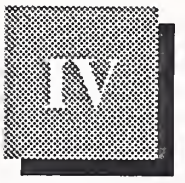
Business is dominated by a number of well-established families with whom business relationships must be developed for business success.

The market is highly competitive, the skill levels are relatively high and the local applications software products market is well developed. Successful entry requires a relationship with a well-established and connected locally based company, such as those listed in Exhibit III-20.

EXHIBIT III-20

Information Services Industry
Market Forecast by Delivery Mode and Submode, 1992-1997
Venezuela

Delivery Modes	1991 ($M)	Growth 91-92 (%)	1992 ($M)	1993 ($M)	1994 ($M)	1995 ($M)	1996 ($M)	1997 ($M)	CAGR 92-97 (%)
Venezuela IS Market	396	17	462	525	598	680	774	881	14
Processing Services	68	18	80	90	100	112	126	141	12
Turnkey Systems	44	32	58	66	74	84	95	107	13
Application Software	110	14	125	144	165	190	219	251	15
Systems Operations	5	20	6	7	8	8	9	11	12
Systems Integration	11	9	12	14	16	18	21	24	15
Professional Services	85	18	100	115	132	152	175	201	15
Network Services	15	7	16	18	19	21	23	26	10
Systems Software	58	12	65	73	83	94	106	120	13



Conclusions and Recommendations

INPUT's fourth assessment of the worldwide market for information software and services reaffirms that a number of the underlying trends for this industry are applicable on a worldwide basis.

Growth rates in almost all countries and all five regions continued to slow, suggesting the following:

- The economic impacts of the continuing recession are truly worldwide, which reinforces the fact that the information services market is becoming a worldwide market. Vendors that operate on a worldwide basis should not plan on significant growth in one region to overcome slowdowns in another and will need strategies built on a worldwide basis to deal with changing global economics.

- The revolutions now present in the North American and Western European markets—downsizing, outsourcing, networking, and re-engineering—are already having worldwide impacts. We can expect them to continue to evolve rapidly over the first half of this decade.

A
Conclusions

The information services industry will be very different by the beginning of the second half of the decade.

Key underlying trends which will drive major changes in the industry are as follows:

- *Client/server and personal computing* - In the smaller developing markets, the cost effectiveness of personal computers and their more powerful relatives, the client/server, are allowing companies to leverage information technology. In the established markets, client/server

technology is launching a revolution of application re-engineering and network integration. In both cases, the ability to use information technology is moving closer to the user.

This shift is not without impact on the information services market. It causes many vendors to rethink their strategies and re-engineer their products and services. Users must also rethink their strategies and architectures. The result is a pause in spending in some instances and expansion in others, as well as reinvestment by vendors.

By the end of 1992, client/server software products were established in the market. Significant undertakings in downsizing, particularly in the U.S., will provide some leading edge insights into how to apply this new technology to the creation of major applications solutions.

As client/server architecture becomes more stable, it seems clear that it will open whole new markets in developing countries where many smaller firms that could not afford traditional mainframe solutions will find client/server solutions both affordable and adaptable to fulfilling their needs for applications solutions.

- *Outsourcing* - The trend to outsource, whether it be software products or professional services or complete systems integration, data center operations, or network management, is growing and becoming a *revolution.*

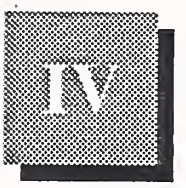
  - Systems operations is an established market in North America, growing quickly in Japan and emerging in Europe. Network management is following close behind. Strong growth will continue for the foreseeable future.

  - Systems integration is the fastest growing sector of the industry in all of the established markets, and the tendency to contract for the full solution with a single vendor is becoming common worldwide.

- *Relationships and organization* - Undertaking partnerships, alliances, acquisitions, and reorganization has become an underlying element of information services vendors' strategies worldwide. The channels of distribution are changing and the role of the large vendor is growing.

  Digital, IBM, and others are reorganizing and rethinking their structural strategies for the 1990s. Alliances, emphasis on services, and independence of business units will distinguish the information services vendors of the 1990s.

  IBM continues the process of downsizing its organization and streamlining its processes to provide responsive support with more localized decision making.



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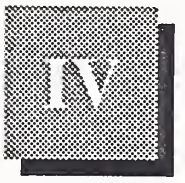

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EDS has organized into numerous vertical organizations to provide market focus and specialized services.

International firms are looking ever more closely at the U.S. market.

Systems operations firms are striving to provide full applications support services to maintain competitiveness. Just running data centers is not enough for today's outsourcing revolution.

Acquisitions by many of the large services firms are turning them into full-service companies, while software products companies speed growth by acquisition in addition to new product development. We are also beginning to see many software firms expanding their professional services capabilities to qualify them to provide full solutions to end-user information systems requirements.

- *International markets* - Today's largest users of information technology operate worldwide and require information services support at that level. The 1990s will see a true worldwide information services market develop.

  - The European market is quickly becoming integrated, with vendors wanting to be active throughout that market.

  - Latin American countries are addressing their inadequate laws relative to the importation of technology and their lack of a telecommunications infrastructure.

  - Even the Japanese market is becoming somewhat more open as the Japanese vendors seek worldwide opportunities.

B
Recommendations

INPUT makes the following recommendations to information services vendors striving for worldwide market opportunities and presence.

- *Know the real buyer* - Today's vendors all want to market solutions. The buyer of a solution is the general manager, not the information systems executive. You must teach your sales forces to sell to the new buyers of the 1990s in order to achieve success in this market..

- *Relationships* - Form relationships with real purpose and work to make them successful. Too many alliances seem to be marriages of convenience and therefore are short-lived. The result is mistrust by the user (both information systems and general management). As users focus more on a single vendor for complete service, they will inspect that vendor's dependence on relationships with other vendors.

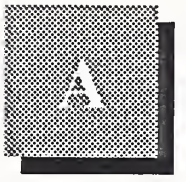
- *Commitment* - Outsourcing, long-term contracts, and relationships with clients and other vendors all require an increased level of commitment. Information services vendors must recognize the length and degree of commitment required when they enter a new geographic market, offer a new service or product, or form a relationship. Commitment will become a significant aspect of performance measurement in the 1990s and will include

  - Commitment to the local market
  - Commitment to the specific product
  - Commitment to after-sale service
  - Commitment to partners
  - Commitment to providing a full-support environment

- *Flexibility* - The 1990s will see a number of revolutions: outsourcing, downsizing, rightsizing, true network integration, and even open systems. None of these revolutions are clearly defined, nor will their foundations become fixed. Only vendors that balance commitment and service with flexibility will survive.

- *International and country focus* - The large multinational vendors will have to have strategies for both the international and local country markets. Smaller vendors must adapt their strategies to the specific countries they choose to enter. One of the keys to success will be the ability to efficiently tailor product, service, and sales/support strategies to localized geographies and cultural situations. One size in software and service does not fit all.

Despite the slowdown in most markets, significant opportunities exist to participate in what is truly becoming a global industry.



Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs. The structure defined in Exhibit 1 is also used in Europe and for the worldwide forecast.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programs for a number or years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry, as defined by INPUT. Other portions of this market (such as software support) are already included.

- Two new submodes have been defined in the *Systems Operations* delivery mode—*desktop services* and *network management.* They are defined on pages 5 and 6.

- A fourth submode has been defined within the Professional Services delivery mode—*applications management.* This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.

A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definitions of Terms* are indicated with a ☆.

B

Overall Definitions and Analytical Framework

1. Information Services

Information Services are 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:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (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 that support the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is 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., electronic data interchange 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.

2. Market Forecasts/User Expenditures

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

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 that have a different parent corporation than the user. It is these expenditures which constitute the information services market analyzed by INPUT, and are included in INPUT forecasts.

3. Delivery Modes

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 nine delivery modes defined by INPUT, six are considered primary products or services:

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

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

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

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

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called "industry-specific" markets.

- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called "cross-industry" markets.

- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

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

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organizations—commercial and non-commercial—involved in producing a good or services.

- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Program.

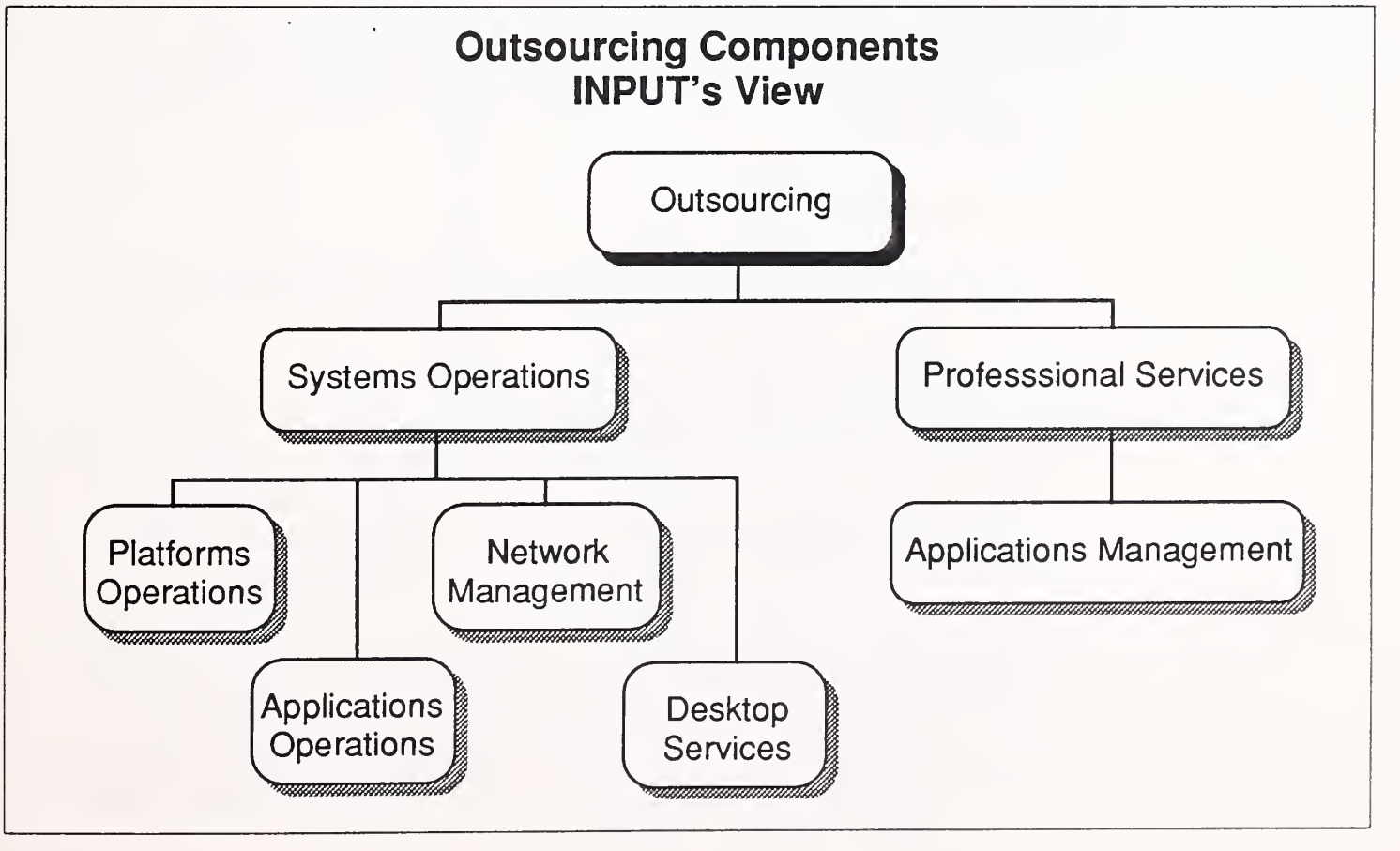
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit 1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT 1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.

- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.

☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.

☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organization. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit 2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

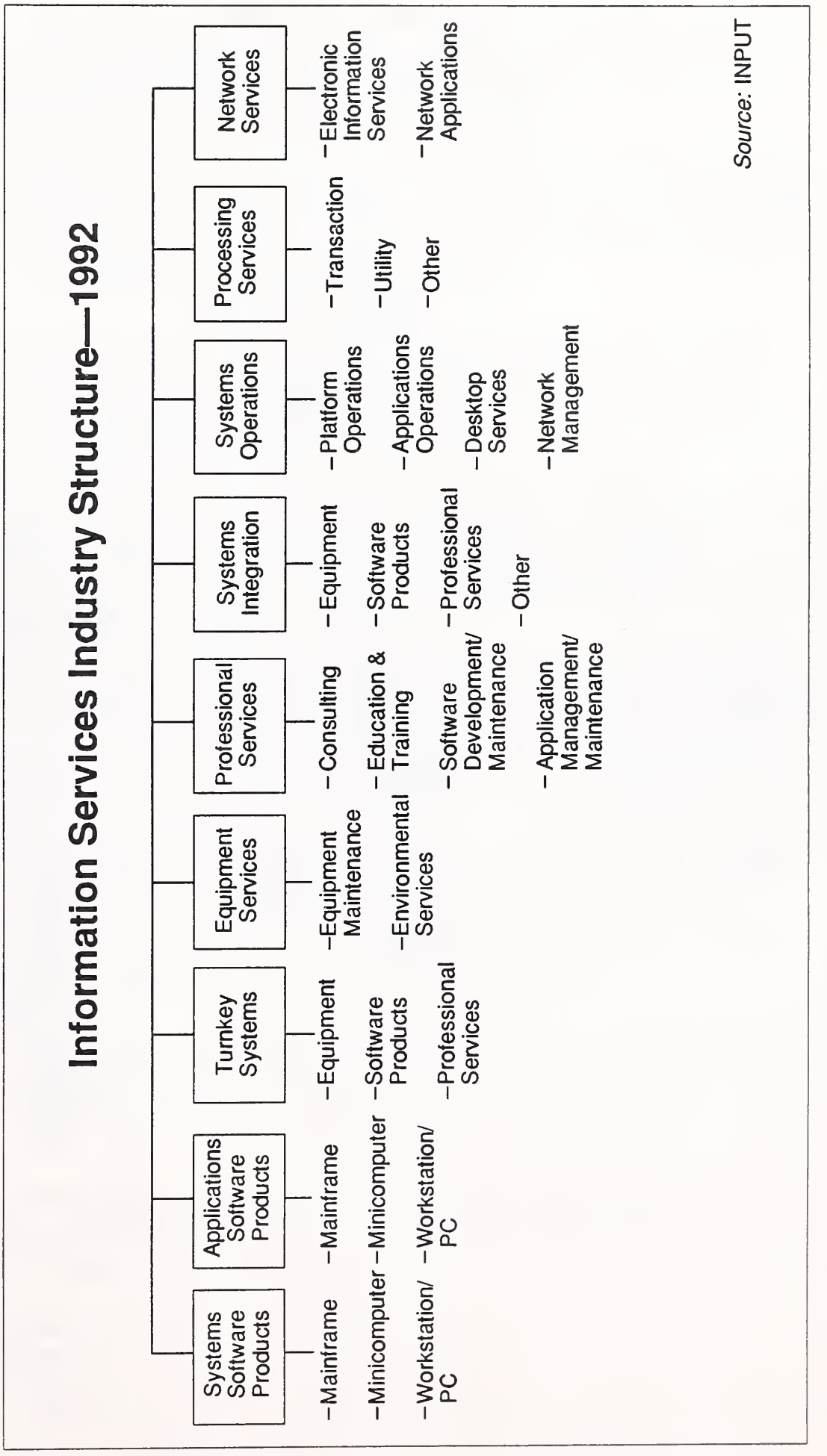
1. Software Products

INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve 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 part of the software pricing, is also included here.

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

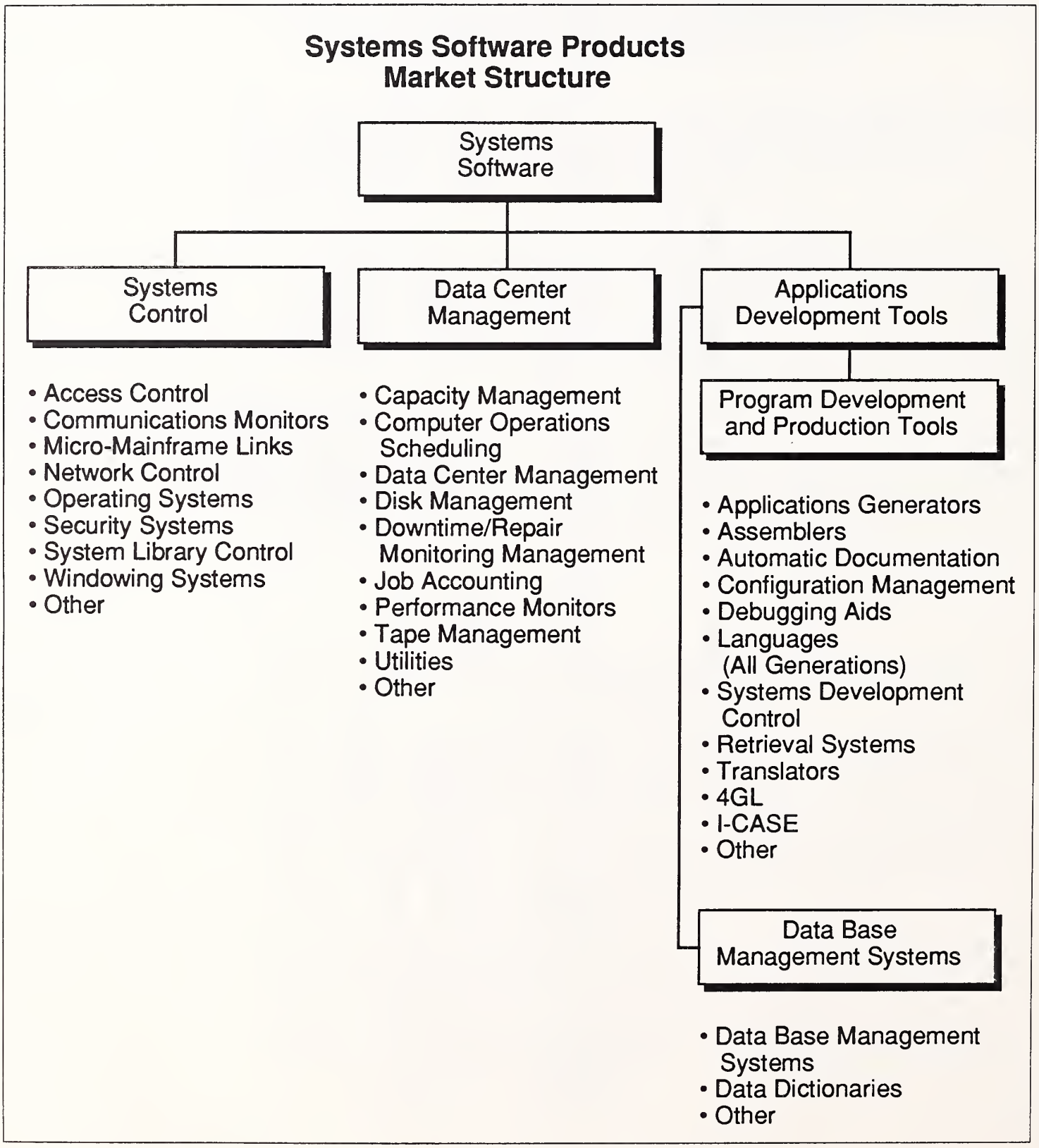
EXHIBIT 2



a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into three submodes. See Exhibit 3.

EXHIBIT 3



- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. 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.

INPUT also forecasts the systems software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit 4.)

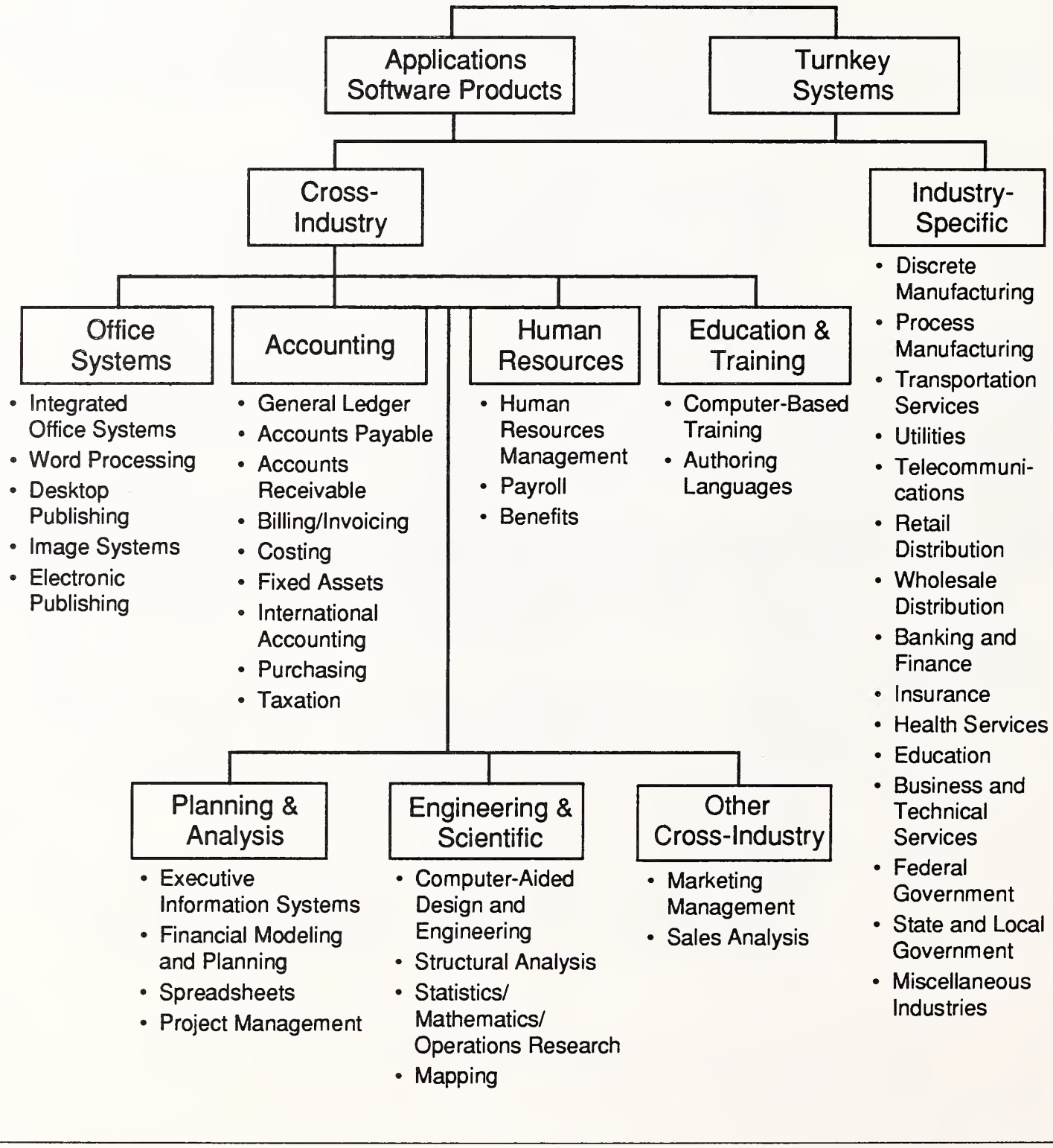
- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

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

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

EXHIBIT 4

Applications Products and Turnkey Systems



2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit 4.)

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.

Computer manufacturers (e.g., IBM or DEC) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

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

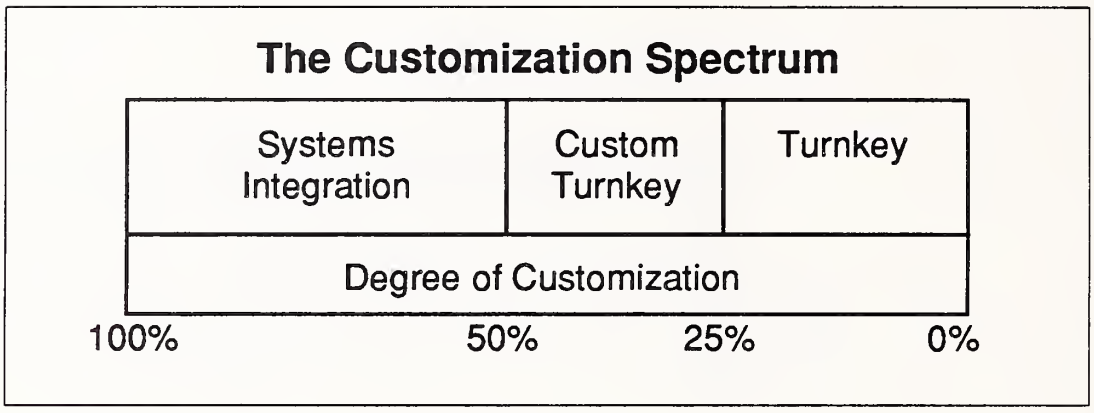
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such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

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit 5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

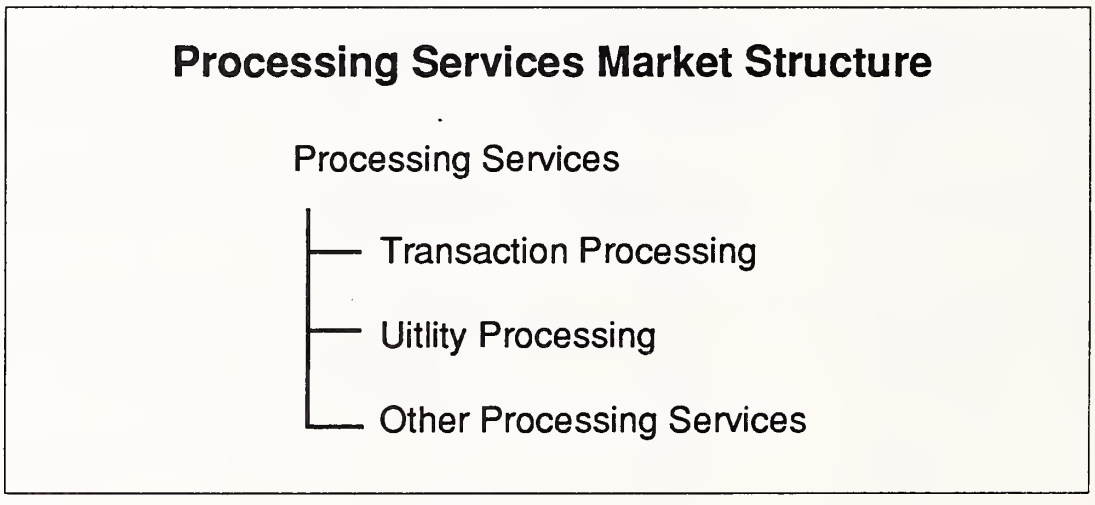
EXHIBIT 5



3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and "other" processing services. See Exhibit 6.

EXHIBIT 6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.

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

- *Other Processing Services* - Vendor provides service—usually at the 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.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programs. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data center operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

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 client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

5. Systems Integration

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development 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. (Refer to Exhibit 7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software products* - prepackaged applications and systems software products.

- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.

- *Other services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

EXHIBIT 7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit 8 provides additional detail.

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

- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems are not included. General education and training products are included as a cross-industry market sector.

- *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.

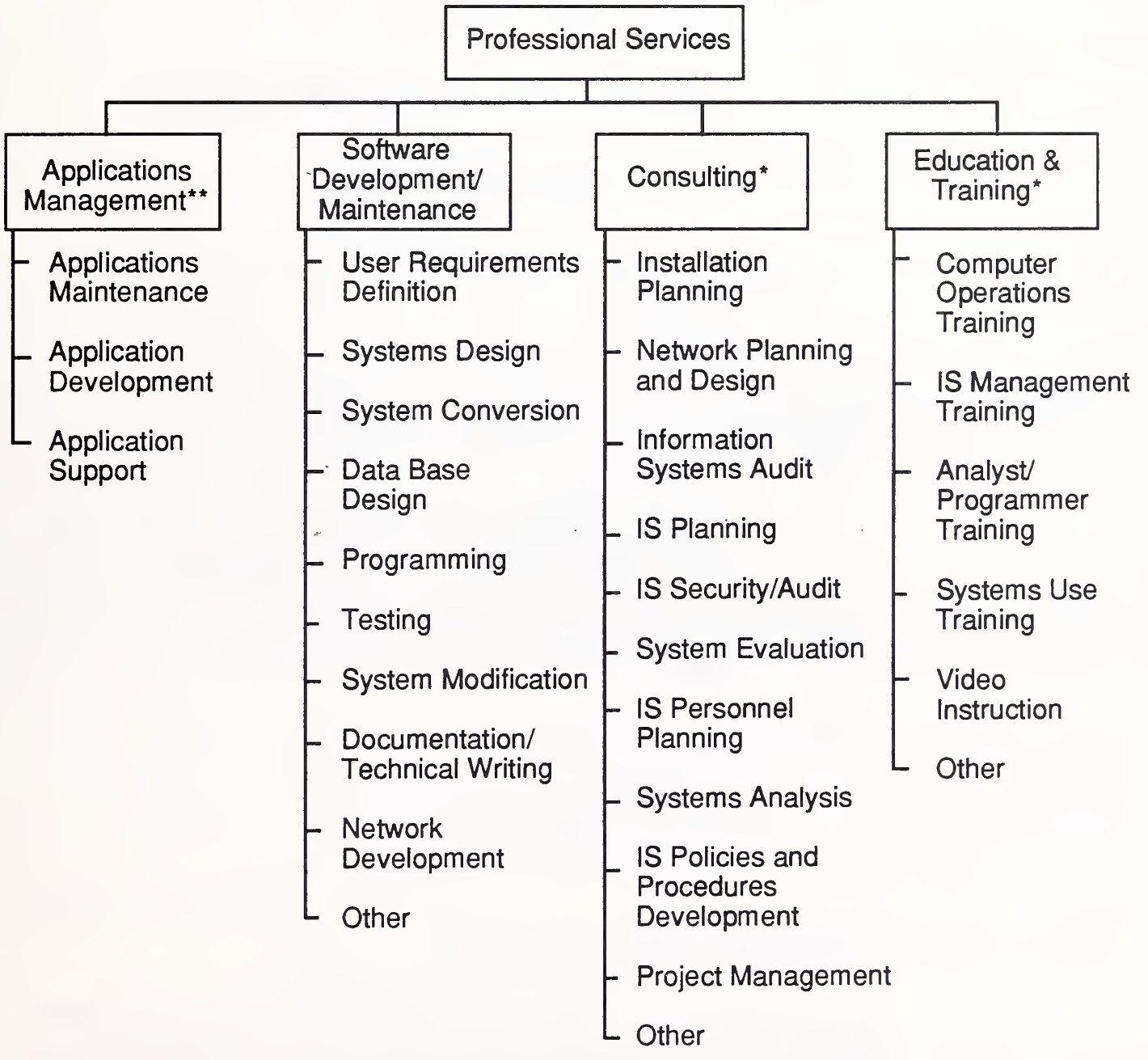
☆ *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

EXHIBIT 8

Professional Services Market Structure



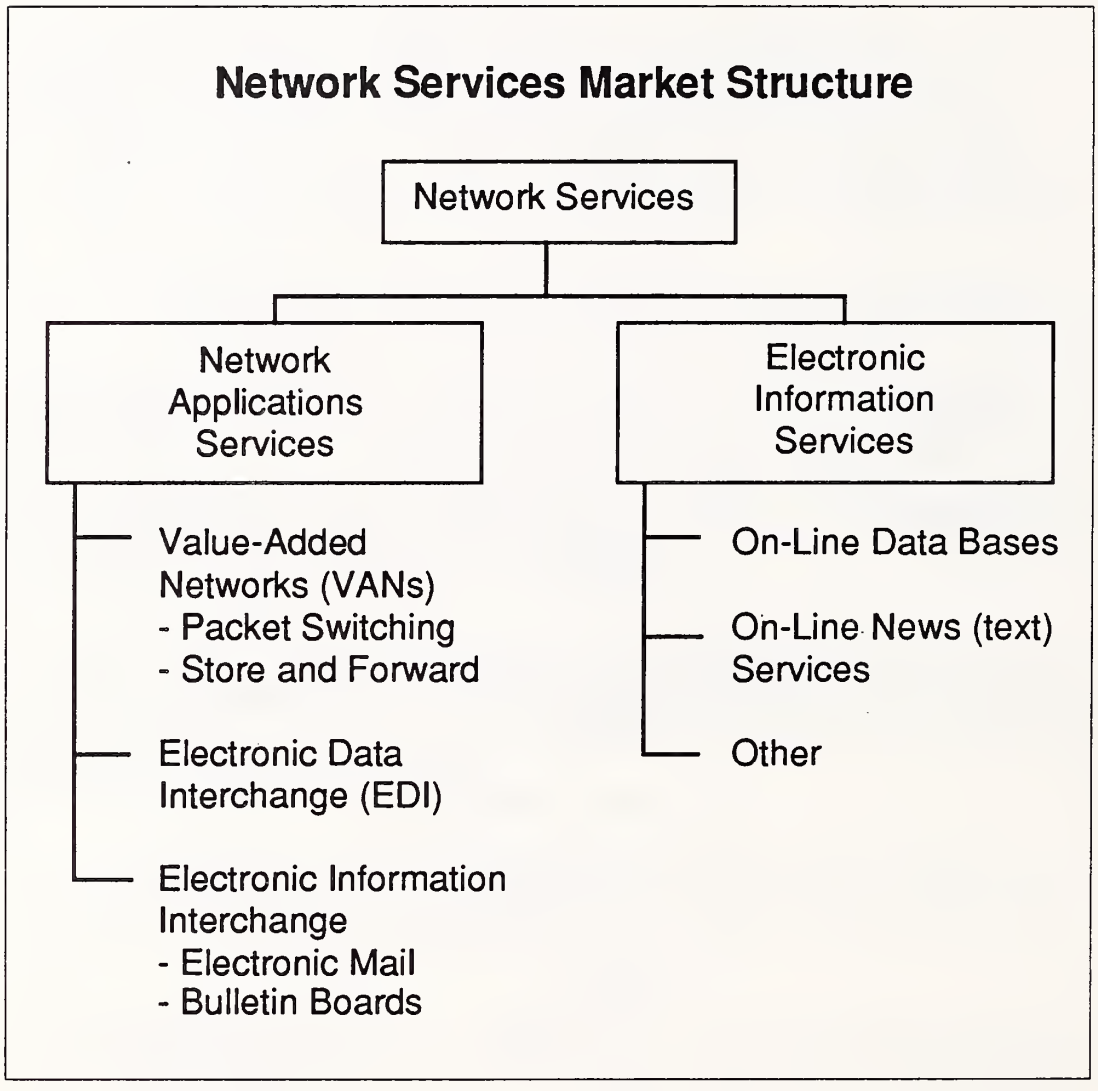
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit 9.

EXHIBIT 9



a. 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 inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

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.

- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

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.

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

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

☆ The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.

☆ *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.

☆ *Environmental Services* - Composed of equipment and data center related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D
Computer Equipment

☆ These definitions have been included to provide the basis for market segmentation in the software products markets.

☆ *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

☆ *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.

☆ *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.

☆ *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

☆ *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control

☆ *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than $5,000.

☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.

☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from $15,000 to $350,000. Many of the emerging client/server computers are in this category.

☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than $350,000.

E
Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit 10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit 9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

EXHIBIT 10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetalic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Distribution	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx 67xx	Depositary institutions Nondepositary institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT 10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Electronic publishing
- Image systems

- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.

- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programs.

- The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.

- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:

  - Sales analysis
  - Marketing management
  - Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit 11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.

- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.

- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.

- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

EXHIBIT 11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction Utility Other	X	X	 X X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform Applications	X X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications Electronic Information Services	X X		X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

  Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.

- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F

Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the valued added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

Exhibit 12 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.

EXHIBIT 12

Vendor Revenue to User Expenditure Conversion

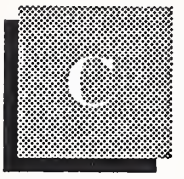
Delivery Mode	Vendor Revenue Multiplier
Applications Software Products	1.18
Systems Software Products	1.10
Systems Operations	0.95
Systems Integration	0.95
Professional Services	0.99
Network Services	0.99
Processing Services	0.99
Turnkey Systems	0.95
Equipment Services	0.99

Currency Conversion Factors

Appendix B lists the currency conversion factors used to convert from local currencies to U.S. dollars. For Europe, the factors are those used by INPUT, Ltd. in its 1992 research. The factors for other countries were derived from the Wall Street Journal, November 13, 1992.

Country	Currency	Value
Argentina	Peso	.99
Australia	Dollar	1.44
Austria	Schilling	10.63
Belgium	Franc	31.26
Brazil	Cruzeiro	8512.01
Canada	Dollar	1.26
Denmark	Krone	5.89
Finland	Markka	4.15
France	Franc	5.18
Germany	Mark	1.52
Greece	Drachma	174.00
Hong Kong	Dollar	7.73
India	Rupee	28.18
Ireland	IR Punt	0.57
Italy	Lira	1,150.00
Japan	Yen	124.00
Korea, South	Won	782.10
Mexico	Peso	3,123.01
Netherlands	Guilder	1.71
New Zealand	Dollar	1.90
Norway	Krone	5.98
Portugal	Escudo	134.90
Singapore	Dollar	1.63

Country	Currency	Value
South Africa	Rand	2.98
Spain	Peseta	96.20
Sweden	Krona	5.54
Switzerland	Franc	1.35
Taiwan	Dollar	25.19
United Kingdom	Pound Sterling	0.532
Venezuela	Bolivar	76.09



Economic Assumptions

EXHIBIT C-1

U.S. GNP Inflation Growth Assumptions 1992-1997 (Percent)

1993 Report Assumptions*	1992E	1993E	1994E	1995E	1996E	1997E	1998E
Nominal GNP	5.3	6.2	6.7	6.1	6.1	5.9	6.1
GNP Deflator	2.9	3.2	3.6	3.7	3.6	3.6	3.5
Real GNP	2.4	3.0	3.0	2.3	2.4	2.2	2.5
1992 Report Assumptions**	1991A	1992E	1993E	1994E	1995E	1996E	1997E
Nominal GNP	3.4	5.3	6.2	6.7	6.1	6.1	5.9
GNP Deflator	3.0	2.9	3.2	3.6	3.7	3.6	3.6
Real GNP	0.4	2.4	3.0	3.0	2.3	2.4	2.2

Source: CONSENSUS™ forecast, Blue Chip Economic Indicators
* Preliminary Estimate Using March 1992 *Blue Chip* Report
** As of March 1992 *Blue Chip* Report

EXHIBIT C-2

Inflation Assumptions 1991 and 1992

Country	Assumption 1991-1996	Assumption 1992-1997	Change
France	3.0	2.7	-0.3
Germany	2.7	3.9	+1.2
United Kingdom	4.8	3.7	-1.1
Italy	4.4	5.2	+0.8
Sweden	6.3	4.0	-2.3
Denmark	2.7	2.4	-0.3
Norway	4.9	3.4	-1.5
Finland	5.0	1.4	-3.6
Netherlands	2.4	3.3	+0.9
Belgium	3.3	3.2	-0.1
Switzerland	3.3	3.5	+0.2
Austria	2.6	3.2	+0.6
Spain	4.7	5.0	+0.3
Portugal	8.0	12.5	+4.5
Greece	12.0	11.0	-1.0
Ireland	3.0	3.0	0.0
European Average	4.0	4.2	+0.2

Sources: OECD Forecasts Q4 1991