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# WORLDWIDE INFORMATION SERVICES FORECAST 1990-1995

INPUT®

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**Market Analysis Program (MAMAP)**

***Worldwide Information Services Forecast, 1990-1995***



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# Abstract

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

The report provides forecasts of user expenditures for information services in 30 countries or geographic areas in North America, Europe (Western and Eastern), Asia and the Pacific, Latin America, and the Middle East and Africa.

For each country or geographic area, the report analyzes user expenditures for each of eight delivery modes that INPUT uses in all information services market forecasts and analyses.

The report provides an overview of each market (regional or national), including the driving forces and inhibiting factors impacting the local information services industry. The report provides a number of considerations for market entry or expansion in each country or area, as well as a number of recommendations for increasing the marketing effectiveness of companies in foreign countries.

This report contains 276 pages, including 147 exhibits.

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# Introduction

# Introduction

## A

## Purpose and Scope

This is the second worldwide information services forecast prepared by INPUT. The first covered the period 1989-1994; this report covers 1990-1995.

In 1990, the worldwide information services and software products market approached the $200 billion (U.S. dollars) level. This market continues to outgrow the rate of economic growth in essentially all 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.

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.

## B

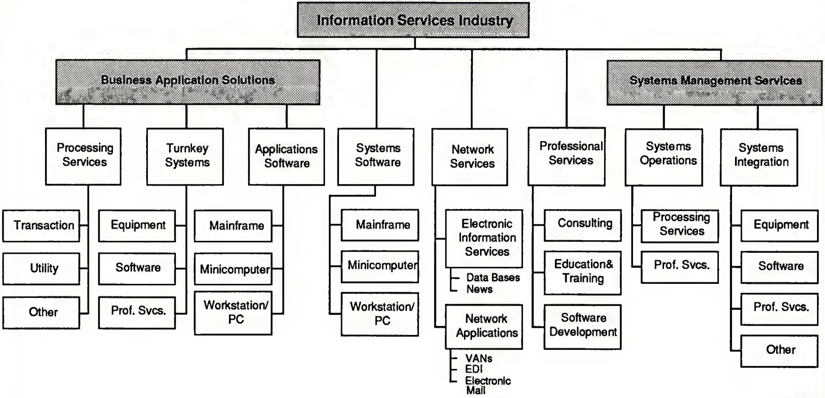
## Methodology

The research conducted for this report included extensive primary and secondary research. It draws upon INPUT's 15-year tradition of forecasting the U.S. and European information services markets and its ever-expanding coverage of worldwide 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. Appendix A provides definitions of the delivery modes and submodes used by INPUT as well as other terms.

EXHIBIT I-1

## Information Services Industry Structure—1990



*Source:* INPUT

In 1990 INPUT changed the information services industry structure to include an eighth delivery mode, systems operations. This delivery mode consists of the former systems operations submodes from the processing services and professional services delivery modes. The addition caused no change in market size, just a realignment of submodes. Please refer to Appendix A for a more complete description.

Primary and secondary research was conducted for 30 countries and geographic areas of the world, including those in the following list. For 1990, East and West Germany have been combined.

- Africa
- Australia
- Argentina
- Belgium
- Brazil
- Canada
- Denmark
- Eastern Europe
- Finland
- France
- Germany
- Hong Kong
- Italy
- Japan
- Korea (South)
- Mexico
- Middle East
- Netherlands
- New Zealand
- Norway
- Other Asia
- Other Western Europe
- 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 1990
- New primary research from INPUT's affiliates in Japan and South Korea
- 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.

During 1991, INPUT plans to perform additional primary research in Latin America, the Pacific Rim, and the Middle East, and a new assessment of the emerging Eastern European market.

## 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 C provides a compendium of economic assumptions used in this report.

Note that some revenue data has been rounded for display in the exhibits. As a result, calculation of a CAGR based on exhibit revenue data could vary from the market data bases provided for the worldwide, regional and country or area markets.

## C

## Report Structure

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 USSR and countries considered part of the 'Eastern Bloc.' East and West Germany are combined in the 1990 report.
- 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.
- 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 is comprised of a brief introduction 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.

## D

## Related INPUT Reports

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

- *U.S. Application Solutions Market, 1990-1995*
- *U.S. Processing Services Market, 1990-1995*
- *U.S. Professional Services Market, 1990-1995*
- *U.S. Network Services Market, 1990-1995*
- *U.S. Systems Operations Market, 1990-1995*
- *U.S. Systems Integration Market, 1990-1995*
- *U.S. Systems Software Products Market, 1990-1995*
- *Canadian Services Market, 1990-1995*
- *Western European Application Solutions Market, 1990-1995*
- *Western European Processing Services Market, 1990-1995*
- *Western European Professional Services Market, 1990-1995*
- *Western European Network Services Market, 1990-1995*
- *Western European Systems Operations Market, 1990-1995*
- *Western European Systems Integration Market, 1990-1995*
- *Western European Systems Software Products Market, 1990-1995*


# Worldwide Summary

II

# Worldwide Summary

## A

## Introduction

This chapter provides a summation of the five regional summaries, each of which is a summation of the countries contained in each region. Included are an overview of the global environment for the information services industry on a worldwide basis, identification of the forces driving and inhibiting the adoption of information technology that are common worldwide, and the worldwide forecast.

## B

## Global Business Environment

The global business environment was impacted by a spreading recessionary element during 1990. The slowdown in the major economy of the United States, combined with slowdowns in the United Kingdom and other European countries, had a dampening effect on the overall market for information services and products. Although growth continues to exceed the local GNP in essentially all geographical areas, the near-term and five-year growth rates are generally somewhat below the 1989 worldwide forecast.

- Globally, businesses continue to become more interrelated.
- Debt and inflation remain significant considerations throughout the world.

In addition, global economies appear to be continuing their shift toward the Far East. The growth rates in the economies and as forecasted by INPUT in this worldwide report favor the Far Eastern markets to some degree. Certainly the markets outside Japan are small and less developed, suggesting that they could see greater growth than the markets of North America and Europe.

The concern that developed throughout 1990 about a recession in the U.S. and elsewhere brought renewed inflationary concerns. However, to date inflation has not been a major problem.

The U.S. information services market makes up 50% of the worldwide total. Therefore, the direction of this market quickly impacts the overall results. Its growth is currently constrained by the recession and the outlook for a modest upswing in late 1991. There is little expectation of a large recovery and thus only continued modest improvement in the business environment.

In smaller markets, the reaction to economic swings is quicker and larger, but does not show directly in the worldwide summary.

## C

## Environmental Factors

The 1989 worldwide report from INPUT identified a number of factors within the information services industry that are impacting the market on a worldwide basis. These factors have been reviewed and revised in this report and are listed in Exhibit II-1. Each of these factors forms part of the underlying basis for growth of the industry worldwide.

EXHIBIT II-1


- *Information society*—Developed and developing countries alike recognize that the use of information is necessary to be competitive in the modern world. The costs of leveraging information technology con-

tinue to decline and vendors successful in the larger markets continue to push into the emerging markets.

For developed countries, information is increasingly a commodity. For newly developing countries, increased amounts of information are necessary for analysis to ensure maximum utilization of resources. Whether a country is developed or developing, information is necessary in building a modern society.

- *Industrial development*—Privatization and the allocation of greater proportions of national budgets to technology are indicators of the recognition of the value of information technology to national development. However, many countries are unable to make significant use of technology.

  There is almost universal recognition that an industrial base is necessary to make maximum use of information technology. Newly developing and less-developed countries are placing increased emphasis on industrial development and the application of technology-based products and services.

- *Personal computer and client/server technology*—The advances in low-cost, high-power computers are bringing new energy to the market for related services and products. In the established larger markets, new opportunities result. In the emerging smaller markets, quicker adoption of information technology will result due to lower costs. LANs and client/servers will open significant opportunities in all of the smaller markets throughout the 1991-1995 period and beyond.

- *Integrated solutions*—In developed and rapidly developing countries, there is increasing focus on the integration of systems. The integration can include large mainframes, office systems and corporate-wide networks. The skills required to achieve this integration often require even the large user organizations to seek support from information services vendors.

- *Industry-specific software*—Increasingly, there is a demand for software that meets the needs of a specific industry or user. As mini and personal computers are introduced into smaller organizations, there is increasing need for software that will meet a particular need, as opposed to generalized (spreadsheet-type) software. Throughout the 1990s the information services market will become more and more oriented toward solutions for specific industries and applications.

- *Networks*—National and local networks are increasingly necessary for the development of an organization and a country. Network-based systems and services are developing as a primary means of information delivery and interorganization communications. The provider of networks will have to have worldwide capabilities or alliances.

- *International standards*—Progress in the creation and adoption of worldwide information technology standards gained speed at the end of the 1980s. This will continue and standards will become an even greater factor in the worldwide information services industry throughout the 1990s. Standards greatly assist the user to gain a return on information technology investment. Vendors that help implement standards will be in significant demand.

## D

## Market Forecast

### 1. Worldwide Summary

The worldwide market for information services and software products grew to $175 billion in 1989 and reached $200 billion in 1990. The projected growth over the next five years is 16% per year—a small decrease from the 17% forecasted previously. By 1995 the market will reach over $400 billion, as shown in Exhibit II-2.

EXHIBIT II-2

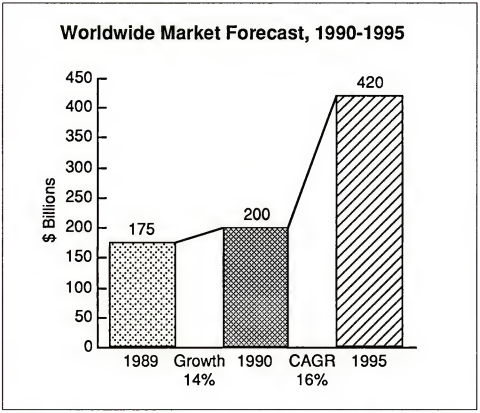


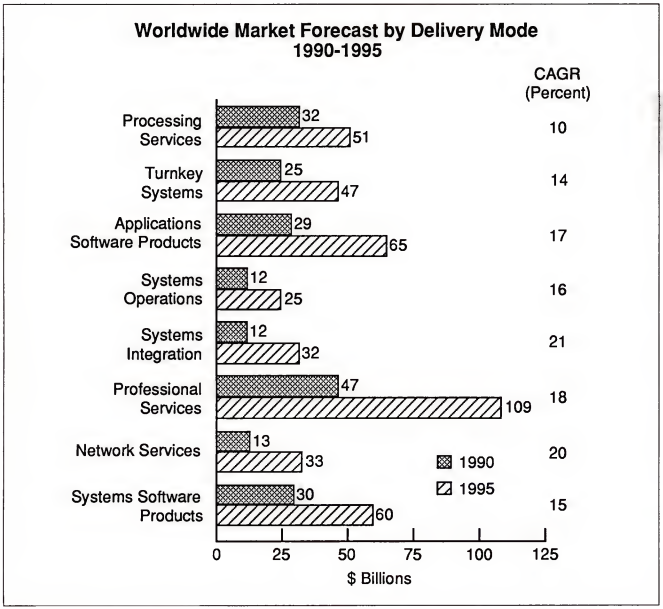

Exhibit II-3 provides the worldwide forecast by the eight delivery modes used by INPUT to analyze the information services industry on a worldwide basis. This information differs from last year's worldwide forecast report as follows:

- The software products sector is projected in two parts: applications and systems software products.
- The systems operations delivery mode was created from portions of the professional and processing services delivery modes.

The stronger delivery modes are also the smaller ones:

- Systems integration with a 21% CAGR

EXHIBIT II-3



- Network services with a 20% CAGR

- Systems operations with a 16% CAGR

Applications software products and professional services are also forecasted to grow faster than the overall market, at 17% and 18%, respectively.

**2. Geographic Distribution**

During the five-year period, 1990 to 1995, the market share for major geographic areas will shift somewhat, as shown in Exhibit II-4. North America will remain by far the largest but will decline from 52% to 46% of the total. The growth rates in Europe and the Asia/Pacific (in particular Japan) will drive the shift.

EXHIBIT II-4

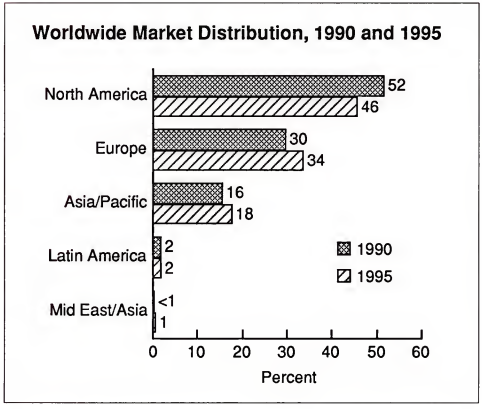



Exhibit II-5 identifies the five largest countries and their market sizes. Together they represent 83% of the worldwide market, but will decline slightly by 1995 to 81%.

EXHIBIT II-5

**Worldwide Market Forecast—Leading Countries**

| Country | 1990 $ Billions | 1990 Total (Percent) | 1995 $ Billions | 1995 Total (Percent) |
|---|---|---|---|---|
| United States | 100 | 50 | 186 | 45 |
| Japan | 26 | 13 | 62 | 15 |
| France | 15 | 8 | 36 | 9 |
| Germany | 12 | 6 | 27 | 6 |
| United Kingdom | 11 | 6 | 25 | 6 |
| Total | 164 | 83 | 336 | 81 |

### 3. Regional Area Comparison

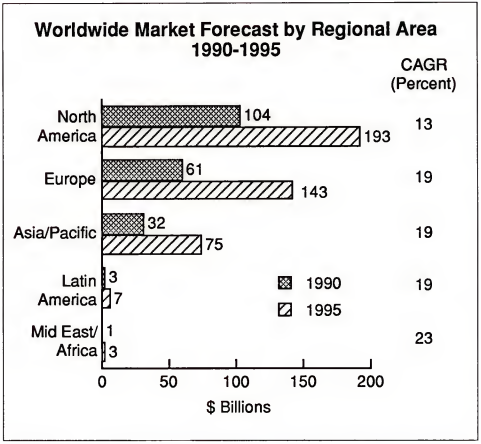
This section provides a comparison of the worldwide market by the five regional areas, first in total and then for each of the delivery modes. All of the charts are in U.S. $ billions.

- Exhibit II-6 provides the forecasts by regional area.
- Exhibits II-7 through II-14 provide the regional area comparisons by delivery mode.

*Processing services*—Although one of the largest segments, processing services will experience growth below the industry overall average in each of the five regional areas.

*Turnkey systems*—Turnkey systems, though currently a market of modest growth in North America, remains a very strong opportunity in the rest of the world. Client/server technology will continue to drive this delivery mode into the 1990s.

EXHIBIT II-6




*Applications software products*—In general, this is one of the strongest delivery modes and offers significant opportunities. Only North America has reached a penetration of greater than 50%. Significant growth opportunities remain in Europe and Asia, particularly in Japan.

*Systems operations*—An established market in North America and to some degree Japan, the systems operations concept remains relatively new and underutilized in the rest of the world. A few worldwide vendors will be pursuing this market in North America, Europe and Japan over the next five years and beyond.

*Systems integration*—The strongest delivery mode, in terms of growth, in the three major regions—North America, Europe and Japan.

*Professional services*—The largest sector overall, professional services will see excellent growth in all markets except North America, where the tendency to shift to systems integration-type services will overshadow professional services to some degree.

*Network services*—This sector truly has the most worldwide aspect in the information services industry. All of the established markets require network access on a worldwide basis. Network applications and electronic information services will see strong growth over the next five years.

*Systems software products*—The growth of systems software products by region is primarily tied to hardware sales and the need to interconnect processing facilities. It remains a market of strong potential with relative ease of international product sales regardless of what country the product originates from. If the product complies with international standards and has functions of measurable value, a market for it will exist in all regions eventually.

EXHIBIT II-7

**Worldwide Market Forecast by Regional Area Processing Services, 1990-1995**

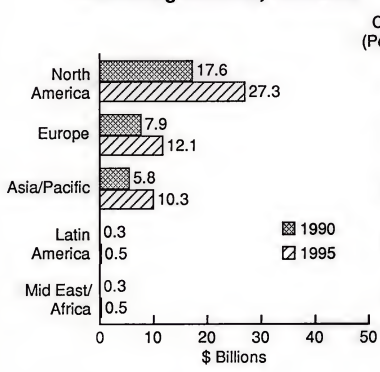
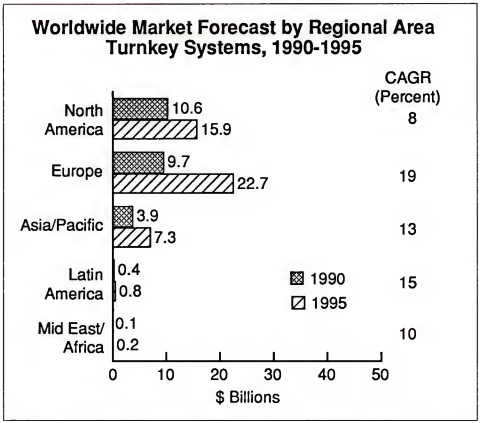


EXHIBIT II-8

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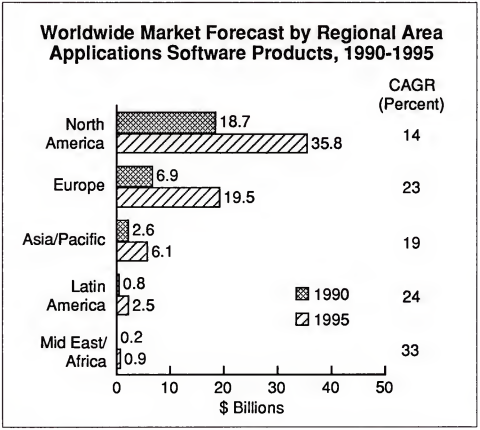


EXHIBIT II-10

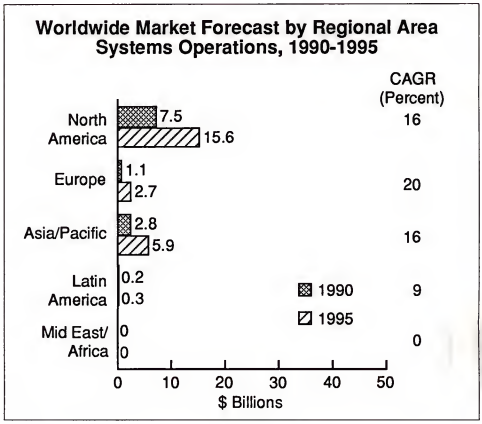



EXHIBIT II-11

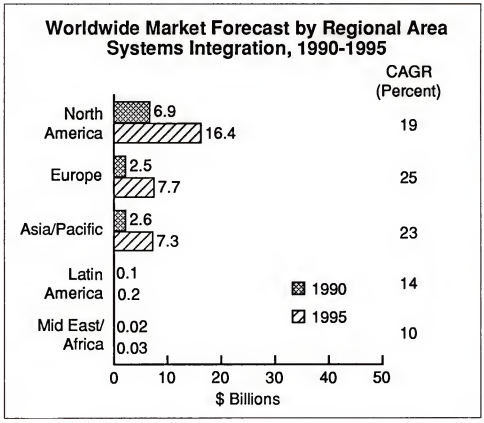


EXHIBIT II-12

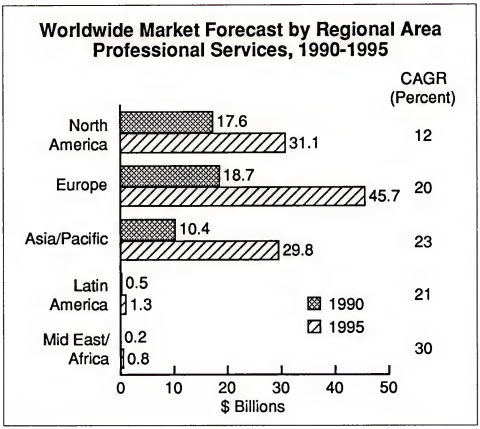



EXHIBIT II-13

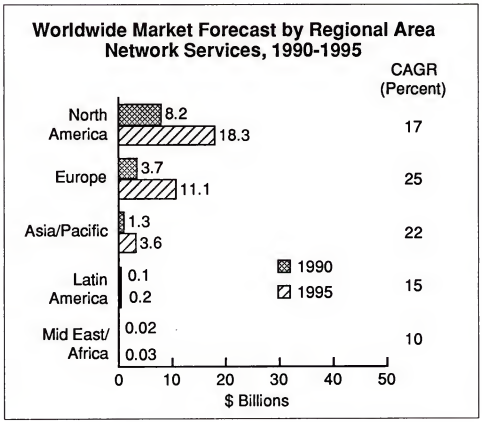
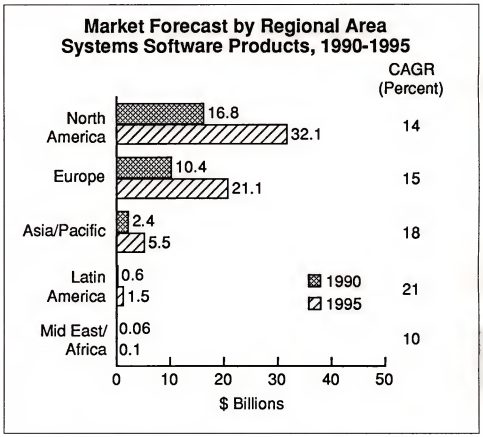


EXHIBIT II-14




The leading information services vendors (excluding computer manufacturers) and their worldwide information services industry revenues are listed in Exhibit II-15. All of the major markets (U.S., Europe, and Japan) are represented in the top vendor list.

Exhibits II-16 and II-17 provide growth rate comparisons between the 1989 and 1990 five-year forecasts by delivery mode and by region. The overall five-year growth rate declined by 1%. Since the North American region represents over 50%, the reduced growth outlook in this region is a key factor in the overall reduction.

Note that in Exhibit II-16, the 1989-1994 CAGRs for processing services and professional services were restated from the 1989 report to reflect the creation of the systems operations delivery mode. The software products forecast from the 1989 report was split to reflect two segments. Because of the way the data was compiled for the 1989 worldwide forecast, these restatements are estimates.

EXHIBIT II-15

## Leading Information Services Vendors Worldwide Revenues and Market Share

| Rank | Vendor (Country) | 1989 Revenue ($ Billions) | Market Share (Percent) |
|---|---|---|---|
| 1 | EDS (U.S.) | 2.4 | >1 |
| 2 | NTT Data (Japan) | 2.2 | >1 |
| 3 | Andersen Consulting (U.S.) | 1.7 | <1 |
| 4 | ADP (U.S.) | 1.7 | <1 |
| 5 | TRW (U.S.) | 1.5 | <1 |
| 6 | CSC (U.S.) | 1.4 | <1 |
| 7 | CAP Gemini Sogeti (France) | 1.1 | 0.5 |
| 8 | Nomura Research Inst. (Japan) | 0.8 | <0.5 |
| 9 | Hitachi Information Sys. (Japan) | 0.8 | <0.5 |
| 10 | AMEX (U.S.) | 0.7 | <0.5 |
| 11 | Finsiel (Italy) | 0.6 | <0.5 |
| 12 | First Financial Management | 0.6 | <0.5 |
| 13 | CSK (Japan) | 0.5 | <0.5 |
| 14 | Japan Research Inst. (Japan) | 0.5 | <0.5 |

EXHIBIT II-16

## Compound Growth Rate Comparison by Delivery Mode

| Delivery Mode | 1989-1994 CAGR (Percent) | 1990-1995 CAGR (Percent) |
|---|---|---|
| Processing Services | 10 | 10 |
| Turnkey Systems | 13 | 14 |
| Applications Software Products | 20 | 17 |
| Systems Operations | 16 | 16 |
| Systems Integration | 24 | 21 |
| Professional Services | 21 | 18 |
| Network Services | 19 | 20 |
| Systems Software Products | 18 | 15 |
| Total | 17 | 16 |

EXHIBIT II-17

## Compound Growth Rate Comparison by Region and Worldwide

| Region | 1989-1994 CAGR (Percent) | 1990-1995 CAGR (Percent) |
|---|---|---|
| Asia/Pacific | 19 | 19 |
| Europe | 19 | 19 |
| Latin America | 19 | 19 |
| Middle East/Africa | 26 | 23 |
| North America | 15 | 13 |
| Worldwide | 17 | 16 |

# Regional Summary—Asia/Pacific

# Regional Summary—Asia/Pacific

## A

## Regional Overview

The Asia/Pacific region continues to be one of the strongest overall economic regions of the world and, if economic projections hold true, will become the center of major economic activities in the next century.

The Asia/Pacific region is one of the most diverse regions of the world. With the largest geographic area, the highest population, a seemingly tireless labor force, and abundant resources, the region has begun to emerge as a world economic leader.

Within the region, three countries—South Korea, Singapore, and Taiwan—and Hong Kong have been consistently demonstrating the highest growth rates in the world. In addition to these "Four Tigers," Malaysia and the Philippines have demonstrated increasingly stable economies and are focusing on national and international development.

Although overall growth of development and trade has slowed over the past several years, there has been stabilization, and most economists believe that the rate of growth in the Asia/Pacific area will continue to exceed the rest of the world by at least one percentage point for the next several years.

The national governments continue to invest significant funds and energy in local development of services that favor the local information services industries. This internal development will continue to fuel the dynamic growth in the region.

There are a number of forces driving the development of information services in the Asia/Pacific area. There are also several factors that could cause their growth to be inhibited over the next several years.

### 1. Driving Forces

The forces driving development of information services are significant.

- *Technology value*—Recognition of the value of technology, in particular information technology, is a strength in this region. As a center for the manufacturing of technology products, Asian countries have come to recognize the direct relationship between investment in technology and national development.

- *Labor skill and energy*—Most newly developing Asian countries have placed significant and increasing focus on educating their populations, as evidenced by South Korea, Japan, and Singapore; much of the emphasis has been in the area of technology. In addition, these countries all benefit from longer work hours than the western regions. Workers in the Four Tiger countries work an average of 41% more hours per week.

- *National development*—Asian countries have implemented extensive plans to develop their national infrastructures. Chief among their priorities is the ability to successfully compete in an economic environment controlled increasingly by electronic means. Nearly all of the countries in this region have aggressive national development programs designed to help them move away from being fundamentally agrarian societies.

### 2. Inhibiting Factors

Although the forces causing the growth of information services are great, there are a number of factors that could have a significant impact on the ability of the countries to continue their development.

- *Political stability*—Long-term political stability remains a concern in many Asian countries. As evidenced by events in the PRC (People's Republic of China), changes in the political environment can happen quickly and cause significant disruption in development efforts. The impact of 1997 on Hong Kong and questionable stability in the second-tier countries raise concerns about market opportunities.

- *Western protectionism*—Protectionism by many Western countries is a concern to many of the Asian countries. While Asia is a growing market for Asian products, the majority of products and services are destined for Western countries. As economies (notably the U.S.) stagnate, national sentiment has been to take steps to limit imports of goods and services. Increased protectionism could affect the growth of Asian economies as it limits investment by Western-based companies.

- *Inflation*—The economies of most Asian countries are tied to the economic health of the West. The recession in North America and Europe, although mild, may slow development in Asia/Pacific.

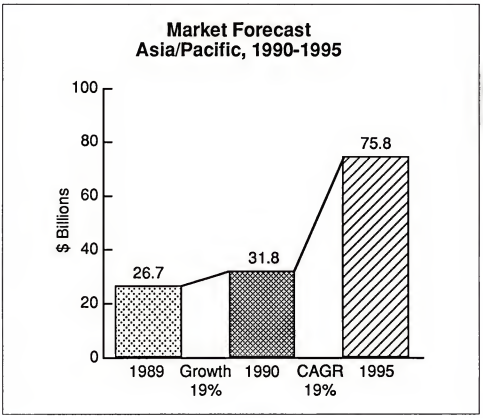
- *Domestic economic base*—Most Asian countries have a small economic base from which to derive investment resources. This small base restricts the speed at which they can grow.

## B

## Information Services Market Forecast

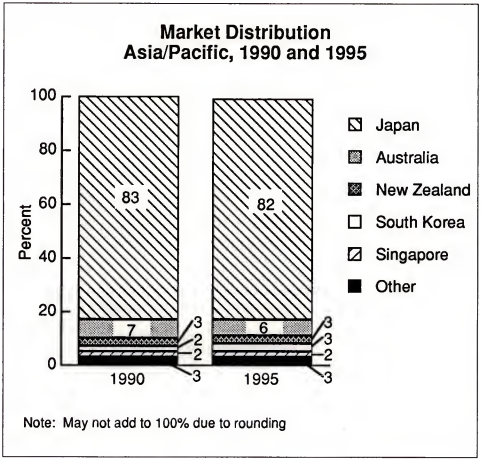
The information services market in the Asia/Pacific area grew to more than $26 billion in 1989. Between 1990 and 1995, the market is expected to grow from almost $32 billion to over $75 billion, as Exhibit III-1 shows, with an annual growth rate of 19%.

EXHIBIT III-1




In the region as a whole, the market in Japan represents approximately 83% of the total, as shown in Exhibit III-2. Little change is expected in Japan's dominance of the region's markets for a number of years to come. However, one change in the pattern of distribution could be significant in the longer term.

EXHIBIT III-2



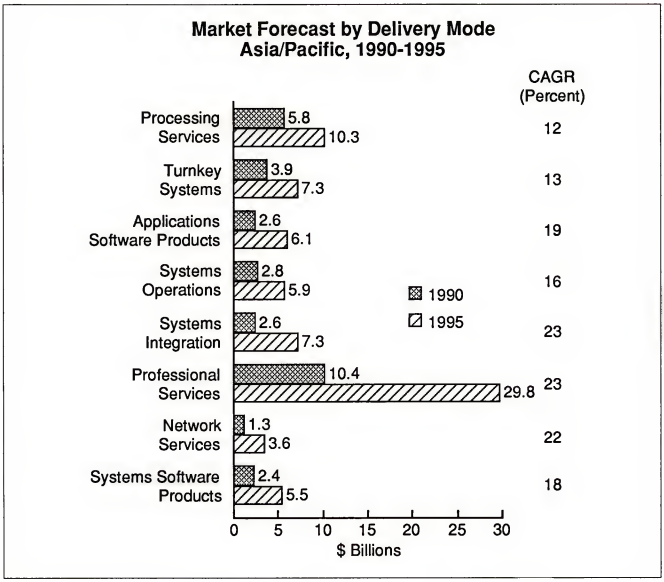

Although Japan's share of the regional market is not expected to change significantly, the second-tier countries (Group 2) are expected to grow at the expense of the less developed countries.

Unless methods are found to introduce technology faster in the less developed countries, they are in danger of sinking further into a 'have not' category. Though the markets are comparatively small, strategies that will contribute to national development of these countries could result in a strong market position.

As shown in Exhibit III-3, growth rates in each of the delivery modes are expected to be strong for the next several years.

- *Processing services*—The market for processing services is expected to be stronger than in Western regions, due to the number of medium-sized companies that have growing processing requirements and that believe they are too large to be able to use personal computers. The market for processing services is expected to grow from $6 billion to an estimated $10 billion by 1995, an annual growth rate of 12%. This compares to a 13% CAGR projected in the 1989 worldwide forecast report.

EXHIBIT III-3




- *Turnkey systems*—In the Asia/Pacific region, turnkey systems are expected to grow at a faster rate than in the U.S. (13% vs. 9%), reflecting the need for short-term solutions to meet growing needs.

  However, note should be made that the majority of the turnkey systems should be expected to be in the lower-end mini- and micro-based systems, rather than in large systems. Overall, the market is expected to grow from an estimated $3.9 billion in 1990 to $7.3 billion by 1995.

- *Applications software products*—The need for applications software products will make this one of the strongest delivery modes in the Asia/Pacific area, growing from $2.6 billion in 1990 to $6.1 billion in 1995—a 19% CAGR. Demand for industry/application-specific microcomputer software is expected to be the major driver.

- *Systems integration*—Requirements for systems integration are expected to be strong. The key market for integration services is Japan, though other market areas such as Australia and South Korea could be significant.

  - Note should be made that identifying a systems integration market in less developed and developing countries is difficult. There are few projects that would qualify as systems integration projects if high value is considered an identifying factor.

  - In the smaller developing countries the separation between turnkey systems and systems integration is less clear than in a country such as Japan. Together these markets represent a significant opportunity to provide fulfillment of information systems requirements.

- *Professional services*—Professional services is the largest and among the strongest delivery modes, with growth of 23%, from over $10 billion in 1990 to over $29 billion by 1995. The requirement for professional services is very strong in Japan and the other larger markets where professional services skills remain somewhat scarce, in particular in medium-sized and smaller companies.

- *Network services*—Starting from a small base, the market for network services is expected to show substantial growth, driven by the increasing need for services such as electronic mail and EDI. The 22% CAGR will create a market exceeding $3 billion by 1995. Growth in some countries will be greater and the overall growth could easily exceed 23% depending on national development priorities in the related telecommunications area.

- *Systems software products*—The market for systems software products is strong, driven by the adoption of PCs/workstations and minicomputers. In addition, interest in CASE and other application development tools creates significant opportunities for software product developers from Western countries.

## C

## Market Considerations

There are a number of considerations related to entering the market for information services in the Asia/Pacific area.

- *National infrastructure*—In many Asian countries, the national infrastructure is extremely limited, indicating that significant effort will be required before extensive use can be made of many technological advances.

- *Size of market*—Outside the Japanese market, each country's market for information services is modest compared to Western markets. This suggests that the costs of entry must be weighed carefully. The use of local agents is the most common approach to market entry.

- *Investment term*—Organizations interested in entering or expanding into the Asia/Pacific area should realize that a long wait may be required before there is a return on investment. All investments must be made with the long term in mind.

- *Organizational stability*—Organizations entering the Asian market must be able to demonstrate long-term stability. Experience with Western companies has indicated that these companies are not prepared to continue as committed players for an extended period. This is particularly true in the area of software services, where numerous organizations have entered the market, then failed to provide ongoing support.

- *Cultural diversity*—Organizations must recognize that there is great cultural diversity in the Far East. Individuals representing products and services must be able to deal successfully with a wide range of business styles, practices and customs.

- *Dynamic markets*—Asian markets are dynamic and will continue to grow for a long time. Organizations willing to make long-term investments could realize significant rewards.

- *Technology transfer*—Asian countries are keenly interested in opportunities to develop the skills of their indigenous population. Organizations willing to transfer some portion of their technology (i.e., software support) through training programs will be better received than those that are not.

- *Competition*—There is a high degree of competition from other countries and from Asian countries that have already begun to develop their own information services capabilities. Keen competition should be expected.

- *Nationalism*—Although all of the markets are open to international companies there remains a strong sense of nationalism in most if not all countries in the Asia/Pacific region. This also favors the use of a local agent.

The leading vendors in Japan, as shown in Exhibit III-4, are also the leading vendors in the region and among the leading vendors in the worldwide information services industry.

EXHIBIT III-4

**Leading Information Services Vendors**
**Japan**

| Rank | Company | 1989 Revenue ($ Billions) |
|---|---|---|
| 1 | NTT Data Services | 2.20 |
| 2 | Nomura Research Institute | 0.80 |
| 3 | Hitachi Information Services | 0.70 |
| 4 | CSK | 0.50 |
| 5 | Japan Research Institute | 0.50 |
| 6 | Hitachi Software Engineering | 0.45 |
| 7 | Quick | 0.42 |
| 8 | Toyo Information Systems | 0.41 |
| 9 | Intec | 0.36 |
| 10 | NIPPON Steel Information & Communications Systems | 0.33 |


# Regional Summary—Europe

# Regional Summary—Europe

## A

## Regional Overview

For the past decade or more, the European software and services industry has experienced extraordinary growth averaging over 20% per year. Today, in spite of the threat of financial recession, there is little sign of cessation in demand for IS solutions in all forms; growth is expected to remain near 20% over the next five years.

As competitors jockey for position, those seeking long-term advantage are picking their partners carefully. The complexity of market conditions and of IS solutions is bringing nearly all the vendors, and even some of their major clients, together in a range of alliances. Joint-venture start-ups, minority stakes, marketing or relationship agreements, distribution rights, lobbying groups, standards consortia, and conventional OEM, VAR and agency agreements are all creating new opportunities for winning and retaining clients.

Alongside the growing realization at board level of the critical role of IS in business is the awareness that in many cases it is feasible to outsource functions traditionally managed in-house. The value for money of new platforms is also boosting demand for downsizing and more ready-made software and service solutions. Driving these market changes is the widespread adoption in Europe of open systems standards that provide greater and cheaper choices for commercial and technical applications.

Economic recession is now being felt in many European countries, though many consider it to be short term. Tighter client budgets result in cutbacks at the strategic end of the market-consultancy, education and training, and new systems development. But for systems management and operations vendors, the recession can be good news that encourages clients to reconsider outsourcing to fix and control costs.

By virtue of their sheer size and geographic spread, the major equipment vendors have a dominant role in the software and services market. Their pan-European coverage has been matched by very few independent European software and services vendors, CAP Gemini Sogeti having had the most notable success.

## B

### Information Services Market Forecast

INPUT estimates that the overall computer software and services market in Europe was nearly $61 billion in 1990. As Exhibit IV-1 illustrates, the overall market is expected to grow to almost $143 billion by 1995, despite the current short-term recession fears in the industry. This forecast includes all of Western Europe as well as the modest emerging market of Eastern Europe. East Germany has been combined with West Germany in the forecast for Germany.

This compound annual growth rate (CAGR) includes the predicted effects of inflation, country by country, around Europe.

EXHIBIT IV-1

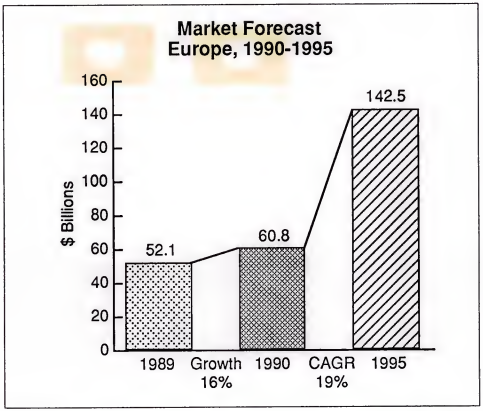
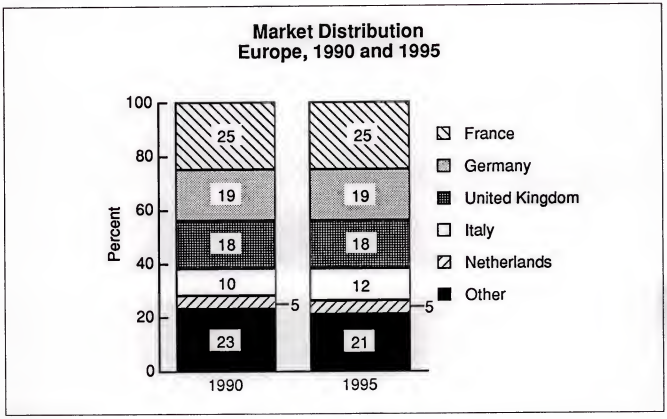



Exhibit IV-2 shows the distribution by country. Four countries—France, Germany, the United Kingdom and Italy—make up almost three-quarters of the European market.

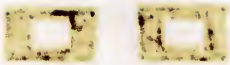
EXHIBIT IV-2




- Little difference is apparent in the overall growth rates for each country, but this similarity hides very significant differences in the business mix traditional to each country. For example, the professional services sector in France represents nearly 40% of the French market for all software and services, whereas packaged applications solutions—turnkey systems plus applications software products—are only 23% of the market. In Germany this pattern is reversed—professional services holds only 22% of the total, compared to packaged solutions with 35% of the total German market. German organizations prefer to buy complete solutions or to develop them using in-house staff.

- France continues to dominate the European market. In 1990, France accounted for one-quarter of all software and services user expenditures in Western Europe.

- The large size of the French market has led to French vendors being the most dominant European vendors as they vie with U.S. vendors for market share. Six of the top 30 vendors are French and eleven are U.S. in origin.



- Of the other Western European software and services markets, the four Scandinavian countries accounted for some 10% of the total in 1990. They have the slowest rate of growth, principally due to the high proportion of processing services in these countries.

- The Benelux countries—the Netherlands, Belgium and Luxembourg—account for 8% of the Western European total because of a strong forecast growth rate of 18% per annum from 1990 to 1995.

- Spain, at 21%, has the fastest growing market among the remaining six countries, (identified as Rest of Europe in the exhibit). On average, these countries will grow at the pace of the total Western European market—19%.

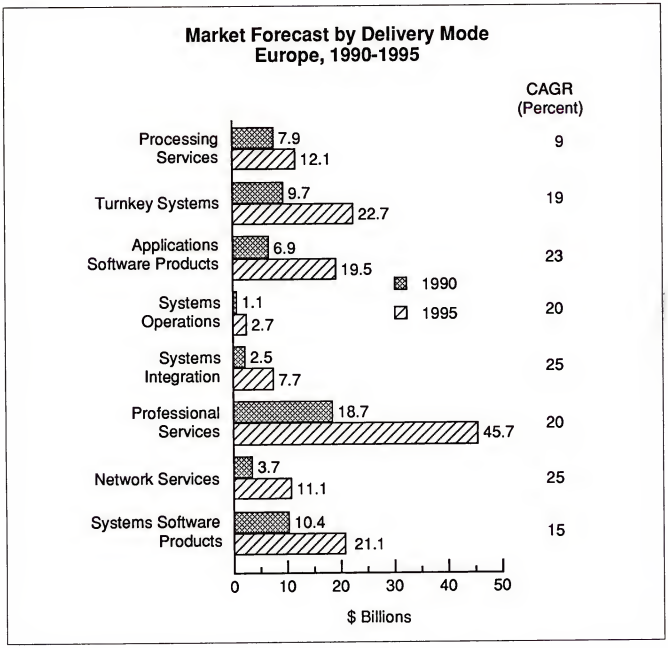
Exhibit IV-3 shows that the fastest growing delivery modes will be network services and systems integration, each of which will have a CAGR of 25% over the period. INPUT forecasts that the applications software products sector will grow at an average of 23% per annum.

*Processing services*—The processing services sector has had the lowest rate of growth throughout the 1980s within an otherwise dynamic and fast-expanding market for software and associated services. However, specialized applications continue to evolve to offer vendors important opportunities that are likely to achieve a CAGR of 9% to take the European market to $12 billion by 1995. Key opportunities for processing services vendors lie in developing critical applications skills in areas such as payroll and credit card processing and offering specialized services such as disaster recovery support.

- The general business and technological environments have changed considerably since the early 1980s, when processing services suffered in competition with low-cost minicomputers and personal computers. Now the emphasis has changed from the ability to offer purely technical computer expertise to emphasis on applications skills. In consequence, vendors that have built knowledge and experience in specialist areas such as payroll processing have prospered as the demand for specific applications transaction processing services has continued. In contrast, utility processing, the provision of basic processing facilities, has declined. However, other specialized capabilities—for example, disaster recovery services—represent significant opportunity.

- Processing services vendors can continue to develop their applications skills to develop and further support applications-based services. Alternatively, they can seek to leverage their experience and knowledge into associated markets. For example, management skills can be translated into the systems operations area.

EXHIBIT IV-3




- Users increasingly demand that applications software products be capable of being integrated and supported by a pan-European organization. Vendors are responding to this challenge by strengthening their competitive positions by means of acquisitions and partnering activities.

*Turnkey systems*—The improving cost/performance of new equipment platforms will depress the equipment portion of turnkey systems overall. The increasing power of workstations/PCs in particular will have the overall effect of driving this sector of the market at the highest rate.

- An important influence on the turnkey systems market is the impact of UNIX. Polarization of the minicomputer market around the de facto standards of IBM AS/400, Digital VMS, and UNIX has made the latter a must for virtually all equipment vendors. The user appeal of UNIX is increased by the introduction of more advanced facilities and acceptance of open systems concepts. The increasing availability of UNIX-based applications supports this trend.

- Growth is driven by the need for delivering specific client benefits, albeit based upon a standard applications product. Strong demand is also expected for additional professional services such as consultancy and education and training, which are vital for successful implementation of the system in the user environment.

- The largest single-country market within Europe for turnkey systems is Germany (30% of the total), followed by the United Kingdom (22% of the total). The appeal of the turnkey systems delivery mode varies among European countries; Italian users prefer custom solutions. These attitudes are likely to change as the cost penalty for an entirely custom-built system increases. Customized adoption of standard applications products represents an attractive alternative.

*Applications software products*—INPUT forecasts that the applications software products market will have a 23% CAGR from 1990 to 1995. It is clear that a much greater opportunity exists for smaller systems, both in respect to relative size and relative growth rates. This forecast is clearly based on an expectation of continued downsizing by users, who are choosing smaller systems—AS/400s instead of 3090s, for example—and a continued trend towards distributed processing systems. The increasing costs and shortages of skilled programmers and the increasing need for speedier applications implementation reinforce the rationale for selecting applications software products instead of opting for the luxury of custom-written systems.

- A number of other factors are of significance in supporting the different growth expectations for different types of equipment platform. These include:

  - Strong growth in manufacturing applications software products is a significant contributor to the minicomputer sector.

- The continued drive towards open systems standards is creating a more stable environment for applications software product development on minicomputer and workstation/PC platforms.

- Increasing use of graphical end-user interfaces is widening the market potential for applications software products on powerful, low-cost systems.

- Overall, the emphasis on downsizing to smaller systems is a direct reflection of the large price/performance disparities among the three major classes of equipment platform. Ability to offer the same applications product on several types of platforms has become an attractive and achievable goal for many vendors.

- A factor of particular relevance in Europe is the increasing use of kernel software or reusable software modules that allow vendors to prepare different versions of applications. These modules can be produced for disparate country environments or different industry sectors. This type of approach significantly reduces the investment needed to offer applications software products within the diverse national environments of Europe.

- Within Europe, the largest individual country market is France, which accounts for approximately one-quarter of the entire applications software products market. The U.K. is the second-largest market, representing about one-fifth of the total. Germany has a relatively low market share (17%) in comparison to the size of its economy. This can largely be attributed to the German preference for the turnkey system delivery mode for an application solution. Over the next five years, high growth is expected for applications software products in the Italian and Spanish markets.

*Systems operations*—An emerging delivery mode in Europe, systems operations was a modest $1 billion in 1990 and will grow to $2.7 billion by 1995 (a 20% CAGR). Europe's use of systems operations is lagging behind that in North America and Japan. That will change over the forecast period.

*Systems integration*—Systems integration is now an established market in Europe. It represents 4% of the total market, versus 6% in the U.S. Growth is the highest of all of the delivery modes and at 25% exceeds the 20% CAGR projected for professional services. In 1995, systems integration will be $7.7 billion and a slightly higher 5% of the total market. The factors driving systems integration are very similar to those driving the strong growth in professional services, which are discussed below.

*Professional services*—The professional services market is the largest sector of the computer software and services business in Europe. It accounted for over 30% of the total Western European market in 1990, valued at nearly $19 billion, and is expected to have an average CAGR of 20%, to reach about $46 billion by 1995.

- The European professional services market is highly fragmented. The market leader, IBM, holds only a 5% market share. Acquisitions and partnerships abound, but only a few companies can yet boast a pan-European presence, and most of those are either French or American. The continued rapid growth of the market is stimulating fierce competition, resulting in new business strategies among traditional suppliers and the newer entries. Three different strategies are visible:

  - Early exploitation of new software technologies, standards and procedures to increase productivity

  - The broadening of existing client services to increase revenues

  - New services aimed at gaining better access to board rooms and business decision-makers in order to win new clients

- The bulk of the professional services market has always been the development of software solutions to individual client requirements. However, the fastest growing subsegments involve activities that precede and follow software development effort. High-growth areas involve the initial consulting services helping the client assess and choose options and the education and training of managers, users and IS staff essential to the success of any project. INPUT projects that both areas will grow at an average of 22% per year over the five-year period. This projection implies a gradual reassignment of many professional services programming staff as the software development workload decreases relative to the increase in other services.

- France is by far the largest European market for professional services. Equal to the combined value of both Germany and the United Kingdom, the French market is home to many of Europe's leading vendors, most notably CAP Gemini Sogeti. French vendors have secured a commanding lead over their independent competitors with a very active strategy of acquiring major software and services companies. The French have also established themselves well in Italy and the U.K. In contrast, the German market has always shown a strong preference for packaged software solutions and turnkey systems.

- Pressure for improvements in productivity and quality has led most vendors to rapidly adopt technical strategies encompassing the latest software tools and methodologies such as relational data bases, 4GLs, CASE tools and project management procedures. With some clients cutting budgets and more competitors crowding into the market, vendors have become more cost conscious. They are looking to new software technology not only to help them win business but also to restore higher profit margins.

*Network services*—The market for network services will see dramatic change as the European telecommunications industry goes thorough significant restructuring over the next five years. Many of the publicly controlled PTTs will be privatized, and with the 1992 change in the EEC many of the existing barriers to intercountry data interchange will be gone. The market will grow at 25% and reach $11.1 billion in 1995. This compares with an $18 billion market in North America in 1995. The opportunities for network services vendors will be significant over the decade in Europe.

*Systems software*—After a decade of high growth, the systems software products sector is now slowing as a result of the decline of the computer equipment market. This slowing is largely caused by downsizing—the selection of lower-cost minicomputers and workstation platforms to replace larger equipment configurations. An expected increase in the practice of software product bundling by equipment vendors, as a response to increasingly competitive market conditions, will depress future growth in this market. INPUT forecasts that growth will be only 15% compounded annually over the next five years. Nevertheless, this growth will generate a systems software products market worth $21 billion in 1995.

- Both the systems software products sector—the general operating and application development environment for the computer hardware—and the applications software products sectors have achieved remarkable growth over the last 10 years. From under $1 billion in sales in 1979, the industry achieved over $18 billion by 1989 and averaged a growth rate in excess of 30% per annum throughout the decade.

- A potential inhibiting factor in the systems software product market is the reality of multiple de facto standards. Products are introduced faster than standards bodies can function; the result is user confusion. Confusion in turn has led to delayed product acceptance by vendors and users. However, open systems standards, notably UNIX, are having a profound impact on the market and are achieving significant growth, albeit at the expense of other system software products.

Exhibit IV-4 lists the leading information services vendors in the European market. The 1990s will undoubtedly see still more consolidation and concentration in the European computer software and services industry. As the technology and the market demand ever-broader mixes of special skills, partnerships and mergers will continue to reshape and polarize the industry into vendors offering multinational capability and vendors that are leaders in their own specialist niches.

EXHIBIT IV-4

**Leading Information Services Vendors**
**Europe, 1989**

| Rank | Vendor | Country of Origin | Revenues ($ Millions) | Market Share (Percent) |
|---|---|---|---|---|
| 1 | CAP Gemini Sogeti | France | 980 | 1.9 |
| 2 | Reuters | U.K. | 900 | 1.7 |
| 3 | Andersen Consulting | U.S. | 520 | 1.0 |
| 4 | Finsiel | Italy | 470 | 0.9 |
| 5 | Computer Associates | U.S. | 440 | 0.8 |
| 6= | GEIS | U.S. | 380 | 0.7 |
| 6= | Sema | France | 380 | 0.7 |
| 8 | SD-Scicon | U.K. | 350 | 0.7 |
| 9 | Sligos | France | 340 | 0.7 |
| 10 | Concept | France | 330 | 0.6 |
| | Others | | 46,965 | 90.3 |
| | Total | | 52,055 | 100.0 |

# Regional Summary—Latin America

# Regional Summary—Latin America

## A

## Regional Overview

With the exception of four countries—Argentina, Brazil, Mexico and Venezuela—Latin America represents one of the least developed areas of the world, and it is an area in which conducting business can be extremely difficult. Use of information services is extremely limited, but this could begin to change over the next several years.

Countries in Latin America 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.

Countries in the first group generally have an active information services industry and offer opportunities to international vendors.

The economic climate within Latin America continues to suffer from inflation and poor development, although during 1989 and 1990 some improvements were recorded in Argentina, Brazil, and Mexico regarding stability and international trade.

Burdened by high debt and a low economic base, prospects for the area over the next several years are only 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.

Overall, few changes are expected in Latin America. Modest growth will be achieved in a number of countries if the world economy remains stable. Downturns in the world economy could have quite adverse effects on many of the Latin American countries.

However, even with only modest growth in the overall economy, interest in a number of information services is expected to grow. 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*—The low level of education has been identified in most countries 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.

- *Public sector spending*—As economic stability develops, public sector spending should increase and offer opportunity to local and international vendors. The majority of spending for information technology comes from the public sector, and increased government spending for development will have a stimulating effect.

- *Technology incentives*—A number of countries have instituted incentives to stimulate the use of computers. This is expected to result in more acquisitions of mini and microcomputers.

- *Mini/personal computer growth*—Growth of higher-capacity mini and personal computers is stimulating computerization of smaller businesses. Information systems are becoming more affordable in these countries with their low per capita economies.

### 2. Inhibiting Factors

There are also a number of significant inhibiting factors in the Latin American information services markets.

- *Stalled economies*—Many of the economies in Latin America are stalled, showing only limited growth. There has been only minor growth stimulus. Without some level of economic stability and controlled inflation, these markets will not increase in attractiveness.

- *High duties/protectionism*—Many countries continue to impose high duties on the importation of technology products and services. For some, such as Brazil, the purpose is to protect domestic industry growth. For others, the purpose is to have an additional source of revenue. Both reasons hinder the application of technology. Some improvements are developing in this area, but more are required to make these markets attractive.

- *Far East competition*—Though the U.S. continues to dominate the high end of the equipment business, competition from Taiwan and Japan is being increasingly felt.

- *Software piracy*—Few countries in Latin America have passed laws related to software protection, which makes the practice of copying common. One report suggests that a single copy might be copied as many as 100 times. Changes in Brazil and elsewhere are starting to bring local copyright practices in line with international practice. If effective, these changes will greatly improve the attractiveness of Latin America to software products vendors.

## B

## Information Services Market Forecast

When compared to the world total, the market for information services in Latin America is small. As noted in the worldwide summary it represents less than 2% of worldwide market. The total market is expected to grow at an annual rate of 19%, from $3.0 billion in 1990 to $7.4 billion in 1995, as shown in Exhibit V-1.

Although the market is small, economic stabilization is expected to result in growth rates greater than in the North American market. And if significant stability is achieved in the group one countries, growth of more than 20% a year is likely. 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. There are renewed signs of stabilization and investment incentives being implemented that should provide a clearer picture over the next two years.

Within the region, the market distribution is not expected to change significantly over the five-year period. Brazil, which currently has an estimated 41% of the market, as Exhibit V-2 shows, will maintain its lead.

EXHIBIT V-1

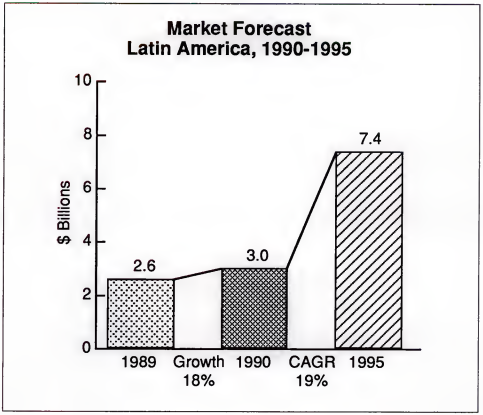
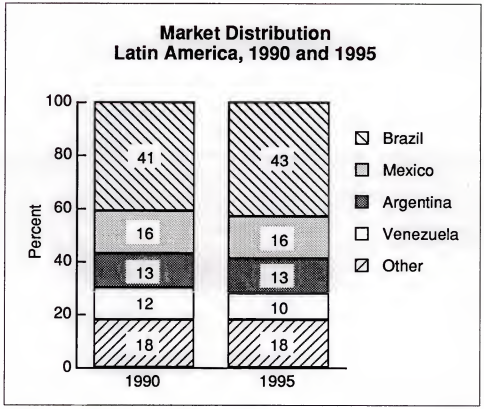



EXHIBIT V-2



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 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 V-3.

- *Processing services*—Processing services is not expected to grow as fast as in other regions, due generally to the lack of business growth. Overall growth is expected to be approximately 10%, as compared to 12% in the U.S. and greater in other developing regions and countries. The market will grow from $0.3 billion to $0.5 billion by 1995.

- *Turnkey systems*—Although a small market ($0.4 billion in 1990), turnkey systems are expected to grow at a rate of 15% to $0.8 billion in 1995. The demand for packaged solutions using more powerful personal computers and supported by the vendor provides a significant development opportunity once the economies stabilize somewhat.

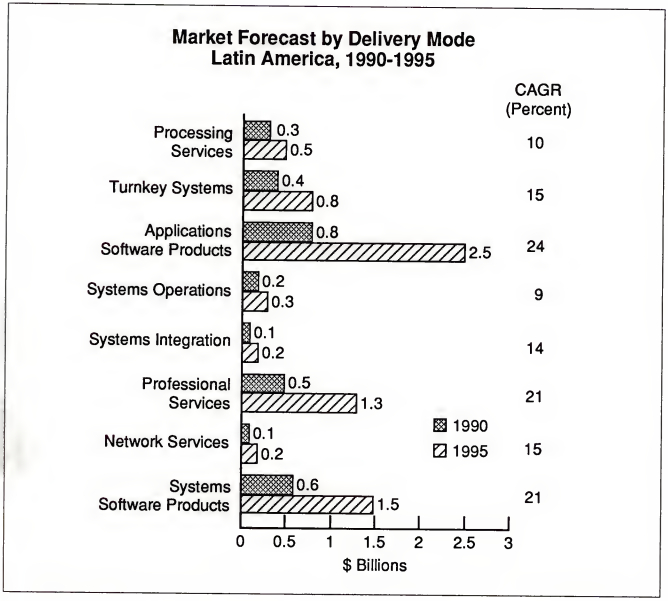
- *Applications software products*—The market for applications software products is a bright spot in Latin America. It represents the largest delivery mode, at $0.8 billion, and should see the strongest growth at 24% CAGR to reach $2.5 billion in 1995. With an inadequate base of computer professionals, the easiest alternative is to turn to packaged solutions.

- *Systems operations*—Systems operations represents a modest market and opportunity. 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 $0.3 billion by 1995.

- *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. The market may only be a modest $0.2 billion by 1995.

- *Professional services*—Growth in professional services is expected to be very strong at 21% CAGR, due to the lack of adequately skilled computer professionals. A market of $0.5 billion should reach $1.3 billion in 1995. This figure could be higher if the economies stabilize and investment funds become available, and increased training of computer professionals is supported by the governments.

EXHIBIT V-3




- *Network services*—The market for network services is small and is expected to remain so. The region suffers from a significant lack of telecommunications infrastructure, a problem which will not be rectified for a number of years. Network services is expected to grow from $100 million in 1990 to $200 million in 1995, 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 to exceed 20% for at least the next several years, due to the continuing demand for mini- and PC-based systems. With a growth rate of 21%, the market for systems software products will increase from $0.6 billion in 1990 to $1.5 billion in 1995.

## C

## Market Considerations

For organizations considering entering or expanding into the Latin American market, cautious optimism is recommended. There are indications that a number of countries are beginning to successfully address their financial problems, 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, office productivity and certain vertical market areas such as manufacturing and financial services.

In Latin America, use of a distributor/representative is a necessity. The primary reason is that success in getting things accomplished 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.

# VI

# Regional Summary—Middle East/Africa

# Regional Summary—Middle East/Africa

## A

## Regional Overview

Although treated in this report as a single region, the Middle East and Africa are two distinct areas with considerably different demographics and business requirements.

Considering the differences, background data is provided for each region separately. However, since the markets are comparatively small, market data is provided for the total region. In addition, note is made that forecasts are limited to the most relevant delivery modes. For delivery modes that are not shown, the market can be considered negligible.

There is little change in the Middle East/Africa region since the 1989 report, with the exception of the change in policy on apartheid by South Africa and the impacts of the Iraq invasion of Kuwait and the subsequent war.

### 1. Africa

Consisting of more than 35 countries and with more than 600 million people (12% of world total), Africa covers an estimated 11.7 million square miles. The area is burdened with vast, virtually uninhabitable land, such as the Sahara desert. Africa is also blessed with vast amounts of undeveloped natural resources.

For the purpose of this report, Africa is divided into two distinct areas: South Africa, and the remainder of the continent. South Africa is considered one of the more developed areas of the industrial world and as such has a developed information services industry.

Continuing economic growth in the country has been impacted by the Comprehensive Anti-Apartheid Act (CAAA) of 1986, which prohibits American firms from investing in South Africa unless investment is made with a firm that has a majority black ownership. Throughout 1990 the

government position on apartheid changed. It is possible that in 1991 the change will become significant enough that the sanctions on trade with South Africa by most of the industrial world will be lifted. When this happens South Africa will again become a market of interest.

Aside from the country of South Africa, the continent is generally fragmented. Only a handful of countries have more than a subsistence economy, and many are plagued with political turmoil. Few significant opportunities are believed to exist in the remainder of the African countries.

### a. Driving Forces

In South Africa, driving forces include the following:

- *Mini/Personal computer availability*—Considering the relative size of businesses in South Africa, increasing emphasis is being placed on the development of mini- and micro-based applications. With the increasing functionality of minis and PCs, many needs are satisfied with these types of equipment and the associated software.

- *Fourth-generation languages*—For the larger firms, there is increased emphasis on the development of systems based on 4GL and data base systems.

- *Economic expansion*—The development of both mini/micro systems and data base systems is being driven by the recognized need to develop up-to-date systems capabilities if South Africa is to compete in the international market. The government is stimulating investment in national development projects.

- *Network development*—With the emphasis on systems development, there is increasing focus on networking, particularly for minis and micros. The majority of networking tools are imported from either the U.S. or the U.K.

- *Education*—There is national recognition of the need to provide education to the black communities, if they are to share in the governing and business process. The government has been placing increased emphasis on providing technology-based tools for the educational system.

For areas outside South Africa, the driving forces are essentially the same. However, the level of emphasis is considerably less.

### b. Inhibiting Factors

As well as driving forces in South Africa, there are a number of inhibiting forces that, to date, have had a negative impact on the information services market in that country.

- *Disinvestment*—Requirements that U.S. firms reduce their investment in South Africa have had a significant impact on the development of the country. Many firms have withdrawn and others have had a difficult time establishing relationships with black-owned firms. The disinvestment requirement is expected to remain at least until there is discernible change in the apartheid philosophy.

- *Labor skill level*—The skill level of local labor is generally considered to be low, outside the small white community. Although effort is being directed to providing increased educational opportunities, a labor shortage is expected to exist for some time.

- *Political policies*—National apartheid policies will continue to be an inhibiting force in South Africa. Though some changes have been made, no dramatic changes are expected in the near and intermediate terms.

- *Social unrest*—In addition to the inhibiting effect of the political policies, the resulting social unrest detracts from a focus on growth.

## 2. Middle East

Comprised of approximately sixteen countries covering the area from Turkey to Saudi Arabia, the Middle East represents one of the most politically complex areas of the world.

It has a population representing 4% of the world total that is growing at 2.5% per year. But development of the area is dominated by two factors—oil and religion— as well as by the political climate of the Arab-Israeli issue.

Having few natural resources, the region has been heavily dependent on the world market for oil. Since the decline of the oil industry, many of the countries have consolidated their economic positions and are experiencing only moderate growth.

In general, the economies of this area see little inflation, and are highly controlled by the government and the wealth from oil. Israel, on the other hand, has a broader industrial economy which is impacted by inflation, costs of defense and continued high immigration.

A key determinant in the growth of the area is the political environment. To date, the focus on religious and territorial differences has diverted a significant portion of national revenues from growth opportunities to defense. This is expected to continue in spite of efforts by Western countries to diminish regional defense spending.

With a fractious political environment, a single-product economy and an isolationist perspective, opportunities in the near term (1-3 years) will be limited and difficult to realize, and for the most part driven by government spending.

There are a number of driving and inhibiting forces in both Africa and the Middle East.

**a. Driving Forces**

Driving forces for the Middle East include:

- *Oil field development*—As a result of being a single-product economy, there is considerable emphasis on the continued development of methods to identify and develop new sources of oil.
- *Production control development*—With the decline in the world oil markets, there has been increased emphasis on obtaining greater benefits from existing production facilities and processes. A number of companies are working to streamline their operations so as to achieve greater efficiency.
- *Industrial development*—Recognizing the need to diversify, a number of countries have begun to search for other forms of industry. Though progress has been slow, focus on alternative revenue sources is expected to continue.
- *Education/Training*—Many countries have recognized that greater efforts are needed to provide educational opportunities. As a result, increased investments have been made in educational processes, including the use of automated tools.

**b. Inhibiting Factors**

In the Middle East, though the driving forces have contributed to growth of the information services industry, the inhibiting forces have had more impact.

- *Political environment*—The political environment continues to have a major negative impact on the development of industry. The Iraq/Kuwait situation has aggravated the political situation, further delaying the possibility of stability and slowing development in many countries.

- *Total solution requirement*—There is increasing emphasis on ability to provide a total solution. This puts single-product vendors at a disadvantage. The market is primarily driven by government spending, which dictates a full-service or solution approach.

- *Local representation*—In many countries, local representation is mandatory. Combined with the custom of noncontracted gratuities, many companies find operating in the Middle East to be extremely expensive and the margins small.

- *Software piracy*—There is a high incidence of software piracy in the Middle East. There is a general lack of recognition of copyright protection, and all packages and applications are subject to extensive copying.

## B

## Information Services Market Forecast

As a region, the Middle East/Africa area, comprised of more than 40 countries, continues to offer one of the least significant opportunities for information services. The best markets are Israel and South Africa, although the more oil-rich markets (such as Saudi Arabia) offer large opportunities to systems integrators.

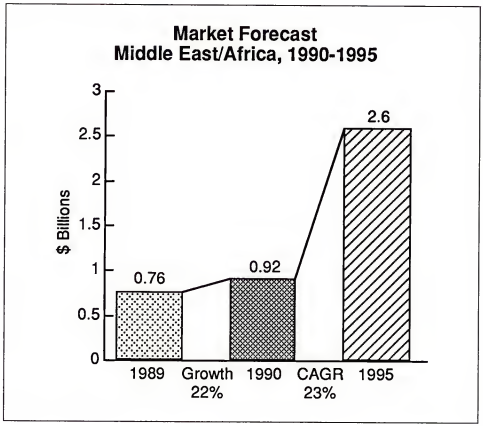
For the period 1990 to 1995, the total market for information services for the region is estimated to grow from approximately $920 million to $2.6 billion, as shown in Exhibit VI-1. The growth rate is expected to be approximately 23%, as countries focus increasingly on building technological infrastructures.

Of the total market, the greatest opportunities are in the processing services, applications software products, and professional services delivery modes, as depicted in Exhibit VI-2.

- Processing services represent a solid and sizeable market, due to the processing requirements of various governments that do not have the internal capabilities to operate their own processing facilities.

- Applications software products represents the largest area of growth, based on increased interest in mini and personal computer systems, in particular for governmental requirements. Much of the growth will result from the need for industry-specific applications. The applications software products sector is expected to grow at an estimated rate of 33%, to reach nearly $1 billion in 1995.

EXHIBIT VI-1




- Professional services is also expected to experience significant growth. Driven by the need to assist in developing technology-based systems and industry-specific applications, and governmental program administration requirements, professional services is expected to grow from over $200 million to over $800 million over the forecast period, a growth rate of 30%.

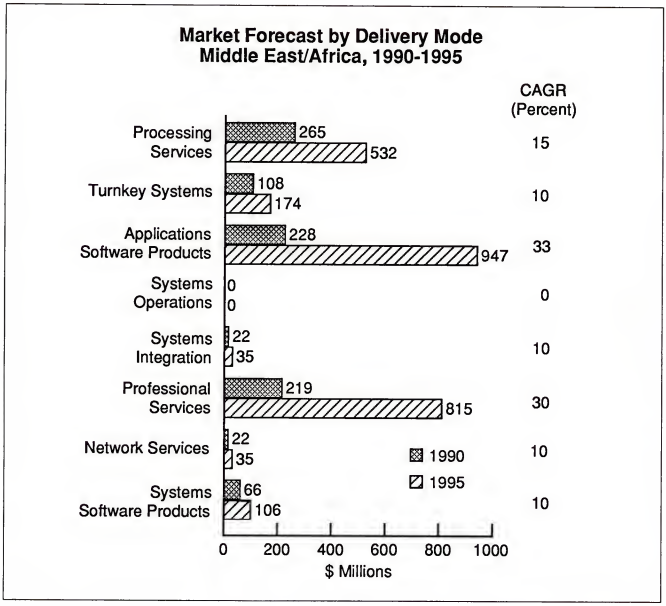
## C

## Market Considerations

Within the area, two countries are expected to contribute the majority of the growth—Israel and South Africa. In total, these two countries represent more than half of the market for all information services.

Delivery modes other than applications software and professional services are expected to grow at respectable rates, but currently represent such a small portion of the overall market that their contribution to the market is small.

EXHIBIT VI-2




The concepts of systems integration and systems operations remain beyond the needs of this region in general.

In South Africa, there are a number of opportunities and they are expected to grow. However, companies must be able to make long-term investments in conjunction with local firms that are familiar with the economy and the social and political customs.

For companies considering entering or expanding into South Africa, investment in local firms is recommended, along with methods of providing education and training for local representatives.

In the Middle East, local representatives are mandatory. In addition, there must be recognition that sales cycles are long, and that personal rebates are part of the business process. It may also be a number of years before the negative impact of the Iraq/Kuwait confrontation is completely eliminated.


# Regional Summary—North America

# Regional Summary—North America

## A Regional Overview

The North American market, consisting of Canada and the United States, remains the largest region in the worldwide information services market. The 1990 market of nearly $104 billion is 52% of the worldwide total. In 1989, North America represented 55% of the worldwide market. Faster growth in Europe and Japan as well as in the rest of the world in general is steadily decreasing the North American share.

The U.S., with its sheer size—$100 billion in 1990—dominates this region and impacts the entire worldwide market. The U.S. information services industry is the headquarters for many of the largest vendors that are active on a worldwide basis.

- The U.S. market is often the first to be impacted by major new trends such as systems integration and systems operations.

- In the immediate period (1990 to 1992), the U.S. market will experience the lowest growth rate of the past 10 to 15 years. Though growth exists (about 12% in 1990), this is not the nearly 20% annual growth rate of the 1980s, nor does it equal the growth being experienced in the other regions of the worldwide market.

The Canadian information services market, as determined in an in-depth analysis during 1990 by INPUT, was $3.4 billion in 1990. Canada makes up only 3% of the North American information services market. The Canadian market though small and often overlooked, is a viable market known for aggressive programs by leading vendors and a number of larger industrial information systems programs that offer excellent opportunities to vendors willing to have a presence in Canada.

- Canadians are sensitive to the U.S. presence and size, and have sought to preserve their independence while entering the American markets. This has been a difficult balancing act, now complicated by the recent Canadian-U.S. trade agreement, which will liberalize regulations and encourage U.S. investment.

- Canadian information systems users have historically preferred to utilize Canadian vendors of applications where possible, but this has not prevented U.S. vendors with well-targeted solutions from gaining market share.

- Canadian information services vendors naturally look to the U.S. as their first target for international expansion. Similarly, U.S. vendors will often use Canada as a test base for international marketing of their products.

- The French language requirement is a complicating factor for English language products. The provincial market of Quebec is the second-largest in Canada; the federal government market is also large and requires dual-language capabilities in many application areas.

Driving and inhibiting forces for the U.S. and Canadian markets are described in detail in the respective country profiles.

## B

## Information Services Market Forecast

The overall information services market, shown in Exhibit VII-1, will grow from nearly $104 billion to nearly $193 billion by 1995, at a 13% CAGR. The sheer size of this market makes it very attractive to vendors in many countries.

- The U.S. market is experiencing the impact of the globalization of the information services industry. Many European and Japanese vendors have entered the market, either by acquisition or by direct penetration, and are gaining market share from U.S.-based vendors. A business base in the U.S. also offers international vendors access to Canada.

- The slower growth rate is a combination of recessionary economies in Canada and the U.S., the sheer size of the market, and lower inflation (INPUT forecasts are in current dollars). The U.S. information services market continues to outgrow the U.S. economy by three to four times when measured in current dollars.

As Exhibit VII-2 confirms, the size of the Canadian market is modest compared to that of the U.S. The distribution of the North American market is not expected to change over the five-year period; Canada will experience essentially the same rate of growth as the U.S. market.

EXHIBIT VII-1

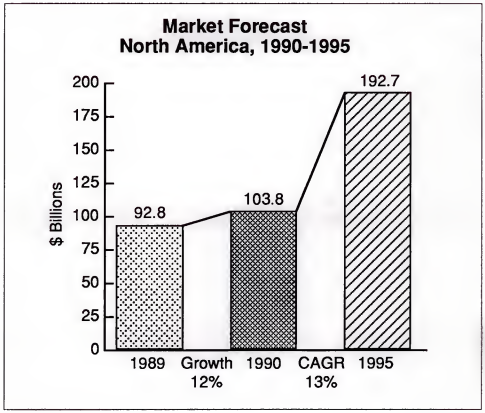
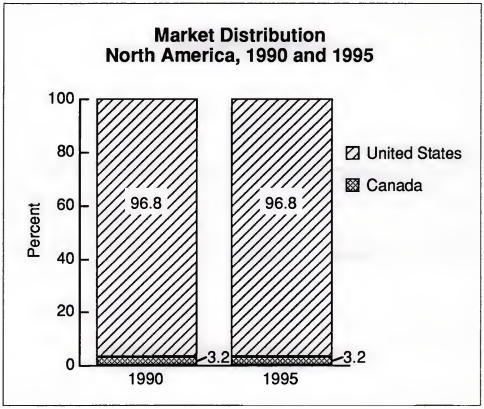


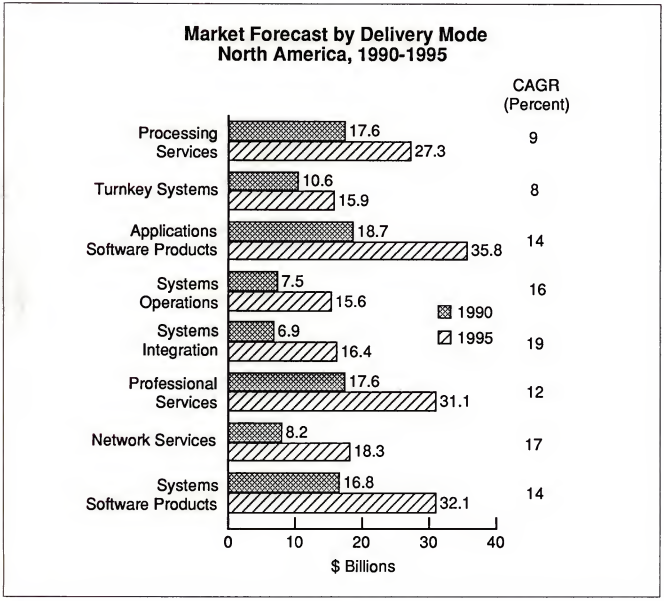

EXHIBIT VII-2



It should be noted that the Canadian market, at over $3 billion, is one of the larger national markets, exceeding many of the European country markets and larger than the total Latin American region.

Exhibit VII-3 shows the size and growth rate of each of the eight delivery modes tracked by INPUT. The growth rates and size of market, of course, parallel those presented for the U.S. in the national profile.

EXHIBIT VII-3



Because the delivery mode forecasts are very similar to those for the U.S., the reader is referred to the national profiles for Canada and the U.S.

On a worldwide basis, North America is leading the industry in establishing systems integration and systems operations as the delivery modes with the greatest growth rates. The larger U.S. vendors are moving quickly to implement full-service strategies and to assume the risk required by these types of services with their fixed pricing and long-term agreements.

## C

## Market Considerations

Sheer size offers significant opportunities even in a slower growth period. As the largest geographic market available, North America offers significant potential to vendors with new products and the ability to penetrate a very established market. There are, however, some factors that make the North American market a challenge.

- Most market niches are well-populated—even overcrowded—at this time, and a vendor shake-out in many sectors is underway.
- The size of the geographical market makes market entry difficult. Many U.S. customers expect a vendor to provide support on a national basis from the start.
- Vertical market focus is a strategy being adopted by many software and services vendors. Increasingly sophisticated users are requiring more complex solutions tailored to their lines of business.
- Vendors must be prepared to offer, as nearly as practical, a total solution with a wide range of supporting services. U.S. vendors are moving in this direction and achieving greater account control and revenues.
- Merger or acquisition may well be the best way to expand in North America. Many small and medium-sized vendors will be receptive to acquisition as a means of growth, liquidity or even survival.

The key to entry in the future may be through an alliance with a larger U.S.-based firm or in partnership with other firms from the same country that wish to enter North America.

Exhibit VII-4 lists the largest U.S. vendors and their 1989 information services revenues. There are a few large Canadian firms that, although they are much smaller than those listed, have found significant opportunity in the U.S. market. Two examples are SystemHouse and Cognos.

EXHIBIT VII-4

## Leading Information Services Vendors United States, 1989

| Vendor | 1989 U.S. Revenues ($ Billions) | Market Share (Percent) |
|---|---|---|
| IBM | 5.0 | 5 |
| EDS | 2.1 | 2 |
| ADP | 1.6 | 2 |
| Digital Equipment | 1.3 | 1 |
| Computer Sciences | 1.2 | 1 |
| Andersen Consulting | 1.0 | 1 |
| Unisys | 0.9 | 1 |
| Control Data | 0.8 | 1 |
| Equifax | 0.8 | 1 |
| Computer Associates | 0.7 | 1 |
| Dow Jones News/Retrieval | 0.7 | 1 |
| TRW | 0.7 | 1 |
| Total | 16.8 | 18 |

# VIII

# National Profiles

# National Profiles

## A

## Introduction

Chapter VIII of the 1990-1995 worldwide forecast provides individual profiles of the market for information services for 29 countries or areas of the world.

- The only change from the *1989-1994 Worldwide Forecast* report is in the German market, which now combines West Germany and East Germany, removing East Germany from the Eastern European information services market.

Each national profile includes:

- An introduction to the country or area, including a discussion of the general business climate for information services and products
- A summary of key technology trends, driving forces, and inhibiting factors impacting the information services market in the country or area
- The current size and forecast of the information services market for the country or area. (Note that the forecast data base table for each country or area is included in this chapter with the national profiles, rather than in Appendix B, for ease of reference.)
- A discussion of the competitive environment and leading vendors, where appropriate.
- A brief summary of considerations regarding entering the market or expanding market presence. Areas of opportunity that appear to be particularly significant have been identified.

Each national profile includes the following exhibits:

- Market Forecast, 1990-1995
- Market Forecast by Delivery Mode, 1990-1995
- Market Forecast Data Base by Delivery Mode and Submode by Year, 1989 through 1995

The forecast charts are in $U.S. billions unless the market is extremely small, in which case they are in $U.S. millions. The market forecast data base tables are all in $U.S. millions.

In many of the national profiles, the information services market situation has not changed significantly from the *1989-1994 Worldwide Forecast*. The driving forces and inhibiting factors are often the same or only slightly revised. All of the country and other area forecasts have been revised. In most instances, the projected growth rates have been reduced slightly.

## B

## Argentina

### 1. National Overview

Argentina remains a country searching for economic stability. It has significant natural and human resources, but suffers from inflation and significant swings between economic growth and decline. It has land area of more than 1 million square miles, a population of 31 million, and a strong European heritage.

During 1990, Argentina made some progress in controlling its excessive inflationary economy under new national leadership, but it remains unclear whether any lasting stability has been achieved.

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

#### a. Driving Forces

- *Industrial investment*—The government is beginning to encourage investment in the industrial sector to stimulate economic growth of the country.
- *Reduced tariffs*—Reductions in tariffs 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*—The country continues to struggle against staggering inflationary pressures that inhibit long-term investment in industry and technology.
- *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.
- *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.

### 2. Information Services Market Forecast

The market for information services in Argentina is small, but with stabilization of the economy and the political environment, it can grow at an estimated 19% rate, from $409 million in 1990 to $966 million by 1995, as shown in Exhibit VIII-1.

EXHIBIT VIII-1

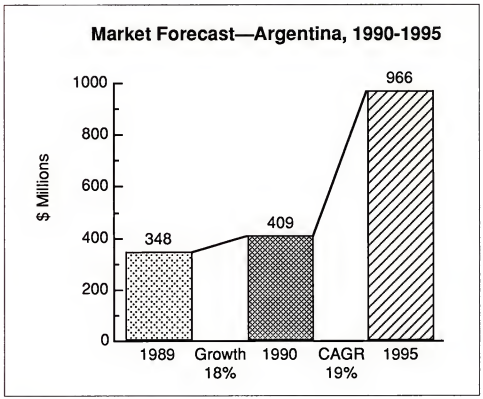
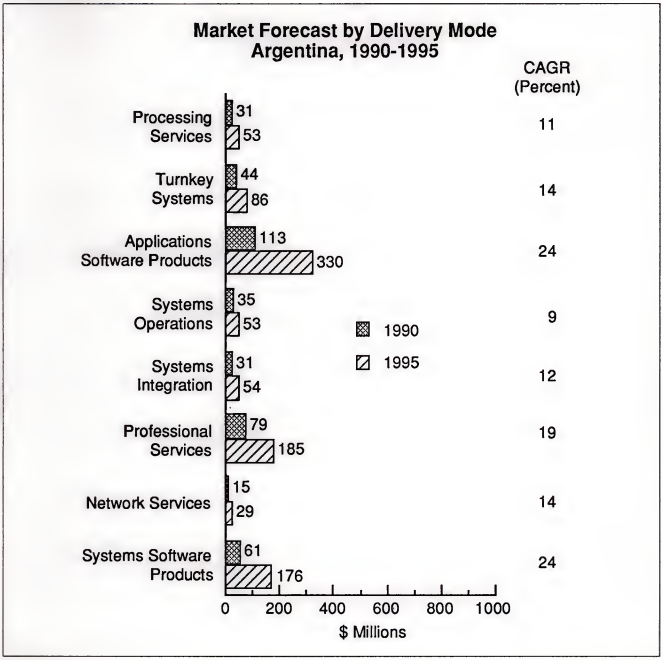


Exhibit VIII-2 provides the forecast by delivery mode. Exhibit VIII-3, found at the end of this profile of Argentina, provides the forecast in greater detail.

EXHIBIT VIII-2




In Argentina, processing services is 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, given the tariff situation on computer equipment. A more modest growth rate (9%) is projected for systems operations, a market of equal size to processing services.

As in other developing economies, turnkey systems are expected to grow at a higher rate than the U.S. average, due to the need to implement solutions immediately.

The network services sector in Argentina is modest and will remain small for several years.

- The country has a very poor telecommunications infrastructure and significant investment will be required before much growth can be expected.

- Note should be made 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.), not enhanced services.

The fastest-growing area of the industry is software products, both 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 45% of the total information services market and will grow at 25% a year over the next few years.

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

- Urgent need exists for systems to be updated. During a visit by INPUT staff, managers responsible for systems indicated that many of their systems were old and there was a major need to upgrade them.

The market for systems integration is expected to grow from nearly $30 million to approximately $54 million by 1995, a growth rate of about 12%. This growth can be expected only if the economy begins to realize high real growth rates within the next couple of years and the local professional services firms increase their ability to assume full project responsibility.

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 $79 million in 1990 to $185 million by 1995. Professional services will continue to outpace systems integration over the next five years.

- While 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. These assumptions are not assured, given the past few years, but 1990 results are generally positive.

### 3. Market Considerations

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

There is a local information services infrastructure, which includes:

- Local professional services firms that include the international accounting and consulting companies such as Deloitte Touche. Relationships tend to be with the European 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, and Software AG. Companies such as Microsoft are represented by independent distributors.

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

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

EXHIBIT VIII-3

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Argentina

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Argentina Information Services Market | 348 | 18 | 409 | 483 | 573 | 680 | 810 | 966 | 19 |
| *Processing Services* | 28 | 11 | 31 | 35 | 38 | 43 | 47 | 53 | 11 |
| -Transaction Processing Services | 12 | 13 | 14 | 15 | 17 | 20 | 22 | 25 | 13 |
| -Utility Processing | 10 | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 10 |
| -Other Processing | 6 | 9 | 7 | 7 | 8 | 8 | 9 | 10 | 9 |
| *Turnkey Systems* | 39 | 14 | 44 | 51 | 58 | 66 | 75 | 86 | 14 |
| -Equipment | 20 | 10 | 22 | 24 | 27 | 29 | 32 | 35 | 10 |
| -Packaged Software | 10 | 20 | 12 | 14 | 17 | 21 | 25 | 30 | 20 |
| -Professional Services | 9 | 15 | 10 | 12 | 14 | 16 | 18 | 21 | 15 |
| *Applications Software Products* | 90 | 25 | 113 | 140 | 173 | 214 | 266 | 330 | 24 |
| *Systems Operations* | 32 | 9 | 35 | 38 | 41 | 45 | 49 | 53 | 9 |
| -Processing Services | 30 | 9 | 33 | 36 | 39 | 42 | 46 | 50 | 9 |
| -Professional Services | 2 | 5 | 2 | 2 | 2 | 2 | 3 | 3 | 5 |
| *Systems Integration* | 28 | 12 | 31 | 35 | 39 | 43 | 49 | 54 | 12 |
| -Equipment | 8 | 10 | 9 | 10 | 11 | 12 | 13 | 14 | 10 |
| -Packaged Software | 12 | 11 | 13 | 15 | 16 | 18 | 20 | 22 | 11 |
| -Other Services | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 4 |
| -Professional Services | 7 | 16 | 8 | 9 | 11 | 12 | 14 | 16 | 15 |
| *Professional Services* | 68 | 16 | 79 | 94 | 111 | 132 | 156 | 185 | 19 |
| -Consulting | 18 | 20 | 22 | 26 | 31 | 37 | 45 | 54 | 20 |
| -Education & Training | 10 | 15 | 12 | 14 | 16 | 19 | 22 | 26 | 18 |
| -Software Development | 40 | 15 | 46 | 54 | 64 | 76 | 89 | 105 | 18 |
| *Network/Electronic Information Services* | 13 | 14 | 15 | 17 | 19 | 22 | 25 | 29 | 14 |
| -Electronic Information Services | 11 | 14 | 13 | 14 | 16 | 19 | 21 | 24 | 14 |
| -Network Applications | 2 | 14 | 2 | 3 | 3 | 3 | 4 | 4 | 14 |
| *Systems Software Products* | 50 | 22 | 61 | 76 | 93 | 115 | 143 | 176 | 24 |
| -Systems Control | 30 | 25 | 38 | 47 | 59 | 73 | 92 | 114 | 25 |
| -Data Ctr. Mgt. | 4 | 12 | 4 | 5 | 6 | 6 | 7 | 8 | 12 |
| -Appl. Dev. | 16 | 20 | 19 | 24 | 29 | 36 | 44 | 54 | 23 |

C

Australia

## 1. National Overview

The past several years have seen significant changes in the overall economic and political setting in Australia. The economy has long been dominated by a highly centralized government, a welfare-oriented economy, and strong labor unions, resulting in slow business development. During 1990, the economy experienced a further slowdown.

Changes in the government have resulted in greater support for business growth and investment. The government has supported moderation of union influence and expansion of private industry investment. During the early 1990s a reasonable rate of economic growth should develop.

The information services industry in Australia has included some significant vendors that have brought software products, such as NetView, to the worldwide market. In general, however, it has concentrated on the importation of technology with local adaptation. A key element has been the continued development, through education and training, of a local data processing profession. Australia has a fairly large human resource base with which to absorb new technologies.

The forces driving and inhibiting growth in the information services market in Australia are summarized below. They are very consistent with those reported in INPUT's *Worldwide Market Forecast, 1989-1994*.

### a. Driving Forces

- *Privatization*—Privatization of industry is providing stimulus for investment, modernization and expansion.
- *Industrial expansion*—The government is working to expand the industrial base of the country.
- *Financial services expansion*—The financial services industry has been one of the first industries to begin expansion.
- *Mini-based applications*—With the availability of high-performance mini and microcomputers, companies are looking for industry-specific applications to meet current and future needs.
- *Network development*—Networking capability is an increasingly important aspect of the information services industry. With a widely dispersed population, network technology is a key development and operational tool.

### b. Inhibiting Factors

- *Unionism*—Unions have traditionally had a strong voice in industrial and political developments. Seeing the potential of losing jobs, the unions generally resist the application of technology. The strength of unions has begun to decline somewhat, but they still have a strong voice, and progress toward the use of information technology must be made slowly.

- *Skilled labor shortage*—There is a significant shortage of skilled labor in the information services industry. Efforts are needed to increase the level of education and practical experience.

- *Infant industry*—The information services industry is in its infancy. Although the growth potential is good, there is a relatively small base from which to grow.

### 2. Information Services Market Forecast

The market for information services in Australia is expected to grow from an estimated $2.2 billion in 1990 to $4.7 billion by 1995, as shown in Exhibit VIII-4. The annual growth rate of 17% is relatively strong, considering the current slowdown in the Australian economy.

EXHIBIT VIII-4

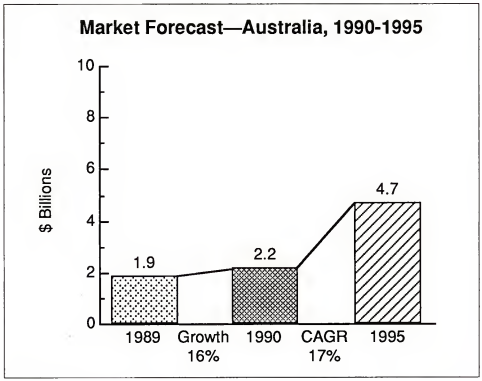
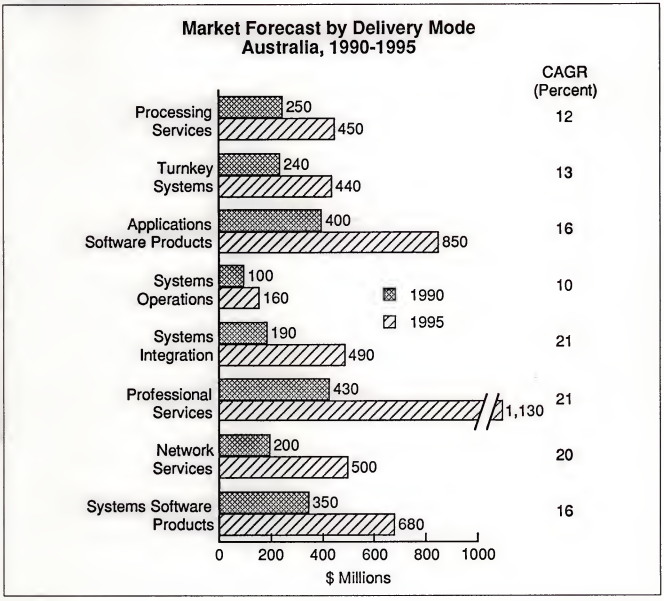


Exhibit VIII-5 provides the forecast by delivery mode, and Exhibit VIII-6 provides the detail behind this forecast.

EXHIBIT VIII-5




The largest growth is projected in network services, systems integration and professional services.

The market for processing services is expected to grow from an estimated $250 million in 1990 to over $450 million by 1995, an average growth rate of approximately 12%, as shown in Exhibit VIII-5.

- The key contributor to the growth of processing services will be the need for access to software tools to develop solutions for user-identified needs.

The demand for turnkey systems in Australia is expected to be reasonably strong, with a 13% CAGR, and strength in the PC/workstation sector for smaller firms.

Both systems and applications software products will continue to grow at a strong rate of 16% per year, driven by the growing need for application, systems control and application development software.

- There will be a continued need for application software in all segments of the economy, ensuring steady growth for the next several years.

- The need for systems control and application development tools is also expected to increase steadily, as an increasing number of organizations work to develop or improve internal processing capabilities.

The $100 million systems operations market will grow at a more modest rate of 10%. The concept of shifting full data center operations lags in Australia, as it does in most smaller information services markets.

The demand for systems integration is expected to become increasingly significant and to result in growth of approximately 21%, from less than $190 million in 1991 to over $490 million in 1995.

Systems integration services are expected to be driven primarily by the government's need to modernize and expand federal and statewide services. A notable example is a recent contract to upgrade the country's national flight systems. Commercial systems integration will lag behind the government sector.

Professional services are also expected to show strong growth in most areas, resulting in an overall growth rate of 21%, from an estimated $430 million in 1990 to approximately $1.1 billion in 1995.

- Within professional services, consulting is expected to grow at a significantly high rate, as companies consider alternatives that will allow them to modernize and leverage newer, more integrated information technologies.

- Education and training is receiving more attention as the country works to develop a broader range of information technology skills. Although the quality of trained staff is high, the country has been generally slow in educating and training sufficient staff to meet growing needs.

The demand for network services is expected to rise, due to the need for the government to provide more service to remote areas of the country, and to the need for on-line services to link financial service centers across the country.

- Given the commitment of the government to network-based services, network services are expected to grow at an estimated 20% per year, from $200 million in 1990 to about $500 million in 1995 (Exhibit VIII-16).

- Strong growth is expected in both electronic information services and network applications.

- Organizations recognize the value of information and have been working to develop an on-line data base industry that will be accessible worldwide. International electronic information services firms are serving the Australian market.

- Data base and information exchange services such as medical services are expected to stimulate growth of network applications as well.

- As in many countries, there is great interest in EDI and E-mail services, which will contribute greatly to the growth of network applications.

In summary, the market for information services in Australia is considered by many to be an infant industry. With a strengthening economy, the market should continue to grow well for at least the next several years.

### 3. Market Considerations

Prospects for entry into or expansion of the Australian market are good. However, vendors should consider the market to be immature and should expect an extended growth period.

Distribution channels are similar to those in the U.S. Processing and professional services are generally sold directly to the prospect. Systems software generally accompanies hardware sales.

There are many distributors of software, and vendors entering the market are encouraged to establish relationships with them as the preferred method of gaining entry.

There are few inhibitors to entering the Australian market.

EXHIBIT VIII-6

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Australia

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Australia Information Services Market | 1,880 | 16 | 2,172 | 2,528 | 2,946 | 3,438 | 4,018 | 4,702 | 17 |
| *Processing Services* | 230 | 12 | 257 | 287 | 321 | 359 | 401 | 448 | 12 |
| -Transaction Processing Services | 190 | 12 | 213 | 238 | 267 | 299 | 335 | 375 | 12 |
| -Utility Processing | 15 | 8 | 16 | 17 | 19 | 20 | 22 | 24 | 8 |
| -Other Processing | 25 | 12 | 28 | 31 | 35 | 39 | 44 | 49 | 12 |
| *Turnkey Systems* | 215 | 11 | 239 | 269 | 303 | 342 | 386 | 436 | 13 |
| -Equipment | 100 | 8 | 108 | 119 | 131 | 144 | 158 | 174 | 10 |
| -Packaged Software | 55 | 10 | 61 | 67 | 75 | 83 | 92 | 102 | 11 |
| -Professional Services | 60 | 17 | 70 | 83 | 98 | 115 | 136 | 161 | 18 |
| *Applications Software Products* | 350 | 15 | 403 | 467 | 542 | 628 | 729 | 845 | 16 |
| *Systems Operations* | 90 | 13 | 102 | 112 | 123 | 136 | 149 | 164 | 10 |
| -Processing Services | 60 | 10 | 66 | 73 | 80 | 88 | 97 | 106 | 10 |
| -Professional Services | 30 | 20 | 36 | 40 | 44 | 48 | 53 | 58 | 10 |
| *Systems Integration* | 160 | 19 | 191 | 230 | 278 | 336 | 406 | 492 | 21 |
| -Equipment | 70 | 16 | 81 | 96 | 113 | 133 | 157 | 186 | 18 |
| -Packaged Software | 15 | 18 | 18 | 21 | 25 | 29 | 34 | 40 | 18 |
| -Other Services | 10 | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 10 |
| -Professional Services | 65 | 25 | 81 | 102 | 127 | 159 | 198 | 248 | 25 |
| *Professional Services* | 355 | 21 | 430 | 522 | 633 | 767 | 931 | 1,130 | 21 |
| -Consulting | 85 | 25 | 106 | 133 | 166 | 208 | 259 | 324 | 25 |
| -Education & Training | 45 | 20 | 54 | 65 | 78 | 93 | 112 | 134 | 20 |
| -Software Development | 225 | 20 | 270 | 324 | 389 | 467 | 560 | 672 | 20 |
| *Network/Electronic Information Services* | 170 | 20 | 204 | 245 | 294 | 353 | 423 | 508 | 20 |
| -Electronic Information Services | 140 | 20 | 168 | 202 | 242 | 290 | 348 | 418 | 20 |
| -Network Applications | 30 | 20 | 36 | 43 | 52 | 62 | 75 | 90 | 20 |
| *Systems Software Products* | 310 | 12 | 346 | 396 | 453 | 518 | 592 | 678 | 14 |
| -Systems Control | 130 | 12 | 146 | 167 | 193 | 221 | 255 | 293 | 15 |
| -Data Ctr. Mgt. | 65 | 10 | 72 | 80 | 90 | 100 | 113 | 126 | 12 |
| -Appl. Dev. | 115 | 12 | 129 | 148 | 170 | 196 | 225 | 259 | 15 |

D

Austria

## 1. National Overview

Austria has a population of 7.6 million and is a member of the European Free Trade Association (EFTA). The total software and services market is relatively small, at $960 million. Inflation was 3.0% in 1990.

The Austrian economy experienced a 'miracle' in the mid-1970s under the socialist government of Bruno Kreisky, who was Chancellor from 1970 to 1983. The economic recovery was driven by state spending and large budget and trade deficits, but at the same time the socialists maintained industrial pace and a strong currency.

The political complexion of the government is now more complex, with a socialist-conservative coalition under a socialist chancellor, Franz Vranitsky, and a controversial conservative president, Kurt Waldheim. The existing arrangement is a coalition rather than consensus, although a reduction of state involvement in economy is agreed, and is being pursued by some privatization. Austerity measures have begun to reduce the budget deficit.

The key question facing Austria is whether or not to join the European Economic Community and what impact joining might have on a country that has been a bridge between East and West Europe and has been generally politically neutral. The Austrian economy is very dependent on that of Germany; events in Berlin are obviously very relevant to Austria.

By far the biggest company in Austria is OAIG, the state-owned holding company that accounts for more than 20% of the total national industrial investment, 17% of national exports, and 15% of jobs in manufacturing. OAIG is going through a restructuring process to become more efficient and more international.

## 2. Information Services Market Forecast

The Austrian market is forecast by INPUT to grow from $960 million in 1990 to $2.1 billion by 1995, as shown in Exhibit VIII-7. The average growth rate over this five-year period will be 17% per year. The five-year CAGR is slightly lower than last year's forecast of 18% and the forecast for all of Europe at 19%.

EXHIBIT VIII-7

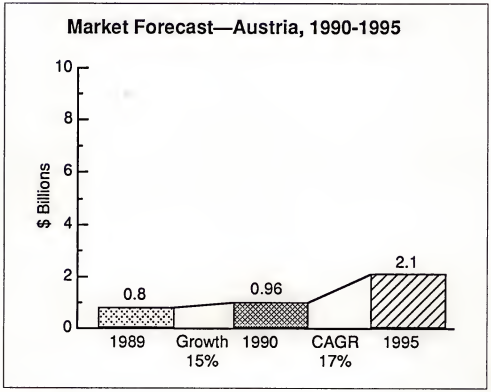



Exhibit VIII-8 provides the forecast by delivery mode, and Exhibit VIII-9, at the end of the Austrian profile, provides the detail behind this forecast.

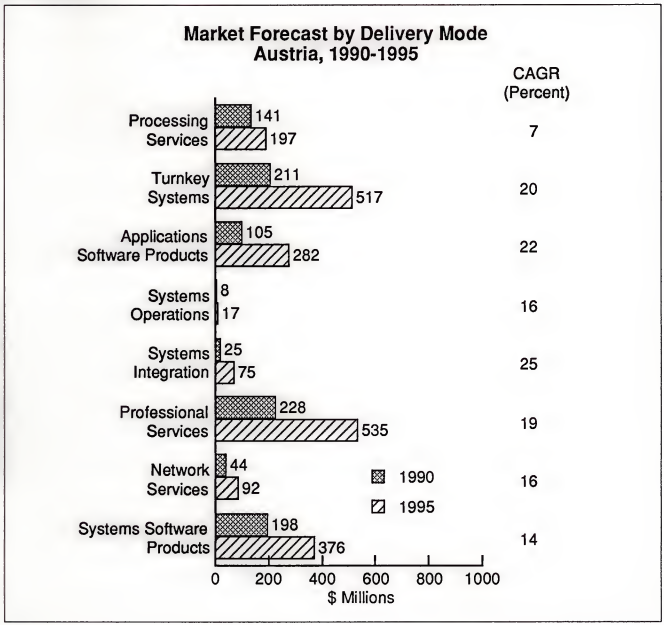
The fastest growing sectors are software products, turnkey systems, and the emerging market for systems integration.

The strong turnkey systems sector indicates the acceptance of PC-based solutions for small businesses.

Relative to the overall European software and services market, the Austrian market is particularly strong in applications software products and turnkey systems. In 1990, these two delivery modes represented 32% of the Austrian market, compared with 27% for the whole of Europe.

Systems operations and network services represent modest local markets. Both are experiencing reasonably strong growth.

EXHIBIT VIII-8




### 3. Market Considerations

The Austrian market is small and centered in Vienna. Many of the larger German vendors are involved. U.S. and German equipment vendors continue to be important.

IBM is the largest software and services vendor in Austria, with revenues of $70 million to $80 million. Nixdorf has revenues in Austria of some $30 million and Mannesmann Kienzle (now owned in part by Digital Equipment) of about $20 million. These three vendors account for close to 20% of the total Austrian market.

The two largest Austrian vendors, Dataservice and Management Data, account for less than 3% of the market.

- The largest Austrian vendor is Dataservice. Dataservice was founded by the Commercial Bank in 1966, and specializes in processing services and development of custom software for IBM mainframes. It is also a large distributor of personal computers.

- Management Data, the second largest Austrian-owned vendor, generated some $11 million from software and services in Austria in 1989. It too is owned by a major Austrian financial institution, Creditanstalt-Bankverein. Some 25% of Management Data's total revenue is from export of its international banking software. Most of its revenues are generated from selling PC solutions to domestic customers.

EXHIBIT VIII-9

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Austria

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Austria Information Services Market | 835 | 15 | 961 | 1,116 | 1,301 | 1,516 | 1,777 | 2,090 | 17 |
| *Processing Services* | 133 | 6 | 141 | 151 | 162 | 173 | 185 | 197 | 7 |
| -Transaction Processing Services | 117 | 7 | 125 | 133 | 143 | 153 | 162 | 172 | 7 |
| -Utility Processing | 5 | 20 | 6 | 6 | 6 | 6 | 6 | 7 | 3 |
| -Other Processing | 10 | 10 | 11 | 12 | 13 | 14 | 16 | 18 | 10 |
| *Turnkey Systems* | 179 | 18 | 211 | 252 | 301 | 359 | 430 | 517 | 20 |
| -Equipment | 98 | 16 | 114 | 129 | 148 | 171 | 196 | 227 | 15 |
| -Software and Professional Services | 80 | 23 | 98 | 123 | 153 | 188 | 234 | 290 | 24 |
| *Applications Software Products* | 87 | 21 | 105 | 128 | 157 | 190 | 230 | 282 | 22 |
| -Mainframe | 12 | 8 | 13 | 14 | 15 | 16 | 17 | 18 | 7 |
| -Minicomputer | 28 | 18 | 33 | 40 | 47 | 56 | 66 | 78 | 19 |
| -Workstation/PC | 47 | 26 | 59 | 74 | 94 | 117 | 147 | 186 | 26 |
| *Systems Operations* | 7 | 14 | 8 | 9 | 11 | 13 | 14 | 17 | 16 |
| -Processing Services | 5 | 20 | 6 | 7 | 8 | 9 | 10 | 12 | 15 |
| -Professional Services | 2 | 0 | 2 | 3 | 3 | 4 | 4 | 5 | 20 |
| *Systems Integration* | 20 | 25 | 25 | 32 | 40 | 49 | 61 | 75 | 25 |
| -Equipment | 9 | 33 | 12 | 14 | 18 | 22 | 26 | 31 | 21 |
| -Software Products | 1 | 100 | 2 | 2 | 3 | 3 | 4 | 5 | 20 |
| -Other Services | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 25 |
| -Professional Services | 9 | 22 | 11 | 15 | 19 | 24 | 30 | 38 | 28 |
| *Professional Services* | 193 | 18 | 228 | 269 | 320 | 377 | 450 | 535 | 19 |
| -Consulting | 25 | 24 | 31 | 37 | 45 | 55 | 67 | 82 | 21 |
| -Education and Training | 27 | 26 | 34 | 42 | 51 | 61 | 77 | 94 | 23 |
| -Software Development | 141 | 16 | 164 | 191 | 224 | 262 | 306 | 359 | 17 |
| *Network Services* | 40 | 10 | 44 | 49 | 57 | 67 | 78 | 92 | 16 |
| -Electronic Information Services | 35 | 9 | 38 | 42 | 47 | 52 | 59 | 66 | 12 |
| -Network Applications | 5 | 20 | 6 | 7 | 11 | 14 | 20 | 26 | 34 |
| *Systems Software Products* | 177 | 12 | 198 | 224 | 255 | 289 | 328 | 376 | 14 |
| -Mainframe | 96 | 6 | 102 | 109 | 117 | 125 | 132 | 141 | 7 |
| -Minicomputer | 53 | 15 | 61 | 70 | 82 | 96 | 111 | 129 | 16 |
| -Workstation/PC | 28 | 29 | 36 | 45 | 56 | 69 | 85 | 106 | 24 |

E

## Belgium

### 1. National Overview

Belgium, a founding member of the European Economic Community (EEC), benefits from being the site of the EEC infrastructure and from serving as the leading example of a country integrated with the rest of Western Europe. The progress in information services within Belgium is directly impacted by the progress within the EEC.

Belgium is a relatively rich country in Europe with a per-capita gross domestic product of $15,100. However, the small domestic market and the fact that the country is bilingual (Flemish Dutch, and Belgian French) means that Belgium tends to be more of a crossroads than a power in its own right.

The country has a reasonably strong economy, centered in Brussels. Belgium has traditionally had a high-wage (although also highly productive) economy, and also has a huge public-sector debt of 120% of the gross national product, but significant recent improvements in economic performance and a tradition of successful exporting of semifinished products mean that many Belgians are confident about the future.

One weakness in the country is the division between the Walloon and Flemish populations.

There are many successful and dynamic small and medium-sized companies, especially in the north, and French companies have been making many acquisitions in the French-speaking south. The impact of the Single European Act and the shift of power from national capitals to Brussels will undoubtedly provide much stimulus to the Belgian economy, especially in the area of professional services, as more and more companies seek representation in the unified European community.

Luxembourg is commonly considered part of the Belgian/Benelux market.

### 2. Information Services Market Forecast

INPUT forecasts that the Belgian software and services industry will grow from $1.8 billion in 1990 to some $4.0 billion by 1995, as shown in Exhibit VIII-10. This represents an average growth rate over the five-year period of 18% per year, down from the 19% CAGR projected in the 1989 report.

EXHIBIT VIII-10

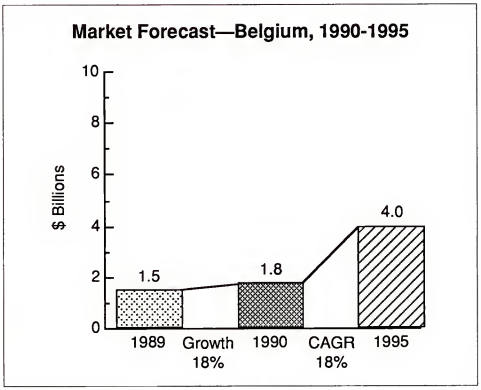



Exhibit VIII-11 provides the forecast by delivery mode, and Exhibit VIII-12, at the end of this profile of Belgium, provides the detail behind this forecast.

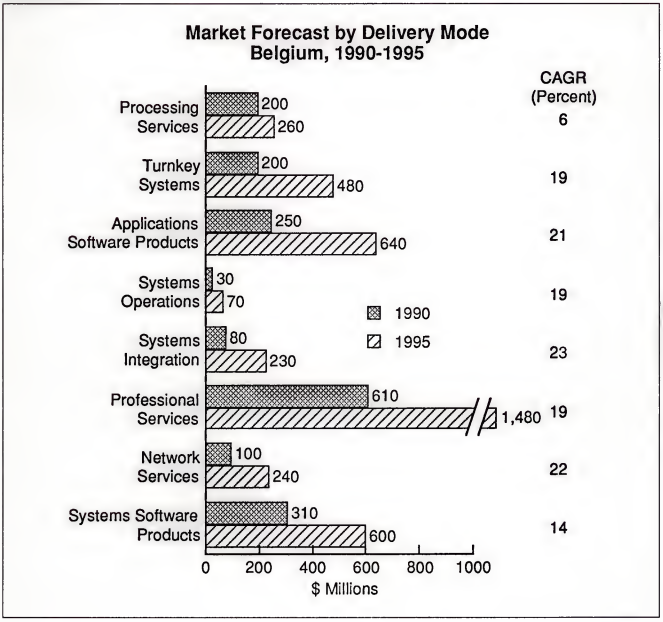
The Belgian market is a strong user of professional services. Systems integration and professional services combined represent some 39% of the Belgian market, compared with 35% for the whole of Europe.

- The professional services sector has been and will continue to be a strong element of the information services market.

Overall, the growth of the market is expected to be very similar to that of the European market as a whole; growth is expected to remain relatively consistent from year to year.

The location of the European Commission in Brussels and Luxembourg is helping to sustain growth in the Belgian and Luxembourg markets. The Commission is developing central electronic information services for the 12 EEC member states. The Commission's host service, ECHO, is located in Luxembourg and aims to provide 900 data bases and 90 host services. The Commission is also developing a communitywide international videotex service to link itself to relevant government departments of the 12 member states.

EXHIBIT VIII-11



### 3. Market Considerations

The two largest domestic vendors, CIG and Intersys, merged in 1988 to form CIG-Intersys, which now holds about 8% of the Belgian market for software and services. CIG-Intersys is now part of Computer Sciences Corporation of the U.S., which makes Computer Sciences the largest independent vendor in the Belgian market.

- The acquisition more than doubled CSC's European revenue and positions it to capture EEC business throughout the 1990s. CSC's Belgian market revenues were about $85 million in 1989.

Other smaller independent Belgian vendors are also targets for acquisition by European and U.S.-based vendors should the importance of the Belgian market continue to grow.

Other leading vendors in the Belgian market are:

- IBM, second largest with $97 million
- CAP Gemini Sogeti of France which acquired Sesa in 1988 and formed CAP Sogeti-Sesa
- Informabel, with over $35 million in revenue, is the largest remaining Belgium-based information services vendor. Informabel's main delivery mode is processing services.

EXHIBIT VIII-12

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Belgium

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Belgium Information Services Market | 1,498 | 18 | 1,774 | 2,081 | 2,452 | 2,893 | 3,394 | 3,998 | 18 |
| *Processing Services* | 189 | 4 | 197 | 207 | 221 | 236 | 250 | 264 | 6 |
| -Transaction Processing Services | 168 | 4 | 175 | 184 | 196 | 209 | 221 | 233 | 6 |
| -Utility Processing | 6 | 5 | 6 | 6 | 7 | 7 | 7 | 7 | 3 |
| -Other Processing | 15 | 22 | 16 | 17 | 19 | 20 | 22 | 25 | 9 |
| *Turnkey Systems* | 171 | 18 | 201 | 239 | 285 | 338 | 403 | 481 | 19 |
| -Equipment | 94 | 14 | 107 | 122 | 141 | 160 | 184 | 210 | 14 |
| -Software and Professional Services | 77 | 23 | 94 | 117 | 144 | 178 | 219 | 271 | 24 |
| *Applications Software Products* | 208 | 20 | 250 | 300 | 360 | 436 | 528 | 641 | 21 |
| -Mainframe | 29 | 5 | 30 | 33 | 34 | 37 | 39 | 42 | 7 |
| -Minicomputer | 66 | 18 | 79 | 93 | 110 | 131 | 155 | 184 | 18 |
| -Workstation/PC | 112 | 25 | 141 | 174 | 215 | 269 | 334 | 415 | 24 |
| *Systems Operations* | 27 | 16 | 31 | 37 | 44 | 51 | 61 | 73 | 19 |
| -Processing Services | 24 | 16 | 27 | 32 | 38 | 45 | 53 | 64 | 19 |
| -Professional Services | 3 | 19 | 4 | 5 | 6 | 7 | 8 | 9 | 18 |
| *Systems Integration* | 67 | 24 | 83 | 104 | 129 | 158 | 192 | 231 | 23 |
| -Equipment | 27 | 24 | 34 | 42 | 51 | 61 | 73 | 86 | 20 |
| -Software Products | 4 | 23 | 5 | 6 | 8 | 10 | 12 | 14 | 23 |
| -Other Services | 2 | 14 | 2 | 2 | 3 | 3 | 4 | 4 | 15 |
| -Professional Services | 34 | 25 | 42 | 53 | 67 | 84 | 103 | 127 | 25 |
| *Professional Services* | 512 | 19 | 611 | 734 | 883 | 1,056 | 1,245 | 1,477 | 19 |
| -Consulting | 71 | 24 | 88 | 109 | 137 | 169 | 210 | 263 | 24 |
| -Education and Training | 40 | 23 | 50 | 60 | 74 | 91 | 110 | 137 | 22 |
| -Software Development | 401 | 18 | 473 | 565 | 673 | 796 | 925 | 1,077 | 18 |
| *Network Services* | 73 | 21 | 88 | 108 | 131 | 160 | 194 | 235 | 22 |
| -Electronic Information Services | 50 | 18 | 59 | 71 | 85 | 100 | 118 | 138 | 19 |
| -Network Applications | 23 | 26 | 29 | 37 | 47 | 60 | 76 | 97 | 27 |
| *Systems Software Products* | 279 | 12 | 313 | 352 | 399 | 457 | 520 | 596 | 14 |
| -Mainframe | 155 | 7 | 166 | 177 | 190 | 206 | 221 | 238 | 7 |
| -Minicomputer | 81 | 16 | 95 | 110 | 129 | 150 | 174 | 202 | 16 |
| -Workstation/PC | 42 | 24 | 52 | 64 | 80 | 101 | 125 | 156 | 25 |

F

Brazil

## 1. National Overview

A country with abundant resources, Brazil has yet to realize its potential. Plagued by political and economic turmoil and protectionist policies, the Brazilian information services industry continues to languish.

1989 and 1990 brought some stability to the economy; however, as in Argentina, it takes time to know if real change is occurring. Fundamental changes now being made that will facilitate the information services industry include:

- *Infrastructure development*—With a more stable economy anticipated, focus is being placed on the development of a national technological infrastructure. Development to date has been fragmented and has been delayed due to continual changes in the economic situation.

- *Local industry development*—The country is committed to the development of a national information services industry. The national computer law provides high protection for national firms and places severe restrictions on the entry of foreign companies.

- *Network development*—The government has recognized the need for a comprehensive national network and is committed to expanding and enhancing network capabilities. However, there are extensive restrictions on participation by foreign firms in this development.

Forces driving and inhibiting growth in the information services market include the following, which are essentially unchanged from the previous worldwide forecast report.

### a. Driving Forces

- *Political stability*—A return to political stability is beginning to attract interest by a number of foreign firms that had delayed entry into the market or reduced their efforts in the country.

- *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 informatics law*—The current informatics law is scheduled to expire in 1992. The planned end to the law has caused some firms to consider entry more favorably. Whether the law will be reinstituted is unknown.

- *Relaxed investment policies/procedures*—The government has proposed to relax a number of the policies and procedures related to investing in the hardware and software industry. Easing of registration times and product ownership rules is being considered.

### b. Inhibiting Factors

- *Protectionism*—The government policy of protecting infant industry is expected to remain in force for the foreseeable future.
- *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.
- *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. As a result of technological isolationism, extreme bureaucracy, and a weak economic infrastructure, the market has languished.

The current market for information services is estimated to be approximately $1.2 billion. The market is expected to grow at an annual rate of 20%, to over $3.1 billion by 1995, as shown in Exhibit VIII-13.

EXHIBIT VIII-13

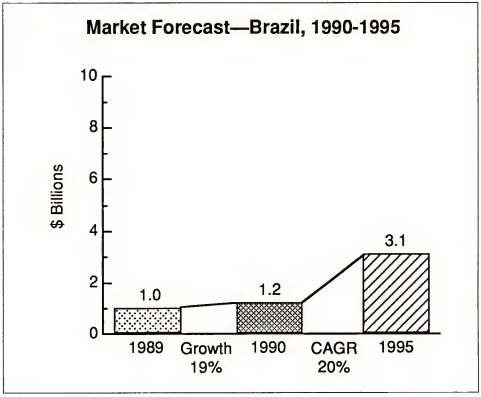
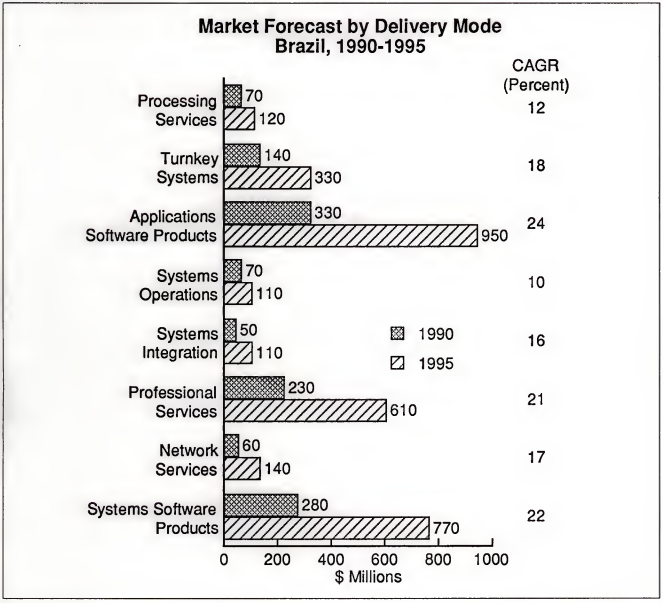


Exhibit VIII-14 provides the forecast by delivery mode. Exhibit VIII-15 provides the detail behind this forecast.

EXHIBIT VIII-14




Key contributors to growth are expected to be software products and professional services. Over the next several years, professional services will be needed to assist in identifying ways to develop technology solutions.

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.

- Efforts to reduce piracy have begun, and the federal government has indicated a commitment to altering its position on product ownership.

- Assuming that these efforts are fruitful, the market for software products is expected to grow from about $600 million in 1990 to $1.7 billion in 1995, an annual growth rate of 23%.

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

As shown in Exhibit VIII-14, the market for processing services is expected to show moderate growth as an increasing number of organizations expand their information services requirements to meet the needs of a growing economy.

The market for network services is expected to show reasonably strong 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.

The market for turnkey systems is expected to grow at a rate about double that in the U.S. This growth is due to residual demand for solutions to address immediate requirements. The market for turnkey systems will exceed $300 million by 1995.

The market for systems integration in Brazil is small. As indicated in Exhibit VIII-14, the requirements for packaged software and other services are estimated to be less than $10 million. However, the systems integration market is expected to grow at an annual rate of 16%, as an increasing number of companies recognize the need to address complex problems.

As Exhibit VIII-14 shows, the market for professional services in Brazil is of moderate size, considering the size of the country. This market is expected to grow at 21% 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.

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

Overall, the market for information services in Brazil has much potential. Recent changes indicate that growth could be sustained for several years. However, much will depend on the success of the government in charting a new moderate direction.

### 3. Market Considerations

Preferring to stimulate and protect indigenous industry, Brazil has not realized the benefit of foreign products and services. In addition, highly bureaucratic processes and very limited financial resources have resulted in underinvestment in information technology.

However, if recent changes in the government and the resulting commitment to provide a stable, directed economy are successful, Brazil could become a major market within the next several years.

Entry into the Brazilian market is suggested, but with a high degree of caution. Policies and procedures are lengthy and complex. Ownership of products entering the country can be questioned.

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

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.

Due to the restrictive environment and the lax enforcement of the copyright protection laws, many firms have delayed entry into Brazil. Major foreign companies include IBM, NCR, and Unisys. Apple, Microsoft, and other software firms are notably absent due to concerns over ownership rights and software piracy.

In addition to the foreign firms, there are a number of local companies in the information services business. Local companies include LABBO, Flebra, SID, GSI, and Villers.

EXHIBIT VIII-15

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Brazil

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Brazil Information Services Market | 1,038 | 19 | 1,240 | 1,489 | 1,790 | 2,157 | 2,603 | 3,146 | 20 |
| *Processing Services* | 62 | 10 | 68 | 76 | 85 | 95 | 107 | 120 | 12 |
| -Transaction Processing Services | 25 | 12 | 28 | 32 | 37 | 43 | 49 | 56 | 15 |
| -Utility Processing | 24 | 9 | 26 | 29 | 31 | 34 | 37 | 40 | 9 |
| -Other Processing | 13 | 10 | 14 | 16 | 17 | 19 | 21 | 23 | 10 |
| *Turnkey Systems* | 123 | 16 | 143 | 167 | 197 | 232 | 274 | 325 | 18 |
| -Equipment | 60 | 10 | 66 | 73 | 81 | 90 | 100 | 111 | 11 |
| -Packaged Software | 33 | 25 | 41 | 52 | 64 | 81 | 101 | 126 | 25 |
| -Professional Services | 30 | 18 | 35 | 42 | 51 | 61 | 73 | 88 | 20 |
| *Applications Software Products* | 260 | 25 | 325 | 403 | 500 | 620 | 768 | 953 | 24 |
| *Systems Operations* | 67 | 9 | 73 | 80 | 88 | 96 | 106 | 116 | 10 |
| -Processing Services | 60 | 10 | 66 | 73 | 80 | 88 | 97 | 106 | 10 |
| -Professional Services | 7 | 5 | 7 | 8 | 8 | 9 | 9 | 9 | 5 |
| *Systems Integration* | 46 | 15 | 53 | 61 | 71 | 82 | 95 | 111 | 16 |
| -Equipment | 20 | 10 | 22 | 25 | 28 | 31 | 35 | 39 | 12 |
| -Packaged Software | 4 | 15 | 5 | 5 | 6 | 7 | 8 | 9 | 15 |
| -Other Services | 2 | 5 | 2 | 2 | 2 | 3 | 3 | 3 | 6 |
| -Professional Services | 20 | 20 | 24 | 29 | 35 | 41 | 50 | 60 | 20 |
| *Professional Services* | 195 | 20 | 233 | 282 | 341 | 413 | 501 | 607 | 21 |
| -Consulting | 50 | 20 | 60 | 75 | 94 | 117 | 146 | 183 | 25 |
| -Education & Training | 30 | 17 | 35 | 41 | 49 | 58 | 68 | 80 | 18 |
| -Software Development | 115 | 20 | 138 | 166 | 199 | 238 | 286 | 343 | 20 |
| *Network/Electronic Information Services* | 55 | 17 | 64 | 75 | 89 | 104 | 122 | 144 | 17 |
| -Electronic Information Services | 45 | 17 | 53 | 62 | 73 | 87 | 102 | 120 | 18 |
| -Network Applications | 10 | 15 | 12 | 13 | 15 | 17 | 20 | 23 | 15 |
| *Systems Software Products* | 230 | 22 | 281 | 343 | 420 | 514 | 630 | 772 | 22 |
| -Systems Control | 140 | 24 | 174 | 212 | 258 | 315 | 385 | 469 | 22 |
| -Data Ctr. Mgt. | 20 | 15 | 23 | 26 | 30 | 35 | 40 | 46 | 15 |
| -Appl. Dev. | 70 | 20 | 84 | 105 | 131 | 164 | 205 | 256 | 25 |

G

Canada

## 1. National Overview

During 1990, INPUT conducted an in-depth assessment of the Canadian information services market. Although many of the underlying trends and issues were identical to those reported in the previous worldwide forecast report, the outlook for growth has been reduced significantly.

Canadian businesses, as well as the government, have long recognized the value of the use of information services. Key factors affecting this market include:

- *Increased technology investment*—Because of stimulation by government actions, there is an increasing amount of investment in information technology and services. The trend is expected to continue for at least the next several years.
- *Increasingly integrated systems*—There is increased emphasis in integrating systems as they are upgraded and expanded. The need for comprehensive processing capabilities has fostered growth of the systems integration market.
- *Expanded DBMS/4GL use*—Many organizations are placing increased emphasis on the development of DBMS systems and the use of fourth-generation languages as part of the development process.
- *Industry-specific applications*—Although the growth of cross-industry applications is strong, greater emphasis being placed on industry-specific applications.

Forces driving and inhibiting growth in the information services market in Canada are listed below. Other than the impact of a recession they are unchanged for the 1989 report.

### a. Driving Forces

There are a number of forces causing change in the information services industry in Canada. These forces are oriented significantly to the overall economy of the country and include the following:

- *Worldwide market position*—The government of Canada has recognized that investment is necessary for Canada to regain its position in the world economy. As a result, significant investment is being made in information technology.
- *Trade agreement*—The recently completed trade agreement with the United States, which liberalizes many import/export requirements, is stimulating investment by American companies. Conversely, Canadian companies are beginning to look south of the border for more business.

- *Government technology development*—The government is spending larger amounts to upgrade its technology base.

- *New systems development tools*—New tools and techniques are stimulating the upgrading and replacement of many systems. They are also fostering more integrated systems.

- *Mini/Micro systems*—More powerful and lower priced mini and micro systems are providing opportunities for smaller firms to take advantage of computer capability.

**b. Inhibiting Factors**

- *Recession*—Canada entered a recession in the third quarter of 1990 that is expected to last through mid-1991. This has deferred decisions throughout the economy, including within the information services industry.

- *Isolationism*—A faction within Canadian society would like to see a return to an isolationist policy to keep out many influences of the industrial world. To date, isolationist efforts have been somewhat obstructive, but without great success. They are not expected to become a major consideration, but do retard the rate of development.

- *U.S. dominance*—There has been continuous effort to develop an indigenous information services industry and there are a number of large and successful Canadian firms. However, there is continuing concern that, with the liberalized trade agreement, the larger U.S. firms will move into the country and dominate the industry.

- *Geographic area*—The size of the country and the concentration of the population into several population centers make national development difficult. The large investment needed to link the centers limits overall development.

- *Language requirements*—Dual-language requirements have an inhibiting effect on the introduction of new products and services. In Quebec, which includes Montréal, French or dual languages are required on all advertising, promotion, and legal documents. To be fully accepted in Quebec, documentation should be available in French.

**2. Information Services Market Forecast**

The strength of the market for information services in Canada is very similar to that in the U.S. The overall growth rate for the next five years will average 13%.

- Exhibit VIII-16 shows that the total market for information services is expected to grow from an estimated $3.4 billion in 1990 to more than $6 billion by 1995.

- This outlook is measurably different from that in the 1989 worldwide report, in which market growth was projected at 20%. The in-depth assessment conducted by INPUT during 1990, and the recession, have provided a clearer, more conservative picture.

EXHIBIT VIII-16

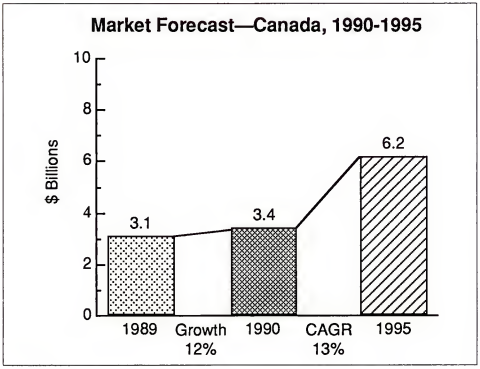
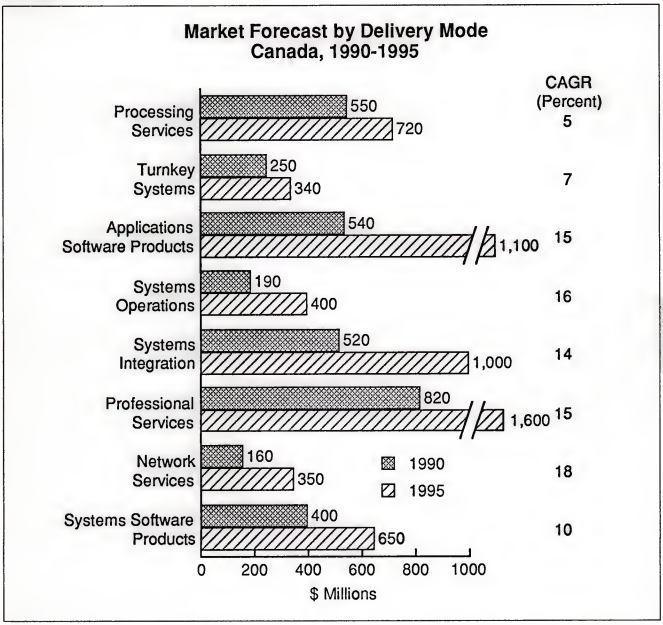



Exhibit VIII-17 provides the forecast by delivery mode, and Exhibit VIII-18 provides the detail behind this forecast.

During the five-year period, processing services are expected to grow at a modest rate of 5%, from $556 million in 1990 to an estimated $720 million by 1995. The systems operations sector of the market will experience a much stronger 16% CAGR and should reach $400 million over the same period. The market in Canada is expected to favor the systems operations alternative.

Turnkey systems growth will also be modest, at 7%.

EXHIBIT VIII-17




Applications software products will see a 15% growth rate, and systems software products a somewhat lower rate of 10%. Growth is impacted by the following:

- U.S. applications software products vendors often find that considerable customization is needed to meet national or local requirements.
- The dual language requirement is also an inhibitor.

The systems integration and professional services sectors will grow in the 14% to 15% range, with the markets reaching a combined $2.6 billion in 1995, or over 40% of the total market.

- In the short term, the market for systems integration is driven primarily by national government efforts to modernize existing systems. In the longer term, an increasing portion of revenues will be derived from the commercial sector, as larger firms respond to modernization efforts.

- Note should be made that one of the leading firms in the field of systems integration—SHL Systemhouse—is Canadian, and strong competition should be expected. In addition, some American companies indicate bias in favor of Canadian companies.

- The growth rate for professional services reflects the growing need for expertise in information technology to assist companies in identifing solution alternatives (consulting) and to implement the solutions with custom software.

The willingness to outsource through systems integration, professional services and systems operations vendors is fairly strong in Canada and makes for a significant market opportunity, even with growth rates lower than in some European countries.

Exhibit VIII-17 shows that the network services CAGR will be an estimated 18%, from $160 million in 1990 to $350 million in 1995. Growth for network services will result from significant emphasis being placed on the development of national network services to serve the more remote areas of the country. Services such as E-mail and EDI will be key contributors to growth.

The overall market for information services in Canada is expected to remain strong until at least the mid-1990s as many government entities try to modernize their systems and more companies implement new systems and services.

### 3. Market Considerations

A number of large, well-established companies operate in the information services industry in Canada, including many U.S.-based firms.

- Canadian firms include SHL Systemhouse and STM, which has recently merged with Westbridge (and includes IBM Canada as a minority owner).

- In addition to these vendors, there are several American companies with significant business interests, such as EDS, Andersen Consulting, Martin Marietta, SAIC, Hewlett-Packard, AT&T, Ashton-Tate, Computer Associates, Microsoft, Lotus, and Software Publishing.

With an estimated 50% of the market, American firms have a strong position in the Canadian market, but are experiencing growing competition from the leading Canadian firms, some of which (STM/Westbridge/IBM) are banding together to provide a broader, full-service offering.

There are few restrictions on entering the Canadian market. However, more than one American company has discovered that entry and success can be quite different. A number of American companies report bias against American companies and a preference among Canadian companies for working with other Canadian companies offering the same services.

In addition, although Canada is a single country, there is a considerably different product orientation in Quebec, where there is strong French influence. In many cases, different marketing strategies are required in Quebec.

There are opportunities throughout Canada, but the primary markets are in Ontario and Quebec. About three-quarters of the top 200 computer users are located in Ontario.

The strong French influence in Quebec provides an opportunity for American companies wishing to enter the French or European markets. French Canadian companies have modified or created systems in French and have been successful in marketing these in France and Europe. Partnership with a French Canadian company could result in entry into the French market without the cost of extensive travel to France.

EXHIBIT VIII-18

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Canada

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Canada Information Services Market | 3,068 | 12 | 3,423 | 3,814 | 4,265 | 4,806 | 5,459 | 6,201 | 13 |
| *Processing Services* | 520 | 5 | 548 | 578 | 609 | 643 | 678 | 715 | 5 |
| -Transaction Processing Services | 312 | 6 | 331 | 351 | 372 | 394 | 418 | 443 | 6 |
| -Utility Processing | 181 | 5 | 190 | 200 | 210 | 220 | 231 | 243 | 5 |
| -Other Processing | 27 | 1 | 27 | 28 | 28 | 29 | 29 | 30 | 2 |
| *Turnkey Systems* | 241 | 3 | 248 | 264 | 281 | 300 | 320 | 341 | 7 |
| -Equipment | 84 | 1 | 85 | 88 | 91 | 93 | 96 | 99 | 3 |
| -Packaged Software | 133 | 3 | 137 | 148 | 159 | 172 | 186 | 201 | 7 |
| -Professional Services | 24 | 6 | 26 | 28 | 31 | 34 | 37 | 41 | 9 |
| *Applications Software Products* | 470 | 15 | 542 | 622 | 716 | 824 | 950 | 1,096 | 15 |
| -Mainframe | 268 | 13 | 303 | 339 | 380 | 426 | 477 | 534 | 12 |
| -Minicomputer | 159 | 17 | 187 | 220 | 260 | 307 | 362 | 427 | 18 |
| -Workstation/PC | 42 | 23 | 52 | 63 | 76 | 92 | 111 | 135 | 21 |
| *Systems Operations* | 165 | 15 | 189 | 219 | 254 | 294 | 341 | 396 | 16 |
| -Processing Services | 123 | 14 | 141 | 163 | 189 | 219 | 254 | 295 | 16 |
| -Professional Services | 41 | 16 | 48 | 56 | 65 | 75 | 87 | 101 | 16 |
| *Systems Integration* | 466 | 12 | 524 | 590 | 670 | 769 | 895 | 1,030 | 14 |
| -Equipment | 200 | 10 | 220 | 247 | 276 | 312 | 352 | 398 | 12 |
| -Packaged Software | 89 | 12 | 99 | 112 | 128 | 146 | 166 | 189 | 13 |
| -Other Services | 153 | 16 | 178 | 203 | 234 | 275 | 335 | 397 | 17 |
| -Professional Services | 23 | 12 | 26 | 29 | 33 | 37 | 41 | 46 | 12 |
| *Professional Services* | 711 | 15 | 819 | 918 | 1,034 | 1,186 | 1,384 | 1,616 | 15 |
| -Consulting | 249 | 15 | 287 | 324 | 369 | 428 | 505 | 597 | 15 |
| -Education & Training | 341 | 15 | 393 | 440 | 492 | 561 | 651 | 755 | 14 |
| -Software Development | 121 | 16 | 140 | 154 | 172 | 197 | 228 | 265 | 14 |
| *Network/Electronic Information Services* | 129 | 20 | 155 | 183 | 215 | 254 | 299 | 353 | 18 |
| -Electronic Information Services | 49 | 16 | 57 | 66 | 77 | 89 | 103 | 120 | 16 |
| -Network Applications | 80 | 22 | 98 | 116 | 139 | 165 | 196 | 233 | 20 |
| *Systems Software Products* | 366 | 9 | 400 | 441 | 486 | 536 | 592 | 654 | 10 |
| -Mainframe | 260 | 8 | 281 | 306 | 334 | 364 | 397 | 433 | 9 |
| -Minicomputer | 84 | 10 | 93 | 103 | 115 | 127 | 141 | 157 | 11 |
| -Workstation/PC | 22 | 21 | 26 | 31 | 38 | 45 | 54 | 65 | 20 |

## H

## Denmark

### 1. National Overview

Denmark has been a member of the European Economic Community (EEC) since 1973. Its software and services market is the tenth largest in Europe. It was $1.5 billion in 1990 and is similar in size to the markets of Finland and Norway. (Sweden has the largest market of the Scandinavian countries, at about $2 billion.)

A prosperous country with a small population, Denmark gave one of the best economic performances of Europe throughout the 1980s. The primary driver of economic growth was exports, which have now slowed. As a result, overall economic growth has stopped and Denmark's information services market is being negatively affected.

Inhibitors negatively impacting Denmark include its dependance on agriculture for exports and an industrial base that is based on small manufacturing companies. Agricultural exports are being negatively affected by changes in the EEC and by worldwide trade policy. Additionally, the small size of the manufacturing industry limits investment in research and development.

The Danes are aggressive exporters and strongly support foreign trade. The changes in the EEC in 1992 and international trade in general should permit the Danish economy to begin to grow again after 1992. Denmark is very open to foreign trade, with very few restrictions, and so it is hoped that the small and medium-sized Danish firms will be able to cope with competition, and therefore will benefit greatly from the evolution to a single European market with 320 million consumers.

### 2. Information Services Market Forecast

Exhibit VIII-19 shows INPUT's forecast that the Danish market will grow from approximately $1.5 billion in 1990 to $3.2 billion in 1995. The average growth rate over this five-year period of 16% is somewhat below the average for all of Europe, in which the projected CAGR is 19%. The smaller market, current economic problems, and the smaller size of user organizations all negatively impact the growth outlook for Denmark compared to the larger European markets such as France and Germany.

EXHIBIT VIII-19

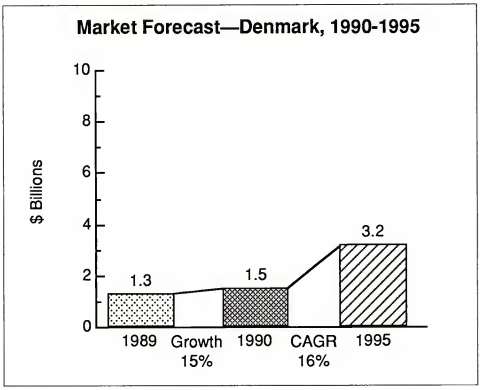
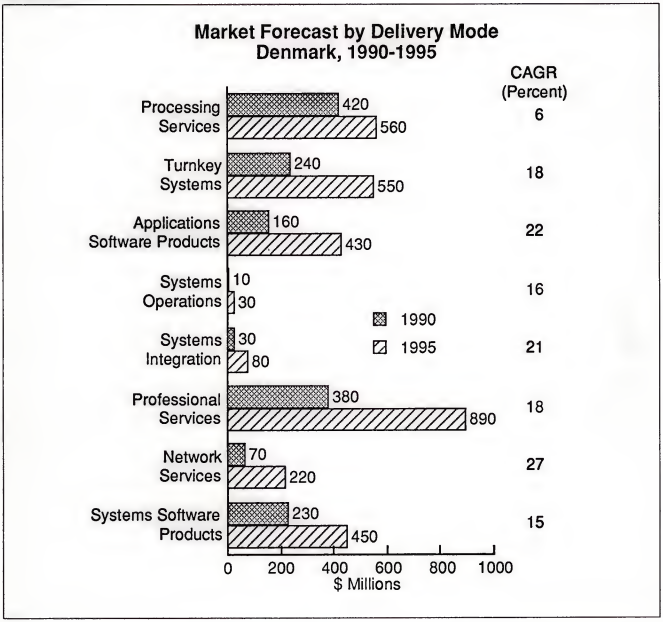



Exhibit VIII-20 provides the forecast by delivery mode and Exhibit VIII-21 provides further detail on this forecast.

The processing services sector is almost 30% of the total information services market in Denmark—a much higher proportion than for Europe as a whole, which is closer to 15%. The outlook is for slow growth in the processing services market in general in Europe, and even slower growth in Denmark, at a 6% CAGR through 1995. By 1995, processing services are expected to represent only 18% of the total information services market in Denmark. The 18% percent share will still be larger than the processing services proportion in Europe overall.

Turnkey systems and applications software products both represent strong points in the Danish market. The numerous small manufacturing firms are all candidates for mini- and personal computer-based applications packages. In general, these firms cannot afford high levels of customization or their own internal staffs to develop applications. Turnkey systems will grow at an 18% CAGR and applications software products at 22%. Together, these delivery modes will represent $1 billion of the $3.2 billion market in 1995.

EXHIBIT VIII-20




Systems integration and systems operations are modest market opportunities in this country. The principal opportunity is in the public or governmental sector.

The professional services market is relatively weak in Denmark, compared to many of the European markets. It currently represents 25% of the total Danish information services market, as opposed to the European average of 30%. The forecasted growth rate of 18% is below the average for Europe. This sector will reach $0.9 billion by 1995.

The fastest-growing delivery mode is expected to be network services. Network services are forecast to grow 27% per year over this five-year period, but only makes up a modest 6% of the market. With Denmark's orientation to export and trade, network services are important but can be easily offered through vendors based in other European countries.

### 3. Market Considerations

Denmark has a reasonably active and successful local group of information services vendors. Four of the leading five Danish vendors are domestically owned.

- The two leading vendors, Kommunedata and Datacentralen, provide services to the public sector. Kommunedata had revenues estimated to be $170 million in 1989 in Denmark, representing some 13% of the overall Danish software and services market. Kommunedata provides central processing services for local government and is owned collectively by a number of local municipal authorities.

- Datacentralen, the second largest Danish vendor, had 1989 revenues of $143 million. Its revenues accounted for some 11% of the Danish market and, with those of Kommunedata, accounted for 24% of the overall market.

Denmark still has strong links with the other three Scandinavian countries, which are not in the EEC. There are some active Scandinavian programs designed to link the information services industries of these neighboring countries.

- Scandinavians consider themselves in need of good communications, and in 1988 Scantel, formerly STS, was created. STS is a joint venture between four Scandinavian PTTs that offers an international VAN service.

- Denmark has launched a joint venture between IBM and the Danish PTT, and has been offering EDI services since 1988.

EXHIBIT VIII-21

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Denmark

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Denmark Information Services Market | 1,337 | 15 | 1,533 | 1,760 | 2,033 | 2,345 | 2,711 | 3,198 | 16 |
| *Processing Services* | 397 | 5 | 417 | 440 | 471 | 504 | 528 | 559 | 6 |
| -Transaction Processing Services | 365 | 5 | 383 | 404 | 433 | 461 | 482 | 511 | 6 |
| -Utility Processing | 8 | 0 | 8 | 9 | 9 | 9 | 10 | 10 | 5 |
| -Other Processing | 24 | 8 | 26 | 27 | 30 | 33 | 36 | 39 | 8 |
| *Turnkey Systems* | 201 | 19 | 240 | 285 | 332 | 391 | 465 | 553 | 18 |
| -Equipment | 111 | 15 | 128 | 149 | 166 | 189 | 217 | 248 | 14 |
| -Software and Professional Services | 91 | 23 | 112 | 136 | 166 | 203 | 248 | 305 | 22 |
| *Applications Software Products* | 129 | 21 | 156 | 187 | 226 | 263 | 316 | 426 | 22 |
| -Mainframe | 13 | 8 | 14 | 15 | 16 | 16 | 17 | 61 | 34 |
| -Minicomputer | 45 | 20 | 54 | 62 | 73 | 86 | 101 | 118 | 17 |
| -Workstation/PC | 70 | 26 | 88 | 109 | 137 | 161 | 198 | 247 | 23 |
| *Systems Operations* | 11 | 18 | 13 | 15 | 17 | 20 | 23 | 27 | 16 |
| -Processing Services | 9 | 11 | 10 | 12 | 14 | 16 | 18 | 21 | 16 |
| -Professional Services | 2 | 50 | 3 | 3 | 4 | 4 | 5 | 6 | 15 |
| *Systems Integration* | 24 | 25 | 30 | 37 | 46 | 55 | 66 | 79 | 21 |
| -Equipment | 10 | 20 | 12 | 15 | 18 | 21 | 23 | 26 | 17 |
| -Software Products | 1 | 100 | 2 | 2 | 3 | 3 | 4 | 5 | 20 |
| -Other Services | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| -Professional Services | 12 | 33 | 16 | 19 | 25 | 30 | 38 | 46 | 24 |
| *Professional Services* | 323 | 19 | 384 | 453 | 536 | 632 | 748 | 885 | 18 |
| -Consulting | 46 | 24 | 57 | 70 | 87 | 106 | 130 | 162 | 23 |
| -Education and Training | 13 | 23 | 16 | 20 | 24 | 29 | 35 | 43 | 22 |
| -Software Development | 263 | 18 | 311 | 363 | 426 | 496 | 582 | 681 | 17 |
| *Network Services* | 52 | 27 | 66 | 83 | 108 | 138 | 172 | 216 | 27 |
| -Electronic Information Services | 35 | 23 | 43 | 51 | 63 | 76 | 90 | 107 | 20 |
| -Network Applications | 17 | 35 | 23 | 32 | 45 | 62 | 82 | 109 | 37 |
| *Systems Software Products* | 199 | 15 | 228 | 260 | 298 | 342 | 393 | 454 | 15 |
| -Mainframe | 92 | 8 | 99 | 106 | 114 | 122 | 130 | 140 | 7 |
| -Minicomputer | 69 | 16 | 80 | 93 | 107 | 123 | 142 | 163 | 15 |
| -Workstation/PC | 38 | 26 | 48 | 61 | 77 | 96 | 121 | 150 | 26 |

I

Eastern Europe

## 1. National Overview

For the purpose of the worldwide forecast, Eastern Europe is composed of Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, Yugoslavia, and the USSR. (Although geographically near the Eastern European countries, Greece is considered part of Western Europe because of its close ties with the EEC.) East Germany is now part of Germany and is included in that profile.

Within Eastern Europe are a variety of economic and social systems and national heritages. However, a common element is that all have been influenced by communist economic and social doctrine.

The year 1990 was one of incredible change in Eastern Europe. East Germany merged with West Germany; Poland, Hungary, and Czechoslovakia all declared increased independence from the influence of the USSR and began the establishment of Western-type economies; and the USSR began to move towards democratic rule. The impacts on the information services market will be negligible in the short term, but all of these changes presage significant opportunities in the decade ahead.

The economic and political setting in Eastern Europe has begun to change dramatically over the past two to three years. Following nearly 30 years of isolation, these countries have begun to move toward increasingly open markets. Although still limited, there is increased business activity with Western countries, as well as increased political and economic influence from the West.

Concurrent with the opening of economic borders, there has been movement toward more openness in government. To date, the result has been increased dialogue and some increase in trade, primarily in agriculture, but economists indicate that additional time and changes will be necessary to bring about a significant difference in the volume of imports.

In general, the economies of the Eastern European countries will encounter significant difficulties as they attempt to expand. Eastern Europe's high external debt and lack of hard currency makes many countries reluctant to lend to Eastern Europe. To date, there have been only limited efforts to liquidate accumulated external debt.

Although the market for information services is very small, the pace of change will quicken and the opportunity for personal computer, workstation and client/server-based products will become significant.

### a. Driving Forces

A number of fundamental driving forces will work to create a significant information services and software products market over the next few years in Eastern Europe.

- *Industrial modernization*—The modernization of industry is the greatest driving force. All Eastern European countries recognize the need to place increased emphasis on productivity improvement tools.

- *Education*—The use of personal computers is the most frequently mentioned need for computing resources in many less developed countries. Increasingly, these countries recognize the need to develop a computer-literate population.

- *Population*—The overall size of the Eastern European market, particularly the USSR market, is a driving force in itself. There are already an estimated 1 million personal computers in the USSR and the number is growing rapidly. The market is large and the West will begin to permit the sale of some types of computing technology to capture foreign trade before a strong local computer industry develops.

- *World trade*—The increasingly open environment in world trade and the interest of the U.S. and Western Europe in gaining access to this emerging market will also positively impact the information services market.

- *Need for information technology*—The need for information technology to compete in world markets is already apparent to these countries. All are expected to place technology high on the priority list for the 1990s.

### b. Inhibiting Factors

In the near term, however, the inhibiting forces will continue to curb the ability of Eastern European countries to realize the benefits of technology. Key inhibiting factors include:

- *Employment*—Countries that have long practiced a policy of full employment have difficulty identifying ways to apply labor-saving tools and retain short-term full employment.

- *Political philosophy*—The dichotomy between communist and capitalist philosophy, though beginning to decline in importance, will take a number of years to totally disappear. The differences will continue to limit the opportunity to transfer technology to some degree.

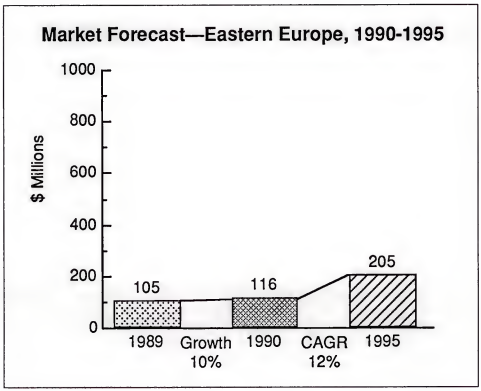
- *Economic policies*—Many of the economies in Eastern Europe are very weak and all are without adequate hard currency. It will simply take time for foreign trade to expand and with it the use of information technology capabilities to a level similar to that in the West.

**2. Information Services Market Forecast**

The market for information services in Eastern Europe is modest and limited. With the struggle going on in the economies of these countries and the limited information technology that is native, the USSR and the rest of the region are greatly dependent on Western technology, which has been restricted as has trade with this region.

Within Eastern Europe, the total market size for information services is estimated to be about $115 million. It consists primarily of software for a limited number of low-end computers. The growth rate is a modest 10% to 12% per year. Exhibit VIII-22 shows INPUT's forecast.

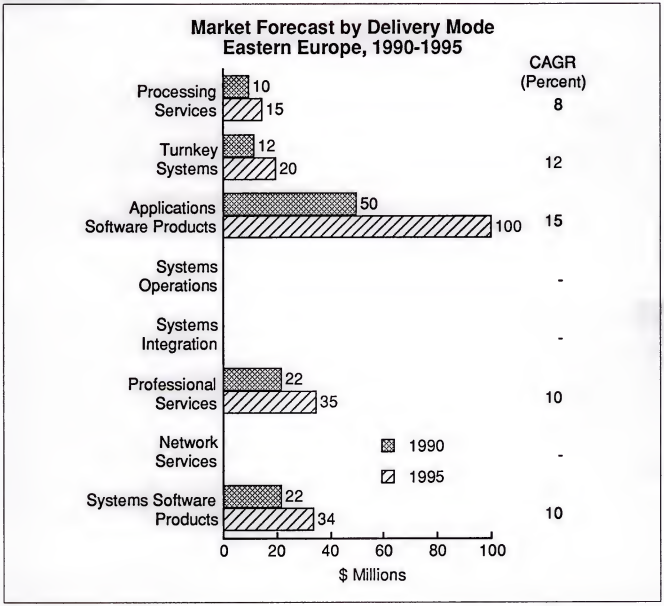
EXHIBIT VIII-22




The growth rate assumes reasonable economic progress in each of the countries towards freer industrial environments and reasonable support for increased trade by the major Western countries.

Exhibit VIII-23 provides the forecast for Eastern Europe by delivery mode. Exhibit VIII-24 provides the detail behind this forecast.

EXHIBIT VIII-23




- The majority of the market is software products-based, either applications or systems software products or turnkey systems (using personal computers primarily). Over 60% of the total estimated market is software products and another 10% is turnkey systems. These sectors are also experiencing the fastest growth.

- There is a modest processing services market, but given the modest size of most businesses and the dominance of government in most of the economies, the opportunity is currently limited.

- Professional services, although modest at present, will offer significant opportunities a few years hence, particularly for education and training as Western information technology is acquired.

### 3. Market Considerations

A number of Eastern European countries (Hungary, Poland, and Czechoslovakia) have begun to initiate national development programs, but the process is expected to be lengthy and the results uncertain. The underlying strength of the economies must increase before the required investment can proceed.

Improving telecommunications capability is important to all of these countries. Opportunities in this area are already developing.

Technology transfer is an area of immediate opportunity. In the short and near terms, the most significant opportunities appear to be for educational systems and services. Most countries are expressing interest in products and services that transfer technology that will help with national development.

Companies interested in entering the Eastern European market are encouraged to attend trade shows conducted periodically to assess the extent of interest in Western products and to become thoroughly familiar with U.S. export regulations pertaining to computer and software products. In the near term, telecommunications- and education-related products will most likely offer the best opportunities.

In almost all cases, local representation and a great deal of patience will be required. Entry into this market must be with a long-term view.

EXHIBIT VIII-24

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Eastern Europe

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Eastern Europe Information Services Market | 105 | 10 | 116 | 133 | 149 | 170 | 183 | 205 | 12 |
| *Processing Services* | 10 | 0 | 10 | 12 | 13 | 15 | 15 | 15 | 8 |
| *Turnkey Systems* | 10 | 15 | 12 | 12 | 13 | 15 | 15 | 20 | 12 |
| *Applications Software Products* | 45 | 11 | 50 | 60 | 70 | 80 | 90 | 100 | 15 |
| *Systems Operations* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Systems Integration* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Professional Services* | 20 | 10 | 22 | 25 | 27 | 30 | 33 | 35 | 10 |
| *Network/Electronic Information Services* | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *Systems Software Products* | 20 | 10 | 22 | 24 | 25 | 30 | 30 | 35 | 10 |

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## Finland

### 1. National Overview

Finland has a population of 5 million and is a member of the European Free Trade Association (EFTA). The software and services market is twelfth largest in Europe, with a total size of $1.1 billion.

Finland has been enjoying steady economic growth at a rate about one-and-a-half times greater than Europe as a whole. It has also benefited from being a neighbor to the USSR, although this trade benefit has declined with the internal economic problems in Russia in particular and the USSR in general.

- Finland was cushioned to some extent from the economic depression of the early 1980s by its closeness to the Soviet Union, which provided oil and natural gas in exchange for manufactured goods.
- Finland's experience in trade with the Soviet Union provides a model for the expanded opportunities within Eastern Europe.

Recently, however, Russia's share of Finnish trade has declined, while trade with the EEC has grown and now accounts for close to 50% of foreign trade.

The biggest company in Finland and sole representative in the European top 100 is Nestle. There are significant barriers to foreigners buying Finnish companies; however, Finnish companies have been acquiring companies elsewhere in Europe in preparation for 1992.

A strong economy is the primary factor driving the Finnish information services market. As long as steady trade growth can be maintained, the relationship with the USSR maintained, and access to the EEC leveraged, a strong information services market should continue to exist.

The most significant element, one that could become an inhibiting factor, may be the changes that will occur in the EEC in 1992. The removal of most trade restrictions for EEC members may restrict the amount of trade Finland can conduct with EEC members without becoming a member itself.

### 2. Information Services Market Forecast

The Finnish software and services market is forecast by INPUT to grow from $1.1 billion in 1990 to $2.4 billion by 1995. Exhibit VIII-25 shows that the average growth rate over this five-year period will be 17% per year. This is lower than last year's 18% and the overall European average of 19% for the 1990-1995 period.

EXHIBIT VIII-25

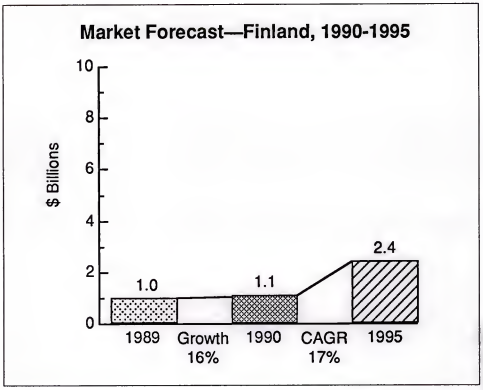


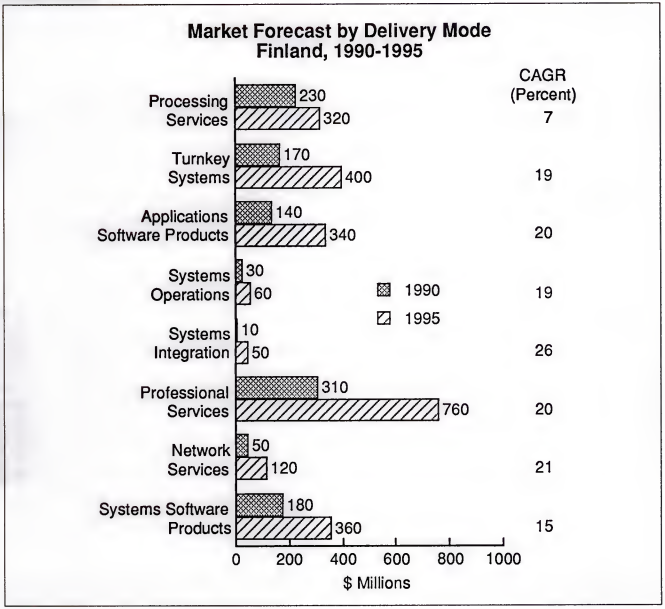

Exhibit VIII-26 provides the forecast by delivery mode. Exhibit VIII-27, at the end of the profile of Finland, provides the detail behind this forecast.

As in all of the Scandinavian countries, the processing services sector is strong in Finland. Processing services represent over 20% of the total information services industry, as opposed to about 15% for all of Europe and 17% in North America. Growth, however, is a modest 7% CAGR. By the end of the forecast period, processing services growth in Finland will equal the European average.

Systems integration, while a small market, is the fastest growing sector at 26% per year. This growth is further supported by a 21% CAGR for professional services. Professional services will reach over three quarters of a billion dollars by 1995. Network services is also expected to sustain high growth, an average of 21% per year.

The software sectors are reasonably strong and follow the patterns being experienced throughout Europe. The ever increasing power of personal computers and client-server systems is a positive influence on this market as it is in any market with a larger number of smaller businesses and organizations that can use this type of platform to provide a full set of applications systems.

EXHIBIT VIII-26




### 3. Market Considerations

The two largest information services vendors are local companies.

- The largest Finnish software and services vendor is Tietotehdas, a public company. It has a market share of 11% and 1989 revenues approaching $100 million. Tietotehdas specializes in professional services for the banking, insurance, and engineering industries and markets. The company also offers processing services for personnel administration. In addition, it sells software products and distributes equipment. Tietotehdas exports its data systems to Sweden and Denmark.

- The second largest vendor is Valtion Tietokoneskus (VTKK) and is the Finnish State Computer Centre. Approximately three-quarters of its 1989 revenues of $86 million are derived from clients within he Finish government. The remainder are from the private sector in Finland.

IBM and Digital are strong in software and services in Finland.

The remainder of the Finnish vendors are more modest and specialize in specific products or services.

Finland has close links with he USSR and is one avenue for entry into the USSR information services market. There are also close links with the Swedish market, its neighbor to the west.

Entry into the Finnish market is relatively open, the market is of modest size and established. Local representation is recommended.

EXHIBIT VIII-27

## Information Services Industry
## User Expenditure Forecast by Delivery Mode, 1990-1995
## Finland

| Delivery Modes | 1989 ($M) | Growth 89-90 (%) | 1990 ($M) | 1991 ($M) | 1992 ($M) | 1993 ($M) | 1994 ($M) | 1995 ($M) | CAGR 90-95 (%) |
|---|---|---|---|---|---|---|---|---|---|
| Total Finland Information Services Market | 958 | 16 | 1,108 | 1,281 | 1,501 | 1,757 | 2,056 | 2,411 | 17 |
| *Processing Services* | 214 | 7 | 228 | 242 | 264 | 283 | 302 | 321 | 7 |
| -Transaction Processing Services | 192 | 6 | 204 | 219 | 235 | 252 | 268 | 285 | 7 |
| -Utility Processing | 7 | 0 | 7 | 8 | 8 | 9 | 9 | 9 | 5 |
| -Other Processing | 14 | 14 | 16 | 16 | 19 | 22 | 24 | 26 | 10 |
| *Turnkey Systems* | 141 | 18 | 167 | 198 | 236 | 283 | 337 | 404 | 19 |
| -Equipment | 77 | 14 | 88 | 100 | 114 | 131 | 148 | 170 | 14 |
| -Software and Professional Services | 64 | 25 | 80 | 99 | 122 | 152 | 189 | 234 | 24 |
| *Applications Software Products* | 113 | 19 | 135 | 163 | 195 | 234 | 283 | 342 | 20 |
| -Mainframe | 15 | 13 | 17 | 18 | 18 | 19 | 20 | 21 | 4 |
| -Minicomputer | 36 | 19 | 43 | 51 | 62 | 74 | 89 | 107 | 20 |
| -Workstation/PC | 62 | 23 | 76 | 94 | 115 | 141 | 173 | 214 | 23 |
| *Systems Operations* | 23 | 17 | 27 | 31 | 37 | 45 | 53 | 64 | 19 |
| -Processing Services | 19 | 21 | 23 | 26 | 31 | 37 | 44 | 53 | 18 |
| -Professional Services | 4 | 0 | 4 | 5 | 6 | 8 | 9 | 11 | 22 |
| *Systems Integration* | 12 | 17 | 14 | 19 | 24 | 29 | 36 | 45 | 26 |
| -Equipment | 5 | 20 | 6 | 7 | 9 | 11 | 13 | 15 | 20 |
| -Software Products | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 25 |
| -Other Services | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| -Professional Services | 6 | 33 | 8 | 10 | 12 | 15 | 19 | 26 | 27 |
| *Professional Services* | 260 | 20 | 311 | 371 | 444 | 530 | 634 | 760 | 20 |
| -Consulting | 38 | 26 | 48 | 57 | 69 | 83 | 102 | 126 | 21 |
| -Education and Training | 14 | 21 | 17 | 19 | 24 | 29 | 36 | 43 | 20 |
| -Software Development | 208 | 19 | 247 | 295 | 352 | 418 | 496 | 591 | 19 |
| *Network Services* | 38 | 18 | 45 | 53 | 65 | 81 | 99 | 119 | 21 |
| -Electronic Information Services | 24 | 13 | 27 | 31 | 37 | 45 | 55 | 64 | 19 |
| -Network Applications | 14 | 29 | 18 | 23 | 29 | 36 | 44 | 55 | 25 |
| *Systems Software Products* | 158 | 13 | 179 | 204 | 236 | 273 | 312 | 356 | 15 |
| -Mainframe | 84 | 7 | 90 | 96 | 105 | 113 | 119 | 126 | 7 |
| -Minicomputer | 46 | 20 | 55 | 63 | 75 | 89 | 103 | 119 | 17 |
| -Workstation/PC | 27 | 26 | 34 | 45 | 57 | 71 | 90 | 112 | 27 |

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France

## 1. National Overview

France's information services market is the largest in Europe, with a total size of $15 billion. It is also the headquarters for a number of the leading European information services vendors who are preparing strategies to leverage the 1992 change in the EEC.

France has the second largest economy in Europe (and the largest information services market). The economy has sustained reasonably strong growth for the past few years under the current government.

Although French president Francois Mitterand is a Socialist, France has not had a Socialist government throughout his presidency. Nevertheless, France has undergone some very significant changes in economic and political style in the last decade.

When the Socialists first came to power, they believed strongly in state intervention and nationalization, but appeared to have a change of mind after less than two years in power. France has therefore gone through a period of nationalization and then a pause, and then much reprivatization. The present government is certainly less inclined to intervene than before and is more centrist, helped to a great extent by a strong decline in the French Communist Party.

Although still inclined to spend government money on infrastructure, such as transport, there is a strong climate of liberalization in France in order to meet the requirements of the Single European Act of 1992.

In preparation for 1992, there has been considerable merger and acquisition activity in France in 1989 and 1990 in the financial and industrial sectors. The French are very strongly in favor of European unity and favor economic union as well as free trade.

The largest companies in France are Renault, Electricite de France, CGE, Elf Aquitaine, and Peugeot. Seventeen of the European top 100 companies are French. France seems to be equally strong in manufacturing, service sectors, and agriculture.

France is stable economically and politically, and is centrally located in the EEC (which makes France extremely important), but there is some uncertainty about how French industry will perform in a wider European market.

## 2. Information Services Market Forecast

The French market for information services represents just under 25% of the total European market. It is a leader in many aspects and a market of much opportunity.

INPUT estimated the 1990 French software and services market at $15 billion and forecasts the market will grow to $36 billion by 1995, as shown in Exhibit VIII-28. The average growth rate over this five-year period is estimated to be 19% per year, the same as that for the European market as a whole.

EXHIBIT VIII-28

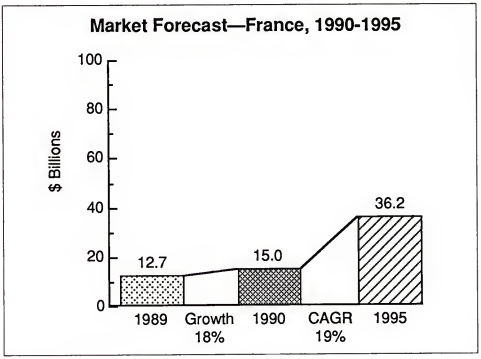


Exhibit VIII-29 provides the forecast by delivery mode. Exhibit VIII-30, at the end of this profile of France, provides the detail behind this forecast.

The French have developed some of the leading professional services vendors in Europe.

- Professional services currently represent some 39% of the total French software and services market. The corresponding figure is only 30% for the whole of Europe.
- As a result, the French professional services market accounts for 30% of the total European professional services market, with French vendors strong in most other European national professional services markets.
- The professional services sector will see strong growth during the 1990-1995 period, averaging 20% per year and resulting in a market of over $14 billion in 1995.

The French software market is centered on local companies with less than normal activity by foreign vendors. Language is a key factor in the strength of the domestic market.