

INFORMATION SERVICES
WORLDWIDE MARKET FORECAST

1989 - 1994

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Abstract

This report provides a comprehensive look at the Worldwide Information Services Industry in 1988, with growth rate projections for the period 1989 through 1994. Performance is analyzed for companies that offer processing services, network services, software products, turnkey systems, systems integration and professional services.

The report provides user expenditures for 1988 for 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 six delivery modes, providing a five-year forecast for the period 1989 through 1994.

In addition to the five-year forecast, the report considers the economic and political setting of each country or area, and the driving forces and inhibiting factors to growth of the information services industry.

The report also 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 341 pages, including 255 exhibits.



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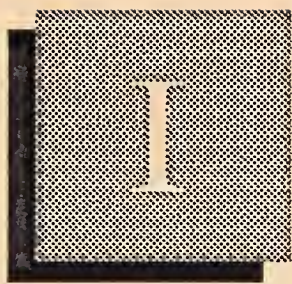
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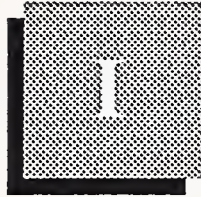
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Introduction





Introduction

A

Purpose and Scope

Whether large or small, businesses are increasingly focusing on foreign countries as a potential market or source of supply.

The growth of international business, coupled with the increasing need to ensure the availability of current, accurate information about business activities, is driving many organizations to seek sources of international information services.

While the market for information services has been growing rapidly in many countries, providers are faced with complex markets, regulations, and difficulties not found at home.

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

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

- Primary research included more than 1,100 interviews with services providers around the world.
- Secondary research included discussions with representatives of trade associations, government agencies, and industry consultants, as well as an extensive review of trade and business publications.

- The primary and secondary research was conducted for nearly thirty countries and geographic areas of the world, including the following:
 - Africa
 - Australia
 - Argentina
 - Belgium
 - Brazil
 - Canada
 - Denmark
 - Eastern Europe
 - Finland
 - France
 - 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
 - West Germany

B

Methodology

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 with more than 1,100 providers throughout the world. Key elements of the research included the following:

- An extensive review of background data about the economic and service environment in countries throughout the world
- Direct contact with trade associations and government agencies representing major countries

- Discussions with industry consultants knowledgeable in the services environment and markets, in key growing countries
- Review and assessment of economic and business trends that could affect the growth of the information services business
- Results of the interviews and discussions were entered into a data base and analysis was conducted to determine trends that might emerge
- Prior to entering financial data into the data base, local currencies were converted into U.S. Dollars. To provide a basis for readers to perform further analysis or prepare forecasts in local currency, the conversion factor for each country is shown in Appendix C.
- In addition to the primary research, the International Trade Administration (ITA) of the U.S. Department of Commerce was contacted, to obtain available information about information services markets in countries throughout the world.
- Data from the ITA was used as a cross reference for data derived from INPUT's research. ITA information was also used as a means of identifying patterns in development or difficulties in market entry.

2. Forecasts and Inflation

Considering the volatility of inflation rates in many areas of the world, and to provide a basis for comparability of market share and growth, forecasts have been prepared using current U.S. Dollars. Exhibit I-1 provides a summary of U.S. growth and inflation rate estimates for the period 1989 to 1994.

EXHIBIT I-1

| Inflation/GNP Economic Assumptions | | | | | | | |
|---|---------|-------|-------|-------|-------|-------|-------|
| | Percent | | | | | | |
| | 1988A | 1989E | 1990E | 1991E | 1992E | 1993E | 1994E |
| Real GNP | 4.4 | 2.8 | 2.5 | 2.3 | 2.0 | 2.0 | 2.0 |
| GNP Deflator* | 3.0 | 4.8 | 5.2 | 5.5 | 5.0 | 4.5 | 4.5 |
| Nominal GNP | 7.4 | 7.6 | 7.7 | 7.8 | 7.0 | 6.5 | 6.5 |

*Year-to-year comparisons. Source: U.S. Department of Commerce

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 GDP and inflation growth rate projections for countries throughout the world.

For some European countries, inflation projections are provided for the period 1989 through 1994. For other areas of the world and for developing countries, estimates are provided only through 1989 or, in some cases, 1990. All available information has been provided.

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 data base shown in Appendix B. Appendix B provides expanded revenue data and the correctly calculated CAGR.

C

Report Organization

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

- Chapter II is an Executive Overview of the report.
- 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 European and eastern European countries. For the purpose of this report, Eastern Europe includes the USSR and countries considered part of the 'Eastern Bloc.'
- Chapter V is a regional summary for Latin America. For the purpose of this report, Latin America includes Mexico and the countries of Central America, South America, and the Caribbean.
- Chapter VI is a regional summary for the Middle East and Africa. The Middle East/Africa region includes all the countries of Africa, and countries generally considered part of the Middle East. For the purpose of this report, Turkey is considered part of the Middle East, and Greece is considered part of Europe.

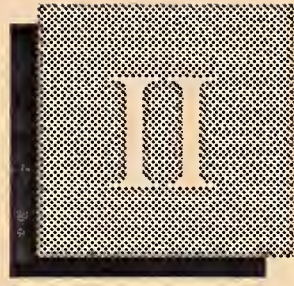
- Chapter VII is a regional summary for North America. The North American summary includes information derived from INPUT's annual research into the U.S. information services industry, combined with research on the Canadian market.
- Chapter VIII is comprised of a brief introduction followed by thirty (30) sections. Each section represents a country or geographic area covered in the research.
- The country/geographic area sections generally include the following type of information:
 - Introduction
 - Economic and Political Setting
 - 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.

D

Related INPUT Reports

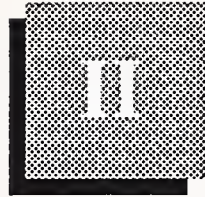
Other INPUT reports related to the Worldwide Market Forecast include the following:

- *U.S. Information Services Industry Analysis and Forecast, 1989-1994*
- *European Information Services Industry Analysis and Forecast, 1989-1994*
- *Systems Integration Market Analysis—Europe, 1989-1994*
- *Systems Integration Market Analysis—USA, 1989-1994*
- *Asia/Pacific Telecommunications Service Trends, 1988-1993*



Executive Overview





Executive Overview

A

Introduction

The Executive Overview provides a summary of the results of the research for all countries and regions of the world. The overview provides a general assessment of the global business environment as it relates to information services, and a summary of the key driving forces and inhibiting factors to global growth of information services.

Following the narrative data, a summary of the worldwide market is provided by region and by delivery mode. Information for the worldwide market is derived from figures contained in the data base for each country or geographic area (see Appendix B).

B

Global Business Environment

The global business environment can best be described as transitional and increasingly 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 following data is derived in large part from information published by the International Monetary Fund (IMF) and the World Bank. Specific figures are derived from their recently published reports.

Overall, the world's economic conditions improved significantly during 1988. World output expanded by 4.1%, almost 1 percentage point more than in 1987 and the highest growth rate since 1984. World trade expanded at the greatest rate since 1984. This expansion was notable in several respects:

- It followed upon the global stock market correction in October 1987 and came as a surprise to many forecasters.
- It came at a relatively late stage of the expansion that began in 1983, which is exceptionally long by historical measures.

- It has been accompanied in most countries by only slight inflationary increases.
- It occurred without any significant changes in fiscal policies and was accompanied by recent tightening of monetary policy.
- It has been based on a sharp expansion of business investment and rapid productivity growth.

However, notwithstanding the growth in 1988, there remains considerable uncertainty about the underlying behavior of the economic environment following the deregulation of the financial markets over the past decade.

There is general consensus among economists that the near-term outlook for economic activity in the industrial countries hinges on the prospects for inflation. Barring a worsening of inflationary pressures, which could lead to a further rise in interest rates, output is expected to expand at a rate of about 3% during 1989, and 2.5% in 1990.

Indicative of changes taking place in the world economy, a number of developing countries experienced growth significantly higher than that of many industrialized countries.

The economies of Hong Kong, South Korea, Singapore, and Taiwan grew at approximately 10.5% during 1988, contributing significantly to an average growth of 9.5% in 1988 among developing Asian countries. This compares favorably to the worldwide growth of just over 4%.

Over the medium term, the International Monetary Fund indicates that the growth of output in the industrial countries should moderate between 1989 and 1990. Between 1991 and 1994, output is expected to expand at an average annual rate of 3%. This expansion rate is generally in line with the estimated growth of productive capacity.

Since the United States remains a strong influence on the world economy, actual performance in the near and medium term hinges on the performance of the U.S. economy.

For the purpose of its annual projection, the IMF has envisaged a widening of the U.S. current account deficit, and continued deterioration of the U.S. net liability position in the near term.

The projections assume that, with a slowing down of adjustments to the trade balance, a slowing down of the demand for U.S. assets will result, since investors will eventually find the continued accumulation of external debt to be unsustainable.

As relates to the information services market, overall economic trends could have the following impact:

- In the near term, continued market stability is expected, particularly for productivity-improving products.
- In the medium and longer term, rising inflation rates could indicate a reduction of market potential for U.S. providers, as price/performance considerations cause shifts to more cost-effective (non-U.S.) providers.

Among the indicators of economic trends, the annual changes in Gross National/Domestic Product reflect the relative ability of countries to contribute to global economic development.

As indicated in Exhibit II-1, performance of the U.S. has been and is expected to remain somewhat modest, while the growth of Asian countries is significant. The impact of the 1992 changes in Europe is unknown, but could have a significantly positive impact on the ability of western European countries to compete. A unified market with consistent standards could significantly increase demand.

EXHIBIT II-1

Annual Changes in GNP/GDP, 1985-1990

| | Percent | | | | | |
|----------------------------|---------|------|------|------|------|------|
| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 |
| Industrial Countries (GNP) | | | | | | |
| Canada | 5.5 | 3.8 | 5.2 | 5.9 | 3.9 | 2.9 |
| United States | 5.4 | 3.5 | 2.5 | 4.0 | 2.8 | 2.5 |
| Japan | 3.6 | 4.2 | 5.7 | 7.5 | 4.8 | 4.7 |
| France | 2.3 | 3.1 | 2.8 | 3.5 | 2.9 | 2.9 |
| West Germany | 1.2 | 3.2 | 3.0 | 3.1 | 2.2 | 3.3 |
| Italy | 2.9 | 3.0 | 4.4 | 4.3 | 3.5 | 3.2 |
| United Kingdom | 2.8 | 3.9 | 4.9 | 6.0 | 3.7 | 1.5 |
| Developing Countries (GDP) | | | | | | |
| Africa | 3.5 | 2.2 | 1.2 | 1.7 | 2.3 | 3.3 |
| Asia | 6.7 | 6.6 | 7.2 | 9.0 | 6.4 | 6.2 |
| Europe | 2.3 | 4.2 | 2.4 | 2.5 | 2.3 | 3.0 |
| Middle East | (1.4) | 0.9 | 1.6 | 3.9 | 2.3 | 2.8 |
| Western Hemisphere | 3.6 | 4.1 | 2.6 | 0.9 | 0.8 | 3.2 |

C

Environmental
Factors

While factors contributing to the growth of information services vary by country and region, there are a number of factors that form an underlying basis for growth of the industry worldwide. Significant factors include the following:

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

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 developed or developing, information is necessary to 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 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 technology. Newly developing and less developed countries are placing increased emphasis on industrial development and the application of technology-based products and services.

- *Mini/Micro systems*—As the power of minis and micros increases, greater emphasis is being placed on them as the primary processing platform. Coupled with this is the increased demand for products to tie systems together (LANs) and software that will meet specific needs.
- *Industry-specific software*—Increasingly, there is a demand for software that meets the needs of a specific industry or user. As mini and microsystems are introduced into more, smaller organizations, there is increasing need for software that will meet a particular need, as opposed to generalized (spreadsheet-type) software.
- *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.
- *Complex systems*—As business becomes more complex and demands for maximum return increase, more emphasis is placed on the development of complex systems that will address the needs of the total organization. With increasing complexity come needs for system development (CASE) tools and increased use of DBMS systems.
- *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.

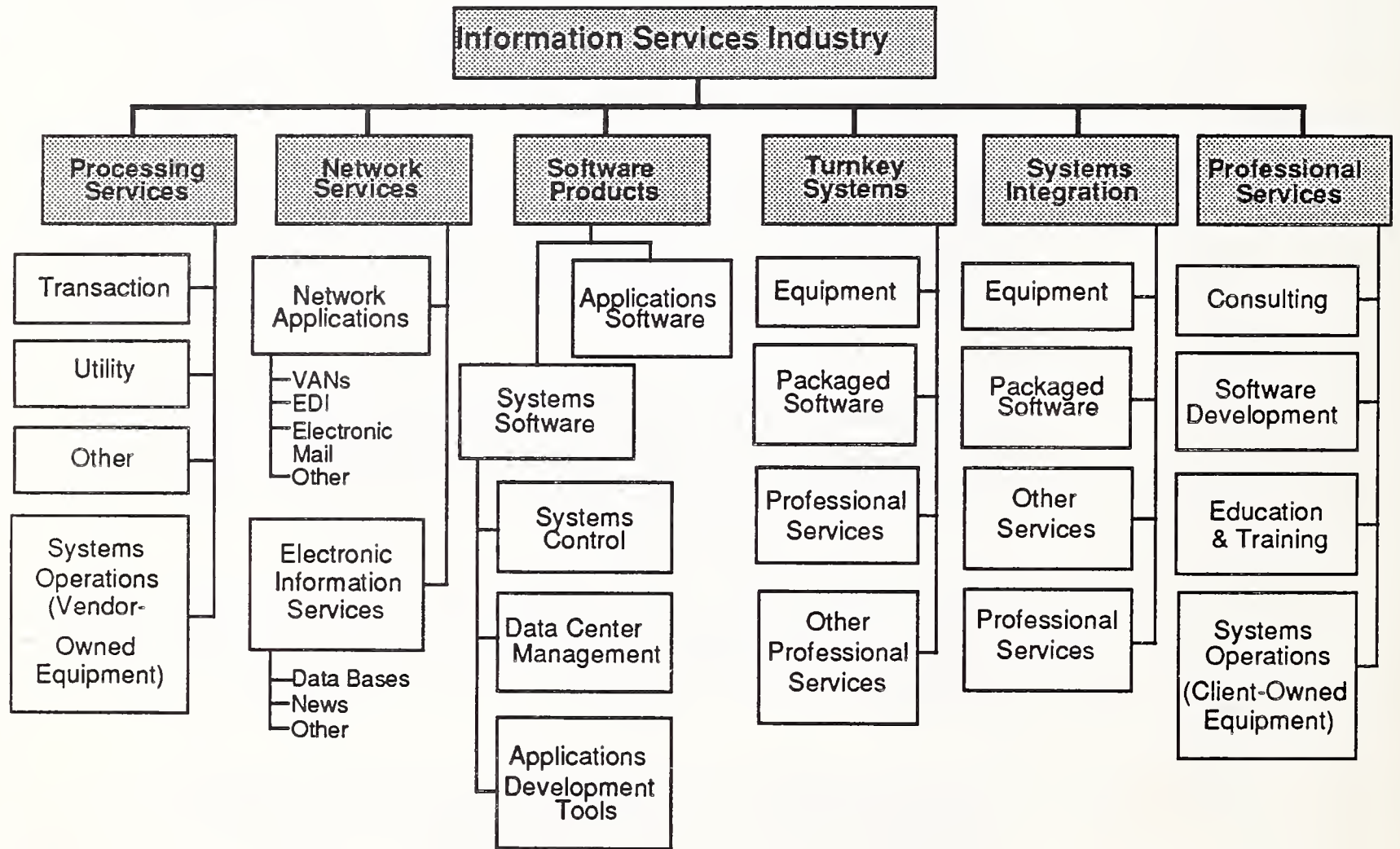
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Services Forecast Summary

For the purpose of the Worldwide Market Forecast, the information services industry, as defined by INPUT, includes the following six delivery modes: processing services, network services, software products, turnkey systems, systems integration, and professional services. The INPUT definition of the worldwide information services industry is given in Exhibit II-2.

EXHIBIT II-2

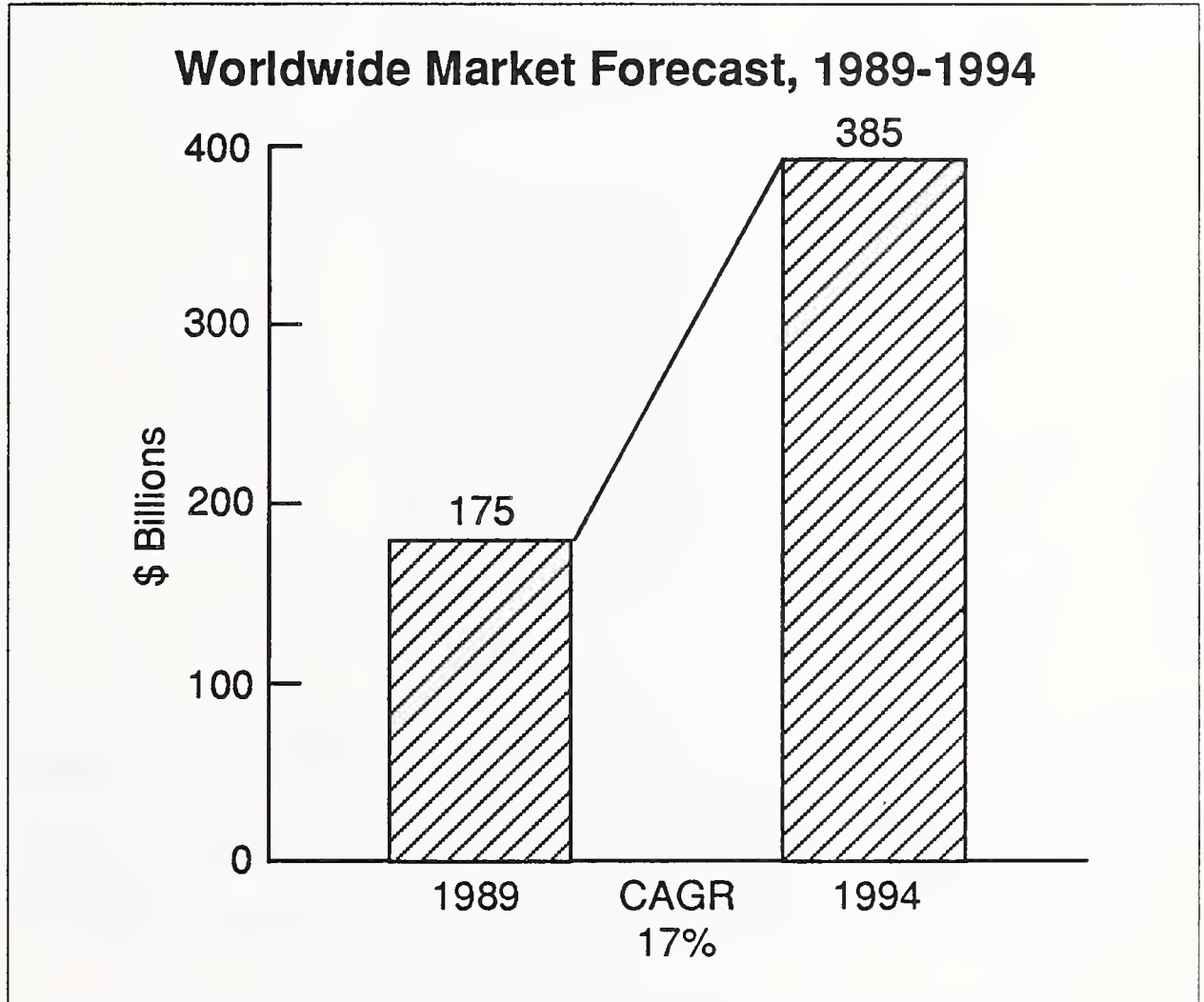
Information Services Industry Structure



Source: INPUT

The worldwide market for information services is estimated to be approximately \$175 billion for 1989, as shown in Exhibit II-3. The market is expected to grow at approximately 17% per year, to \$385 billion by 1994.

EXHIBIT II-3



During the five-year period from 1989 to 1994, the market share by major geographic area is not expected to change significantly, as Exhibit II-4 illustrates. During the period, regions other than North America are expected to gain some ground. However, North America will continue to represent at least 50% of the market for several years to come.

Of the total market worldwide, five countries represent an estimated 83% of the total market, as shown in Exhibit II-5. The United States leads the list, with an estimated 53%.

EXHIBIT II-4

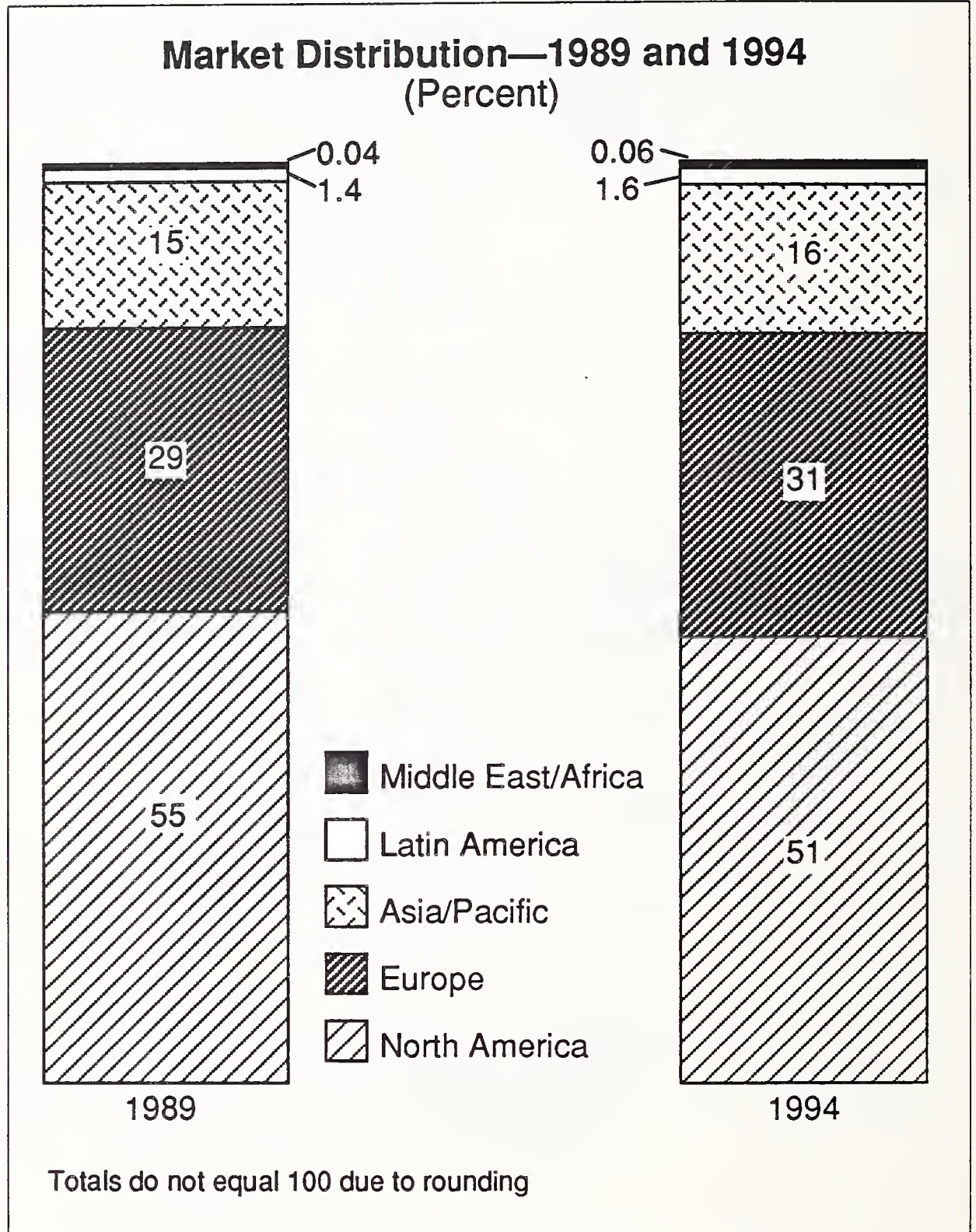


EXHIBIT II-5

Worldwide Market Forecast— Leading Countries

| Country | 1989 Revenues (\$ Billions) | Percent of Total |
|----------------|-----------------------------------|---------------------|
| United States | 92 | 53 |
| Japan | 22 | 12 |
| France | 12 | 7 |
| West Germany | 10 | 6 |
| United Kingdom | 9 | 5 |
| Total | 145 | 83 |

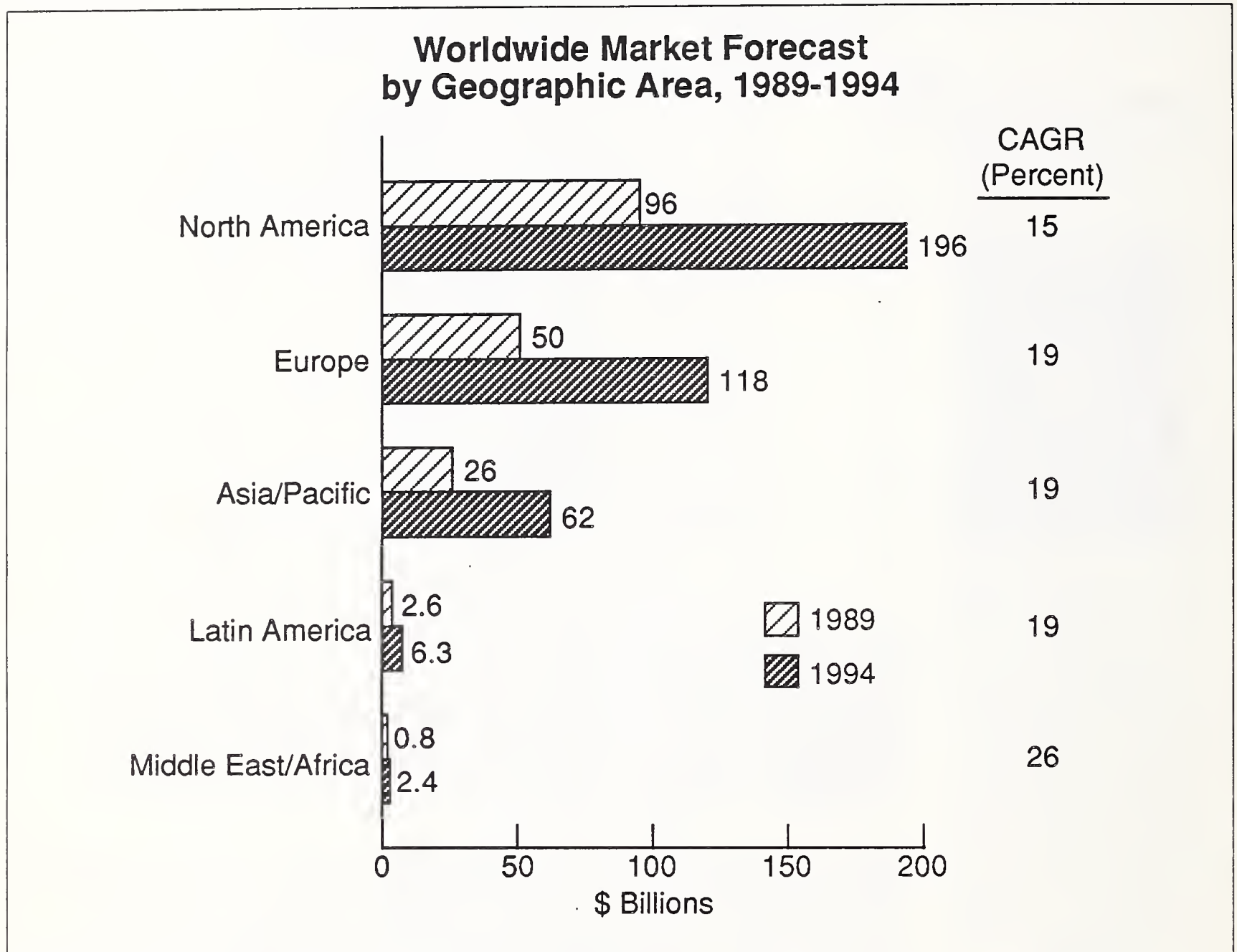
Following the U.S., the national percent of the worldwide total drops significantly. Japan is second with an estimated 12%, followed by France and West Germany, which represent 7% and 6% respectively. Following the United Kingdom (5%) are a number of other European countries.

While the United States is the largest market, the growth rate is expected to be somewhat less than in other areas of the world, as Exhibit II-6 shows. The U.S. market is expected to grow from approximately \$92 billion in 1989 to \$188 billion by 1994, at an average annual growth rate of 14%. (Note that the figures shown in Exhibit II-6 for North America include Canada.)

The regions of Europe, Asia/Pacific and Latin America are expected to exhibit similar growth rates (19%). The Middle East/Africa region is expected to show the highest growth rate (26%).

The higher rate of growth for the Middle East/Africa region is accounted for by two factors. The two key markets in the region are the countries of South Africa and Israel. South Africa is aggressively pursuing technology investment, as the country works to establish itself as a leader in African development. Israel has been working to establish itself as a software development center, and has been making significant investment.

EXHIBIT II-6

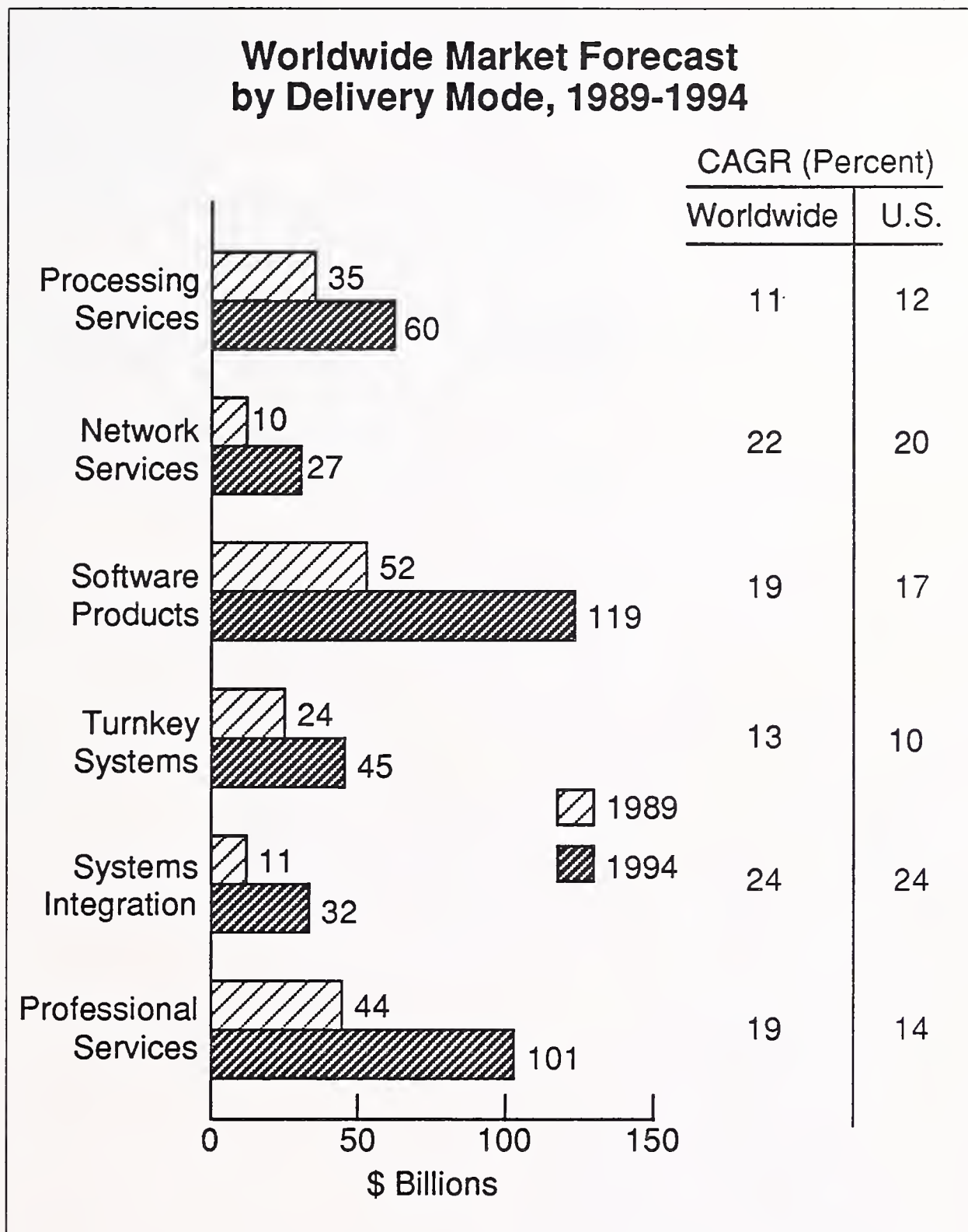


Although the levels of expenditure in South Africa and Israel are low, they result in growth rates that are comparatively high.

The overall pattern of annual growth rates is expected to be similar to the U.S., as shown in Exhibit II-7; however, there are a number of delivery modes that will experience higher rates.

Network services is expected to grow at an annual rate of 22% worldwide, compared to 20% in the U.S. The slightly higher worldwide rate is due to the increased emphasis on services such as videotext in other countries, and to the general emphasis on the development of network-based products (E-mail, etc.) in the newly developing countries.

EXHIBIT II-7



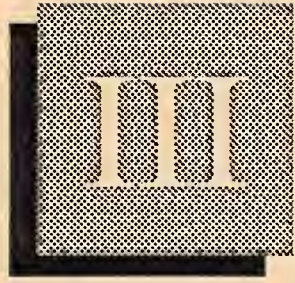
The growth of software products is expected to be approximately 19% worldwide, as compared to an estimated 17% in the U.S. The slightly higher growth rate is attributable to the significant investment that is needed in most countries, and to the high level of growth in micro-based software.

The most significant difference between the U.S. and the worldwide market is in the area of turnkey systems. In the U.S., the market for turnkey systems has slowed, reflecting increased emphasis on custom solutions.

There is also increasing emphasis on custom solutions worldwide. However, residual demand for short-term processing capability is expected to keep the demand for turnkey systems somewhat higher for the next several years.

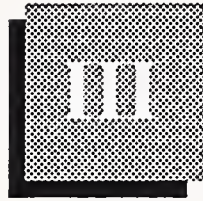
Professional services is expected to grow at an estimated annual rate of 19% worldwide, as compared to 14% in the U.S. The higher rate is attributable to two factors: first, there is a significant and growing need for consulting services to determine strategic approaches for utilizing technology in national development. Second, in many countries there is a growing need for custom software development to meet unique needs.

Overall, the growth of markets will be significant in all areas of the world and in each of the delivery modes for a number of years to come.



Regional Summary— Asia/Pacific





Regional Summary—Asia/Pacific

A

Introduction

The Asia/Pacific region is believed by many economists to be the fastest growing area of the world and, if economic projections hold true, will be the center of major economic activities in the next century.

In a report issued by the United Nations, the world economic growth for 1988 was an estimated 3.9%. During the same period, overall growth for developing countries was 4.4%. Growth in a number of Asia/Pacific countries has been consistently greater than the world average, and has generally been considerably higher than most of the western economies. This trend is expected to continue.

B

Regional Economic/ Political Setting

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, four countries (Hong Kong, South Korea, Singapore, and Taiwan) 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.

One of the reasons for the continued high growth rate is the amount of national expenditure allocated for the development of services. Three Asian countries rank among the top twenty.

- Between 1987 and 1988, the level of expenditure for national development in Japan was estimated to be approximately 13%.
- In Korea, the increase in national expenditure for development between 1987 and 1988 was estimated to be 20%.
- In Taiwan, the increase in national expenditures was projected to be nearly 20%.

Countries in Asia are expected to continue to grow and allocate increasing funds toward national development. Other indicators of the dynamic growth of the region include the following:

- The growth rate in major Asian countries is among the highest in the world, as shown in Exhibit III-1. Comparison to the U.S. indicates strong growth potential. Note that the somewhat lower growth rates projected for 1989 are a result of the worldwide economic adjustment and are expected to rebound.

EXHIBIT III-1

Asia/Pacific Countries Basic Economic Data

| | Population (Millions) | Population Growth ⁽¹⁾ (Percent/Year) | Real GDP Growth (Percent) ⁽²⁾ | |
|-------------|--------------------------|---|---|--------------------|
| | | | 1988 (Est.) | 1989 (Forecast) |
| Australia | 16 | 1.4 | 3.9 ⁽²⁾ | 3.0 |
| China (PRC) | 1080 | 1.3 | 11.0 | 6.0 |
| Hong Kong | 6 | 1.0 | 7.5 | 5.8 |
| India | 781 | 2.0 | 10.5 | 5.0 ⁽⁴⁾ |
| Indonesia | 171 | 1.7 | 10.5 | 5.0 |
| Japan | 122 | 0.4 | 5.7 | 4.7 |
| Korea | 23 | 3.1 | 11.5 | 7.5 |
| Malaysia | 17 | 2.2 | 8.1 | 7.5 |
| New Zealand | 3 | 0.6 | -1.0 ⁽³⁾ | 0.5 |
| Philippines | 58 | 1.9 | 6.7 | 5.0 |
| Singapore | 3 | 0.8 | 11.0 | 8.0 |
| Taiwan | 20 | 1.5 | 7.3 | 6.5 |
| Thailand | 54 | 1.5 | 10.5 | 8.0 |

(1) IMF projection, 1987-2000 (2) IMF, Barclays Bank projections
(3) Actual (4) Forecast

- The projected real annual growth rate for the major countries in the region could exceed 8% annually.
- Corporate profits for major companies in the region could exceed 20%.
- Workers in the major countries consistently work longer hours than workers in the West. Workers in the Four Tiger countries consistently average 55 hours per week, an estimated 41% more than their counterparts in Japan or the Western countries. Korean workers generally work 50% more hours per week than their counterparts in Japan.
- In 1950, the Japanese share of the world capitalization was estimated to be 0.5%. By 1970, this had risen to 5%. By 1988, Japan's share of world capitalization had risen to an estimated 43%.

As a result of capital and labor investments, corporate earnings are expected to remain high, at least through 1989 (Exhibit III-2).

EXHIBIT III-2

**Corporate Earnings Projections
Key Asian Countries**

| | 1988 (Percent) | 1989 (Percent) |
|---------------|-------------------|-------------------|
| Hong Kong | 24 | 15 |
| Singapore | 35 | 16 |
| Korea (South) | 23 | 20 |
| Taiwan | 10 | 10 |
| Thailand | 71 | 20 |
| Philippines | 47 | 20 |
| Malaysia | 33 | 18 |

Source: Tyndall-Newport Management

C

**Environmental
Factors**

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*—Chief among the driving forces is the recognition of the value of technology. 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*—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.
- *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 recognize the need to move away from a fundamentally agrarian society.

2. Inhibiting Factors

While 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.

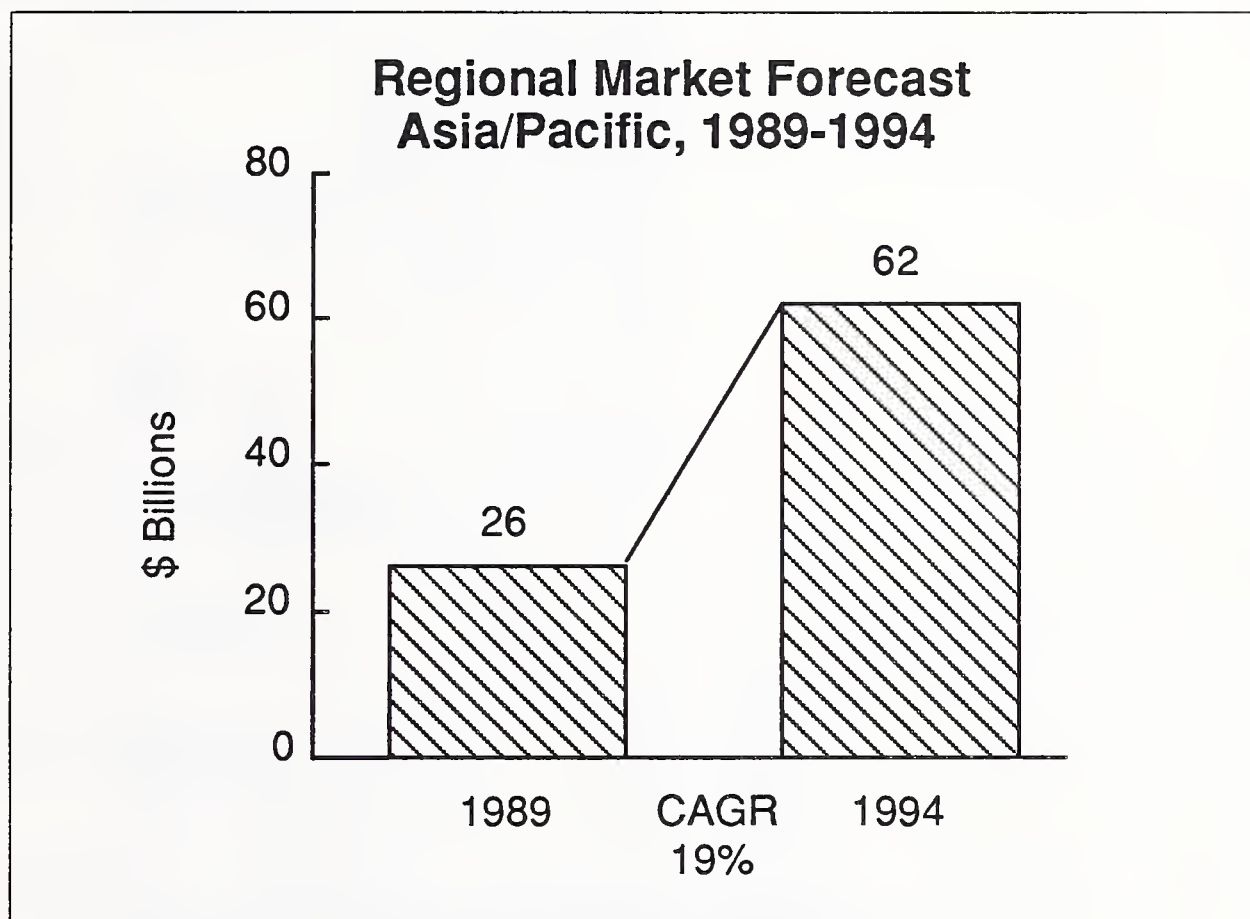
- *Political stability*—Long-term political stability remains a concern in many Asian countries. As evidenced by events in the PRC (People's Republic of China), changes in the political environment can happen quickly and cause significant disruption in development efforts.
- *Western protectionism*—Protectionism 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.
- *Inflation*—Significant increases in the rate of inflation in western countries could adversely affect the growth rate of Asian countries that are reliant on western markets.
- *Domestic economic base*—Most Asian countries have a small economic base from which to derive investment resources. This small base restricts the speed with which they can grow.

D

Regional Services Forecast

Between 1989 and 1994, the market for information services in the Asia/Pacific area is expected to grow from \$26 billion to \$62 billion, as Exhibit III-3 shows, an annual growth rate of 19%.

EXHIBIT III-3



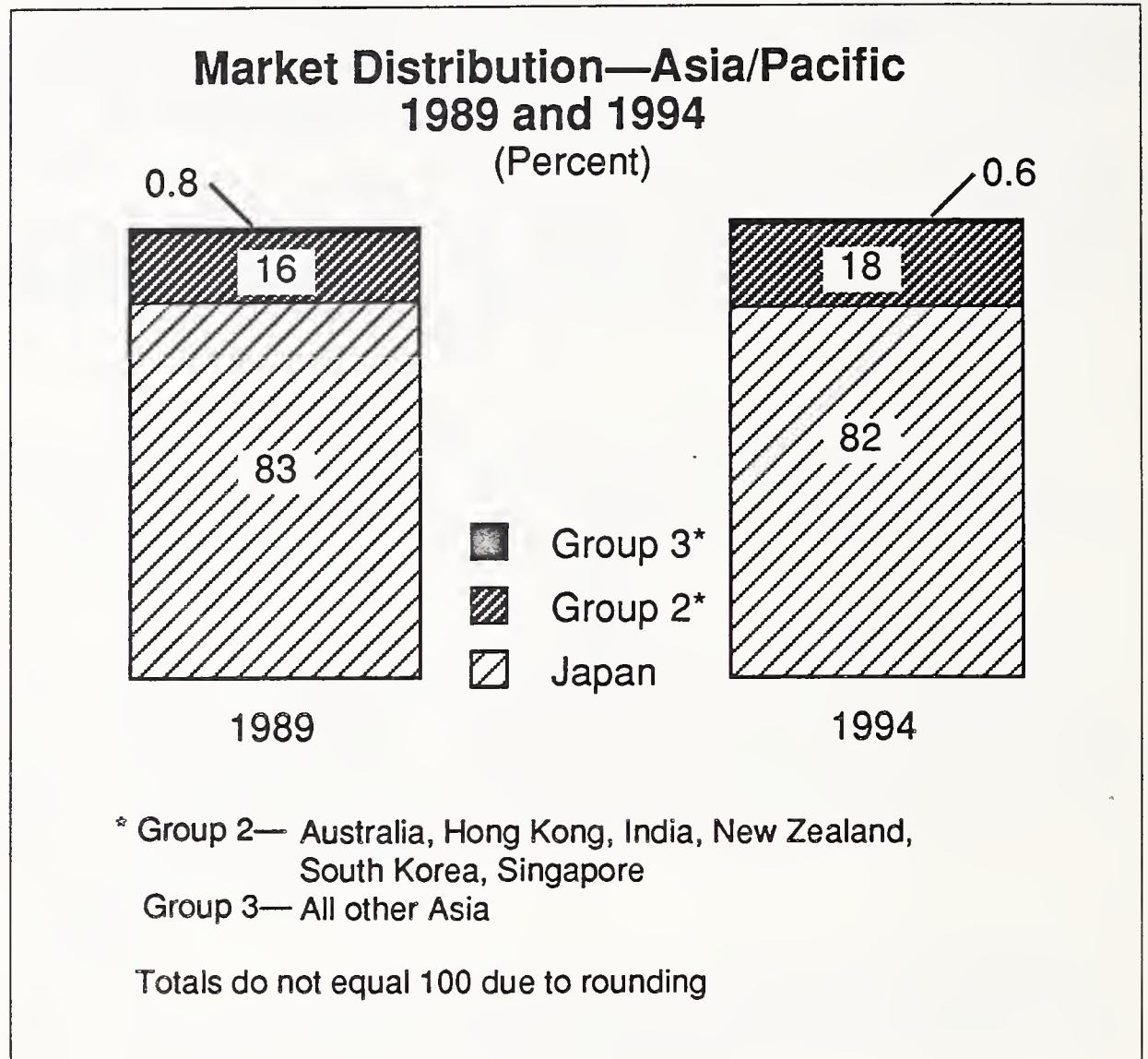
In the region as a whole, the market in Japan represents approximately 83% of the total, as displayed in Exhibit III-4. Little change is expected in Japan's dominance of the region's markets for a number of years to come. However, one change in the pattern of distribution could be significant in the longer term.

While 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-5, growth rates in each of the delivery modes are expected to be strong for the next several years.

EXHIBIT III-4

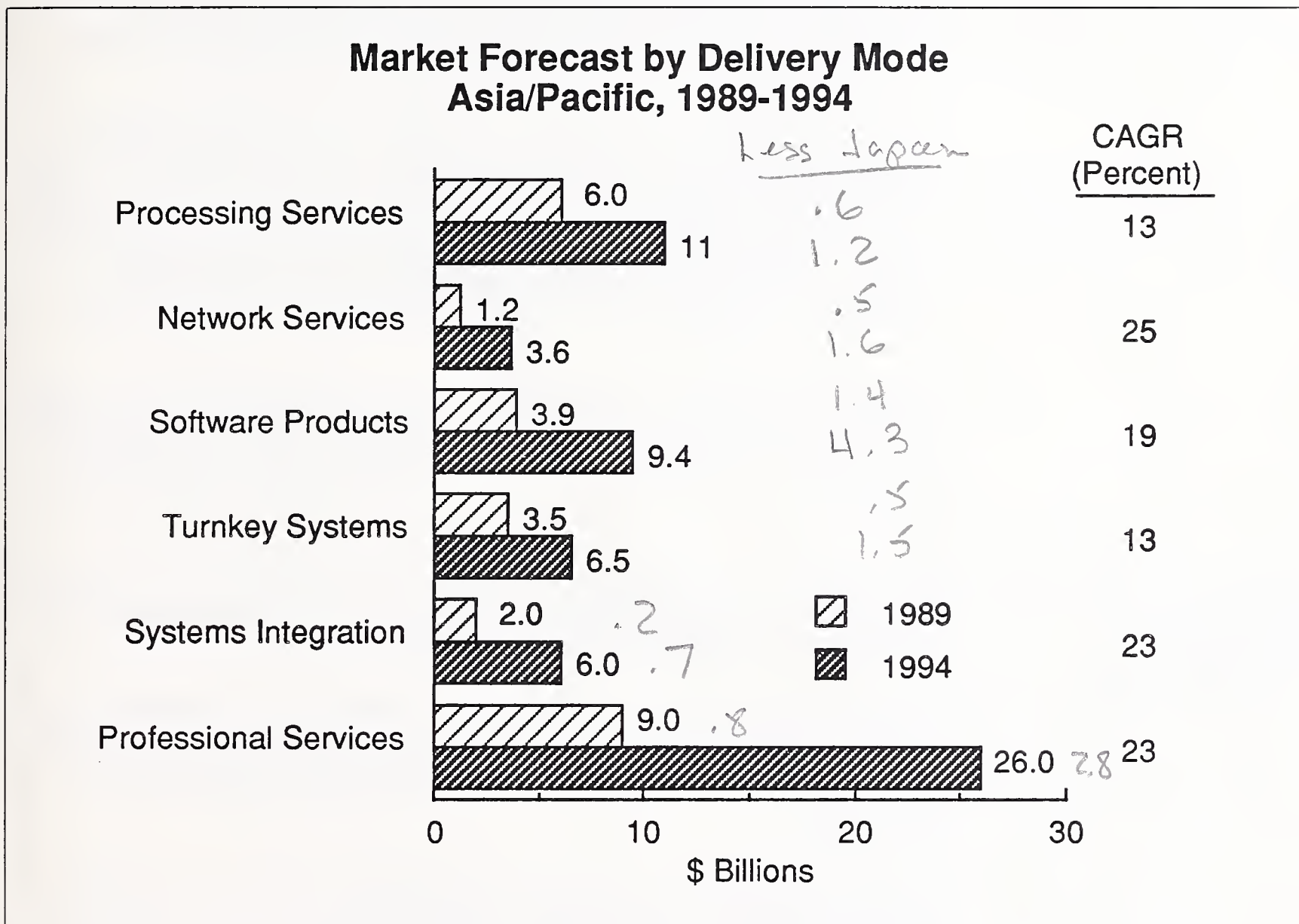


- *Processing services*—The market for processing services is expected to be strong, due to the number of medium-sized companies that have growing processing requirements and that believe they are too large to be able to use microsystems. The market for processing services is expected to grow from \$6 billion to an estimated \$11 billion by 1994, an annual growth rate of 13%.
- *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.

Note should be made that while the region-wide growth rate is estimated to be 25%, results of a recently completed INPUT study on the telecommunication services market in the Asia/Pacific region indicates that the growth rate could be higher than 35%. Providers in some countries indicate growth as high as 50% for the next several years.

With a growth rate of 25% per year for the next five years, the market for network services should grow from \$1.2 billion to at least \$3.6 billion by 1994.

EXHIBIT III-5



- *Software products*—The need for software products will also be strong in the Asia/Pacific area, growing from \$3.9 billion in 1989 to \$9.4 billion in 1994. Demands for system development tools (CASE, DBMS, etc.) and industry/application-specific microcomputer software are expected to be the major drivers.
- *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 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 \$3.5 billion in 1989 to \$6.5 billion by 1994.

- *Systems integration*—Requirements for systems integration are expected to be strong, although starting from a small base. 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 value (high) is considered important in identifying the market.

Due to the difficulty of identifying projects that qualify as systems integration, portions of the market may have been overlooked. For this reason, INPUT estimates that the total value of the systems integration market could be somewhat higher than the \$2 billion estimate given for 1989. The market could also grow to more than the projected \$6 billion by 1994. However, the rate of growth is not expected to be greater than projected.

- *Professional services*—Professional services are expected to be strong, growing from \$6 billion in 1989 to \$16 billion by 1994. The growth rate of 23% is driven primarily by the need for custom software development.

E

Market Entry/ Expansion 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.
- *Investment term*—Organizations interested in entering or expanding into the Asia/Pacific area should realize that an extended amount of time 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 extensive 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.
- *High competition*—There is a high degree of competition, both from other countries and from Asian countries that have already begun to develop their own information services capabilities. Keen competition should be expected.



Regional Summary—Europe





Regional Summary—Europe

A

Introduction

The region of Western Europe is one of the most significant economic regions in the world. It consists of the twelve European Economic Community (EEC) countries with a population of 320 million and an average per capita Gross Domestic Product of \$14,600, and the six members of the European Free Trade Association (EFTA) with a population of 31 million and an average per capita Gross Domestic Product of \$21,600. Taken together, they have a total GDP in excess of \$5.6 billion, which is bigger than that of the United States.

B

Regional Economic/ Political Setting

Although by no means a homogeneous area, Europe appears to be experiencing a thorough regeneration as a result of political initiatives such as the Single European Act in the West, and Glasnost in the East.

Initiatives to create an entity that is more unified both politically and economically, along with a determination to compete worldwide, is removing the image of comfort, complacency and decadence.

There are significant changes taking place, and although there are many issues to be resolved, there appears to be a greater determination to succeed, to make Europe more technologically advanced, to make European companies more efficient, and to spread wealth more equitably throughout the continent.

This, allied with the changes that are taking place in Eastern Europe, make the climate for European business very dynamic and exciting.

The four largest markets in Europe are Germany, France, Italy and the United Kingdom. It is expected that these four will be the principal battlegrounds as European industry goes through a period of adjustment and restructuring as a result of increased competition.

At the same time, countries that are both rich and small, such as Belgium, Luxembourg, Denmark, and The Netherlands, will benefit from no longer being restricted by small domestic markets, whilst the poorer countries, such as Spain, Ireland, Greece and Portugal, will benefit from access to wealthier markets.

The interesting issues are the policies that will develop as a result of the EEC's attitude to other trading blocs—European countries in the EFTA, Eastern Europe, the United States, and Japan.

There is fear on the part of non-European competitors that there will be an attempt to erect a 'Fortress Europe' that would create an internal market protected from outside competition. There is also fear that disintegration or 'Balkanisation' could take place that would disrupt the equilibrium that has existed between NATO and the Warsaw Pact countries.

Since individual countries have failed repeatedly to protect domestic industries from world competition, INPUT believes that a 'Fortress Europe' is unlikely to become a reality.

At the same time, the economies of Eastern Europe are so far behind that they could not bear an opening to direct competition, and it is unlikely that they would want to.

It would be a mistake to assume that countries emerging from behind the iron curtain want to become capitalist democracies, or that the Single European Act will create a single market overnight.

The changes that are taking place in Europe are happening very quickly, but the results will be accomplished over a long period of time.

C

Regional Services Forecast

The Western European software and services market is forecast by INPUT to grow from \$50 billion in 1989 to \$118 billion by 1994. The average growth rate over this five-year period, given in Exhibit IV-1, is estimated to be 19% per annum.

Exhibit IV-2 illustrates the breakdown of the European market by the six delivery modes, as defined by INPUT.

- Professional services is the most important delivery mode, accounting for some 30% of the overall market in 1989.
- The fastest-growing sector forecast by INPUT is systems integration, at an average growth rate over the five-year period of 26% per annum.

EXHIBIT IV-1

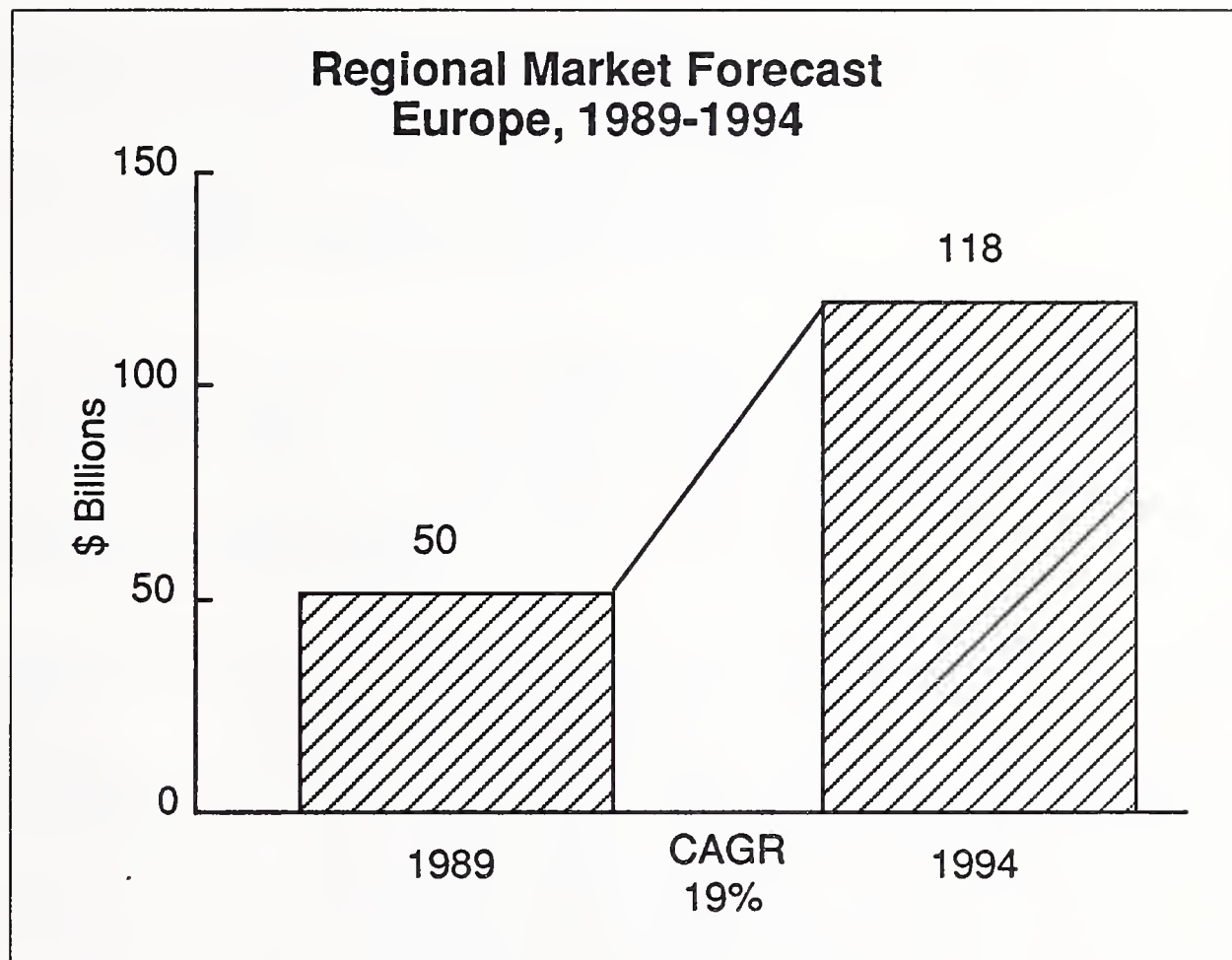
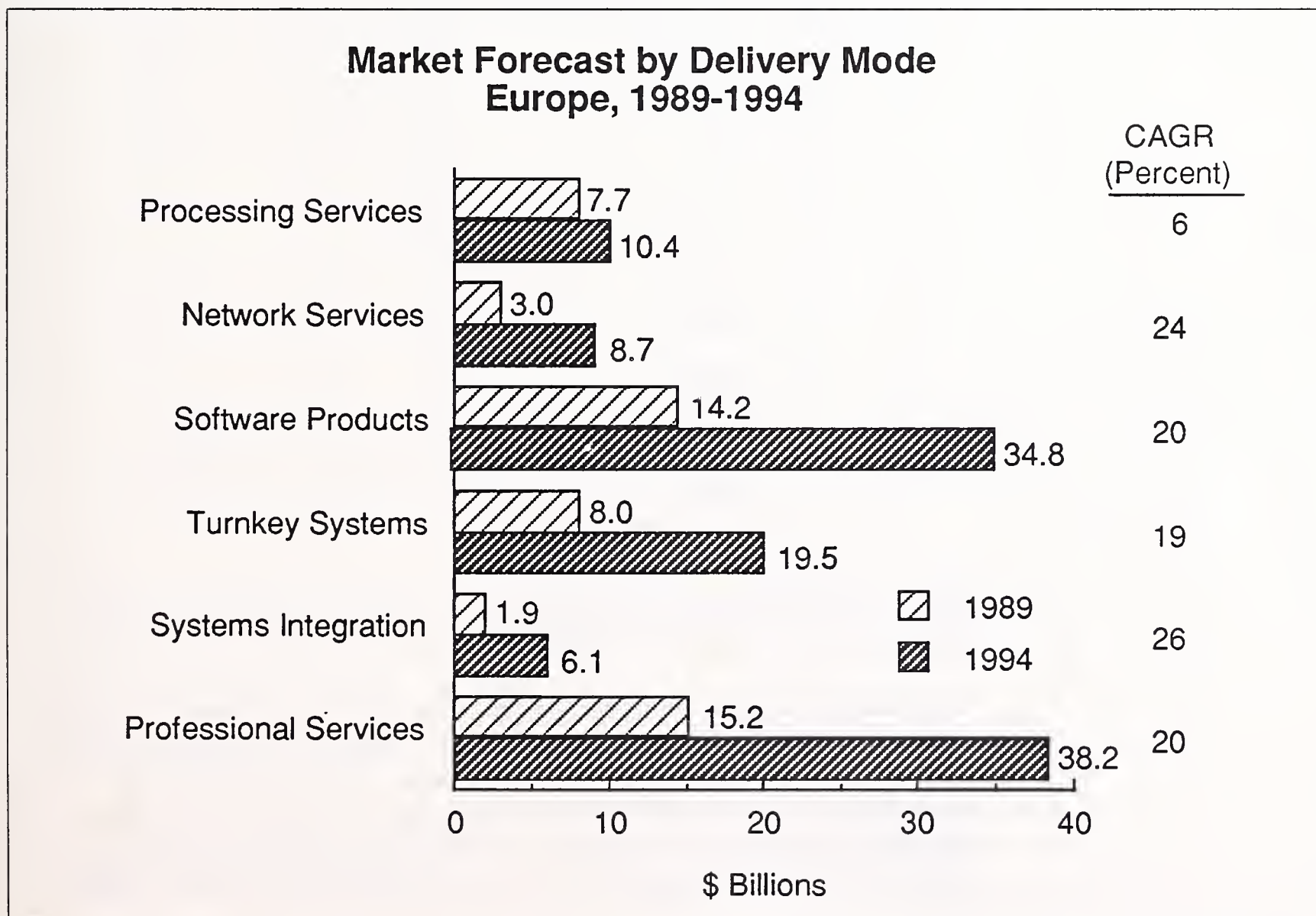


EXHIBIT IV-2



The largest country market is France, accounting for some 24% of the overall European software and services market in 1989.

The software and services markets of the four major European economies—West Germany, France, the U.K. and Italy—accounted for 75% of the total European market in 1989.

D

Competitive Environment

Exhibit IV-3 provides a listing of the top 10 software and services vendors in Western Europe in 1988, as identified by INPUT.

EXHIBIT IV-3

| Leading Vendors—Europe | | | |
|-------------------------------|-------------------|------------------------|----------------------------------|
| Rank | Company | Market Share (Percent) | Estimated Revenues (\$ Millions) |
| 1 | IBM | 8.1 | 3,420 |
| 2 | Nixdorf | 2.5 | 1,060 |
| 3 | Cap Gemini Sogeti | 1.9 | 800 |
| 4 | Reuters | 1.9 | 780 |
| 5 | Siemens | 1.8 | 740 |
| 6 | Bull | 1.6 | 660 |
| 7 | Unisys | 1.5 | 640 |
| 8 | Prime | 1.2 | 520 |
| 9 | Finsiel | 1.1 | 470 |
| 10 | Olivetti | 1.0 | 430 |
| | Other | 77.4 | 32,560 |
| | Total | 100.0 | 42,080 |

IBM was the leading software and services vendor in 1988, with European revenues of some \$3.4 billion, or about 8% of the overall market.

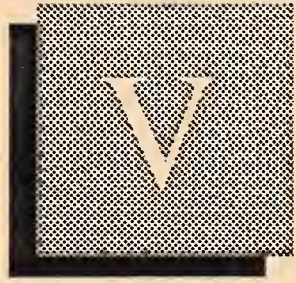
The leading European vendor was the West German equipment vendor, Nixdorf. Specializing in turnkey systems, Nixdorf sold some \$1 billion worth of systems in 1988 throughout Europe. However, it ran into financial problems as chip costs increased, and the domestic German banking market began to stagnate; but more importantly, Nixdorf was faced with porting its huge portfolio of applications software to UNIX.

During 1988, Nixdorf tried to postpone the move to UNIX. However, end user demand grew in Europe to such a degree that Nixdorf was forced to announce the decision by the end of the year. It had to show its customers that there was a clear development path from its proprietary operating system to UNIX. This delay cost Nixdorf market share and considerable investment.

The largest European independent, the French professional services vendor Cap Gemini Sogeti, continued to grow strongly. Its global revenues grew by 39% from 1987 to 1988, and in 1988 the company gained some \$800 million in software and services revenues from Western Europe. Its merger with the French systems integration expert, Sesa, was successful and boosted growth throughout the year.

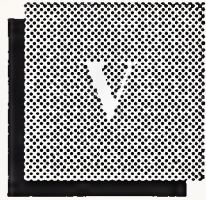
U.S. vendors continue to feature strongly in the European market. Both Unisys and Prime are among the top 10 vendors in Europe.

Prime is the leading CAD/CAM and graphics vendor in Europe, delivering its applications as turnkey systems. However, it had financial problems following a number of acquisitions, including Computervision and General Electric's CAD/CAM business, Calma. In early 1989, MAI Basic Four made a hostile bid for Prime, which Prime had to spend most of 1989 defending. Eventually an alternative bid was made by J.H. Whitney of the U.S.



Regional Summary— Latin America





Regional Summary—Latin America

A

Introduction

With the exception of four countries—Argentina, Brazil, Mexico and Venezuela—Latin America represents one of the least developed areas of the world, and 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.

B

Regional Economic/ Political Setting

Countries in Latin America can be divided roughly into two groups. The first group includes Argentina, Brazil, Mexico, Panama, Uruguay and Venezuela, which have the highest per capita GNP in the area. In U.S. dollars, the per capita income ranges from \$1,820 to \$3,230. The average is \$2,305.

The second group includes the remainder of the countries of the area. In these countries, the per capita income ranges from a low of \$380 in Guyana to a high of \$1,550 in Costa Rica.

Economically, Latin America has continued to suffer from exceptionally high inflation rates. Between 1980 and 1987, Argentina, Bolivia and Peru experienced average annual inflation rates of 298%, 601% and 102%, respectively. From 1965 to 1987, the average annual per capita growth rates ranged from a high of 4.1% in Brazil to a low of -0.9% in Venezuela.

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.

The political environment in Latin America can best be described as unstable. Dominated by a few strong groups, there has been little to suggest strong, progressive leadership. Dominance by the few small groups has continued to foment unrest and frequent changes in governments.

There have been few major changes in the political arena in Latin America. Although there have been positive changes in Mexico, and there are indications of change in Argentina, general instability is anticipated at least until national leadership can demonstrate an ability to deal with many of the problems.

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 significantly 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 be primarily be software and professional services.

C

Environmental Factors

1. Driving Forces

While the technological base is relatively small in the majority of the countries, there are a number of forces beginning to cause change. The key changes are summarized in Exhibit V-1.

EXHIBIT V-1

Driving Forces—Latin America

- Training/Education
- Public sector spending
- Technology incentives
- Mini/Micro growth

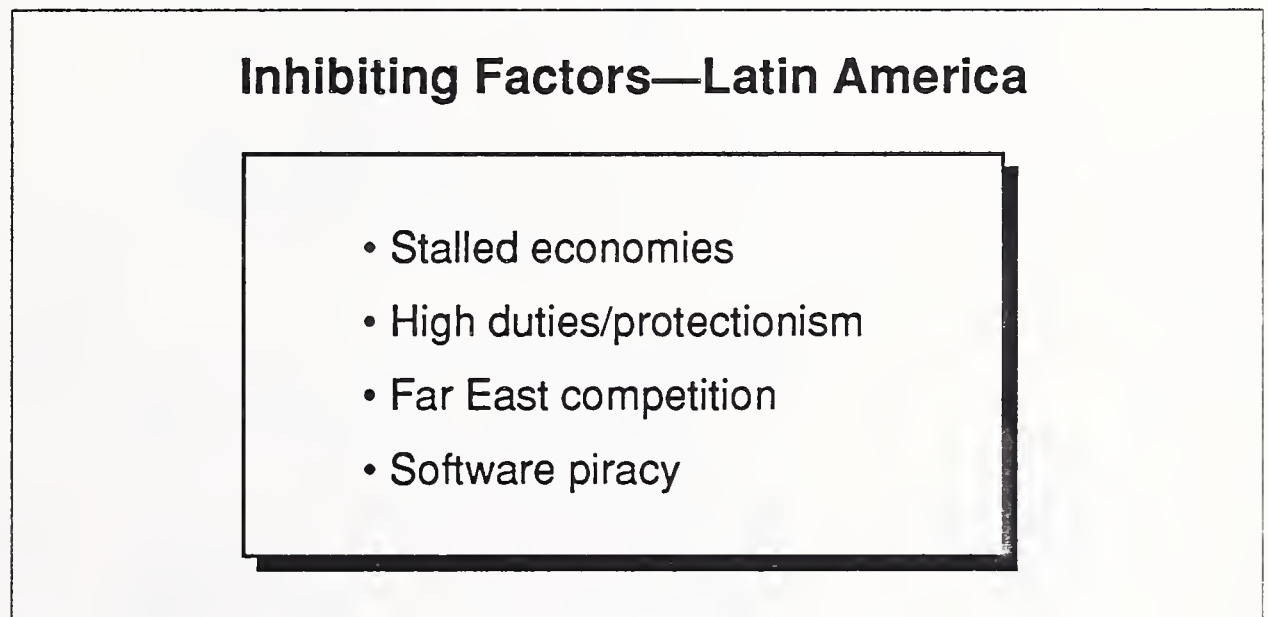
- *Training/Education*—The low level of education has been identified in most countries as a key contributor to the lack of industrial development. As a result, many countries have instituted national education and training programs, with emphasis on the use of technology.

- *Public sector spending*—With the majority of spending for information technology coming from the public sector, increased government spending for development is having a stimulating effect.
- *Technology incentives*—A number of countries have instituted incentives to stimulate the use of computers. This is expected to result in the increased acquisition of mini and microcomputers.
- *Mini/Micro growth*—Growth of higher-capacity mini and microcomputers is having a stimulating effect on the computerization of smaller businesses.

2. Inhibiting Factors

As well as driving forces, there are a number of significant inhibiting factors, as Exhibit V-2 illustrates.

EXHIBIT V-2



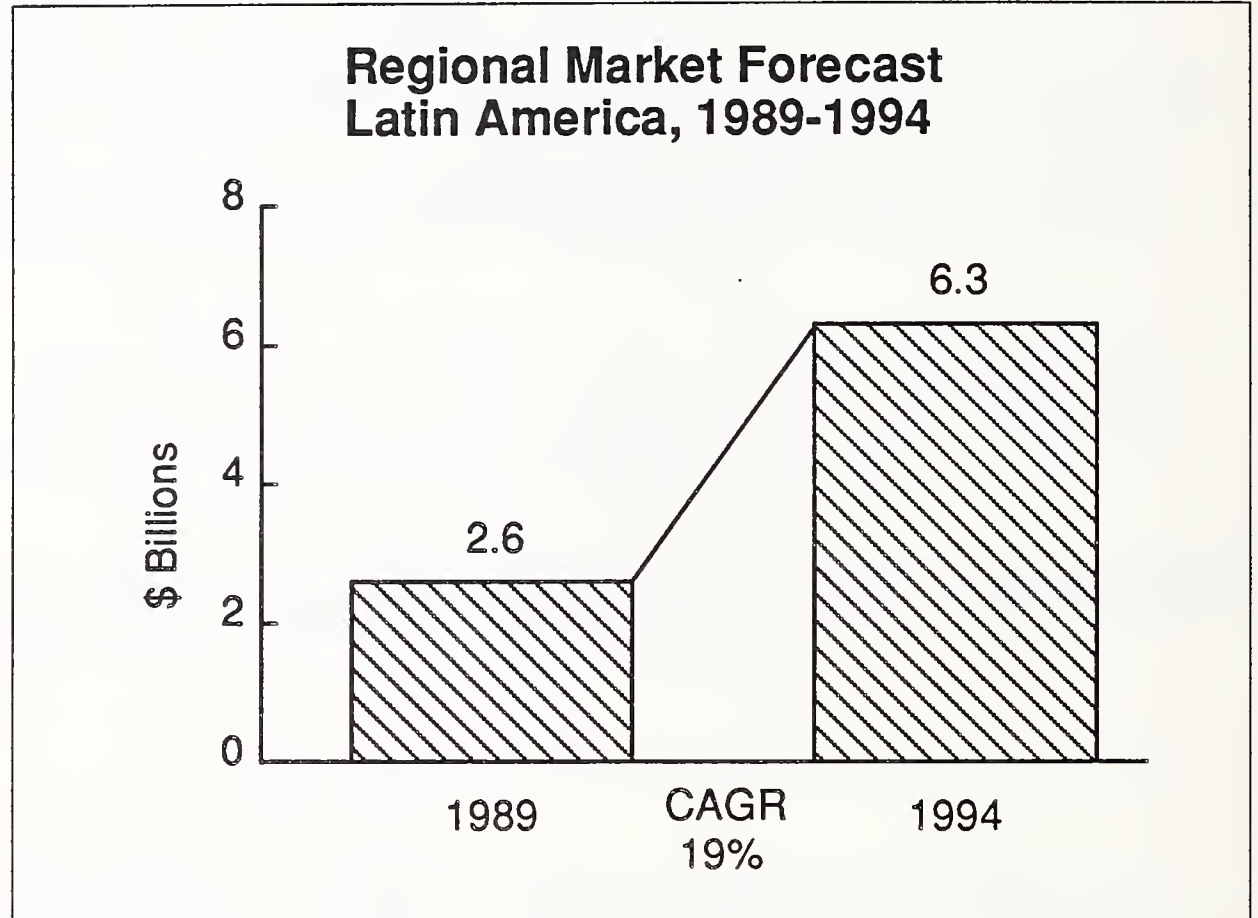
- *Stalled economies*—Many of the economies in Latin America are stalled, showing only limited growth. There has been only minor growth stimulus.
- *High duties/protectionism*—Many countries continue to impose high duties on the importation of technology products and services. For some, such as Brazil, the purpose is to protect domestic industry growth. For others, the purpose is to have an additional source of revenue. Both reasons reduce the application of technology.
- *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. As a result, there is extensive copying. One report suggests that a single copy might be copied as many as 100 times.

D

Regional Services Forecast

When compared to the world total, the market for information services in Latin America is small, as Exhibit V-3 depicts. The total market is expected to grow at an annual rate of 19%, from \$2.6 billion in 1989 to \$6.3 billion in 1994.

EXHIBIT V-3



Although the market is small, economic stabilization could result in growth rates greater than those projected. 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. However, there are signs of stabilization beginning and investment incentives being implemented.

Within the area, 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-4 shows, will maintain its lead.

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.

Consideration of the delivery modes 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-5.

EXHIBIT V-4

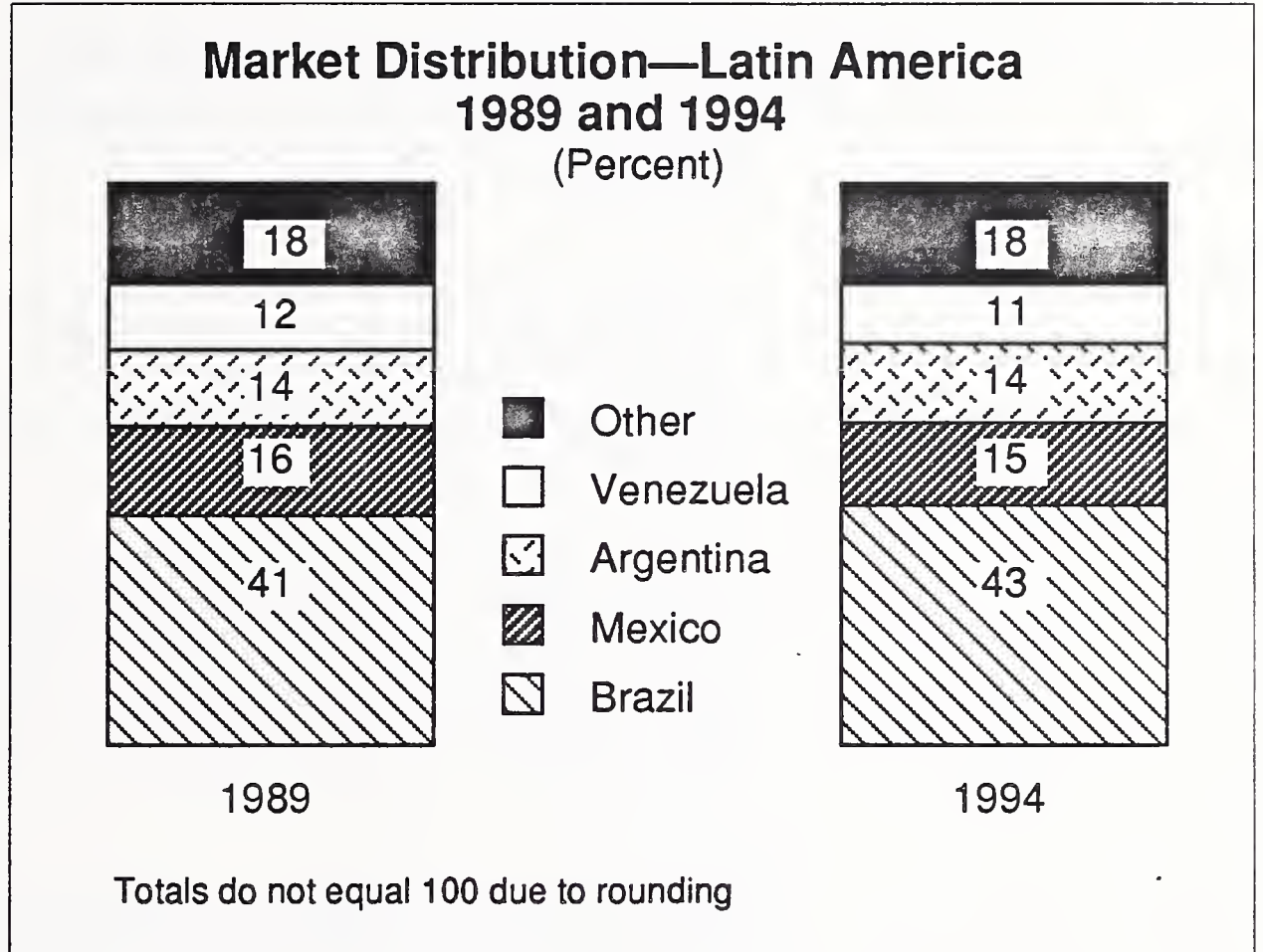
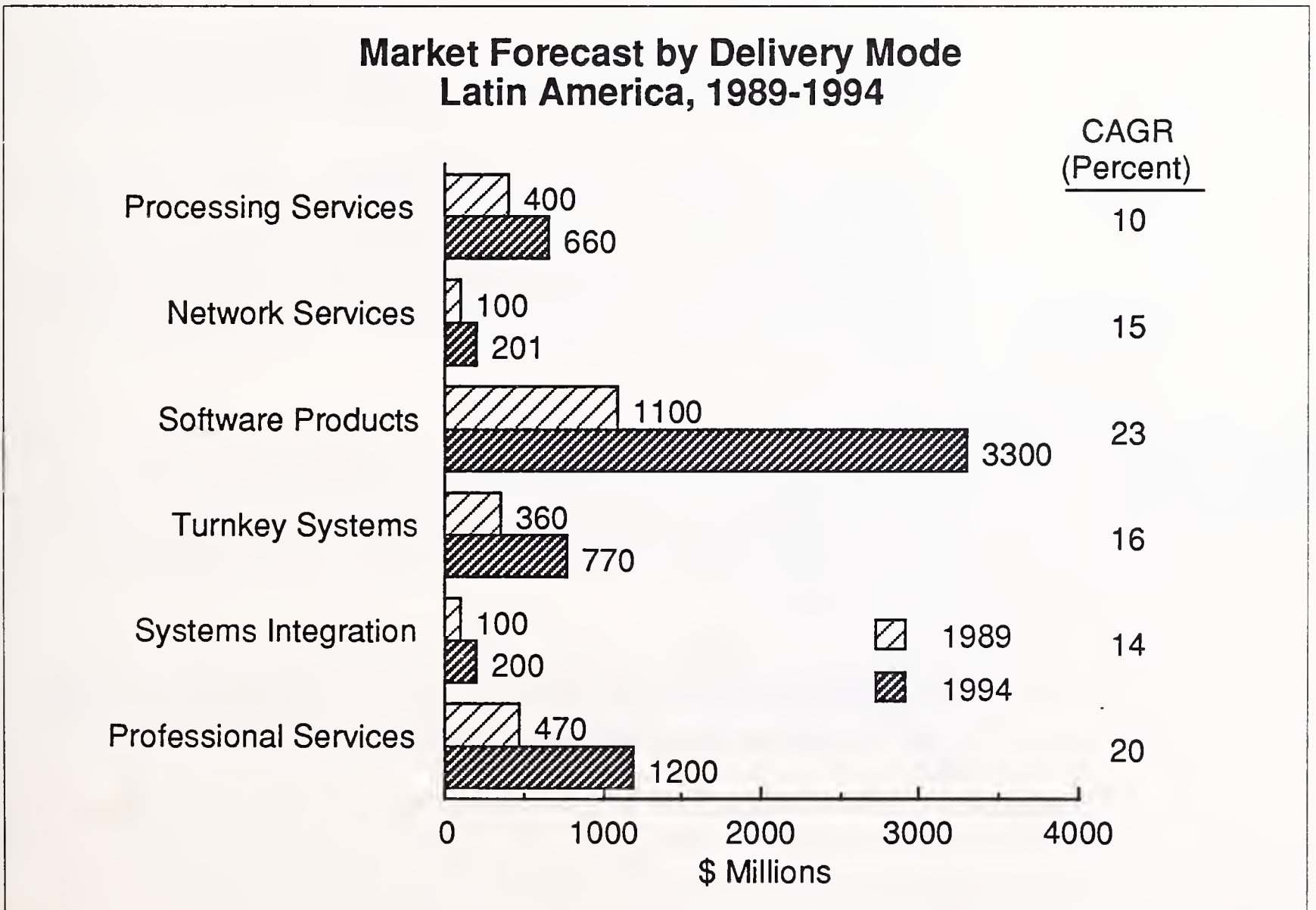


EXHIBIT V-5



- *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., resulting in a market growth from \$400 million to \$660 million by 1994.
- *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 1989 to \$201 million in 1994, a growth rate of 15%.
- *Software products*—The market for software products is a bright spot in Latin America. Growth of software products is expected to continue to exceed growth in the U.S. (17%) for at least the next several years, due to the continuing demand for mini- and micro-based systems. With a growth rate of 23%, the market for software products will increase from \$1.1 billion in 1989 to \$3.3 billion in 1994.
- *Turnkey systems*—Although a small market (\$360 million in 1989), turnkey systems are expected to grow at a rate of 16%, due to the need for packaged solutions. The majority of the market for turnkey systems is in mini- and micro-based systems.
- *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.
- *Professional services*—Growth in professional services is expected to exceed the U.S. rate of 19%, due to the need for custom software to meet specific needs. However, the market is generally small, growing from \$470 million in 1989 to \$1.2 billion in 1994. This figure could be higher if the economies stabilize and investment funds become available.

E

Market Entry/ Expansion 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.

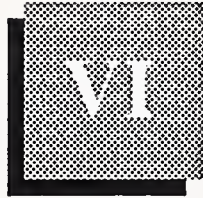
From research conducted, primary opportunities appear to be in the area of mini/micro software in the fields of education, office productivity and certain vertical market areas such as manufacturing and financial services.

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.



Regional Summary— Middle East/Africa





Regional Summary—Middle East/ Africa

A

Introduction

Although treated in the 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 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.

B

Regional Economic/ Political Setting

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 the 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. U.S. investment in South Africa is estimated to be approximately 33% of the total investment in all of Africa. Of the total U.S. exports to Africa, an estimated 44% are to South Africa. The real growth for 1988 was estimated to be approximately 3.2%, representing the second year of economic growth.

However, 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.

As a result of the Act, numerous firms withdrew from the country. The withdrawal resulted in significant trade imbalances and culminated in the imposition of import surcharges of up to 40% to compensate for a poor balance of payments situation. Combined with this, a projected inflation rate of 15% to 17% for 1989 is expected to have an adverse effect on economic growth.

The political climate in South Africa continues to be precarious. Black activists continue to demand increased participation in government decision-making and the ruling white minority continues to resist reduction of its apartheid policies.

For at least the next two to three years, little change in the economic or political situation is expected. The government is expected to continue to find ways to stabilize the economic situation, but changes in the political arena are expected to come slowly.

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.

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 which is growing at 2.5% per year. But development of the area is dominated by two factors—oil and religion.

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 many of the countries, annual inflation has been moderate over the period 1980-1987, with some countries (Kuwait, Oman, Saudi Arabia and the United Arab Emirates) experiencing negative inflation rates. Israel continues to experience the highest rates, estimated to be over 150% for the same period.

The trend is expected to continue, assuming that the Arabian oil cartel can maintain a semblance of agreement over the production and prices for oil sold to the western world.

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.

The focus on defense-related activities is not expected to abate in the near term, nor is the animosity toward the western world, specifically the United States. Efforts to establish working relationships are continuing, but few political observers are willing to speculate on the progress that will be made.

With a fractious political environment, a single-product economy and an isolationist perspective, many observers believe that opportunities over the near term (1-3 years) will be limited and difficult to realize.

However, opportunities do exist in several countries, primarily Israel and Saudi Arabia. Opportunities also exist in Bahrain, Oman and the United Arab Emirates, but the size of their economies results in only small markets.

C

Environmental Factors

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

1. Driving Forces

In Africa, driving forces summarized in Exhibit VI-1 include the following:

EXHIBIT VI-1

Driving Forces—Africa

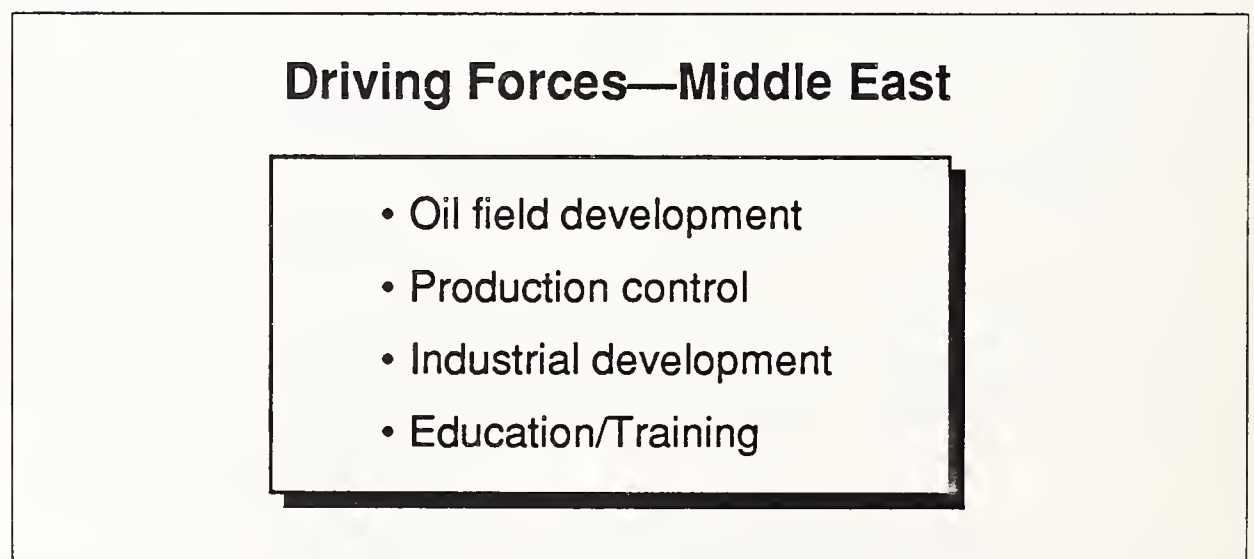
- Mini/Micro availability
- Fourth generation languages
- Economic expansion
- Network development
- Education

- *Mini/Micro 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 micros, 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.

Exhibit VI-2 shows that for the Middle East, there are also a number of driving forces.

EXHIBIT VI-2



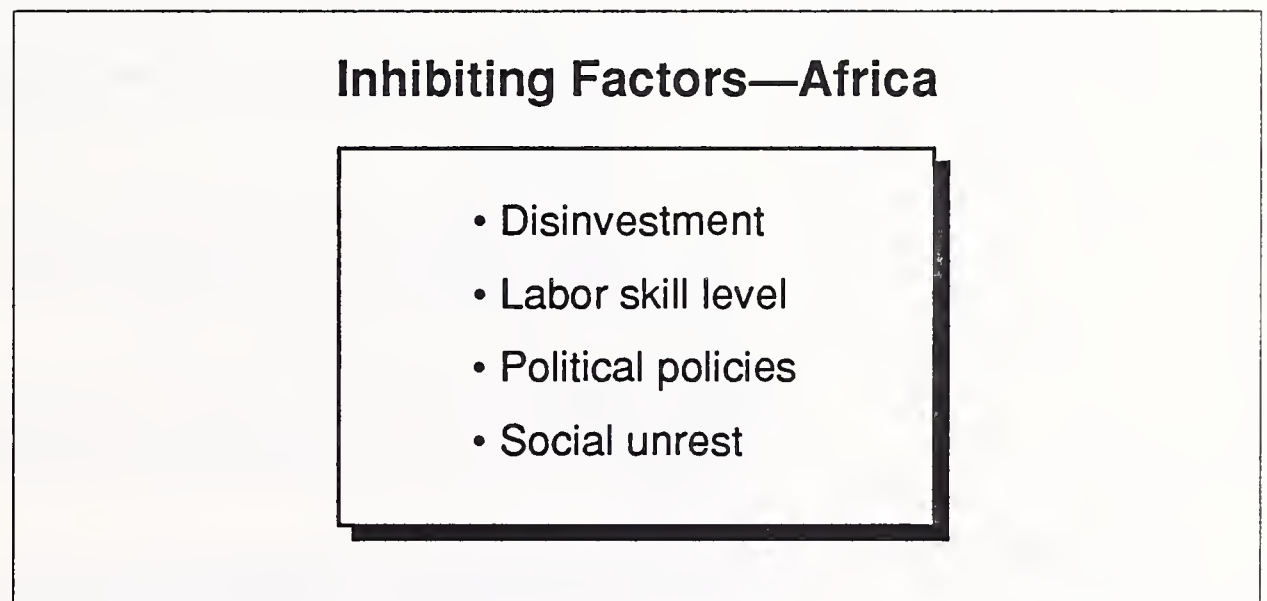
- *Oil field development*—As a result of being a single product economy, there is considerable emphasis on the continued development of methods to identify and develop new sources of oil.

- *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. While 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.

2. Inhibiting Factors

As well as driving forces in South Africa, there are a number of inhibiting forces that, to date, have had a significant impact on the development of the country. Inhibiting factors, summarized in Exhibit VI-3, include the following:

EXHIBIT VI-3



- *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. While 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. While some changes have been made, no dramatic changes are expected for at least the near and intermediate term.
- *Social unrest*—In addition to the inhibiting effect of the political policies, the resulting social unrest detracts from a focus on growth.

In the Middle East, while the driving forces have contributed to the growth of the information services industry, the inhibiting forces have had a more significant impact. Key inhibiting forces are summarized in Exhibit VI-4.

EXHIBIT VI-4

Inhibiting Factors—Middle East

- Political environment
- Total solution requirement
- Local representation
- Software piracy

- *Political environment*—The political environment continues to have a major negative impact on the development of industry. This is not expected to change in the near term.
- *Total solution requirement*—There is increasing emphasis on ability to provide a total solution. This puts single-product vendors at a disadvantage.
- *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.

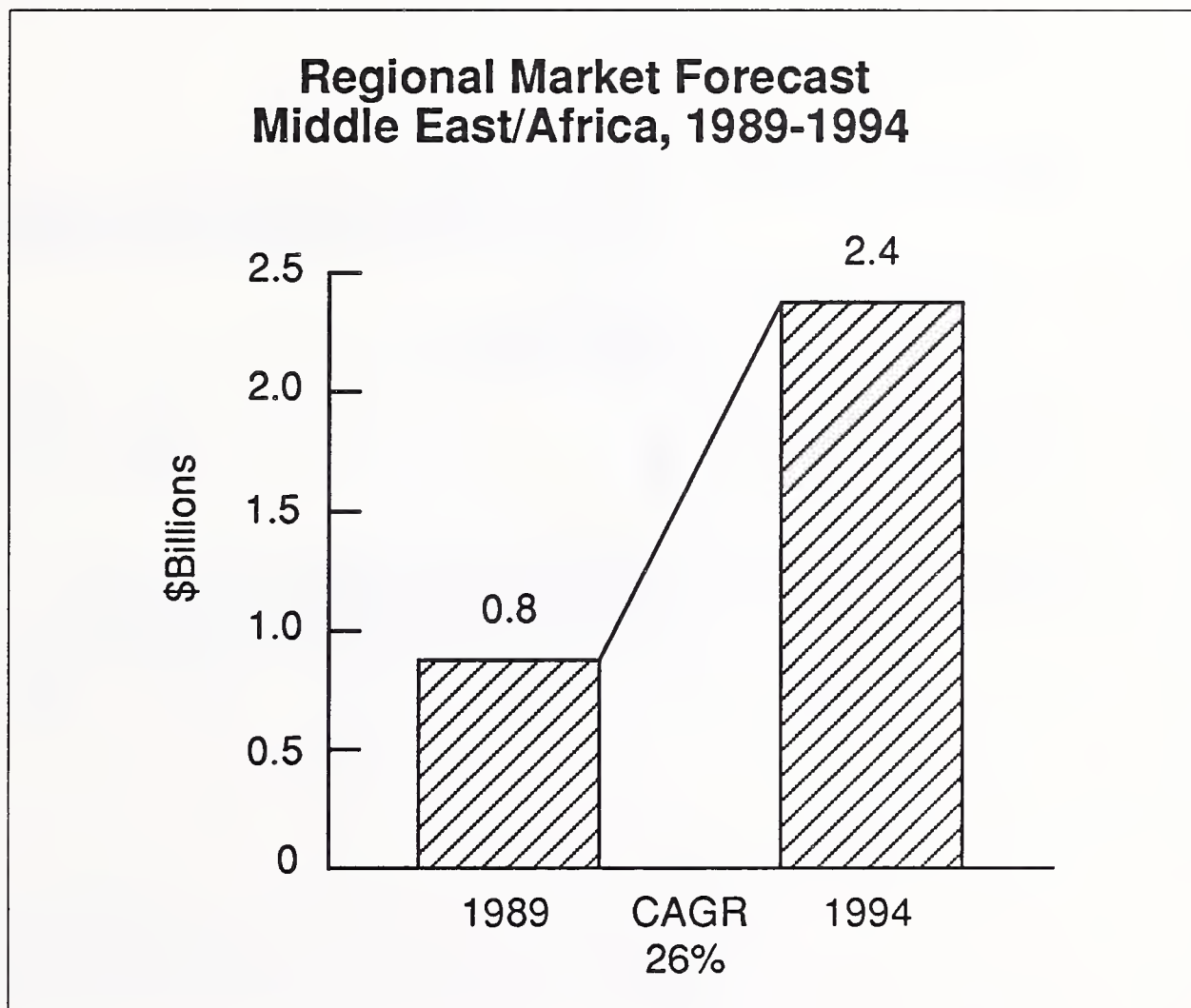
D

Regional Services Forecast

As a region, the Middle East/Africa area, comprised of more than 40 countries, represents one of the least significant opportunities for information services.

For the period 1989 to 1994, the total market for information services for the area is estimated to grow from approximately \$760 million to \$2.4 billion, as shown in Exhibit VI-5. The growth rate is expected to be approximately 26%, as countries focus increasingly on building a technological infrastructure.

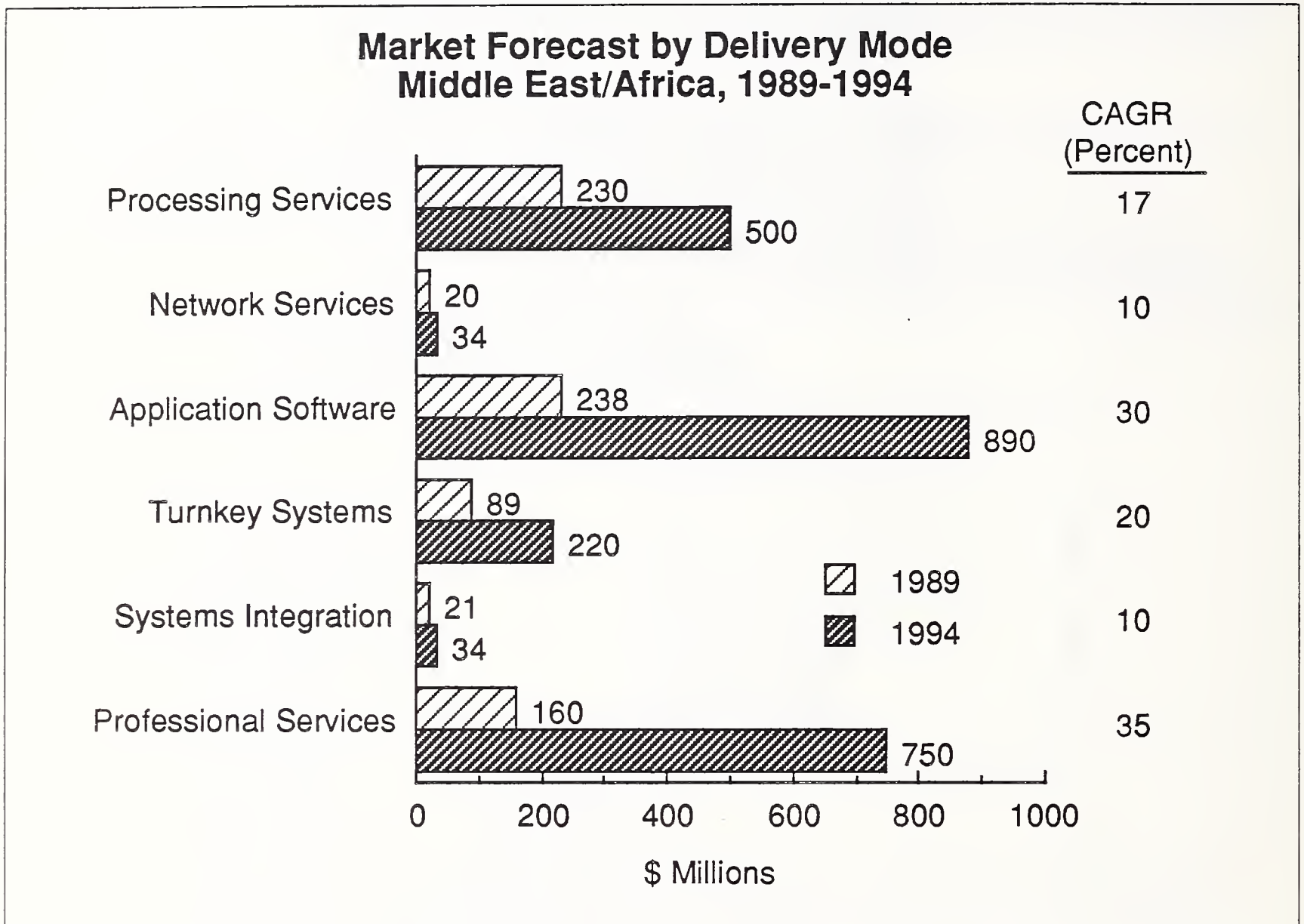
EXHIBIT VI-5



Of the total market, the greatest opportunities are in two submodes, as depicted in Exhibit VI-6:

- Software products represents the largest area of growth, as growth in mini and micro systems continues. Much of the growth will result from the need for industry-specific applications. Software products are expected to grow at an estimated rate of 30%, from \$238 million in 1989 to nearly \$890 million in 1994.
- Professional services is also expected to experience significant growth. Driven by the need to assist in developing technology-based systems and industry-specific applications, professional services is expected to grow from \$160 million to \$750 million over the forecast period, a growth rate of 35%.

EXHIBIT VI-6



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

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

E

**Market Entry/
Expansion
Considerations**

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 to provide 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.



Regional Summary— North America





Regional Summary—North America

A

Introduction

The North American market, consisting of Canada and the United States, is the largest covered in this report. The \$95.6 billion market (in 1989) is 55% of the world's total, and is the target of many overseas vendors.

Canada (\$3.5 billion in 1989) is only 3.6% of this market; the remainder is the U.S. market. It is thus understandable that the Canadian market, while quite healthy, is sometimes overlooked by observers, or overseas vendors contemplating entry.

B

Regional Economic/ Political Setting

The U.S., by sheer size, tends to dominate this geographic region. Canadians have been sensitive to the U.S. presence, 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.

Within Canada, the Quebec-oriented French language requirement is a complicating factor for English language products, as the provincial market (Quebec) is the second-largest in Canada.

C

Environmental Factors

Driving and inhibiting forces for both the U.S. and Canadian markets are described in detail in the country profile section of this report.

D

Regional Services Forecast

The overall information services market, given in Exhibit VII-1, will grow from \$96 billion to \$196 billion by 1994, a 15% growth rate. The sheer size of this market makes it very attractive to vendors in many countries.

EXHIBIT VII-1

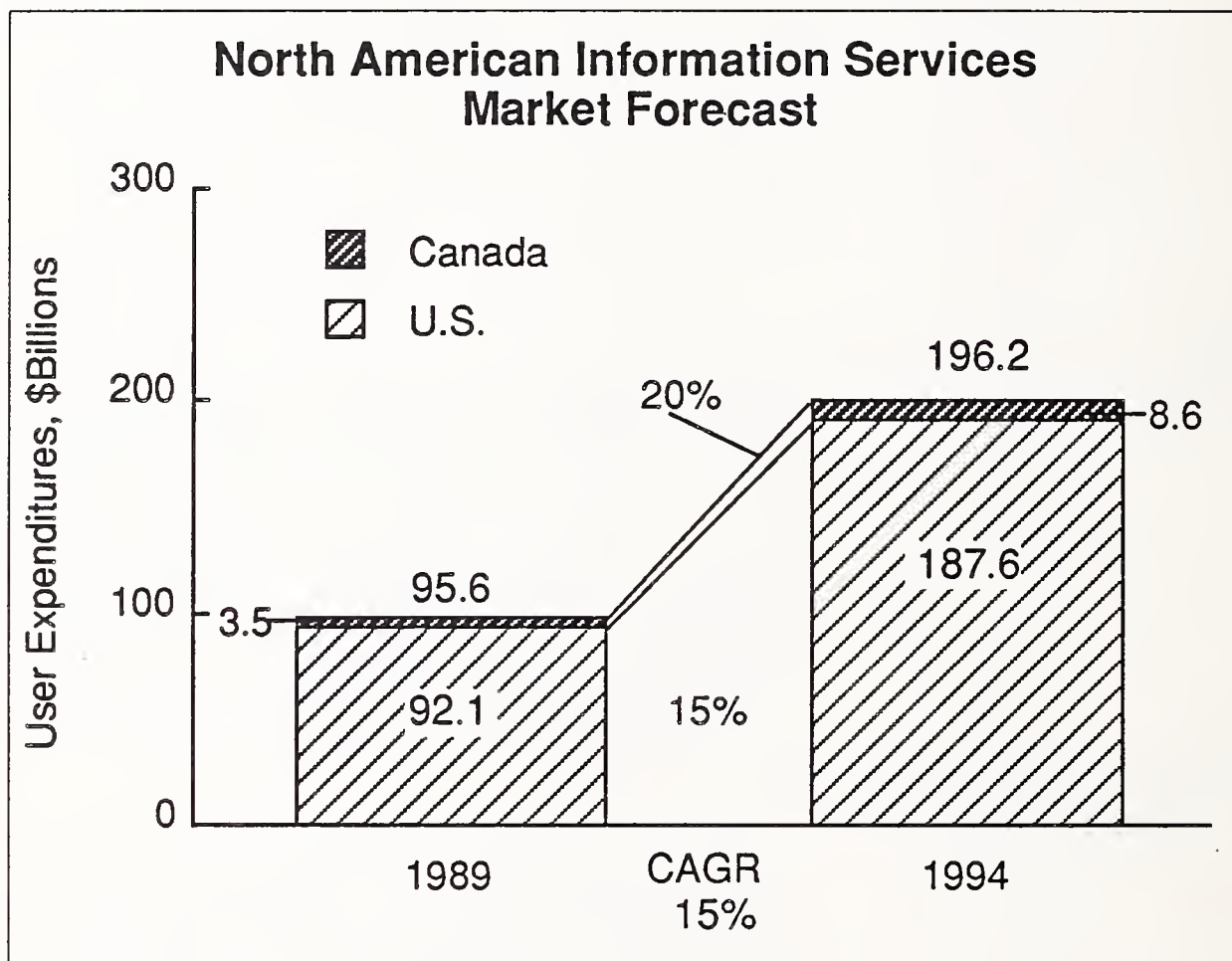
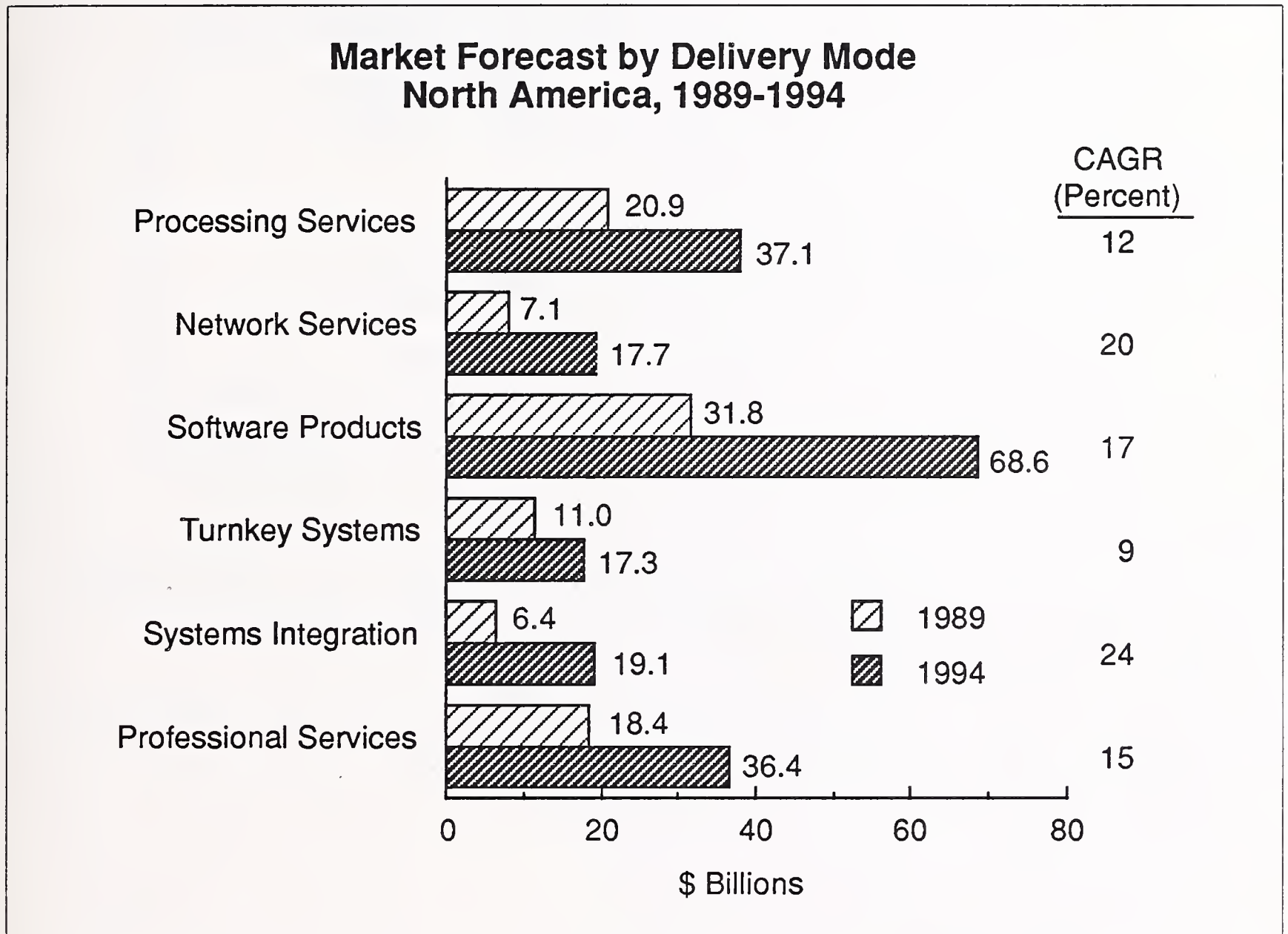


Exhibit VII-2 shows size and growth rates for each of the six delivery modes tracked by INPUT. They are, of course, very close to those of the U.S. market. Note the predominance of software products, and the rapid growth of systems integration and network services.

EXHIBIT VII-2



E

**Market Entry/
Expansion
Considerations**

As the largest geographic market available, North America offers the greatest potential. But there are other considerations as described below and listed in Exhibit VII-3:

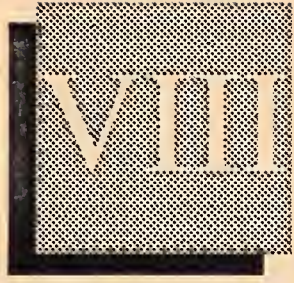
- Most market niches are well-populated, even overcrowded at this time, and a vendor shake-out in many sectors is underway.
- Vertical market focus is a strategy being adopted by many software and services vendors. Increasingly sophisticated users are requiring more complex solutions tailored to their 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 thereby.

EXHIBIT VII-3

**North American Market
Entry/Expansion Considerations**

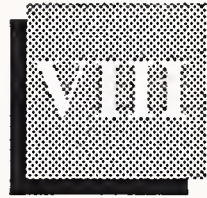
- Largest potential
- Crowded niches
- Vertical market solutions
- Expanded breadth of services
- Alliance/merger strategies
- French language (Canada) requirements

- 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.
- Vendors who expect to be significant players in the Canadian market need to understand the requirement for French language programs and documentation in the province of Quebec.



National Service Profiles





National Service Profiles

A

Introduction

Chapter VIII of the worldwide forecast provides an individual profile of the market for information services in 30 countries or areas of the world.

Each profile begins with a brief introduction (Section 1) to the country or area. This is followed by a summary of the political and economic setting (Section 2). Following the political and economic setting, Section 3 provides a summary of key technology trends. This is followed by a summary of the key driving forces (Section 4) and inhibiting factors (Section 4) causing change in the country or area.

Where the leading vendors are known, a summary listing is provided as part of Section 5. In a number of countries or areas, identification of specific vendors was not possible, generally due to the presence of a great number of smaller vendors and a lack of large dominant providers.

In Section 6, a forecast of the market for services is provided for at least primary delivery modes. For major countries or countries considered to be particularly important, forecasts are made for key submodes.

Each profile concludes with a brief summary of considerations regarding entering the market or expanding market presence (Section 7). Where there are areas of opportunity that appear to be particularly significant, they have been identified.

B**Argentina****1. Introduction**

Argentina is one of the many countries in Latin America with significantly underdeveloped resources. It has a land area of more than 1 million square miles, a population of 31 million, and strong European heritage. But Argentina has displayed a somewhat manic-depressive character, with frequent changes in leadership (only recently brought about by orderly, peaceful processes), and wide swings in development, from dynamic growth to stagnation and depression.

Through the swings, businesses have survived through continued emphasis on basic resources, rather than the ability to make significant investment in technological resources. There is little to suggest that this will change in the near term.

2. Economic and Political Setting

The political setting of Argentina is unstable and little is expected to change in the near term. Although the country recently and successfully completed a peaceful change of government, there is continuing concern about the ability of the country to establish a sound political process.

The new government, headed by Carlos Menem, has promised to address many of the country's economic problems. Initial efforts include an increase in the price of public services by up to 200%. In addition, there are plans provide greater liberalization so as to attract new investment.

As part of the liberalization process, there are plans to reduce tariffs on electronic components from their current high of 85% to 15% in 1989. A full removal of tariffs is planned within the next four years. Tariffs on software products are also expected to decline from their current range of 20-140%.

High inflation, and minimal growth remain the greatest problems. Overall economic growth in 1988 was minimal, following a 2% growth in 1987. During 1988, the country experienced an inflation rate estimated at 400%. Without significant changes, the country could experience an inflation rate of nearly 900% in 1989.

3. Key Technology Trends

Technological trends in Argentina are similar to those in many countries that are working to develop their basic infrastructures. Key trends are shown in Exhibit VIII-1:

EXHIBIT VIII-1

Key Technology Trends Argentina

- Industrial automation
- Increased imports
- Industry-specific applications

- *Industrial automation*—With a planned stabilization of the economy, the country is working to develop its industrial base, providing greater investment opportunities. Automation is a major part of the development process.
- *Increased imports*—With the planned reduction in tariffs, significantly increased imports of hardware and software are expected.
- *Industry-specific applications*—Increased emphasis is being placed on industry-specific applications in preference to generic packaged applications.

4. Environmental Factors

There are a number of factors contributing to the growth of the information services industry. There are a number of equally significant factors that could continue to retard growth of the industry.

a. Driving Forces

EXHIBIT VIII-2

Driving Forces—Argentina

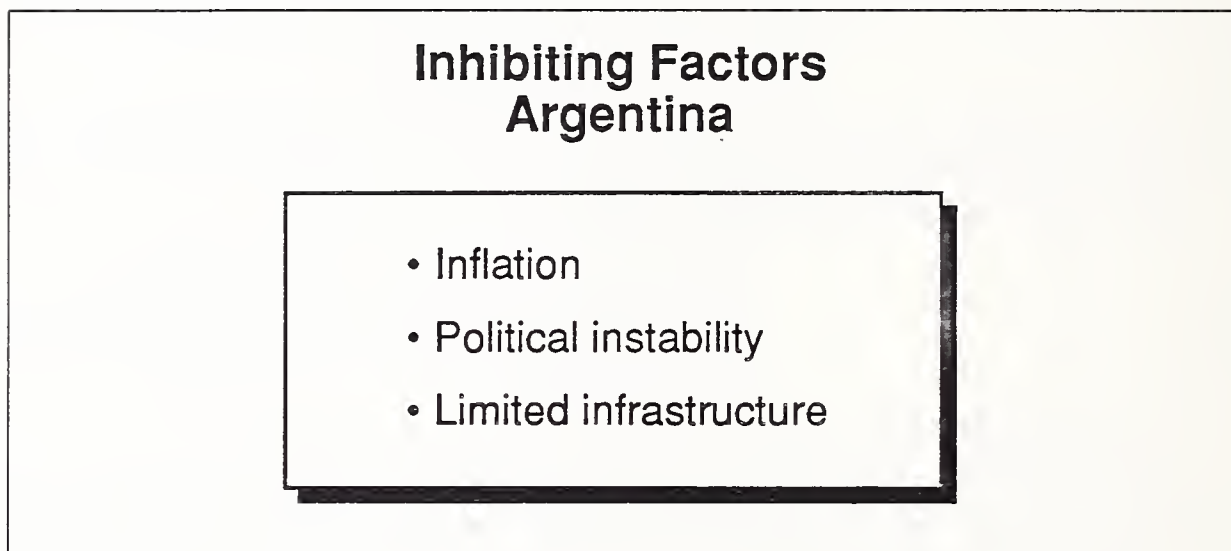
- Industrial investment
- Reduced tariffs
- Economic stabilization

- *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 both hardware and software.
- *Economic stabilization*—There are significant efforts to establish a stable economic base from which to grow.

b. Inhibiting Factors

EXHIBIT VIII-3



- *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. Significant investment must be made before information services technology will be of benefit.

5. Leading Vendors

The country's leading hardware and software vendors are from the U.S. and Europe. As a general guideline, mainframes and minicomputers, as well as programming languages and operating systems, are imported from the U.S. Application software is designed by both foreign and Argentine firms. An increasing number of micro systems come from the Far East.

Leading vendors of hardware and software include IBM, Unisys, Computer Associates, Cullinet and Software AG. Companies such as Microsoft are represented by independent distributors.

6. Services 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 \$350 million in 1989 to \$850 million by 1994 (Exhibit VIII-4).

EXHIBIT VIII-4

Market Forecast—Argentina, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 56 | 62 | 100 | 10 |
| Network Services | 12 | 14 | 28 | 15 |
| Software Products | 120 | 140 | 430 | 24 |
| Turnkey Systems | 34 | 39 | 82 | 16 |
| Systems Integration | 25 | 28 | 48 | 12 |
| Professional Services | 59 | 70 | 160 | 18 |
| Total | 300 | 350 | 850 | 19 |

*Figures may not add due to rounding

- As indicated, the fastest-growing area of the industry is software products. Though import duties and taxes have had the effect of holding down the importation of computer systems, there is a sufficiently large installed base to support a growing software market, but it is being under or inefficiently utilized.

Within Argentina, processing services is expected to show steady growth (Exhibit VIII-5) as companies expand their processing capabilities or seek short-term solutions to meet growth demands.

EXHIBIT VIII-5

**Market Forecast, Processing Services
Argentina, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 11 | 12 | 23 | 13 |
| Systems Operations | 28 | 31 | 47 | 9 |
| Utility Processing | 11 | 12 | 19 | 10 |
| Other Processing | 6 | 7 | 11 | 10 |
| Total | 56 | 62 | 100 | 10 |

Network services in Argentina is an extremely small area (Exhibit VIII-6), 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.

EXHIBIT VIII-6

**Market Forecast, Network Services
Argentina, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 10 | 12 | 23 | 15 |
| Network Applications | 2 | 2 | 4 | 14 |
| Total | 12 | 14 | 28 | 15 |

*Figures may not add due to rounding

- Note should be made that the country has recently begun major efforts to upgrade its infrastructure. However, with the high demand for increased quality and quantity of basic services (telephone, telex, etc.), it will be some time before there is high demand for enhanced services.
- An exception to the general trend is the growth of value-added network services. Recent interest has been noted in expanding the country's value-added network services, and aggressive expansion efforts could result in a higher growth rate than projected.

The market for software products is expected to be significant over the next several years. With the planned lowering of duties and tariffs, residual demand should result in high growth rates for application, systems control and application development software (Exhibit VIII-7).

EXHIBIT VIII-7

**Market Forecast, Software Products
Argentina, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 73 | 91 | 278 | 25 |
| Systems Software | | | | |
| Systems Control | 26 | 33 | 99 | 25 |
| Data Center Mgt. | 4 | 4 | 8 | 12 |
| Application Dev. | 13 | 16 | 45 | 23 |
| Total | 116 | 144 | 440 | 23 |

*Figures may not add due to rounding

- Primary needs exist 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.
- While applications development products were not specifically mentioned as a great need, development tools are expected to be in demand if the economy remains stable and begins to expand. All managers indicated that they placed high value on technology-based 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 increased demand is expected to result in a growth rate of 16% and a doubling of the market, from almost \$40 million in 1989 to over \$80 million in 1994 (Exhibit VIII-8).

EXHIBIT VIII-8

**Market Forecast, Turnkey Systems
Argentina, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 18 | 20 | 32 | 10 |
| Packaged Software | 8 | 10 | 31 | 25 |
| Custom Software | 2 | 2 | 6 | 20 |
| Other Professional Services | 6 | 7 | 14 | 15 |
| Total | 34 | 39 | 82 | 16 |

*Figures may not add due to rounding

The demand for systems integration is not expected to be high in Argentina for the next several years. Though there is a significant need for enhanced systems capabilities, the level of activity is comparatively low due to the general state of development in the country.

The market for systems integration is expected to grow from nearly \$30 million to approximately \$50 million by 1994, a growth rate of about 12% (Exhibit VIII-9). These figures can be expected only if the economy begins to realize high real growth rates within the next couple of years.

EXHIBIT VIII-9

**Market Forecast, Systems Integration
Argentina, 1989-1994**

| Systems Integration | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 7 | 8 | 12 | 10 |
| Packaged Software | 11 | 12 | 21 | 11 |
| Other Services | 1 | 1 | 1 | 4 |
| Professional Services | 6 | 7 | 14 | 15 |
| Total | 25 | 28 | 48 | 12 |

*Figures may not add due to rounding

As industry begins to address lingering productivity problems, the professional services sector is expected to benefit, primarily from the need for consulting to identify solution alternatives (Exhibit VIII-10). The professional services sector is expected to grow from \$70 million in 1988 to \$160 million by 1994.

EXHIBIT VIII-10

**Market Forecast, Professional Services
Argentina, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 15 | 18 | 45 | 20 |
| Education and Training | 10 | 12 | 27 | 18 |
| Software Development | 32 | 38 | 86 | 18 |
| Systems Operations | 2 | 2 | 3 | 5 |
| Total | 59 | 70 | 161 | 18 |

*Figures may not add due to rounding

- 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.

The projections for Argentina should be considered somewhat fragile. They are based on the assumption that the country will be able to begin to establish a moderately improved economic base and that the political environment will remain stable.

The assumptions are not at all certain. Exceeding expectations will result in much higher growth rates. Not meeting them will result in another cyclical swing downward.

7. Market Entry/Expansion Considerations

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.

C**Australia****1. Introduction**

Australia has been characterized as a country with unrealized potential. Part of the potential has been the application of technology and the use of information services as a tool for development. This has begun to change in the past several years.

2. Economic and Political Setting

The past several years have seen significant changes in the overall economic and political setting in Australia. Long dominated by a highly centralized government, a welfare oriented economy and strong labor unions, business development has languished. (Between 1965 and 1987, the annual per capita GNP growth rate averaged 1.8%.)

Changes in the early 1980s set the stage for the beginning of a number of changes. Key to the changes were economic studies in the financial and telecommunications sectors, indicating that privatization should be initiated and organizations permitted to chart their own courses.

Concurrent with studies into economic direction was a fundamental change in the government, to leadership that has supported greater business growth and investment. The government has supported a moderation of union influence and expansion of private industry investment.

As of the end of 1988, real per capita growth was over 3.5%. Growth for 1989 has been projected to be approximately 3%. Stable growth is expected to continue for the next several years.

3. Key Technology Trends

The Australian information services industry is generally considered to be in its infancy, and with a limited information services infrastructure, there is a comparatively small base from which to grow. Key trends in the growth process, summarized in Exhibit VIII-11, include the following:

EXHIBIT VIII-11

Key Technology Trends Australia

- Skills development
- Industry-specific applications
- Communications network development
- Product/service importation
- DBMS/4GL development
- Data base access

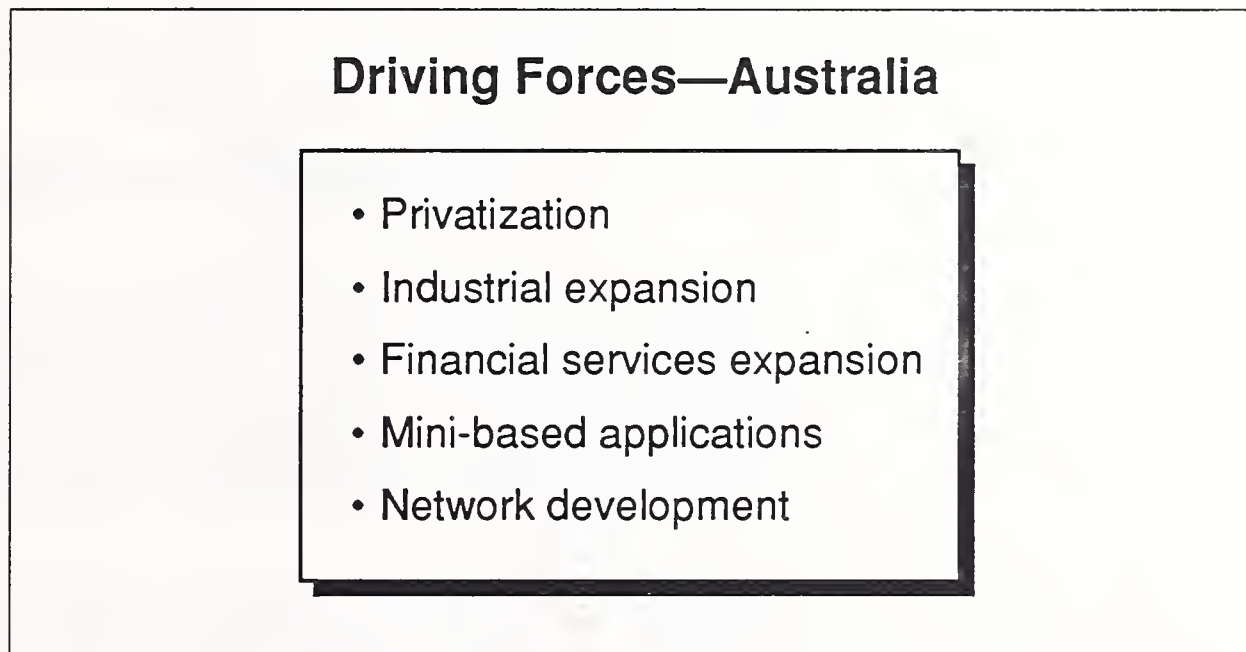
- *Skills development*—There is a general shortage of skilled staff in Australia. Coming from a background of low technology investment, there has been little emphasis on training and little opportunity for practical experience. Skill development has been identified as an area of emphasis by both industry and educational institutions; however, shortages are expected to exist for some time.
- *Industry-specific applications*—Emphasis is being placed on development of industry-specific applications as an alternative to generalized processing software.
- *Communications network development*—With a small population dispersed over a wide geographic area, there is high interest in communication-based services. Included are value-added services through circuit and satellite (VSAT) networks, and direct broadcast satellite services.
- *Product/Service importation*—Though there is a strong need to develop national capabilities, there is a strong inclination to acquire services from abroad to meet short and medium-term needs. Currently, an estimated 85% of Australia's information services products are acquired from abroad, predominantly from the U.S. and the U.K.
- *DBMS/4GL development*—There is a strong focus on development systems using data bases and fourth generation languages. The trend is to use the most up-to-date technologies and methods to accomplish development.
- *Data base access*—Strong interest has been indicated in the development of data base services to be used for research. Initial emphasis is being placed on access to global data bases.

4. Environmental Factors

a. Driving Forces

- Driving forces behind information services development in Australia include the following (Exhibit VIII-12):

EXHIBIT VIII-12



- *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 is 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

There are a number of inhibiting forces, shown in Exhibit VIII-13, that are having a dampening effect on the rate of growth of the industry.

EXHIBIT VIII-13

**Inhibiting Factors
Australia**

- Unionism
- Skilled labor shortage
- Infant industry

- *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. While the growth potential is good, there is a relatively small base from which to grow.

5. Services Forecast

The market for information services in Australia is expected to grow from an estimated \$1.9 billion in 1989 to \$4.1 billion by 1994 (Exhibit VIII-14), an annual growth rate of 17%.

Within the country, network services, systems integration and professional services are expected to experience the highest growth rates.

- The demand for network services is expected to rise, due to the need for the government to provide increasingly greater service to remote areas of the country, and to the need for on-line services to link financial service centers across the country.
- Systems integration services are expected to be driven primarily by the government's need to modernize and expand federal and statewide services.

EXHIBIT VIII-14

Market Forecast—Australia, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 260 | 290 | 510 | 12 |
| Network Services | 150 | 180 | 490 | 22 |
| Software Products | 570 | 650 | 1,290 | 15 |
| Turnkey Systems | 195 | 215 | 395 | 13 |
| Systems Integration | 130 | 160 | 410 | 21 |
| Professional Services | 325 | 395 | 1,005 | 21 |
| Total | 1,630 | 1,890 | 4,100 | 17 |

*Figures may not add due to rounding

- Professional services will also grow significantly, due to the demand for consulting and software development.

The market for processing services is expected to grow from an estimated \$290 million in 1989 to over \$500 million by 1994, an average growth rate of approximately 12%, as shown in Exhibit VIII-15.

EXHIBIT VIII-15

Market Forecast, Processing Services Australia, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 170 | 190 | 335 | 12 |
| Systems Operations | 55 | 61 | 97 | 10 |
| Utility Processing | 13 | 14 | 21 | 8 |
| Other Processing | 24 | 28 | 56 | 15 |
| Total | 264 | 293 | 509 | 12 |

*Figures may not add due to rounding

- 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.
- Though systems operations is currently the second-highest contributor to processing services, the growth rate is somewhat less than the other submodes due to the projected shift from processing services to in-house processing solutions. However, systems operations will continue to grow at a strong rate of approximately 10%.

Network services are expected to grow at a high rate due to the commitment of the government to provide network access to all parts of the country.

The government of Australia is committed to making network service capabilities the primary means for delivering services such as education and financial services throughout the country. The government has been protective of the telecommunications industry and has placed high priority on network services.

Given the commitment of the government to network-based services, network services are expected to grow at an estimated 22% per year, from nearly \$200 million in 1989 to about \$500 million in 1994 (Exhibit VIII-16).

EXHIBIT VIII-16

**Market Forecast, Network Services
Australia, 1989-1994**

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 120 | 150 | 400 | 22 |
| Network Applications | 27 | 33 | 89 | 22 |
| Total | 147 | 183 | 489 | 22 |

*Figures may not add due to rounding

- 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. Data bases and information exchange services such as medical services are expected to stimulate growth of network applications.
- As in many countries, there is high interest in EDI and E-mail services. These are expected to contribute greatly to the growth of network applications.

Software products are expected to grow at a significant rate, driven by the growing need for application, system control and application development software—as shown in Exhibit VIII-17.

EXHIBIT VIII-17

Market Forecast, Software Products Australia, 1989-1994

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 295 | 340 | 680 | 15 |
| Systems Software | | | | |
| Systems Control | 115 | 130 | 265 | 15 |
| Data Center Mgt. | 58 | 64 | 110 | 12 |
| Application Dev. | 100 | 115 | 230 | 15 |
| Total | 568 | 649 | 1,285 | 15 |

*Figures may not add due to rounding

- There will be a continued need for application software in all segments of the economy, ensuring steady growth for the next several years.
- However, the need for systems control and application development software is expected to increase just as steadily as an increasing number of organizations work to develop or improve internal processing capabilities.

The demand for turnkey systems in Australia is expected to be comparable to the demand in the U.S., as shown in Exhibit VIII-18.

- The demand for turnkey equipment is expected to be approximately the same as in the U.S.; however, there is a higher demand for customized software to meet specific user or industry needs.
- In addition, the need for professional services is expected to be higher, due to the desire of many companies to identify systems and services that will meet their needs.
- The overall demand is slightly higher due to the need of medium-size companies to find short-term solutions.

EXHIBIT VIII-18

Market Forecast, Turnkey Systems Australia, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 96 | 100 | 170 | 10 |
| Packaged Software | 49 | 54 | 90 | 10 |
| Custom Software | 18 | 21 | 53 | 20 |
| Other Professional Services | 33 | 38 | 87 | 18 |
| Total | 196 | 213 | 400 | 13 |

*Figures may not add due to rounding

The demand for systems integration is expected to become increasingly significant and to result in growth from less than \$200 million in 1989 to over \$400 million in 1994, a growth rate of approximately 21%. This growth is shown in Exhibit VIII-19.

- A key to the growth of systems integration will be the need for the development of custom solutions (professional services) to large, complex problems. A notable example is a recent contract to upgrade the country's national flight systems.

Professional services are also expected to show strong growth in most areas, resulting in an overall growth rate of 21%, from an estimated \$390 million in 1989 to approximately \$1 billion in 1994, as shown in Exhibit VIII-20.

EXHIBIT VIII-19

**Market Forecast, Systems Integration
Australia, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 59 | 70 | 170 | 19 |
| Packaged Software | 13 | 15 | 35 | 18 |
| Other Services | 8 | 9 | 15 | 11 |
| Professional Services | 51 | 64 | 195 | 25 |
| Total | 131 | 158 | 415 | 21 |

*Figures may not add due to rounding

EXHIBIT VIII-20

**Market Forecast, Professional Services
Australia, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 69 | 86 | 265 | 25 |
| Education and Training | 39 | 47 | 115 | 20 |
| Software Development | 190 | 230 | 565 | 20 |
| Systems Operations | 29 | 32 | 57 | 12 |
| Total | 327 | 395 | 1,002 | 21 |

*Figures may not add due to rounding

- Within professional services, consulting is expected to grow at a significantly high rate, as companies consider alternatives to modernize and define requirements for new or upgraded systems.
- Software development will also contribute significantly to the growth of professional services, as companies develop custom software to meet a variety of growing needs.
- 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 lacking in educating and training sufficient staff to meet growing needs.

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 for at least the next several years.

6. Market Entry/Expansion 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 as the preferred method of gaining entry.

There are few inhibitors to entering the market.

D**Austria****1. Introduction**

Austria is a country with 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 10,700 shillings (\$790 million).

2. Economic and Political Setting

Austria has a gross domestic product per capita of \$16,700, which is slightly more than the European average. The economy grew 4.2% per year in 1988 and will grow 2.0% per year in 1990. Inflation is 2% now and is projected to be 3.0% in 1990. Austria is running a current account deficit expected to vary between \$500 million and \$800 million.

The Austrian economy experienced a 'miracle' in the mid-seventies 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 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.

3. Services Forecast

The Austrian market is forecast by INPUT to grow from \$785 million in 1989 to \$1.8 billion by 1994. The average growth rate over this five-year period will be 18% per year. Details are in Exhibit VIII-21.

EXHIBIT VIII-21

Market Forecast—Austria, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 120 | 130 | 170 | 6 |
| Network Services | 25 | 38 | 115 | 26 |
| Software Products | 205 | 245 | 570 | 18 |
| Turnkey Systems | 145 | 170 | 420 | 20 |
| Systems Integration | 14 | 19 | 59 | 25 |
| Professional Services | 155 | 185 | 440 | 19 |
| Total | 664 | 787 | 1,774 | 18 |

*Figures may not add due to rounding

Relative to the overall European software and services market, the Austrian market is particularly strong in software products and turnkey systems, as is the market in West Germany. In 1989, these two delivery modes represented 57% of the Austrian market, compared with less than 45% for the whole of Europe.

Exhibits VIII-22 through VIII-27 provide a breakdown of the market for services for each of the delivery modes in Austria.

EXHIBIT VIII-22

**Market Forecast, Processing Services
Austria, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 115 | 125 | 160 | 5 |
| Systems Operations | 4 | 5 | 12 | 18 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 119 | 130 | 172 | 6 |

*Figures may not add due to rounding

EXHIBIT VIII-23

**Market Forecast, Network Services
Austria, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 22 | 33 | 86 | 21 |
| Network Applications | 3 | 4 | 30 | 50 |
| Total | 25 | 37 | 116 | 25 |

*Figures may not add due to rounding

EXHIBIT VIII-24

**Market Forecast, Software Products
Austria, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 66 | 81 | 220 | 22 |
| Systems Software | 135 | 165 | 350 | 16 |
| Total | 201 | 246 | 570 | 18 |

*Figures may not add due to rounding

EXHIBIT VIII-25

**Market Forecast, Turnkey Systems
Austria, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 84 | 92 | 190 | 16 |
| Packaged Software | 44 | 52 | 155 | 25 |
| Custom Software | 10 | 13 | 38 | 23 |
| Other Professional Services | 9 | 10 | 38 | 30 |
| Total | 147 | 168 | 421 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-26

**Market Forecast, Systems Integration
Austria, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 6 | 8 | 19 | 19 |
| Packaged Software | 1 | 1 | 4 | 24 |
| Other Services | ** | 1 | 1 | 14 |
| Professional Services | 7 | 9 | 35 | 31 |
| Total | 14 | 19 | 59 | 24 |

*Figures may not add due to rounding

**Only minimal amounts noted

EXHIBIT VIII-27

**Market Forecast, Professional Services
Austria, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 20 | 24 | 61 | 21 |
| Education and Training | 22 | 26 | 70 | 22 |
| Software Development | 115 | 130 | 305 | 18 |
| Systems Operations | 1 | 2 | 4 | 18 |
| Total | 155 | 182 | 440 | 19 |

*Figures may not add due to rounding

4. Competitive Environment

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

IBM is the largest software and services vendor in Austria and had revenues of some \$70 million in 1988. Nixdorf has revenues in Austria of some \$30 million and Mannesmann Kienzle about \$20 million. These three equipment vendors account for 17% of the total Austrian market.

The largest Austrian vendor, Dataservice, had software and services revenues of some \$16 million in 1988. Dataservice was founded by the Commercial Bank in 1966. It specializes in processing services and development of custom-developed software for IBM mainframes. A significant proportion of its total revenues comes from acting as a distributor for PCs.

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

E**Belgium****1. Introduction**

Belgium is a country with a population of 10 million and is a founding member of the European Economic Community (EEC). Belgium is also part of Benelux, a customs union that was one of the foundations of the EEC.

Benelux is now one of the most integrated parts of Western Europe; no physical frontier controls exist between the three members—Belgium, the Netherlands, and Luxembourg. Luxembourg has a population of only 380,000; because of its small size, for marketing purposes it is generally included as part of Belgium.

2. Economic and Political Setting

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 Belgian economy is undoubtedly fitter than it was in the early eighties: it grew 4.2% in 1988 and is projected for 1990 to grow 2.6%. Inflation was 1.1% in 1988 and is projected to be 3.2% in 1990. Belgium and Luxembourg are running a current trade surplus of around \$3 billion; this surplus is expected to decrease only slightly.

The prime minister, Wilfried Martens, is head of Belgium's coalition government, which has provided considerable stability over the last year, and also an ambitious program of structural and constitutional reform.

The country is seriously divided between the Walloon and Flemish populations, and a federal system has been proposed as a logical consequence. However, many are concerned that the country may disintegrate.

Belgium has traditionally had a high-wage (although also highly productive) economy, and also has to face up to 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.

Belgian companies in the European top 100 are Petrofina, Societe Generale de Belgique and Solvay et Cie. The unsuccessful attempt by Carlo De Benedetti to take over Societe Generale has certainly wakened this sleeping giant, which controls perhaps 20% of the Belgian economy.

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 impetus to the Belgian economy, especially in the area of professional services as more and more companies seek representation in the unified European community!

After the decline of a once-dominant steel industry, Luxembourg has prospered as a kind of fiscal paradise, with low taxes, banking secrecy, duty-free shopping, etc. However, there is some fear that the approach of the Single European Market will remove Luxembourg's competitive advantage. Other EEC members that are going through liberalization of capital controls will be unhappy about Luxembourg's presence and potential assistance to tax avoiders, and will wish to legislate.

3. Services Forecast

INPUT forecasts that the Belgian software and services industry will grow from \$1.4 billion in 1989 to some \$3.4 billion by 1994 as shown in Exhibit VIII-28. This represents an average growth rate over the five-year period of 19% per year.

EXHIBIT VIII-28

Market Forecast—Belgium, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 195 | 205 | 265 | 5 |
| Network Services | 49 | 68 | 205 | 25 |
| Software Products | 370 | 455 | 1,100 | 19 |
| Turnkey Systems | 140 | 160 | 405 | 21 |
| Systems Integration | 50 | 63 | 185 | 24 |
| Professional Services | 405 | 485 | 1,200 | 20 |
| Total | 1,209 | 1,436 | 3,360 | 19 |

*Figures may not add due to rounding

The Belgian market is strong in custom software development. Professional services represents some 34% of the Belgian market, compared with 30% for the whole of Europe.

The growth of the market is expected to be very similar to that of the European market as a whole; growth is not expected to change significantly over the next five years.

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.

Exhibits VIII-29 through VIII-34 provide a breakdown of markets for services for each of the delivery modes in Belgium.

EXHIBIT VIII-29

**Market Forecast, Processing Services
Belgium, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 175 | 180 | 210 | 3 |
| Systems Operations | 20 | 23 | 53 | 18 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 195 | 203 | 263 | 5 |

*Figures may not add due to rounding

EXHIBIT VIII-30

Market Forecast, Network Services Belgium, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 36 | 47 | 125 | 22 |
| Network Applications | 13 | 21 | 79 | 30 |
| Total | 49 | 68 | 204 | 25 |

*Figures may not add due to rounding

EXHIBIT VIII-31

Market Forecast, Software Products Belgium, 1989-1994

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 160 | 195 | 525 | 22 |
| Systems Software | 210 | 260 | 575 | 17 |
| Total | 370 | 455 | 1100 | 19 |

*Figures may not add due to rounding

EXHIBIT VIII-32

**Market Forecast, Turnkey Systems
Belgium, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 79 | 88 | 183 | 16 |
| Packaged Software | 42 | 50 | 150 | 25 |
| Custom Software | 10 | 13 | 37 | 23 |
| Other Professional Services | 8 | 10 | 37 | 30 |
| Total | 139 | 160 | 407 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-33

**Market Forecast, Systems Integration
Belgium, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 21 | 26 | 61 | 19 |
| Packaged Software | 3 | 4 | 11 | 24 |
| Other Services | 1 | 2 | 4 | 14 |
| Professional Services | 24 | 31 | 110 | 28 |
| Total | 50 | 63 | 185 | 24 |

*Figures may not add due to rounding

EXHIBIT VIII-34

Market Forecast, Professional Services Belgium, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Professional Services | 403 | 482 | 1,197 | 20 |
| Consulting | 54 | 66 | 195 | 23 |
| Education and Training | 32 | 38 | 99 | 20 |
| Software Development | 315 | 375 | 895 | 19 |
| Systems Operations | 2 | 3 | 8 | 22 |
| Total | 403 | 482 | 1,197 | 20 |

*Figures may not add due to rounding

4. Competitive Environment

During 1988, the two largest domestic vendors, CIG and Intersys, merged to form CIG-Intersys. In 1988, CIG-Intersys generated some \$90 million from the Belgian market, or some 8% of total Belgium software and services end-user revenues.

In 1989, Computer Sciences Corporation of the U.S. acquired CIG-Intersys. This acquisition makes Computer Sciences the largest independent vendor in the Belgian market.

The acquisition has been made due to the belief by Computer Sciences that the Belgian market will be stimulated by the 1992 initiative of the European Commission. This acquisition will more than double Computer Sciences' revenues in Europe.

There is concern within the domestic market that the Belgian market is too small to generate competitive European vendors on its own. It is expected that there will be further Belgian acquisitions by foreign vendors. Both Dutch and French vendors have a strong presence in Belgium.

IBM was the second largest Belgian vendor in 1988, with revenue of \$85 million. During 1988, the largest European independent vendor, Cap Gemini Sogeti from France acquired Sesa Group. Cap Gemini merged its

Belgian operation with the Belgian subsidiary of Sesa to create Cap Gemini-Sesa and became the third largest independent vendor in Belgium. In 1988, Cap Gemini-Sesa had Belgian revenues of \$30 million.

The only domestic Belgian vendor in the top-ten ranking in 1988 was Informabel. It ranked third largest jointly with Cap Gemini-Sesa and had 1988 revenues of \$30 million. As with CIG-Intersys, Informabel's main delivery mode is processing services.

The largest Dutch vendor in the Belgian market was Volmac, which specializes in professional services. Volmac ranked eighth with revenues of \$25 million. Cap Gemini-Sesa and Volmac are the two leading professional service vendors in Belgium.

F**Brazil****1. Introduction**

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 has languished.

Although there are signs of change, there have been false signs in the past. Previous indications have frequently resulted in yet another round of turmoil and false starts.

Whether current efforts will be fruitful is open to speculation. However, there are indications of a recognition that the country must be able to successfully deal in the world economy in order to develop. Time will determine whether the recognition will be brought to fruition.

2. Economic and Political Setting

In a country with a geographic area greater than Western Europe and 160 million people with significant European orientation, 1988 could be the beginning of a new era for Brazil.

Following years of government turmoil, Brazil has begun creating a new constitution to bring more political stability and provide a base for economic development.

With inflation rates that have topped 1000% per year over the past several years, the country has recognized that previous practices have perpetuated self-defeating policies that cannot continue. In 1988, the country experienced an overall growth rate of 0.04%. Industrial growth was approximately -3.2%.

Among the indications of a change in direction are the following:

- There is a growing awareness in business, military, and political sectors that Brazil must become a trusted member of the world community. Prior practices, such as renegeing on foreign debt payments, have not fostered trust.
- There is recognition that the country's fate cannot be left in the hands of politicians who derive their thinking from the 1940s and 1950s. This recognition has led to the formation of a comparatively stable middle-of-the-road political coalition seeking to bring peaceful change.
- Recognizing the need for foreign investment, the country has begun to modify and clarify regulations that govern foreign investment.

Some time will be needed to determine whether the changes will be successful. Some interim adjustments in policy and direction are expected, but successful change could chart a new and dynamic course for the country.

3. Key Technology Trends

Key technology trends in Brazil are shown in Exhibit VIII-35.

EXHIBIT VIII-35

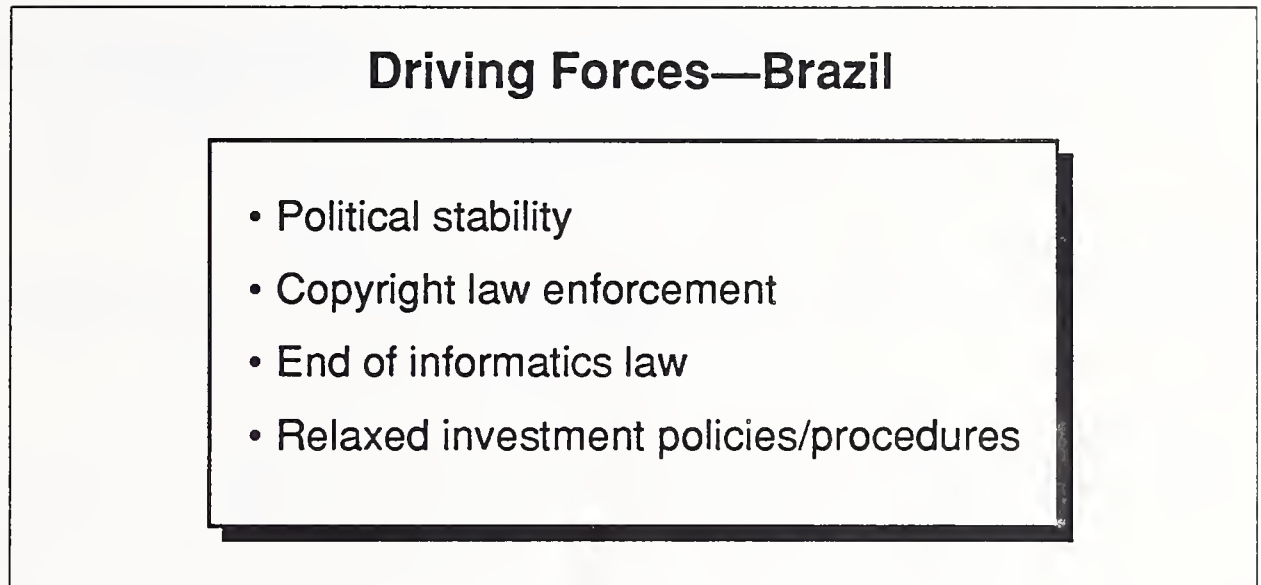


- *Infrastructure development*—With a more stable economy anticipated, focus is being placed on the development of a national technological infrastructure. Development to date has been fragmented and has been delayed due to continual changes in the economic situation.
- *Local industry development*—The 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 has committed to expanding and enhancing network capabilities. However, there are extensive restrictions on participation in the development by foreign firms.

4. Environmental Factors

Driving forces in Brazil include the following, also shown in Exhibit VIII-36.

EXHIBIT VIII-36

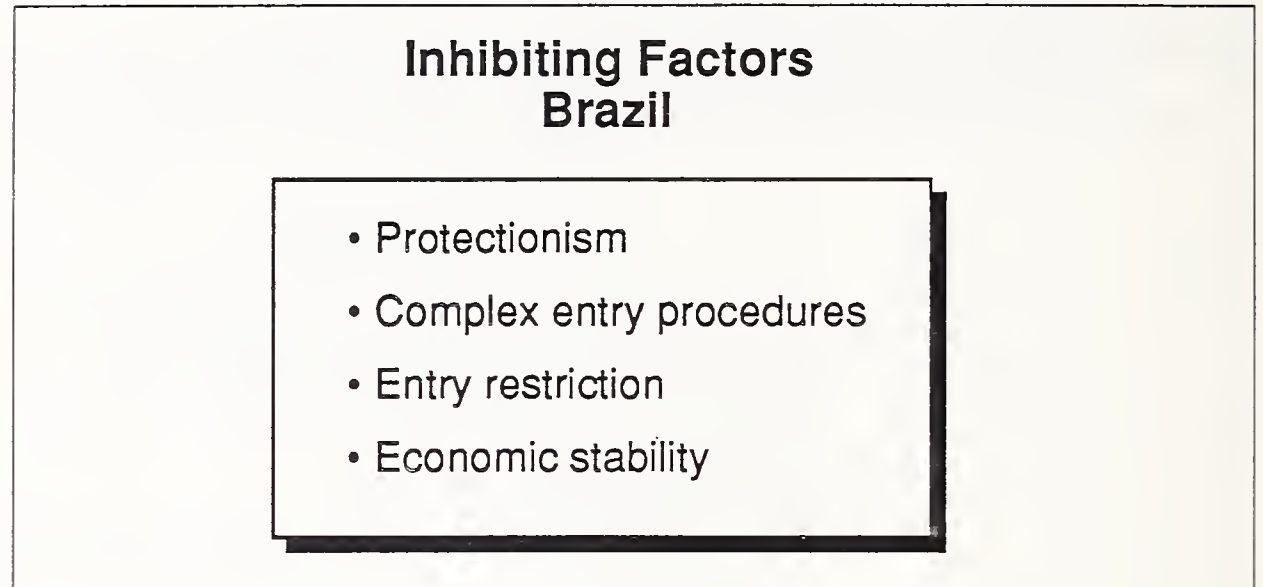
**a. Driving Forces**

- *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. There has been the beginning of a reduction in software piracy, causing some companies to consider increased efforts in the country.
- *End of informatics law*—The current informatics law is scheduled to end in 1992. The planned end to the law has caused some firms to consider entry more favorably. Whether the law will be reinstated 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 are being considered.

b. Inhibiting Factors

There are a number of inhibiting factors related to entry into the Brazilian market, as shown in Exhibit VIII-37.

EXHIBIT VIII-37



- *Protectionism*—The government policy of protecting infant industry is expected to remain 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 approvals needed 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.

5. Leading Vendors

Due to the restrictive environment and the lax enforcement of the copyright protection laws, many firms have delayed entry into the country. 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.

6. Services 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.

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

The current market for information services is estimated to be approximately \$1.1 billion. The market is expected to grow at an annual rate of 21%, to \$2.7 billion by 1994, as shown in Exhibit VIII-38.

EXHIBIT VIII-38

Market Forecast—Brazil, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 115 | 125 | 210 | 11 |
| Network Services | 47 | 55 | 125 | 18 |
| Software Products | 395 | 490 | 1,425 | 22 |
| Turnkey Systems | 115 | 130 | 300 | 19 |
| Systems Integration | 45 | 50 | 105 | 16 |
| Professional Services | 180 | 210 | 540 | 21 |
| Total | 897 | 1,060 | 2,705 | 21 |

*Figures may not add due to rounding

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 alternatives 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.

As shown in Exhibit VIII-39, 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.

EXHIBIT VIII-39

Market Forecast, Processing Services Brazil, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 23 | 26 | 52 | 15 |
| Systems Operations | 57 | 63 | 100 | 10 |
| Utility Processing | 22 | 24 | 37 | 9 |
| Other Processing | 12 | 13 | 21 | 10 |
| Total | 114 | 126 | 210 | 11 |

*Figures may not add due to rounding

Exhibit VIII-40 shows that 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.

Growth of the software market is highly dependent on a curtailment of the extensive piracy that currently exists, as well as on policies that will facilitate cooperative efforts between domestic and foreign providers.

EXHIBIT VIII-40

**Market Forecast, Network Services
Brazil, 1989-1994**

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 38 | 45 | 100 | 18 |
| Network Applications | 9 | 10 | 22 | 16 |
| Total | 47 | 55 | 122 | 18 |

*Figures may not add due to rounding

Assuming that these efforts are fruitful, the market for software products is expected to grow from nearly \$500 million in 1989 to \$1.4 billion in 1994, an annual growth rate of 24%. Details are shown in Exhibit VIII-41.

EXHIBIT VIII-41

**Market Forecast, Software Products
Brazil, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 210 | 260 | 795 | 25 |
| Systems Software | | | | |
| Systems Control | 115 | 140 | 380 | 22 |
| Data Center Mgt. | 19 | 22 | 44 | 15 |
| Application Dev. | 56 | 68 | 208 | 25 |
| Total | 400 | 490 | 1,427 | 24 |

*Figures may not add due to rounding

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

As illustrated in Exhibit VIII-42, the market for turnkey systems is expected to grow at a higher rate than in the U.S. The reason is a residual demand for solutions to address immediate requirements. The market for turnkey systems is expected to grow from an estimated \$128 million to \$300 million by 1994, an annual rate of 19%.

EXHIBIT VIII-42

Market Forecast, Turnkey Systems Brazil, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 56 | 62 | 99 | 10 |
| Packaged Software | 27 | 34 | 115 | 28 |
| Custom Software | 8 | 10 | 29 | 25 |
| Other Professional Services | 20 | 23 | 57 | 20 |
| Total | 111 | 128 | 302 | 19 |

*Figures may not add due to rounding

- For turnkey systems, the fastest growing requirements are expected to be for packaged and customized software. Packaged software will grow somewhat faster due to a willingness to accept enhanced software capability when compared to local software.

The market for systems integration in Brazil is small. As indicated in Exhibit VIII-43, 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-44 shows, the market for professional services in Brazil is of moderate size, considering the generally poor state of the economy. This market is expected to grow at 21% per year for the next several years.

EXHIBIT VIII-43

**Market Forecast, Systems Integration
Brazil, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 21 | 23 | 41 | 12 |
| Packaged Software | 4 | 4 | 9 | 15 |
| Other Services | 2 | 2 | 3 | 6 |
| Professional Services | 18 | 21 | 52 | 20 |
| Total | 45 | 50 | 104 | 16 |

*Figures may not add due to rounding

EXHIBIT VIII-44

**Market Forecast, Professional Services
Brazil, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 46 | 55 | 170 | 25 |
| Education and Training | 28 | 32 | 74 | 18 |
| Software Development | 98 | 115 | 290 | 20 |
| Systems Operations | 7 | 7 | 9 | 5 |
| Total | 179 | 209 | 543 | 21 |

*Figures may not add due to rounding

- Within professional services, the highest growth rates are expected 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.

Overall, the market for information services in Brazil has high 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.

7. Market Entry/Expansion Considerations

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.

G**Canada****1. Introduction**

In a country in which only an estimated 2% of its 26 million people use information services, Canada is believed to have high latent demand for services that will meet personal and business needs.

2. Economic and Political Setting

With a per-capita income of over \$15,000 and an annual growth rate of 2.7%, Canada is among the top ten countries in the world. However, Canada has begun to lose its standing in the world economy; its share of worldwide products and services declined from an estimated 4.5% to 2.5% over the past several years.

In response to the general decline, the government has taken a number of steps. Two major activities are:

- The government has placed greater emphasis on the development of the national technological infrastructure, invested in information services, and encouraged the expansion of national telecommunication services. The government has begun a number of projects to significantly overhaul a number of major systems.
- The government has concluded a liberalized trade agreement with the United States to stimulate investment and the exchange of technology. The liberalized environment is expected to result in significant added investment in Canada by U.S. companies.

Although there have been efforts to improve the overall economic setting in the country, some factions continue to favor isolationist policies. Quebec separatists, of predominantly French origin, create difficulties for the provincial and national government. The continued demands for a separate government and the ongoing requirements for dual language cause extensive difficulties and higher operating costs.

3. Key Technology Trends

Canadian businesses, as well as the government, have recognized the value of the use of information services. As part of INPUT's research, a number of trends were noted and are shown in Exhibit VIII-45.

EXHIBIT VIII-45

Key Technology Trends Canada

- Increased technology investment
- Increasingly integrated systems
- Expanded DBMS/4GL use
- Enhanced local/national networking
- Centralization
- Industry-specific applications

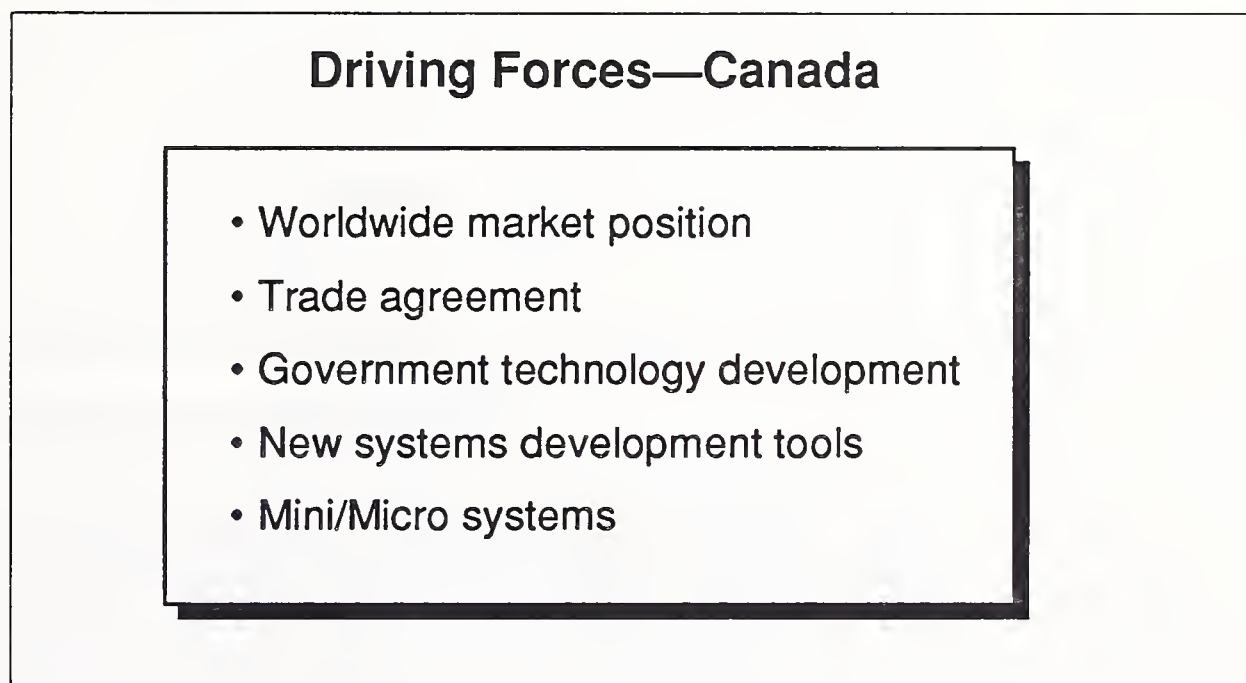
- *Increased technology investment*—Because of stimulation by government actions, there is an increasing amount of investment in information technology and services. The trend is expected to continue for at least the next several years.
- *Increasingly integrated systems*—There is increased emphasis in integrating systems as they are upgraded and expanded. The need for comprehensive processing capabilities has fostered growth in 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.
- *Enhanced local/national networking*—Significant emphasis is being placed on the development of local and national networks. The government has recently launched efforts to expand the national telecommunications network to ensure access from remote locations.
- *Centralization*—With the decreasing prices of hardware, there is a growing trend toward use of central systems with large data bases. Centralized mainframes are accessed through minis and micros for applications such as customer information files (CIFs) and computer integrated manufacturing (CIM).
- *Industry-specific applications*—Although the growth of cross-industry applications is strong, greater emphasis being placed on industry-specific applications.

4. Environmental Factors

a. Driving Forces

There are a number of forces causing change in the information services industry in Canada. As indicated in Exhibit VIII-46, these forces are oriented significantly to the overall economy of the country and include the following:

EXHIBIT VIII-46

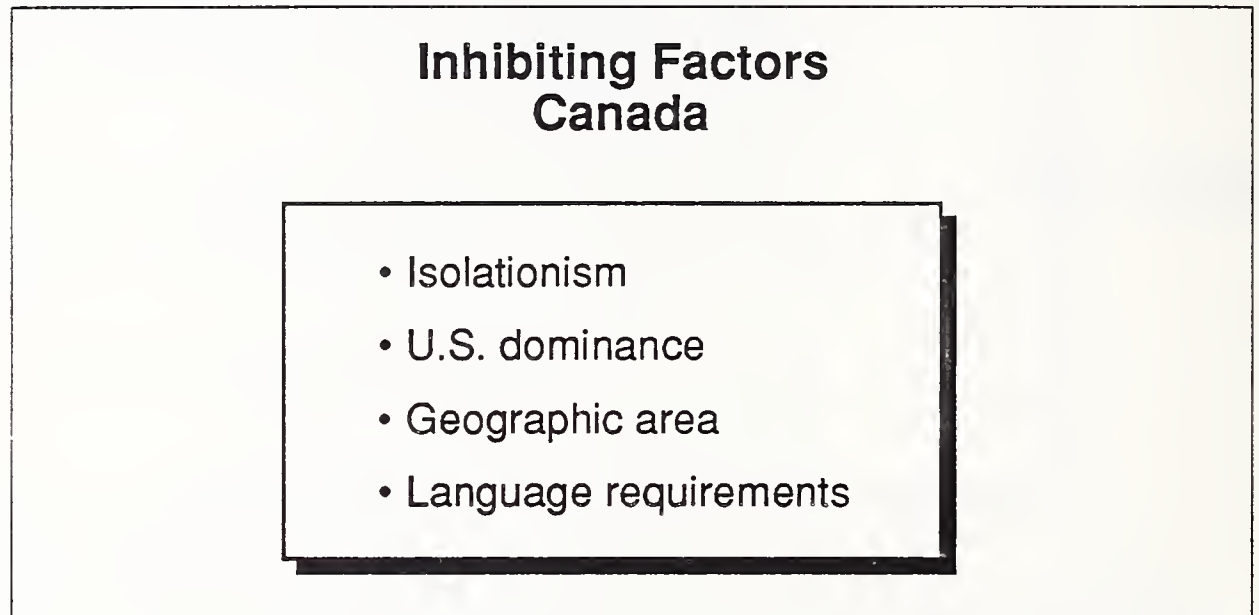


- *Worldwide market position*—The government of Canada has recognized that investment is necessary for Canada to regain its position in the world economy. As a result, significant investment is being made in information technology.
- *Trade agreement*—The recently completed trade agreement with the United 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

Although the industry is growing at a significant rate, there are a number of forces that are having a somewhat retarding effect on growth. These forces are shown in Exhibit VIII-47.

EXHIBIT VIII-47



- *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 obstructionist, but without great success. They are not expected to become a major consideration, but do have a retarding effect on the rate of development.
- *U.S. dominance*—There has been continued effort to develop an indigenous information services industry and there are a number of large and successful firms, 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 makes national development difficult. The large investment needed to link the centers together has a limiting effect on the 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.

5. Leading Vendors

As indicated in Exhibit VIII-48, a number of large, well-established companies operate in the information services industry. It is interesting

to note that, to a great extent, these large companies have somewhat different market segments.

EXHIBIT VIII-48

| Leading Information Services Vendors—Canada | |
|--|-----------------------|
| Vendor | Market Segment |
| COGNOS | System software |
| DMR Group | Professional services |
| SHL Systemshouse | Systems integration |
| STM | Processing services |

In addition to these vendors, there are several American companies with significant business interests. Included are IBM, 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, the position of American firms is strong, but is experiencing growing competition from the leading Canadian firms.

6. Services Forecast

The market for information services in Canada is robust, with growth rates for six delivery modes ranging from a low of 15% to a high of 25%. Exhibit VIII-49 shows that the total market for information services is expected to grow from an estimated \$3.5 billion in 1989 to more than \$8 billion by 1994. The compound annual growth rate is approximately 20% per year.

During the five-year period, processing services are expected to grow at an average rate of 19%, from \$548 million to an estimated \$1.3 billion by 1994. Exhibit VIII-50 shows these numbers.

- Much of the growth for processing services will be from companies just beginning to make use of technology, but without the funds to implement in-house systems. The fastest growth will be from transaction processing, which will grow at a 20% CAGR.

EXHIBIT VIII-49

Market Forecast—Canada, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 460 | 550 | 1,305 | 19 |
| Network Services | 75 | 88 | 195 | 17 |
| Software Products | 885 | 1,040 | 2,350 | 18 |
| Turnkey Systems | 215 | 250 | 500 | 15 |
| Systems Integration | 495 | 620 | 1,905 | 25 |
| Professional Services | 770 | 930 | 2,395 | 21 |
| Total | 2,900 | 3,478 | 8,650 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-50

**Market Forecast, Processing Services
Canada, 1989-1994**

| Processing Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Transaction Services | 355 | 425 | 1,060 | 20 |
| Systems Operations | 35 | 43 | 86 | 15 |
| Utility Processing | 46 | 53 | 105 | 15 |
| Other Processing | 23 | 26 | 53 | 15 |
| Total | 459 | 547 | 1,304 | 19 |

*Figures may not add due to rounding

Exhibit VIII-51 shows that the network services CAGR will be an estimated 17%, from \$88 million in 1989 to \$198 million in 1994.

EXHIBIT VIII-51

Market Forecast, Network Services Canada, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 60 | 69 | 140 | 15 |
| Network Applications | 15 | 19 | 58 | 25 |
| Total | 75 | 88 | 198 | 17 |

*Figures may not add due to rounding

- 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 the growth.

Exhibit VIII-52 shows that software products are expected to grow from a base of approximately \$1 billion in 1989 to an estimated \$2.3 billion in 1994, a CAGR of 18%.

- For the five-year period application software is expected to grow at an estimated 15%. Although this figure could generally be estimated to be larger in an expanding industry, the need to Canadianize software has a limiting effect on the market for pure application systems. Considerable customization is frequently needed to meet national or local requirements.
- During the same period, application development software is expected to grow at a rate of 22%. Unlike application software, localization is not required for application development software, resulting in a larger market opportunity during the expansion period.

EXHIBIT VIII-52

Market Forecast, Software Products Canada, 1989-1994

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 450 | 515 | 1,040 | 15 |
| Systems Software | | | | |
| Systems Control | 165 | 200 | 470 | 19 |
| Data Center Mgt. | 185 | 220 | 550 | 20 |
| Application Dev. | 87 | 105 | 285 | 22 |
| Total | 887 | 1,040 | 2,345 | 18 |

*Figures may not add due to rounding

Turnkey systems are expected to have a strong growth rate as a result of steady growth of minicomputer systems and of customized software to meet national or local requirements. As indicated in Exhibit VIII-53, the market for turnkey systems is expected to grow from an estimated \$248 million in 1989 to approximately \$500 million by 1994, an annual growth rate of 15%.

Systems integration is expected to have strong growth during the next several years. As indicated in Exhibit VIII-54, the market is expected to grow from \$619 million in 1989 to \$1.9 billion in 1994.

- 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 Systemshouse—is Canadian and strong competition should be expected. In addition, some American companies indicate bias in favor of Canadian companies.

EXHIBIT VIII-53

**Market Forecast, Turnkey Systems
Canada, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 76 | 87 | 175 | 15 |
| Packaged Software | 93 | 105 | 215 | 15 |
| Custom Software | 10 | 11 | 23 | 15 |
| Other Professional Services | 37 | 43 | 86 | 15 |
| Total | 216 | 246 | 499 | 15 |

*Figures may not add due to rounding

EXHIBIT VIII-54

**Market Forecast, Systems Integration
Canada, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 200 | 245 | 685 | 23 |
| Packaged Software | 25 | 30 | 82 | 22 |
| Other Services | 99 | 120 | 295 | 20 |
| Professional Services | 175 | 225 | 840 | 30 |
| Total | 499 | 620 | 1,902 | 25 |

*Figures may not add due to rounding

Exhibit VIII-55 shows that the market for professional services is expected to grow from an estimated \$928 million in 1989 to nearly \$2.4 billion in 1994, a growth rate of 21%.

EXHIBIT VIII-55

Market Forecast, Professional Services Canada, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Professional Services | | | | |
| Consulting | 190 | 240 | 730 | 25 |
| Education and Training | 53 | 63 | 143 | 18 |
| Software Development | 480 | 575 | 1,425 | 20 |
| Systems Operations | 46 | 52 | 91 | 12 |
| Total | 769 | 930 | 2,389 | 21 |

*Figures may not add due to rounding

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

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.

7. Market Entry/Expansion Considerations

There are few restrictions for 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 prefer to work with a 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 a strong French influence. In many cases, different marketing strategies are required in Quebec.

There are an estimated 700,000 companies in Canada. The majority are less than \$15 million in size. Of these, three-quarters are estimated to be uncomputerized or undercomputerized.

There are opportunities throughout Canada, but the primary markets are in Ontario and Quebec. Of the top 200 computer companies, 74% of the companies and 88% of the revenues are in Ontario. Quebec is second with 14% and 8%, respectively.

The strong French influence in Quebec provides an opportunity for American companies wishing to enter the French or European market. 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 extensive travel to France.

In general, to be successful in Canada, marketing relationships are advised until products have been deemed successful. At a minimum, all companies entering or expanding in Canada should ensure that they have a thorough understanding of the difference in marketing strategies necessary for success.

H

Denmark

1. Introduction

Denmark has a population of 5 million and has been a member of the European Economic Community (EEC) since 1973. Its software and services market is the tenth largest in Europe, with a total size of \$1.2 billion.

2. Economic and Political Setting

With a gross domestic product (GDP) per capita of \$21,200, Denmark is one of the richest countries in the world, but a small population means a total GDP of only just over \$100 billion.

Denmark was one of the best economic performers in the eighties and had one of the highest per-capita export figures. However, with such a small domestic market, this export figure was very much a necessity, and was bought at a cost.

More recently, Denmark has been having hard times: it has a large public sector and foreign debt of \$36 billion, about 33% of the total GDP. The Danish economy shrank 0.4% in 1988, and forecasts for 1990 barely exceed 1%. Inflation is close to 5%, and Denmark is running a current account deficit of \$1.8 billion.

One of the critical problems affecting Danish prospects is that a quarter of the total exports have been based upon agriculture, which is beset by global trade policy problems and a shift in emphasis within the EEC. Also, the Danish manufacturing base is small and consists of small companies. This smallness has meant low investment in research and development.

The Danes are definitely aware of the importance of solving these problems and tackling the deficits. 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.

In order to capitalize on the emerging unified market, Prime Minister Poul Schlueter's nonsocialist minority coalition government will probably have to make reductions in Denmark's high indirect and direct taxes.

3. Services Forecast

Exhibit VIII-56 shows INPUT's forecast that the Danish market will grow from approximately \$1.2 billion in 1989 to \$2.7 billion in 1994. The average growth rate over this five-year period is expected to be 17% per year.

EXHIBIT VIII-56

Market Forecast—Denmark, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 365 | 375 | 495 | 6 |
| Network Services | 35 | 49 | 160 | 27 |
| Software Products | 250 | 305 | 770 | 20 |
| Turnkey Systems | 165 | 190 | 480 | 20 |
| Systems Integration | 19 | 23 | 66 | 24 |
| Professional Services | 250 | 305 | 745 | 20 |
| Total | 1,084 | 1,247 | 2,716 | 17 |

*Figures may not add due to rounding

The processing services sector represents some 30% of the total software and services market in Denmark, compared with 15% throughout Europe. With the expected slow growth of the processing services market in general in Europe, by 1994 processing services are expected to represent only 18% of the total software and services market in Denmark. This percent share can be compared with the forecast of 9% for the whole of Europe in 1994 for this sector.

The professional services market is relatively weak in Denmark. It currently accounts for 24% of the total Danish software and services market, as opposed to the European average of 30%. This relative position is not expected to change by 1994. 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, compared with 24% for the whole of Europe.

Exhibits VIII-57 through VIII-62 provide a breakdown of the market for services for each of the delivery modes in Denmark.

EXHIBIT VIII-57

**Market Forecast, Processing Services
Denmark, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 360 | 365 | 475 | 5 |
| Systems Operations | 7 | 9 | 21 | 19 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 367 | 374 | 495 | 6 |

*Figures may not add due to rounding

EXHIBIT VIII-58

**Market Forecast, Network Services
Denmark, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 27 | 33 | 96 | 24 |
| Network Applications | 8 | 16 | 65 | 32 |
| Total | 35 | 49 | 161 | 27 |

*Figures may not add due to rounding

EXHIBIT VIII-59

**Market Forecast, Software Products
Denmark, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 98 | 121 | 340 | 23 |
| Systems Software | 150 | 185 | 425 | 18 |
| Total | 248 | 306 | 770 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-60

**Market Forecast, Turnkey Systems
Denmark, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 94 | 105 | 215 | 16 |
| Packaged Software | 49 | 58 | 175 | 25 |
| Custom Software | 12 | 15 | 43 | 23 |
| Other Professional Services | 10 | 11 | 43 | 31 |
| Total | 165 | 187 | 476 | 21 |

*Figures may not add due to rounding

EXHIBIT VIII-61

**Market Forecast, Systems Integration
Denmark, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 8 | 9 | 22 | 19 |
| Packaged Software | 1 | 1 | 4 | 24 |
| Other Services | 1 | 1 | 1 | 14 |
| Professional Services | 9 | 11 | 39 | 28 |
| Total | 19 | 22 | 66 | 24 |

*Figures may not add due to rounding

EXHIBIT VIII-62

**Market Forecast, Professional Services
Denmark, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 36 | 43 | 125 | 23 |
| Education and Training | 11 | 12 | 31 | 20 |
| Software Development | 205 | 245 | 590 | 19 |
| Systems Operations | 1 | 2 | 5 | 22 |
| Total | 253 | 302 | 751 | 20 |

*Figures may not add due to rounding

4. Competitive Environment

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 \$135 million in 1988 in Denmark, representing some 14% of the overall Danish software and services market. Kommunedata provides central processing services for local government and is owned collectively by a number of municipal local authorities.

Datacentralen, the second largest Danish vendor, had 1988 revenues of \$130 million. Its revenues accounted for some 13% of the Danish market and, together with Kommunedata, accounted for 27% of the overall market.

Denmark still has strong links with the other three Scandinavian countries, even though they are not in the EEC. Scandinavians see themselves in need of good communications, and in 1988 Scantel, formally STS, was created. STS is a joint venture between four Scandinavian PTTs to offer an international VAN service.

Denmark has two PTTs and Danet. The joint venture between IBM and the Danish PTT, not involved in Scantel, launched its EDI service in 1988, followed by GEIS in 1989.

I**Eastern Europe****1. Introduction**

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

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.

2. Economic and Political Setting

The economic and political setting in Eastern Europe has begun to change dramatically over the past two to three years. Following nearly thirty 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 is increased dialogue and some increase in trade, primarily in agriculture, but economists indicate that additional time and changes will be necessary for significant changes in the volume of imports.

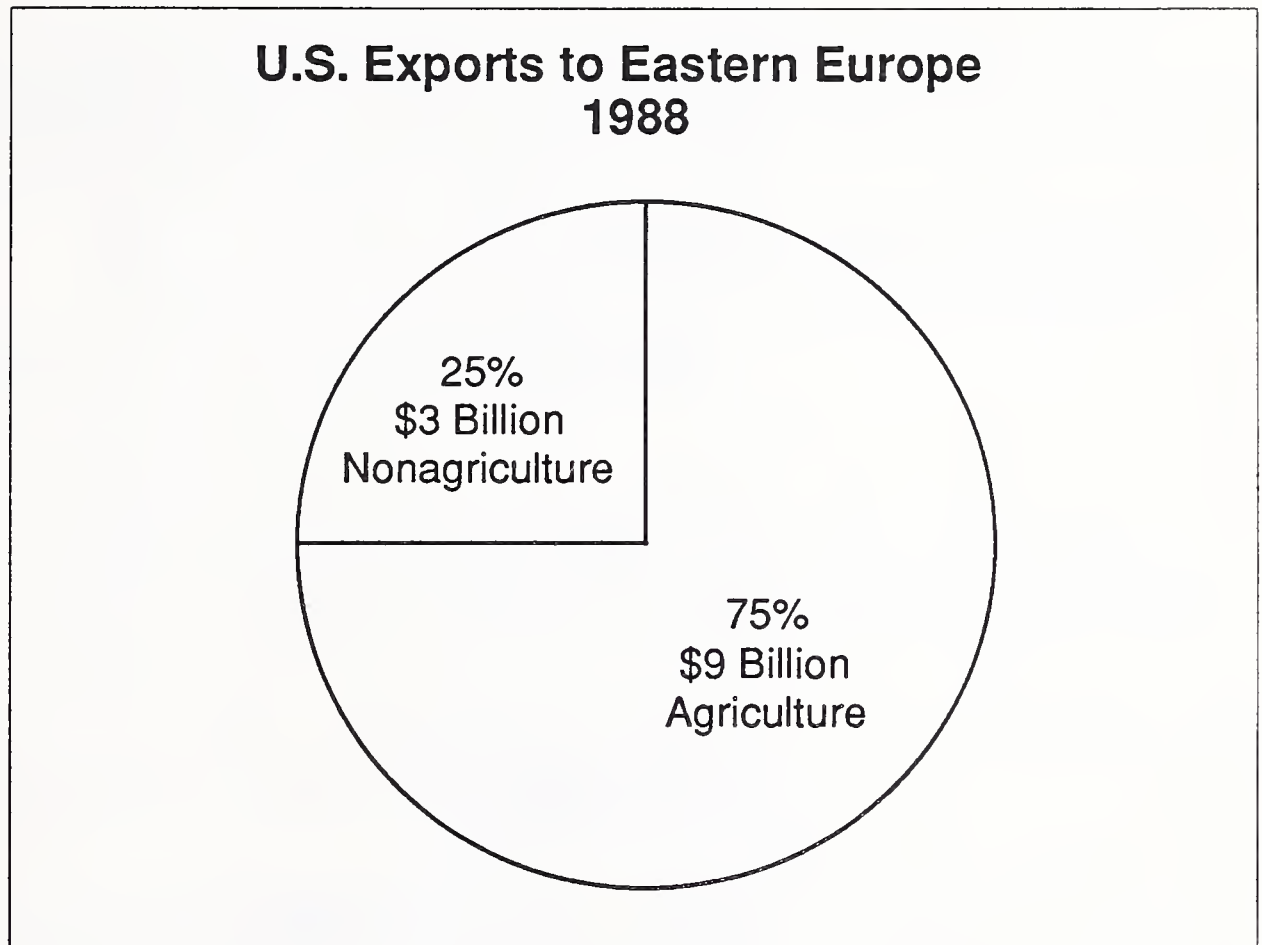
In general, the economies of the Eastern European countries will be encountering significant difficulties as they attempt to expand. Eastern Europe's high external debt and lack of hard currency makes many countries reluctant to lend to Eastern Europe. To date, there have been only limited efforts to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

As an indication of the level of development in Eastern European countries, in 1988, the total value of goods and services from the west was estimated to be \$10-12 billion.

Exhibit VIII-63 shows that, of the total imported, approximately 75% (\$9 billion) was for agricultural products. The remainder represented all other products and services.

Although there are few published figures indicating the total imports or local production of computers or information services, a limited economic base coupled with severe restrictions on the importation of technology-based products indicates a very limited market for western computers and related services.

EXHIBIT VIII-63



INPUT estimates that the average total market for information services for all Eastern European countries is no greater than 6% of the total import of nonagricultural products. (Country reports published by the U.S. Department of Commerce indicate that this figure could be as low as 1%). In addition, from published data, INPUT believes that there is only negligible local manufacture of hardware or software products.

3. Key Technology Trends

Published data indicate that the Eastern European countries have been placing increased emphasis on the development of technology-based services.

Following years of neglect, many countries have only limited technological infrastructure; with import/export restrictions on high-technology products, little has been imported. However, this situation will probably change.

- Data from the U.S. Department of Commerce indicate that the USSR has an installed base of approximately 300,000 computers. The total is expected to be approximately 1.0 million by 1990. Of the current installed base, an estimated 95% are minicomputers.
- During his recent trip to Eastern Europe, President Bush indicated a willingness to begin shipment of some types of computers to Eastern European countries.

- The government of Hungary recently tendered an offer to acquire telecommunications products and services as part of a new five-year plan. The government has recently requested a loan from the World Bank to help finance the acquisition of more than \$800 million in telecommunications equipment. The plan states a number of key objectives:
 - Begin rehabilitation of the national telecommunications network, with particular emphasis on areas outside Budapest.
 - Expand and modernize the long-distance network.
 - Expand the rudimentary telex and data network.
 - Improve the efficiency of network utilization.
 - Improve the mobilization of financial resources for telecommunications by tapping new sources, including joint ventures, etc.
- Further indication of the commitment to development is approval by Hungary's telecommunications authority of a joint venture between Coopinvest (Budapest) and Bond Corporation (Australia) to build a cellular mobile telephone network. The cooperative venture is expected to result in a network with an estimated 50,000 connections in Budapest within three years.

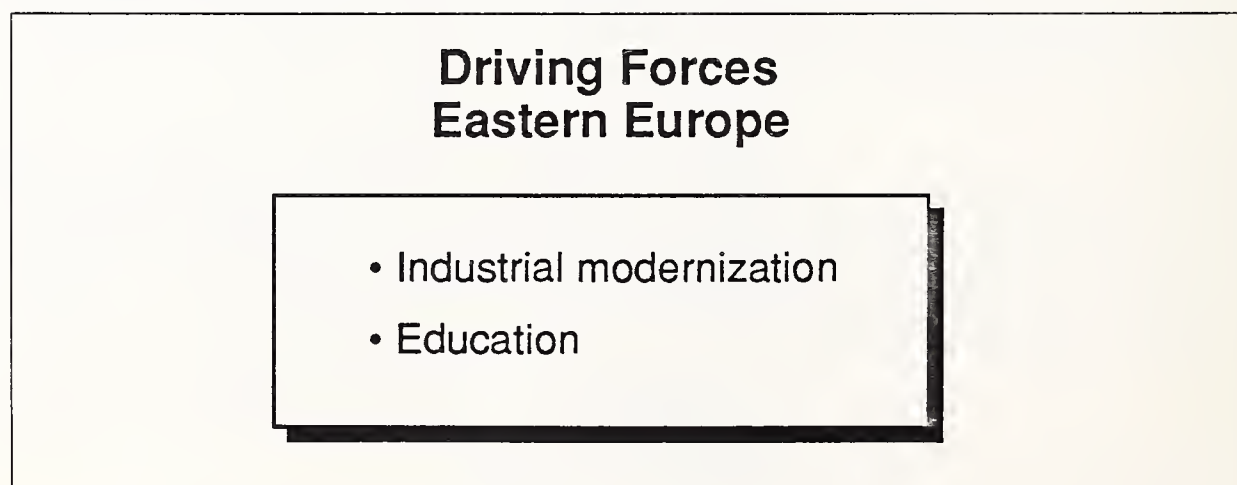
Overall, the trend is to view technology as increasingly important to the development of the country and the area. Although many restrictions will remain, a general trend toward the increased importation of software and hardware products is expected.

4. Environmental Factors

a. Driving Forces

- As indicated in Exhibit VIII-64, there are two key driving forces behind the increasing use of computers and technology.

EXHIBIT VIII-64

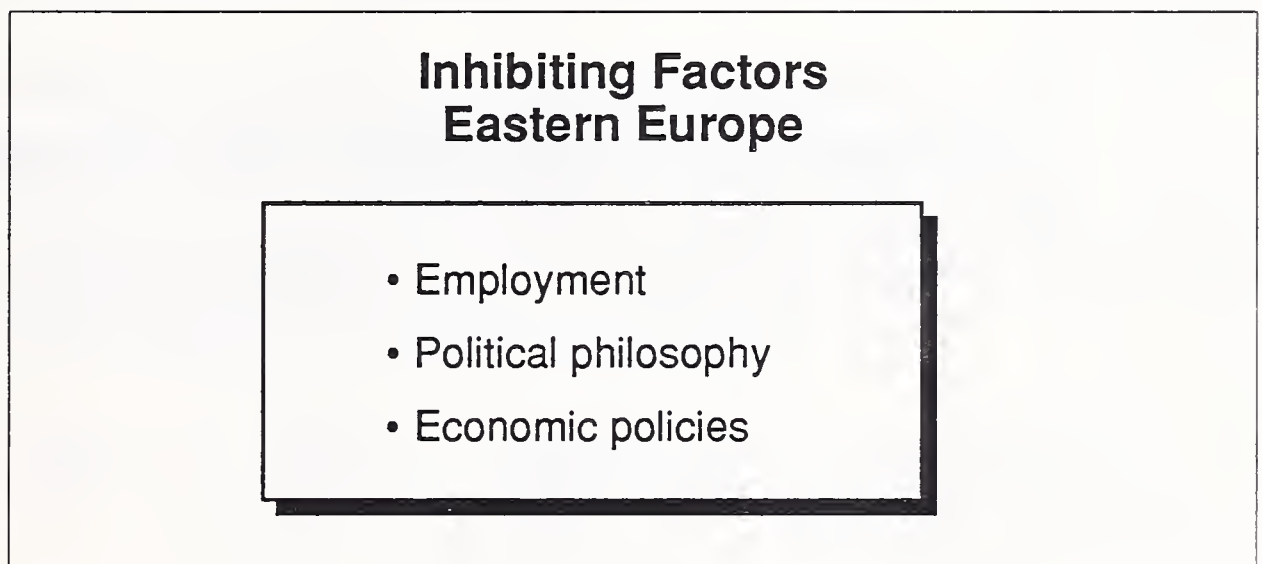


- *Industrial modernization*—The modernization of industry is the greatest driving force. All Eastern European countries recognize the need to place increased emphasis on productivity improvement tools.
- *Education*—The use of personal computers is the most frequently mentioned need for computing resources in many less developed countries. Increasingly, these countries recognize the need to develop a computer literate population.

b. Inhibiting Factors

- Exhibit VIII-65 shows a number of inhibiting forces. In the near term, the inhibiting forces could significantly impact the ability of Eastern European countries to realize the benefits of technology. Key inhibiting factors include:

EXHIBIT VIII-65



- *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 is not expected to disappear in the near term. The differences will continue to limit the opportunity to transfer technology to any great degree.
- *Economic policies*—Continuation of policies that limit the availability of hard currencies will limit opportunities to take advantage of western technology.

5. Services Forecast

The market for information services in Eastern Europe is believed to be limited. Because of economies that are struggling to develop basic infrastructures, political systems that retain some orientation to communism, and heavily bureaucratic processes, opportunities for technology-based services appear to be minimal.

Within Eastern Europe, the total market size for information services is estimated to be no more than \$110 million, primarily software for a limited number of low-end computers. Exhibit VIII-66 shows INPUT's forecast.

Overall growth is estimated to be approximately 14% per year for the next several years, resulting in a market of approximately \$200 million by 1994. These figures assume continued economic development and political liberalization. Reversals in the current political trends could have a significant effect on growth of the information services industry.

- Of the total estimated market for 1989 (\$110 million), approximately \$70 million is believed to be for software. Of the remaining \$40 million, the majority is believed to be for professional services related to the development of an information technology infrastructure.

EXHIBIT VIII-66

Market Forecast—Eastern Europe, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 10 | 10 | 10 | 10 |
| Network Services | - | - | - | - |
| Software Products | 70 | 70 | 140 | 15 |
| Turnkey Systems | 10 | 10 | 20 | 15 |
| Systems Integration | - | - | - | - |
| Professional Services | 10 | 20 | 30 | 15 |
| Total | 100 | 110 | 200 | 14 |

*Figures may not add due to rounding
 - Market size less than \$10 million not shown

6. Market Entry/Expansion Considerations

A number of Eastern European countries (Hungary, Poland, Czechoslovakia) have begun to initiate national development programs, but the process is expected to be lengthy and the results uncertain.

In the short and near term, the most significant opportunities appear to be for educational-based systems and services. Most countries are expressing interest in products and services that will transfer technology that will help with national development.

A significant consideration is whether recent political and economic changes will continue or whether countries will revert to their previous insular orientation. Some economists anticipate that at least another two to three years will be needed to determine whether the current trends will continue.

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 represent the greatest opportunities.

J**Finland****1. Introduction**

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 \$940 million.

2. Economic and Political Setting

Finland is a newly rich country in Europe with a per-capita GDP of \$21,400. The economy has been growing 2.8% per annum in the last decade, compared with a European average of 1.6%.

The economy, which grew an estimated 5.2% in 1988, is projected to grow 2.5% in 1990. Inflation in 1990 is projected to be 6%. Finland's account deficit is expected to increase from \$3 billion in 1988, to \$4 billion in 1989, to \$5 billion in 1990.

Finland was cushioned to some extent from the economic depression of the early eighties by its closeness to the Soviet Union, which provided oil and natural gas in exchange for manufactured goods.

However, Russia's share of Finnish trade has reduced from 26% to 13%; the EEC now accounts for 44% of Finland's trade. "Finladization," used to refer to the special relationship with Russia, is certainly more respectable now because of economic success, and is perceived by many as a possible model for Eastern European countries emerging from many years of economic failure.

Despite glasnost, it is improbable that Finland, unlike Austria, could consider full membership in the EEC. An opening of East-West trade could also threaten Finland's secure markets in the Soviet Union.

The attitude of the European Commission to countries (such as Finland) that enjoy a special relationship but that do not have to contribute to the structural funds and the EEC budget, will be critical to the future prospects of tackling an increasing trade deficit.

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

3. Services Forecast

The Finnish software and services market is forecast by INPUT to grow from \$935 million in 1989 to \$2.1 billion by 1994. Exhibit VIII-67 shows that the average growth rate over this five-year period is seen to be 18% per year.

EXHIBIT VIII-67

Market Forecast—Finland, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 220 | 235 | 335 | 7 |
| Network Services | 25 | 37 | 120 | 26 |
| Software Products | 200 | 260 | 655 | 20 |
| Turnkey Systems | 120 | 140 | 350 | 20 |
| Systems Integration | 9 | 12 | 41 | 26 |
| Professional Services | 210 | 255 | 640 | 20 |
| Total | 784 | 939 | 2,141 | 18 |

*Figures may not add due to rounding

As in other Scandinavian countries, the processing services sector is strong in Finland. Processing services represent 25% of the total Finnish software and services industry, some 10% more than the average for the whole of Europe.

The fastest growth sector is forecast by INPUT to be systems integration, with a 28% average growth rate over the five-year period 1989 to 1994. Network services is also expected to sustain high growth, an average of 26% per year.

Exhibits VIII-68 through VIII-73 provide a breakdown of the market for services for each of the delivery modes in Finland.

EXHIBIT VIII-68

**Market Forecast, Processing Services
Finland, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 200 | 220 | 290 | 6 |
| Systems Operations | 16 | 20 | 46 | 19 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 216 | 240 | 336 | 7 |

*Figures may not add due to rounding

EXHIBIT VIII-69

**Market Forecast, Network Services
Finland, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 19 | 23 | 69 | 25 |
| Network Applications | 7 | 14 | 49 | 28 |
| Total | 25 | 37 | 118 | 26 |

*Figures may not add due to rounding

EXHIBIT VIII-70

**Market Forecast, Software Products
Finland, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 125 | 110 | 310 | 23 |
| Systems Software | 74 | 150 | 345 | 18 |
| Total | 199 | 260 | 655 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-71

**Market Forecast, Turnkey Systems
Finland, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 69 | 75 | 155 | 16 |
| Packaged Software | 36 | 43 | 130 | 25 |
| Custom Software | 8 | 12 | 31 | 22 |
| Other Professional Services | 7 | 8 | 31 | 31 |
| Total | 120 | 138 | 347 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-72

**Market Forecast, Systems Integration
Finland, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 4 | 5 | 14 | 22 |
| Packaged Software | 0 | 1 | 2 | 20 |
| Other Services | ** | ** | 1 | 14 |
| Professional Services | 5 | 6 | 23 | 29 |
| Total | 9 | 12 | 40 | 24 |

*Figures may not add due to rounding

**Only minimal amounts noted

EXHIBIT VIII-73

**Market Forecast, Professional Services
Finland, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 30 | 37 | 96 | 21 |
| Education and Training | 12 | 14 | 34 | 19 |
| Software Development | 170 | 205 | 505 | 20 |
| Systems Operations | 2 | 3 | 8 | 23 |
| Total | 214 | 259 | 643 | 20 |

*Figures may not add due to rounding

4. Competitive Environment

The largest Finnish software and services vendor is the public sector company Tietotehdas. In 1988, it had total software and services revenue in Finland of \$125 million, and controlled some 16% of total market revenues.

Tietotehdas specializes in professional services for the banking, insurance, and engineering 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 also Finnish-owned. Valtion Tietokoneskus (VTKK) is the Finnish State Computer Centre. In 1988, Finnish revenues were about \$80 million, some three-quarters of which were derived from central government clients and the remainder from the private sector.

IBM and Digital are strong in software and services in Finland. Apart from Tietotehdas, nearly all Finnish vendors specialize in specific products or services.

There are close links between the Finnish and Swedish software and services markets. Language and culture are similar. However, Finland lags behind Sweden by some four years technically. Finland also has close links with the USSR. However, exports of high-tech products to the Soviet Union are restricted.

K**France****1. Introduction**

France has a population of 54 million and is a founding member of the European Economic Community (EEC). Its software and services market is the largest in Europe, with a total size of over \$12.1 billion.

2. Economic and Political Setting

A GDP per capita of \$16,900 and a relatively large population make France the second largest economy in Europe. The economy is growing at approximately 3.4% per year. This growth rate is projected to decrease slightly to just under 3% for 1990.

Inflation is increasing slightly from its previous position of under 3%. Inflation is projected to be approximately 3.5% for 1990. France is running a current account deficit of \$3.6 billion. This deficit is expected to increase to \$5 billion in 1989 and \$6 billion in 1990.

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 and 1992.

In preparation for 1992, there has been considerable merger and acquisition activity in France in 1989 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 biggest 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 in how French industry will perform in a wider European market.

3. Services Forecast

The French market is the largest national market for computer software and services in Europe; France represents some 24% of the total European market.

INPUT estimated the 1989 French software and services market as \$12.1 billion and forecasts the market will grow to \$28.9 billion by 1994. These numbers are in Exhibit VIII-74. 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-74

Market Forecast—France, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|---------------|---------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 1,680 | 1,730 | 2,145 | 4 |
| Network Services | 510 | 670 | 1,970 | 24 |
| Software Products | 2,785 | 3,415 | 8,370 | 20 |
| Turnkey Systems | 1,070 | 1,245 | 3,065 | 20 |
| Systems Integration | 330 | 410 | 1,405 | 28 |
| Professional Services | 3,760 | 4,590 | 11,920 | 21 |
| Total | 10,135 | 12,060 | 29,235 | 19 |

*Figures may not add due to rounding

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

Professional services currently represent some 38% 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.

Exhibits VIII-75 through VIII-80 provide a breakdown of the market for services for each of the delivery modes in France.

EXHIBIT VIII-75

**Market Forecast, Processing Services
France, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 1,550 | 1,575 | 1,785 | 3 |
| Systems Operations | 130 | 155 | 360 | 18 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 1,680 | 1,730 | 2,145 | 4 |

*Figures may not add due to rounding

EXHIBIT VIII-76

**Market Forecast, Network Services
France, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 315 | 420 | 1,160 | 23 |
| Network Applications | 195 | 250 | 810 | 26 |
| Total | 510 | 670 | 1,970 | 24 |

*Figures may not add due to rounding

EXHIBIT VIII-77

**Market Forecast, Software Products
France, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Software Products | | | | |
| Application Software | 1,130 | 1,405 | 3,957 | 23 |
| Systems Software | 1,655 | 2,010 | 4,410 | 17 |
| Total | 2,785 | 3,415 | 8,367 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-78

**Market Forecast, Turnkey Systems
France, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|--------------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Turnkey Systems | | | | |
| Equipment | 610 | 685 | 1,380 | 15 |
| Packaged Software | 320 | 385 | 1,135 | 24 |
| Custom Software | 75 | 99 | 275 | 23 |
| Other Professional Services | 64 | 75 | 275 | 30 |
| Total | 1,069 | 1,244 | 3,065 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-79

Market Forecast, Systems Integration France, 1989-1994

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 140 | 170 | 465 | 22 |
| Packaged Software | 20 | 24 | 84 | 28 |
| Other Services | 10 | 12 | 28 | 18 |
| Professional Services | 160 | 205 | 830 | 32 |
| Total | 330 | 411 | 1,407 | 28 |

*Figures may not add due to rounding

EXHIBIT VIII-80

Market Forecast, Professional Services France, 1989-1994

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|--------------|---------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 410 | 505 | 1,250 | 20 |
| Education and Training | 315 | 380 | 1,020 | 22 |
| Software Development | 3,005 | 3,665 | 9,510 | 21 |
| Systems Operations | 32 | 41 | 136 | 27 |
| Total | 3,762 | 4,591 | 11,916 | 21 |

*Figures may not add due to rounding

France has the largest number of domestic software and services vendors of any European country, some 6,000.

Compared with the other three major European markets—West Germany, the U.K. and Italy—the French market has the lowest penetration by foreign vendors, only some 18%. Although domestic vendors are strong and France is the largest European market, few French vendors are major exporters.

French vendors that have moved into export markets have tended to look south to Spain and Italy, rather than to the north (apart from Belgium, which is French-speaking). Many French financial institutes have direct financial interests in French vendors; the state maintains very close working relationships with the French software and services industry.

Up to the mid-1980s, there was a strong bias toward French suppliers in many areas of the French market. Local government contracts were nearly always based on Bull equipment.

However, with the European Commission pushing for a more open EEC, especially with its 1992 initiative, the French market has changed. France is at the center of the EE and is the most pro-European nation. It has already dropped many of its national biases and is more accessible to foreign vendors.

4. Competitive Environment

As Exhibit VIII-81 illustrates, eight of the top vendors in the French market are French. IBM is the largest software and services vendor, with 1988 revenues in France of \$615 million. The largest French vendor is Cap Gemini Sogeti, which is also the largest independent European software and services vendor.

Cap Gemini Sogeti and Sema Group Sema is tied for the seventh largest French vendor) are two of Europe's leading professional services vendors, underlining the strength of the French in this market sector.

Cap Gemini Sogeti has spread its professional services and systems integration expertise through Europe, and in many European countries is one of the top vendors.

Sema Group was formed in 1988 through the merger of Sema Metra of France and Cap Group of the U.K. Sema Group is also very strong in professional services and systems integration.

EXHIBIT VIII-81

Top Ten Vendors—France, 1988

| Rank | Company | Market Share (Percent) | Estimated Revenues (\$ Millions) |
|------|-------------------|------------------------|----------------------------------|
| 1 | IBM | 6.1 | 615 |
| 2 | Cap Gemini Sogeti | 4.3 | 435 |
| 3 | Bull | 3.3 | 335 |
| 4 | Sligos | 2.6 | 265 |
| 5 | GSI | 1.6 | 160 |
| 5 | Concept | 1.6 | 160 |
| 7 | Sema | 1.2 | 125 |
| 7 | CISI | 1.2 | 125 |
| 9 | CGI | 1.1 | 115 |
| 10 | Unisys | 1.0 | 105 |
| | Other | 75.9 | 7,700 |
| | Total | 100.0 | 10,140 |

The third-largest French software and services vendor, Bull, is the only major French equipment vendor. As with nearly all European equipment vendors, over 50% of Bull's revenues are generated from its domestic base.

The banking and finance market is an important market in France, accounting for some 20 to 25% of the total software and services market.

Sligos, the second largest domestic French vendor, is owned 63% by the bank Crédit Lyonnais and offers a wide range of products and services—from processing services of credit cards to turnkey systems on PCs.

In late 1987, GSI underwent a management buyout from Alcatel. GSI has one of the largest independent European-owned networks that was not developed through a European PTT.

The French market is concerned about growing competition in the 1990s. It recognizes that U.K. vendors are strong in banking, finance, and insur-

ance and could well capture significant shares of this important sector of the French market. The French also recognize the potential threat from U.S. vendors.

To exploit a more open Europe in the 1990s, leading vendors will have to have good pan-European coverage and must be involved in the French market, which is so central to the total EEC software and services market.

U.S. vendors in particular have better pan-European organizations than many European vendors and than most French vendors, except for the few leading vendors that have already successfully moved into export markets.

L**Hong Kong****1. Introduction**

As the transition from an independent business center under the arms-length control of England to a province of the People's Republic of China (PRC) occupies considerable time and resources, a growing technological infrastructure provides a base for continued development of information services in Hong Kong.

Key to continued development will be the belief of Hong Kong residents in continued independence, following the change of control to the PRC in 1997. Positive signals from Beijing will stimulate continued growth. Negative signals could significantly affect investment in technology projects with long-term return.

2. Economic and Political Setting

The transfer of power from England to China in 1997 dominates political considerations. Most significant is acceptance by Hong Kong residents of the sincerity of the PRC in abiding by the Basic Law being drafted and of the degree of economic and political freedom in Hong Kong after 1997.

An economic center of only 404 square miles, Hong Kong has a population of more than five million. Although the majority of the population are refugees, the business center is one of the most sophisticated in the world.

With a heavy concentration of export manufacturing, Hong Kong has consistently achieved a growth rate of over 7% per year. With a general rebound in the world economy, Hong Kong is expected to have a growth rate that could exceed 10% for 1989. During the same period, inflation is expected to be approximately 9%, due to rising wage scales.

A key contributor to rising wages is the rate of emigration. Fear of the transition in power is causing many middle management and skilled professionals to move to other countries such as Canada and Australia. This outflow is creating a significant shortage of trained technical and managerial personnel.

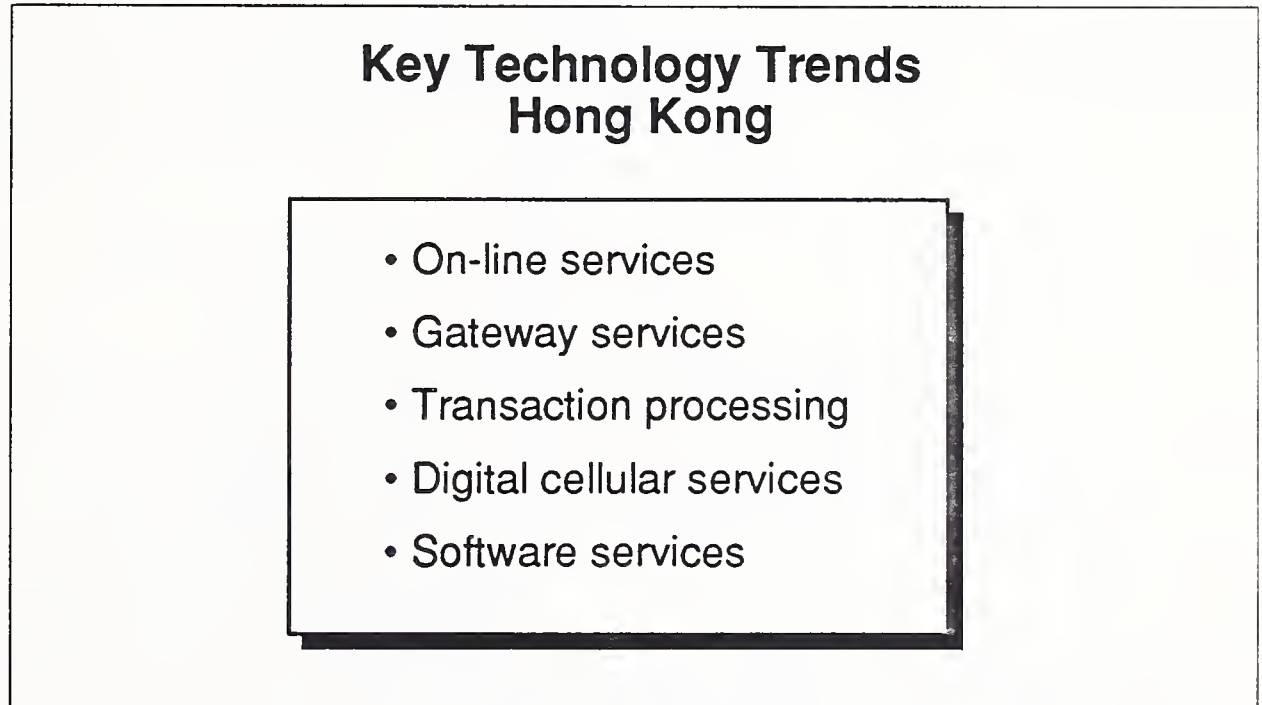
The economic and political future of Hong Kong is unknown. Some believe that the change will have little effect in the long term. Others believe that the change will signal the beginning of a decline of Hong Kong as an economic center in the Asia/Pacific area.

Due to such uncertainty, many companies have adopted a wait-and-see attitude and are preparing defensive investment strategies that will protect long-term positions. However, significant investment is being made and a continuation is expected for the next several years.

3. Key Technology Trends

Key trends in technology are shown in Exhibit VIII-82.

EXHIBIT VIII-82

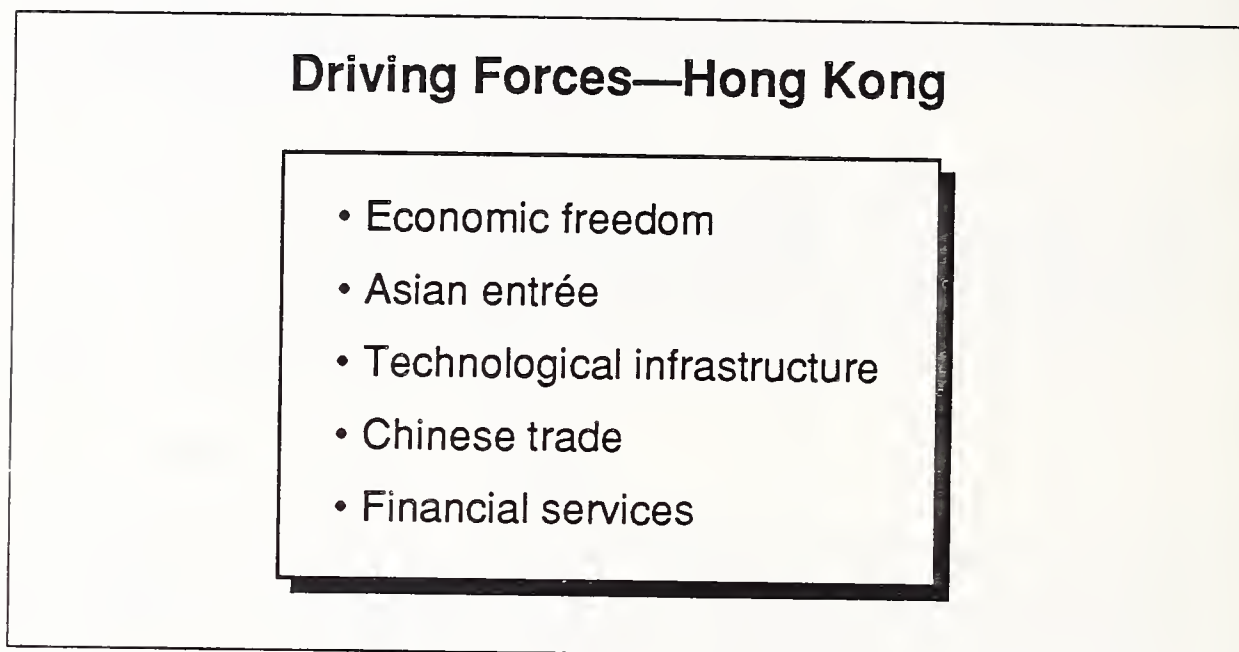


- *On-line services*—With a basic infrastructure in place, focus is being placed on the development of on-line services such as cable-based services and interactive cable TV. A major development effort to implement a major new cable network has recently been awarded.
- *Gateway services*—As well as being a developed technological center, Hong Kong continues to be a primary gateway for information services provided to other countries in southeast Asia.
- *Transaction processing*—As work shifts from an economy based on manual labor to one based on information, the country is becoming a leader in developing transaction processing services. Continued emphasis on on-line transaction processing (OLTP) services is expected to continue.
- *Digital cellular services*—Digital cellular services have exhibited strong growth over the past several years. Growth is expected to continue for at least the next three to four years.
- *Software services*—There is a continuing need for quality software services. Historically, foreign firms have not provided high quality support for products brought to the colony. This lack of support has resulted in a generally poor quality of software being used.

4. Environmental Factors

Exhibit VIII-83 illustrates the forces contributing to the continued growth of information services in Hong Kong.

EXHIBIT VIII-83



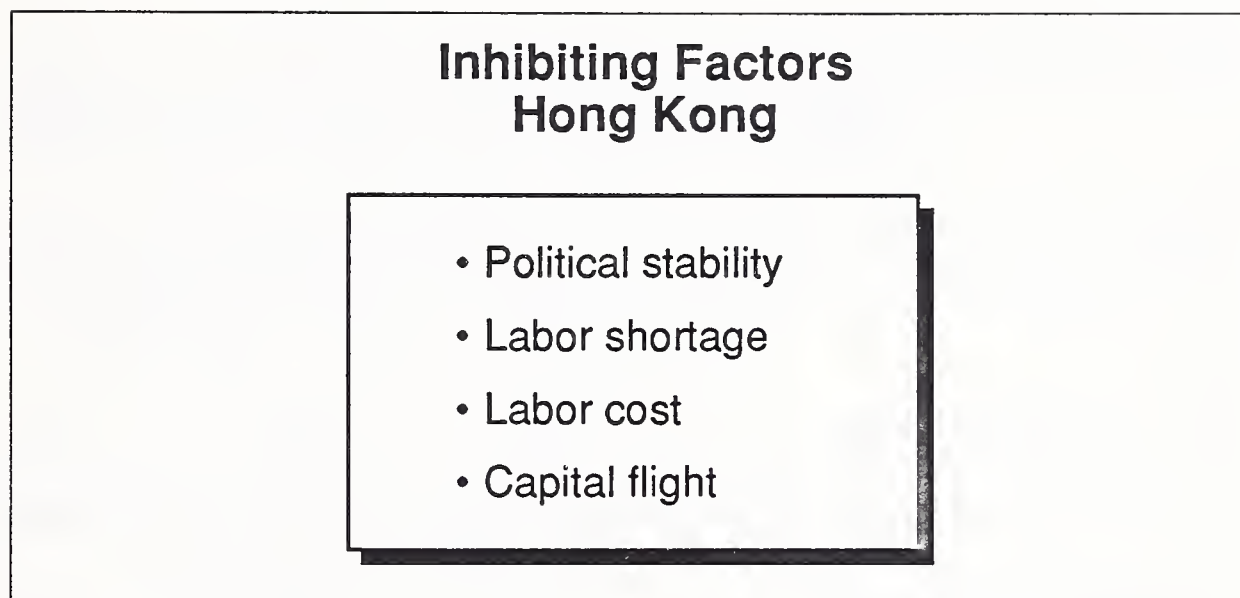
a. Driving Forces

- *Economic freedom*—A policy of “positive nonintervention” contributes to a continuing flow of funds to develop and provide an increasing number of services.
- *Asian entrée*—Numerous firms continue to recognize Hong Kong as the primary center for entrée into the Asian market.
- *Technological infrastructure*—Hong Kong has a developed technological infrastructure that provides a base for the use of advanced products, particularly in the area of financial services.
- *Chinese trade*—Hong Kong is the recognized center for contacts and business development with the People’s Republic of China.
- *Financial services*—As a financial center for southeast Asia, Hong Kong is in continuing need of services to improve its position in the world financial community.

b. Inhibiting Factors

Exhibit VIII-84 lists a number of inhibiting factors that could have a significant effect on future development in the colony.

EXHIBIT VIII-84



- *Political stability*—Concern over long-term political stability is expected to continue to be the most significant factor affecting future investment and development.
- *Labor shortage*—There is a growing shortage of skilled labor in the colony. Emigration is diluting the labor force and driving up wages. The colony is in need of services that can supplant the waning pool of middle management and technical skills.
- *Labor cost*—With the declining labor supply, salaries are increasing. This increase is contributing to a number of firms considering other areas as opportunities for investment.
- *Capital flight*—Also related to the political situation, a number of firms are protecting their economic position by moving portions of their capital from the colony, thus reducing the amount of funds available for long-term investment.

5. Leading Vendors

All major U.S., European, and Japanese vendors of hardware and software are represented in Hong Kong. In addition, many information services have representation through local firms.

The least represented are firms providing software support. Although most products are available, after-sales support is generally considered quite poor.

6. Services Forecast

Exhibit VIII-85 shows that the market for information services in Hong Kong is estimated to be approximately \$400 million in 1989. The market will grow to approximately \$1 billion by 1994. Although the size of the economic base could suggest that the market might be bigger, there are three reasons why this is not the case.

EXHIBIT VIII-85

Market Forecast—Hong Kong, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 64 | 71 | 115 | 10 |
| Network Services | 19 | 23 | 61 | 22 |
| Software Products | 120 | 190 | 510 | 22 |
| Turnkey Systems | 29 | 32 | 66 | 15 |
| Systems Integration | 16 | 19 | 49 | 21 |
| Professional Services | 76 | 95 | 285 | 25 |
| Total | 324 | 430 | 1,086 | 23 |

*Figures may not add due to rounding

- A key reason that the market is not greater is the nature of the business community. Many major users of information services are foreign firms that acquire hardware and support services (maintenance, etc.) locally, but rely on a headquarters office in another country for much of their software, software development, and consulting services.
- Unlike Japan, the U.S., and the countries of Europe, Hong Kong has a comparatively low industrial base. Hong Kong's GNP is derived primarily from labor-intensive and financial trade businesses.
- In Hong Kong, industry contributes only 28% to the total GNP; the contribution of industry is more than 40% in Japan. In addition, a large portion of the industrial community is geared to the re-export of products (adding value to imported products that are subsequently exported). Without a large and growing industrial base, the potential market for information services products is reduced.

As shown in Exhibit VIII-86, the market for processing services is estimated to be approximately \$70 million. The market will grow at a steady 10% per year to an estimated \$115 million by 1994.

- The market for processing services is expected to continue to grow, and to be driven by general increases in the volume of business by companies that are too large for micro systems and have not identified a suitable mini or mainframe solution.

EXHIBIT VIII-86

Market Forecast, Processing Services Hong Kong, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 32 | 36 | 60 | 11 |
| Systems Operations | 16 | 17 | 27 | 9 |
| Utility Processing | 10 | 11 | 18 | 10 |
| Other Processing | 6 | 7 | 11 | 10 |
| Total | 64 | 71 | 116 | 10 |

*Figures may not add due to rounding

Exhibit VIII-87 shows that network services are expected to show strong growth (22%) for the next several years, from \$23 million in 1989 to \$60 million in 1994.

EXHIBIT VIII-87

Market Forecast, Network Services Hong Kong, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 8 | 10 | 26 | 22 |
| Network Applications | 11 | 13 | 36 | 22 |
| Total | 19 | 23 | 62 | 22 |

*Figures may not add due to rounding

- The recent awarding of a contract to build a new network for the delivery of cable services could drive the market for network services higher than projected.
- However, considering the time necessary to build the network, the added revenues should not be notable until near the end of the five-year horizon.
- Services such as E-mail and EDI will also help to drive the market; however, the implementation of EDI is just beginning and it will be several years before significant revenues are derived.

Exhibit VIII-88 illustrates that the software market is growing at a high rate (28%) as companies seek vendors that will provide the quality of products and follow-on support services that are needed. Growth is expected to be from \$150 million in 1989 to over \$500 million in 1994.

- The greatest opportunity for software products is in Application Software for the constantly expanding micro market. Next most advantageous systems control products needed to support increasingly sophisticated financial systems. Neither of these opportunities is expected to abate in the next few years.

Exhibit VIII-89 illustrates that the market for turnkey systems is expected to grow from \$32 million to an estimated \$66 million by 1994.

EXHIBIT VIII-88

**Market Forecast, Software Products
Hong Kong, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 60 | 78 | 290 | 30 |
| Systems Software | | | | |
| Systems Control | 29 | 37 | 122 | 27 |
| Data Center Mgt. | 17 | 20 | 51 | 20 |
| Application Dev. | 12 | 15 | 46 | 25 |
| Total | 118 | 150 | 509 | 28 |

*Figures may not add due to rounding

EXHIBIT VIII-89

**Market Forecast, Turnkey Systems
Hong Kong, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 14 | 15 | 35 | 18 |
| Packaged Software | 7 | 8 | 12 | 10 |
| Custom Software | 3 | 3 | 7 | 15 |
| Other Professional Services | 5 | 6 | 12 | 15 |
| Total | 29 | 32 | 66 | 15 |

*Figures may not add due to rounding

- The market for turnkey systems is driven primarily by companies that are outgrowing their micro systems and seeking mini and mainframe solutions. In addition, there is an increasing number of smaller businesses in need of micro-based solutions.
- Note should be made however, that there will be a higher demand for customized rather than packaged software. Negative experience with support of packaged software has led many companies to customized software and increased reliance on local providers for after-sales support.

The market for systems integration in Hong Kong is small as shown in Exhibit VIII-90. The 1989 market is estimated to be approximately \$20 million. The market will grow at 21% per year to reach \$50 million by 1994.

EXHIBIT VIII-90

Market Forecast, Systems Integration Hong Kong, 1989-1994

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 8 | 10 | 24 | 20 |
| Packaged Software | 2 | 2 | 4 | 12 |
| Other Services | 2 | 2 | 3 | 8 |
| Professional Services | 4 | 5 | 18 | 28 |
| Total | 16 | 19 | 49 | 21 |

*Figures may not add due to rounding

- The small market size for systems integration products and services is a reflection of the nature and composition of the business community in Hong Kong.
- Since many of the larger companies are foreign, major systems changes (systems integration) are initiated and managed by the headquarters office. In addition, many of the service sector firms are too small for systems integration services.

Exhibit VIII-91 shows that professional services are expected to grow from an estimated \$100 million in 1989 to nearly \$300 million in 1994—an annual rate of 25%.

EXHIBIT VIII-91

**Market Forecast, Professional Services
Hong Kong, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Professional Services | | | | |
| Consulting | 15 | 20 | 72 | 30 |
| Education and Training | 9 | 11 | 26 | 19 |
| Software Development | 46 | 58 | 175 | 25 |
| Systems Operations | 6 | 7 | 12 | 12 |
| Total | 76 | 96 | 285 | 25 |

*Figures may not add due to rounding

- As noted in the exhibit, the key requirement for professional services is in the area of software development. This requirement results from the need to develop and support custom software as a result of the general lack of acceptance of packaged products.

The market for information products and services should remain strong for at least the next several years. Although the situation is not entirely clear, there is an expectation among some managers expect that a number of companies are making investments now and could reduce or curtail investments as 1997 draws near.

As the government changes take place, many companies may want to be able to react quickly for at least the first couple of years following the change.

7. Market Entry/Expansion Considerations

Entry into the market is generally easy. However, with cost for facilities already high and the rising labor rates, operating costs can be quite high. Key opportunities are for telecommunications and for software support services. Hong Kong also provides opportunities for entrée into China.

M**Italy****1. Introduction**

Italy, with a population of 57 million, is a founding member of the European Economic Community (EEC). The software and services market is the fourth largest in Europe—after France, Germany, and the United Kingdom. The size is \$5.8 billion.

2. Economic and Political Setting

Italy has a GDP per capita of \$14,400, which, with the second largest population, makes Italy the third most important economy in Europe.

The economy grew 3.9% in 1988 and is projected to grow 2.5% in 1990. Inflation in 1988 was estimated to be 5%; inflation is expected to grow to 5.6% by 1990. Italy is running a significant current account deficit. In 1988, the deficit exceeded \$5 billion and is expected to reach \$11 billion in 1989 and \$13 billion in 1990.

The conventional wisdom in Europe has tended to be that a strong, stable government is good for the economy. Italy has had more changes in government since the late 1940s than any other country in western Europe, but it has still experienced considerable growth and prosperity. The economy has grown at 20% in real terms, and for much of that time there have been rapidly changing governments or no government at all.

The state has a very important role in Italian industry. Four Italian companies—IRI, Fiat, ENI, and Montedison—are in the European top 500; IRI and ENI are state-owned.

Geographically, Italy can be divided into the industrial north, with a preponderance of small and medium-sized businesses; the administration and bureaucracy centered around Rome; and the poor south. A great deal of government and EEC financing is taking place in the south of Italy to level out the strong differences in regional wealth.

Opinion polls show that the Italians are the most pro-European, but they are lagging behind other European countries in implementing the legislation for the Single European Act.

Forced to liberalize the economy and public procurement, there is a very real dilemma in predicting how Italy's strong public sector will survive in a more competitive market, however, the strength and sheer number of small Italian businesses has always provided the economy with considerable strength and flexibility.

3. Services Forecast

As shown in Exhibit VIII-92, the Italian market is forecast by INPUT to grow from \$5.8 billion in 1989 to \$14.2 billion by 1994. The average growth rate over this five-year period is projected to be 20% per year. Italy is the fourth-largest national software and services market in Europe.

EXHIBIT VIII-92

Market Forecast—Italy, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-------|--------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 765 | 835 | 1,240 | 8 |
| Network Services | 225 | 320 | 910 | 23 |
| Software Products | 1,745 | 2,165 | 5,565 | 21 |
| Turnkey Systems | 450 | 520 | 1,250 | 19 |
| Systems Integration | 140 | 170 | 590 | 28 |
| Professional Services | 1,455 | 1,790 | 4,635 | 21 |
| Total | 4,780 | 5,800 | 14,190 | 20 |

*Figures may not add due to rounding

Relative to the overall European software and services market, the Italian market is stronger in software products and professional services than in other delivery modes.

Exhibits VIII-93 through VIII-98 provide a breakdown of the market for services for each of the delivery modes in Italy.

EXHIBIT VIII-93

**Market Forecast, Processing Services
Italy, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | | | | |
| Transaction Services | 680 | 740 | 995 | 6 |
| Systems Operations | 82 | 99 | 250 | 20 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 762 | 839 | 1,245 | 8 |

*Figures may not add due to rounding

EXHIBIT VIII-94

**Market Forecast, Network Services
Italy, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|---------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Network Services | | | | |
| Electronic Information Services | 175 | 250 | 640 | 21 |
| Network Applications | 50 | 71 | 270 | 31 |
| Total | 225 | 321 | 910 | 23 |

*Figures may not add due to rounding

EXHIBIT VIII-95

**Market Forecast, Software Products
Italy, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|-------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 760 | 945 | 2,780 | 24 |
| Systems Software | 985 | 1,215 | 2,785 | 18 |
| Total | 1,745 | 2,160 | 5,565 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-96

**Market Forecast, Turnkey Systems
Italy, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 255 | 285 | 560 | 14 |
| Packaged Software | 135 | 160 | 460 | 24 |
| Custom Software | 31 | 43 | 115 | 22 |
| Other Professional Services | 28 | 32 | 115 | 29 |
| Total | 449 | 520 | 1,250 | 19 |

*Figures may not add due to rounding

EXHIBIT VIII-97

**Market Forecast, Systems Integration
Italy, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 60 | 71 | 195 | 22 |
| Packaged Software | 7 | 9 | 35 | 31 |
| Other Services | 4 | 5 | 11 | 16 |
| Professional Services | 71 | 85 | 350 | 33 |
| Total | 142 | 170 | 591 | 28 |

*Figures may not add due to rounding

EXHIBIT VIII-98

**Market Forecast, Professional Services
Italy, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 200 | 245 | 715 | 24 |
| Education and Training | 105 | 130 | 385 | 24 |
| Software Development | 1,130 | 1,390 | 3,450 | 20 |
| Systems Operations | 21 | 30 | 81 | 24 |
| Total | 1,456 | 1,795 | 4,631 | 21 |

*Figures may not add due to rounding

Software products represent some 37% of the Italian information services market; software products are 28% for the whole of Europe. Professional services account for 31% of the Italian market, compared with 30% on average for Europe.

The greater proportion in Italy is explained by the fact that Italian end users prefer customized solutions to standard solutions. Turnkey systems therefore represent only some 9% of the market, compared with the European average of 17%.

Many vendors trying to sell solutions based on standard software application packages in Italy are forced to try to make the packages look as though they are customized solutions.

Manufacturing and business is centered in the north, around Milan. Government is in the geographical center of Italy, in Rome. In the Italian public sector, patronage and inefficiency have always been problems.

INPUT has observed during its research that the Italian government is opening public sector procurement tending to other EEC nations, including procurements for software and services. The Italian market is very pro-EEC.

U.S. vendors are strong in the Italian market and account for some 19% of total 1989 revenues. However, competition from European countries is small, accounting for only 2% of total Italian end-user revenues.

Only French software and services vendors have made a concerted effort to target the Italian market, often through acquisitions rather than by setting up local subsidiaries. Other European vendors have made little effort to export to Italy in a major way.

4. Competitive Environment

Exhibit VIII-99 lists the top 10 Italian vendors in 1988, as identified by INPUT.

IBM was the leading vendor and had Italian revenues of \$545 million. The Italian state has high involvement in many areas of the Italian economy, and also in major software and services vendors.

Finsiel, the largest domestic Italian vendor, is owned 83% by the state and 17% by Banca d'Italia. With 1988 revenues of \$470 million, Finsiel controlled 10% of the overall Italian market, and specializes in processing services and customized software development.

EXHIBIT VIII-99

Top Ten Vendors—Italy, 1988

| Rank | Company | Market Share (Percent) | Estimated Revenues (\$ Millions) |
|------|----------------------|------------------------|----------------------------------|
| 1 | IBM | 11.4 | 545 |
| 2 | Finsiel | 4.8 | 470 |
| 3 | Olivetti | 6.1 | 290 |
| 4 | Bull | 2.2 | 105 |
| 5 | Reuters | 1.5 | 70 |
| 6 | Cerved | 1.3 | 60 |
| 7 | Andersen | 1.2 | 55 |
| 8= | Database Informatica | 1.0 | 50 |
| 8= | Unisys | 1.0 | 50 |
| 8= | GEIS | 1.0 | 50 |
| | Other | 63.5 | 3,035 |
| | Total | 100.0 | 4,780 |

Olivetti, the Italian equipment vendor specializing in PCs and minicomputers, was the third largest software and services vendor in 1988. During 1988, Olivetti reorganized into market product groups (Olivetti Office, Olivetti Systems & Networks, Olivetti Information Services, and Olivetti Technology), as have many other European equipment vendors.

The Italian market is noted for its large number of small domestic vendors. INPUT estimates that there are some 4,000 domestic vendors active in the Italian market.

N

India

1. Introduction

An extremely poor country, India is beginning to emerge as a developer of high technology. Placing increased emphasis on the allocation of government resources for technology development, India is being recognized as a potential source of well-trained personnel for development projects.

2. Economic and Political Setting

Political and economic liberalization plans implemented by President Gandhi have run into some opposition in India, but plans have progressed to liberalize imports and rules concerning direct foreign investment in the country.

Progress toward industrialization has been slow, but progress has been made. As an indication of the changes that have taken place, the following table provides a summary of the percentage of GDP that is derived from key industrial sectors.

| | <u>1965</u> | <u>1987</u> |
|---------------|-------------|-------------|
| Agriculture | 47 | 30 |
| Industrial | 22 | 30 |
| Manufacturing | 15 | 20 |
| Services | 31 | 40 |

(Note that the manufacturing group is shown separate from the industrial group because of manufacturing's significance as part of the industrial group. Because of the separation, the figures total to more than 100%. The sum of the data for agriculture, industrial, and services is 100%.)

The continued rate of development is speculative. In 1988, plans to devote significant national funds to technology development had to be changed due a major drought that required use of the funds for economic relief in the agriculture sector. Continued diversion of funds will inhibit development.

In addition to the limit on national funds available to stimulate industrial development, the country has a fractious political environment. Regional political groups continue to seek increased representation in national affairs, thus creating instability.

3. Key Technology Trends

Key trends in India center on the need to provide a base from which to continue to develop the country. Exhibit VIII-100 shows these trends.

EXHIBIT VIII-100

**Key Technology Trends
India**

- Infrastructure development
- Network development
- Mini/Micro growth

- *Infrastructure development*—The country is expected to continue to invest in the development of the basic infrastructure by liberalizing trade and investment policies and encouraging partnerships that will result in a transfer of technology.
- *Network development*—Development of a national network is high on the list of national priorities. The country recognizes that a reliable communications capability is necessary to support multinational investment in the country.
- *Mini/Micro growth*—As in many newly developing countries, mini and micro systems are an increasingly important tool to achieve automation.

4. Environmental Factors

Exhibit VIII-101 shows the driving forces behind the development of information services.

EXHIBIT VIII-101

Driving Forces—India

- Industrial development
- Trade liberalization
- Technology transfer
- Software development

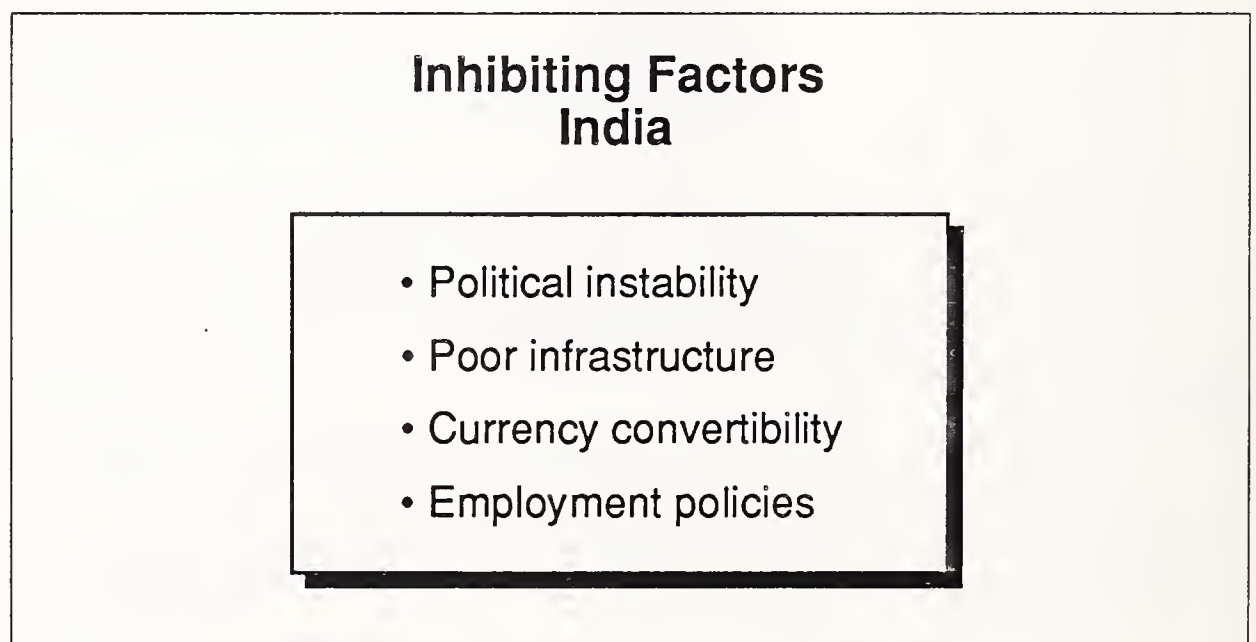
a. Driving Forces

- *Industrial development*—The country has made a commitment to moving from a rural, agrarian society to a knowledge-based society.
- *Trade liberalization*—Growth of information products and services is being stimulated by recent changes in trade policies. These changes encourage investment and partnering in information technology.
- *Technology transfer*—The country has expressed eagerness to enter into agreements that will permit the training and transfer of technology in a number of high-technology areas. India has particular interest in telecommunications products and services.
- *Software development*—The government believes that its highly trained, English-speaking workforce can provide resources for complex software development projects and is receptive to cooperative development arrangements.

b. Inhibiting Factors

Exhibit VIII-102 shows a number of inhibiting factors.

EXHIBIT VIII-102



- *Political instability*—With a fractious political environment, there are concerns about the long term political stability of the country. Reduced confidence restrains a number of firms from making long-term investments.
- *Poor infrastructure*—A poor technological infrastructure reduces the willingness of many countries to invest in the country.
- *Currency convertibility*—The inability to freely convert the local currency to other currencies restricts a company's ability to freely move funds to meet demands.

- *Employment policies*—Until recently, the government provided tax incentives to firms for hiring more people. There have been no incentives for investment in technology.

5. Leading Vendors

Until recently, there was only limited representation by U.S. firms in India. Policies that required companies to be majority owned by Indian nationals caused IBM to significantly reduce its representation.

Liberalization has stimulated a number of firms to re-enter the market. IBM reopened offices in major cities. Unisys has continued its presence through joint-venture agreements. DEC is reported to have limited representation.

The major information service companies are Indian. The two leaders are Tata Consulting (also Tata Unisys) and Wipro. Both are involved in hardware and software sales and service. Tata is the largest consulting company.

6. Services Forecast

The market for information services in India is small, but with economic stimulation, has the potential of becoming large. As shown in Exhibit VIII-103, the market in 1989 is estimated to be only slightly more than \$100 million. INPUT projects that the market will grow to \$600 million by 1994, an annual growth rate of 34%.

- *Processing services*—There are few firms providing these types of services due to the few number of firms that have sufficiently large processing requirements. With an industry that is oriented to hiring increasing numbers of people, there has been only limited demand for processing services.
- *Network services*—There is only a limited network capability in India. The infrastructure is poor and there is only limited demand for any of the traditional services. The demand that does exist results from the needs of multinational firms communicating with offices in other countries.
- *Software products*—The software industry is a bright spot in the industry and is expected to continue to grow. There are major national efforts to establish an offshore software development industry and there is high interest in use and development of all types of software. Micro software is in high demand.
- *Turnkey systems*—The demand for turnkey systems results from the demand for mini- and micro-based system solutions from the few, but growing, companies that are in need of processing solutions.

- *Systems integration*—Although there are undoubtedly some projects that could possibly qualify as systems integration, no recognizable market was identified. This situation could change over the next several years if the government is able to stimulate the information services industry.
- *Professional services*—There is high demand for professional services, particularly to participate in software development efforts. In addition, there is an increasing need for consulting services in the public sector to assist in preparing plans for the development of technology-based services.

EXHIBIT VIII-103

Market Forecast—India, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 11 | 12 | 19 | 10 |
| Network Services | 4 | 5 | 12 | 20 |
| Software Products | 43 | 57 | 240 | 30 |
| Turnkey Systems | 6 | 8 | 29 | 30 |
| Systems Integration | ** | ** | ** | ** |
| Professional Services | 42 | 59 | 315 | 40 |
| Total | 106 | 141 | 615 | 34 |

*Figures may not add due to rounding

7. Market Entry/Expansion Considerations

With an underdeveloped infrastructure and limited market opportunities, full representation would be considered less than cost-effective in the short and medium term.

However, since significant effort is being directed toward national development, representation through joint ventures is recommended as the most cost-effective method of entry or expansion in the market. Investment should be considered a long-term investment.

In the short and medium terms, the greatest areas of opportunity are in the development of telecommunications and in micro-based applications.

O**Japan****1. Introduction**

A country with a population approximately half the size of the U.S. (121 million) and a land area totaling less than the state of California (146,000 square miles), Japan has emerged as one of the most technologically advanced countries in the world.

The Japanese market for information services is the second largest in the world, following only the United States, but is estimated to contribute slightly less than 1% to the total GNP of the country. This is approximately half the relative amount that information services contributes in the United States.

Considering the increasing importance of information to the economy of Japan, there is ample opportunity for growth.

2. Economic and Political Setting

Despite the recent changes in the senior ranks of the Japanese government, the government is stable and is expected to remain stable for the foreseeable future.

Although there has been pressure for change from the Liberal (actually conservative) dominance to a more socialist government orientation, few significant changes are expected. Senior policymakers are aware of the failings of socialist policies in other parts of the world.

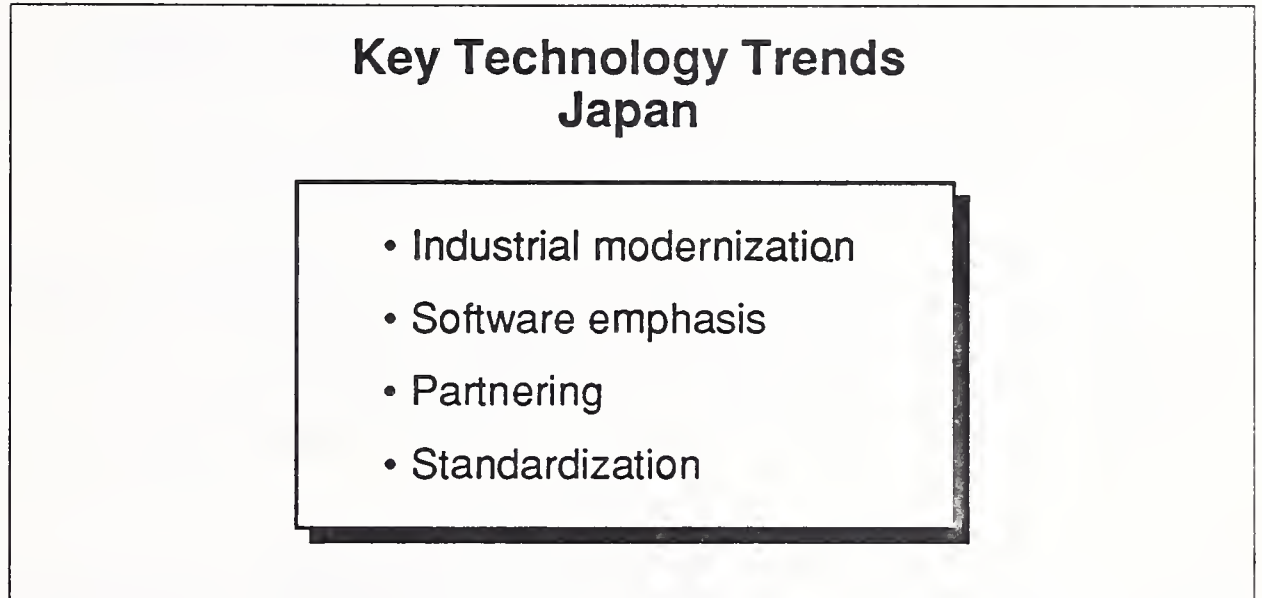
Overall, the government's economic policies are expected to remain essentially the same for the next several years, assuming no major disruptions in the global economic environment. Capital investment in Japan is expected to continue to be an estimated 10% per year, and overall growth in GNP is estimated to be approximately 5.5% per year for the next several years.

Although stability and growth is expected, trade friction is also expected to continue, with western countries pressuring Japan for greater freedom of Japanese markets and for Japan to assume greater responsibility for global economics.

3. Key Technology Trends

Although technologically sophisticated, Japan has yet to take full advantage of technology as a service. However, this picture is beginning to change. There are several trends that are expected to result in substantial changes over the next several years. The key trends are summarized in Exhibit VIII-104.

EXHIBIT VIII-104



- *Industrial modernization*—Although the production facilities (hardware) of Japanese industry are sophisticated, considerable work remains to be done in the front office and in the use of information.

The government has recognized the value of information and is providing inducements for investment in technology products such as software and for capital investment in new services such as cellular telephone and network services.

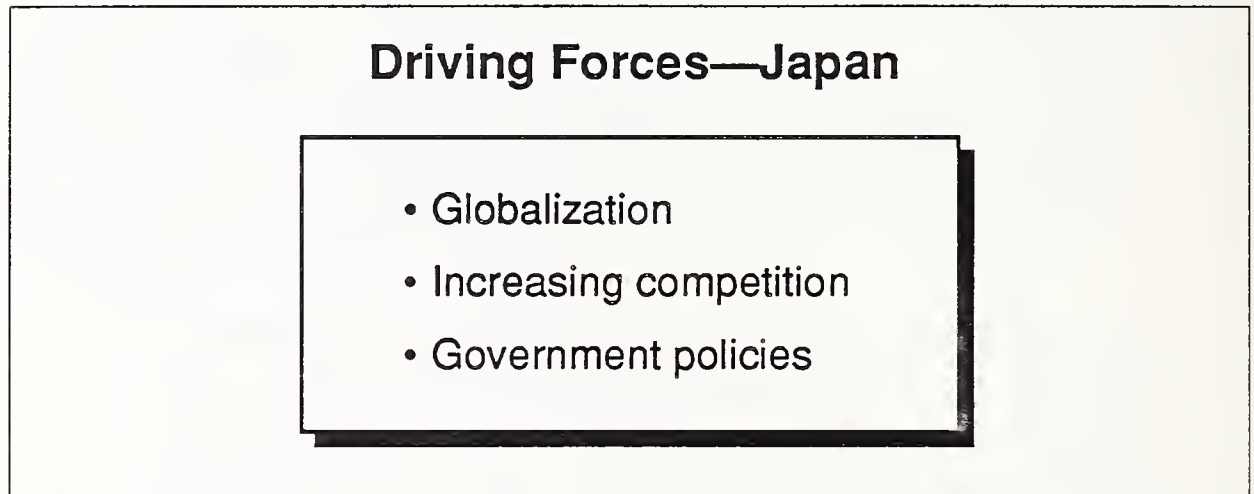
- *Software emphasis*—With a strong base in hardware, industry and government are beginning to place increased emphasis on the development of software.
- *Partnering*—There is an increasing trend toward the use of partners for the development of information services. There are indications that partners will be increasingly important as the country develops its software industry.
- *Standardization*—Japan has been a consistent supporter of international standards. The trend is expected to continue. Emphasis on standards is consistent with the Japanese interest in orderliness and common work interests.

4. Environmental Factors

a. Driving Forces

There are several forces causing changes in Japanese industry, as shown in Exhibit VIII-105.

EXHIBIT VIII-105



- *Globalization*—Japan is expanding its influence into other countries. Major Japanese companies have expanded, or will be expanding, into numerous countries. In addition, Japan is being pressured by international political and economic institutions to play more prominent role in the international community.

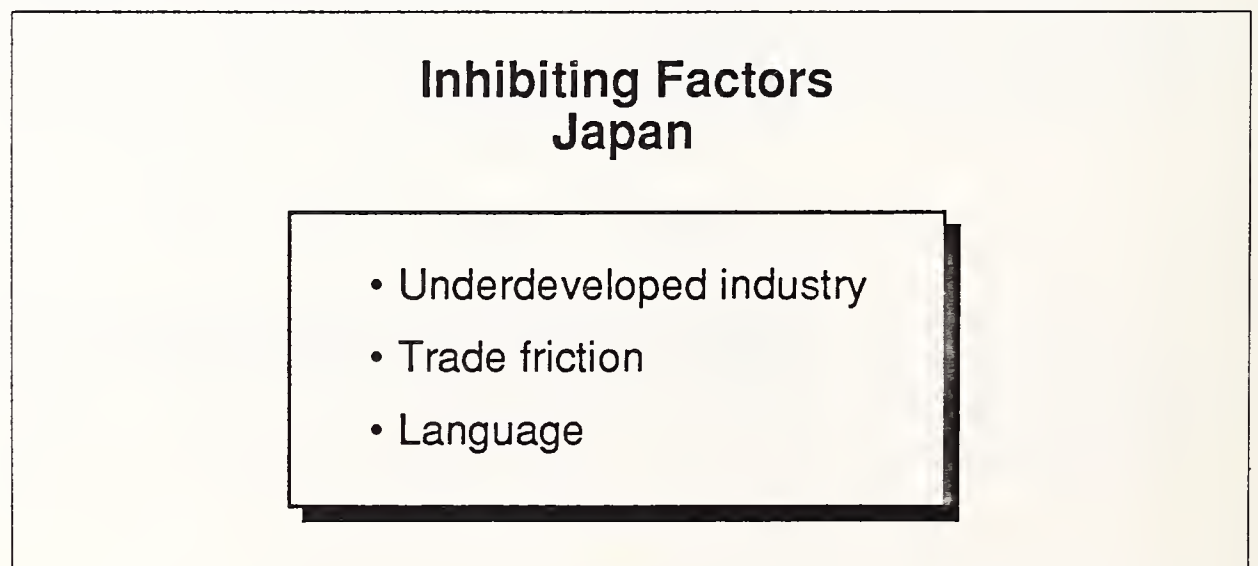
To meet the needs of a global competitive environment, Japanese companies need increased information services to meet local and international operating requirements.

- *Increasing competition*—An increasing number of organizations are entering the information services market. Large industrial companies have established separate information service subsidiaries.
- *Government policies*—Through financial incentives, the government is stimulating the growth of information services.

b. Inhibiting Factors

There are few inhibiting factors to growth of the information services industry in Japan. However, certain factors could continue to be a retarding force. The key factors are summarized in Exhibit VIII-106.

EXHIBIT VIII-106



- *Underdeveloped industry*—The information services industry in Japan is considered to be underdeveloped. The lack of development is inhibiting, due to an inability to take advantage of the key services. Time will be required for the newest services to be accepted and used.
- *Trade friction*—Continued trade friction could retard development of the information services industry. Having to continually respond to questions about market competitiveness and respond to international standards development issues has an inhibiting effect, since the Japanese are frequently reluctant to move aggressively prior to consensus on a subject.
- *Language*—Language differences continue to be a barrier for Japanese businesses. Japan has traditionally placed only limited emphasis on foreign language skills, making joint-development projects difficult and reducing the acceptance of foreign-language-based products.

5. Leading Vendors

There are numerous large and small vendors of information products and services in Japan, including representation of the majority of the large foreign companies. However, the majority of the market is dominated by several large companies. The largest companies and their estimated 1988 revenues (in U.S. dollars) are shown in Exhibit VIII-107.

EXHIBIT VIII-107

| Company | 1988 Revenue (\$ U.S. Billions) |
|-----------|------------------------------------|
| NTT Data | 1.7 |
| Fujitsu | 1.3 |
| Hitachi | 0.8 |
| IBM Japan | 0.8 |
| NEC | 0.7 |
| HIS | 0.5 |
| CSK | 0.4 |
| JAIS | 0.4 |
| Unisys | 0.4 |
| NKI/NCC | 0.3 |

6. Services Forecast

As indicated in Exhibit VIII-108, the market for information services in Japan is expected to grow from an estimated \$22 billion in 1989 to nearly \$51 billion in 1994. The overall growth rate is estimated to be approximately 19%.

EXHIBIT VIII-108

Market Forecast—Japan, 1989-1994

| Delivery Mode | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-------------|-------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 4.9 | 5.4 | 9.8 | 12 |
| Network Services | 0.6 | 0.7 | 2.0 | 22 |
| Software Products | 2.1 | 2.5 | 5.1 | 15 |
| Turnkey Systems | 2.7 | 3.0 | 5.5 | 13 |
| Systems Integration | 1.5 | 1.8 | 5.3 | 24 |
| Professional Services | 6.9 | 8.2 | 23.2 | 23 |
| Total | 18.7 | 21.6 | 50.9 | 19 |

*Figures may not add due to rounding

Although the total market for information services currently represents only an estimated 1% of the Japanese GNP (the U.S. industry is approximately 2% of the U.S. GNP), the size of the market makes Japan as the second largest market in the world; second only to that of the United States. The percentage of GNP is expected to grow over time.

Analysis of the delivery modes for the Japanese market indicates two key differences between the market in Japan and in other countries.

- First—The market for software products in Japan is estimated to be approximately 12% of the total information services market as compared to an estimated 30% in the United States. The low percentage is attributable to three reasons:

- The Japanese place high emphasis on the reliability of software and expend considerable added effort to ensure the reliability of products. The Japanese are frequently displeased with the quality of foreign software products.
- The Japanese generally prefer products that are industry- and task-specific, as compared to more-generalized packaged software available in the U.S. and Europe.
- The differences in language cause the Japanese considerable problems. Frequently, documentation and programs must be translated into Japanese to be fully usable.
- Second—The percentage of professional services is estimated to be nearly 38% of the industry. (Some estimates indicate that professional services should be closer to 50%).

The higher percentage of professional services is generally attributable to the increased level of custom software development in Japan.

Processing services represent the industry's second-highest category of services. Exhibit VIII-109 breaks out this category. The market for processing services is estimated to be approximately \$5.4 billion in 1989 and to grow to nearly \$10 billion by 1994.

- Within processing services, transaction services represent the highest category, resulting from the processing requirements of numerous medium-sized companies that have not implemented systems.
- Processing services are expected to continue to grow at a reasonable rate (12%). Because companies place increased emphasis on implementing mini- and micro-based processing solutions, higher rates are not expected.

EXHIBIT VIII-109

**Market Forecast, Processing Services
Japan, 1989-1994**

| Processing Services | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Transaction Services | 3.2 | 3.5 | 6.2 | 12 |
| Systems Operations | 1.0 | 1.2 | 2.4 | 15 |
| Utility Processing | 0.2 | 0.2 | 0.2 | -5 |
| Other Processing | 0.4 | 0.5 | 1.0 | 15 |
| Total | 4.9 | 5.4 | 9.8 | 12 |

*Figures may not add due to rounding

As a percentage of the information services industry, network services are comparatively small (3%). However, the rate of growth is expected to be approximately 22%, growing from an estimated \$700 million in 1989 to \$2 billion by 1994. Growth figures are in Exhibit VIII-110.

- Electronic information services are expected to represent the greatest portion of network services for the foreseeable future. Growth is expected to be attributable to new products and new forms of delivery. However, services such as EDI and E-mail will ensure that the growth of network applications remains strong.

The Japanese software industry has been comparatively slow to develop. In the U.S., software accounts for an estimated 30% of industry revenues. In Japan, software products account for an estimated 12% of the industry. Exhibit VIII-111 shows the software forecast.

EXHIBIT VIII-110

**Market Forecast, Network Services
Japan, 1989-1994**

| Network Services | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 0.5 | 0.6 | 1.6 | 22 |
| Network Applications | 0.1 | 0.1 | 0.4 | 22 |
| Total | 0.6 | 0.7 | 2.0 | 22 |

*Figures may not add due to rounding

EXHIBIT VIII-111

**Market Forecast, Software Products
Japan, 1989-1994**

| Software Products | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 1.1 | 1.3 | 2.6 | 15 |
| Systems Software | | | | |
| Systems Control | 0.4 | 0.5 | 0.9 | 15 |
| Data Center Mgt. | 0.4 | 0.5 | 0.9 | 12 |
| Application Dev. | 0.2 | 0.3 | 0.8 | 25 |
| Total | 2.1 | 2.5 | 5.1 | 15 |

*Figures may not add due to rounding

- In 1989, application software product revenues are expected to be approximately \$1.3 billion. This figure is expected to grow to approximately \$2.6 billion by 1994, an annual growth rate of 15%.
- System software, particularly application development tools, is expected to grow at a somewhat higher rate, from \$1.3 billion in 1989 to \$2.6 billion by 1994. The growth rate for system software products is expected to be approximately 16%, with the growth rate for application development tools being at least 25%.
- The growth rate for application development tools is expected to be higher than for other submode categories due to the increased emphasis on software development efforts. Key emphasis will be on products such as CASE tools.

As Exhibit VIII-112 shows, turnkey systems are expected to follow the general trend and to exhibit a growth rate of approximately 13%—growing from \$3.0 billion in 1989 to \$5.5 billion in 1994.

EXHIBIT VIII-112

Market Forecast, Turnkey Systems Japan, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 0.9 | 1.0 | 1.7 | 10 |
| Packaged Software | 1.2 | 1.3 | 1.8 | 8 |
| Custom Software | 0.5 | 0.6 | 1.7 | 25 |
| Other Professional Services | 0.1 | 0.2 | 0.4 | 18 |
| Total | 2.7 | 3.0 | 5.5 | 13 |

*Figures may not add due to rounding

- The growth rate is somewhat higher than the figure for the U.S. due to the increased emphasis on computerization by medium-sized and smaller companies. However, unlike in the U.S., Japanese companies will place greater emphasis on tailoring software to meet specific needs, rather than using standard packaged software.

The market for systems integration services are also expected to grow significantly over the next several years as larger companies work to integrate production and office processes.

Exhibit VIII-113 shows that the market for systems integration services is expected to grow at a rate of 24%—from \$1.8 billion in 1989 to an estimated \$5.3 billion in 1994.

EXHIBIT VIII-113

**Market Forecast, Systems Integration
Japan, 1989-1994**

| Systems Integration | Market Forecast* (\$ Billions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 0.7 | 0.8 | 1.8 | 19 |
| Packaged Software | 0.1 | 0.2 | 0.4 | 18 |
| Other Services | 0.1 | 0.1 | 0.2 | 11 |
| Professional Services | 0.6 | 0.8 | 2.9 | 30 |
| Total | 1.5 | 1.8 | 5.3 | 24 |

*Figures may not add due to rounding

- In the market for systems integration services, professional services are expected to have the highest growth rate, reflecting continued emphasis on the development of software to meet specific needs. The growth rate for professional services is expected to be nearly 30%. Hardware growth is also expected to be strong, as companies acquire new hardware to meet increased processing requirements.

Exhibit VIII-114 illustrates that professional services growth is also expected to be strong, with a rate estimated to increase from the current 19% to an estimated 23% over the five-year period.

EXHIBIT VIII-114

Market Forecast, Professional Services Japan, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Professional Services | 1.4 | 1.7 | 5.3 | 25 |
| Consulting | 0.8 | 1.0 | 1.9 | 15 |
| Education and Training | 4.0 | 4.8 | 14.6 | 25 |
| Software Development | 0.6 | 0.7 | 1.4 | 14 |
| Systems Operations | 6.9 | 8.2 | 23.2 | 23 |
| Total | | | | |

*Figures may not add due to rounding

- As part of professional services, software development should be strong, following the trend in using custom-developed software to meet specific needs. Consulting services are also expected to show strong growth as Japanese industry works to develop more-integrated management systems.

7. Market Entry/Expansion Considerations

Now is generally considered to be a good time to enter or expand in the Japanese market. However, there are several considerations that could have a significant impact on a company's ability to realize its objectives.

- *Long-term investment*—Any investment should be considered very long term. Significant value is placed on relationships in Japan, and developing relationships can require an extended time.
- *Japan-specific products*—Generic products and services will generally meet with little success. To be successful, products and services must reflect the differences in the way business is conducted in Japan.
- *Creative products*—Products that provide only basic services will not meet with great success. Japanese industry is creative and looks for products that will meet future goals rather than just immediate needs.

- *Vertical-industry knowledge*—To be successful in a vertical industry, a high degree of industry knowledge is required. With the exception of the medical industry, generalized industry products are not expected to compete successfully.
- *Unique personal computers*—Most PCs in Japan have been adapted to meet unique local needs. IBM Japan has converted its PCs to meet local requirements; these PCs are not able to run much of the industry software.
- *Distributor agreements*—Considering the high cost of startup and marketing, distributor and partner agreements are recommended as the best means of market entry.

Key opportunities are expected to exist for the following products and services:

- *CASE/DBMS products*—Development tools and data base products are expected to have the highest growth opportunity in the near term.
- *CAD/CAM*—CAD/CAM systems are expected to be in increasing demand as industry works to integrate processes.
- *Decision support systems*—Systems that support the decision process are expected to be in greater demand in the future.
- *Project management systems*—Products to manage large, complex development efforts are expected to be in high demand over the next several years.

Overall, the industry in Japan is expected to be dynamic for a number of years. Companies able to invest in the long term could realize significant opportunities.

P**South Korea****1. Introduction**

Rising from near obscurity twenty years ago, South Korea is now one of the leading industrial countries in the Asia/Pacific area. Categorized as one of the Four Tigers (Hong Kong, South Korea, Singapore, and Taiwan), South Korea is a leader in industrial production and is emerging as a leader in the use of information services technology.

2. Economic and Political Setting

Following years of internal turmoil, South Korea began to achieve political stability with the formation of the Second Republic in 1960. Although the country continues to struggle with significant internal political differences, formation of the Second Republic set the stage for economic growth that exists today.

Although political development has been somewhat contentious, the fundamental economic policies have not deviated significantly from programs set forth nearly twenty years ago.

During the early years, the government maintained extremely tight control over the economic environment and targeted specific industries as favored industries for investment and growth.

Although there has been a general liberalization of the financial services industry over the past several years (to attract more foreign investments), the government continues to favor and protect industries, including information-service-related industries, that it considers key to national development.

Strong, centrally controlled economic policies have resulted in South Korea's having one of the highest real growth rates in the region and among the highest in the world. Following growth rates in real GDP of 12.2% and 10.3% in 1987 and 1988 respectively, the country is expected to realize at least a 7.4% rate in 1989.

Overall, South Korea's economic growth rate is expected to continue to be strong for the next several years. The government has targeted the use of information technology as a key element to continued growth.

3. Key Technology Trends

There are several trends notable in the development of information services in South Korea. Identified in Exhibit VIII-115, these trends include the following:

EXHIBIT VIII-115

**Key Technology Trends
South Korea**

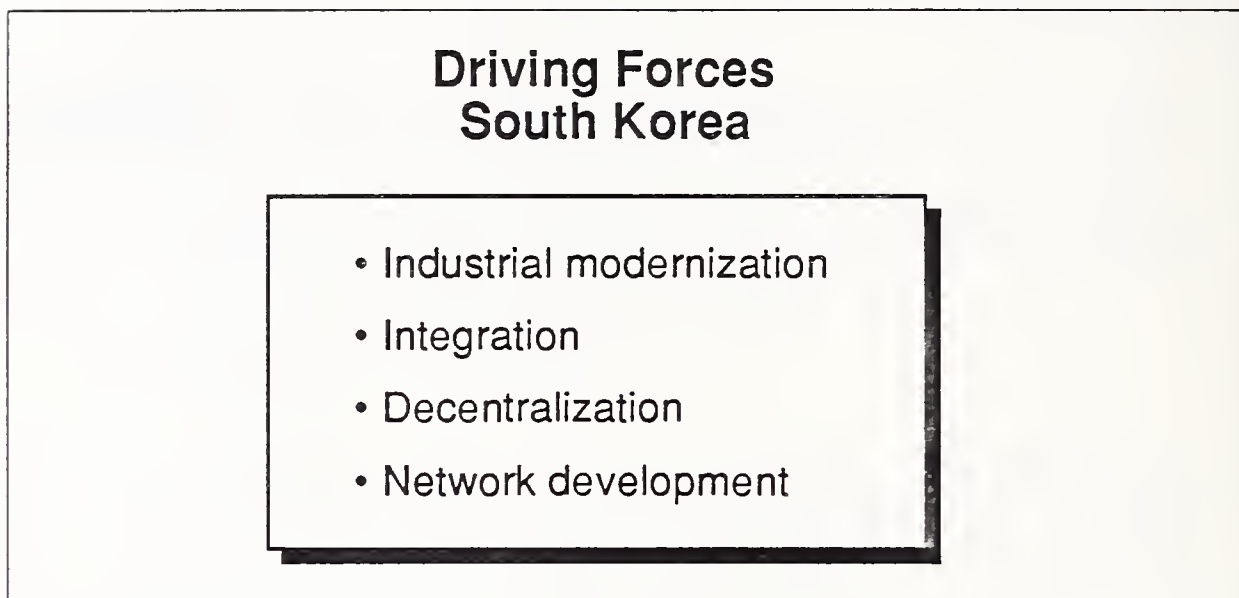
- Mini/Micro systems
- Distributed processing
- Office automation
- Value-added networks

- *Mini/Micro systems*—There is an increasing trend away from large systems to high-capacity mini and micro systems. These systems are being connected through a growing number of local-area networks.
- *Distributed processing*—As industries become larger and more complex, an increasing number are shifting from a totally centralized to a distributed form of processing, in which offices and plants are connected to central facilities.
- *Office automation*—Business growth and organizational complexity are driving many companies to automate their offices to gain operational efficiencies. With the automation, local area networks become increasingly important.
- *Value-added networks*—Value-added networks are a national priority. The government has identified five separate national networks as priority development efforts.

4. Environmental Factors**a. Driving Forces**

Driving forces behind many of the changes in South Korea include the following (Exhibit VIII-116):

EXHIBIT VIII-116

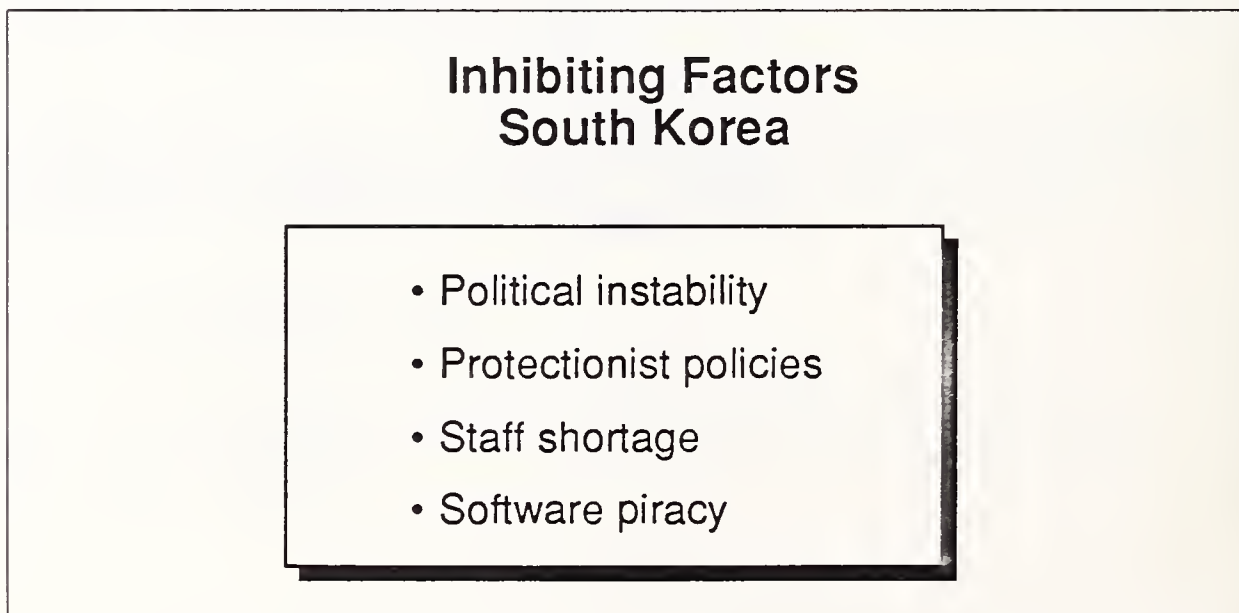


- *Industrial modernization*—There is extensive effort to modernize all industry to ensure the ability to compete.
- *Integration*—There is significant effort being made to integrate the industrial processes and to create closer ties between production, marketing, etc.
- *Decentralization*—Many organizations are being forced to decentralize to achieve greater control. As authority is pushed down the organizational structure, automation necessary for control is being implemented.
- *Network development*—The government is placing a high priority on the development of national value-added networks.

b. Inhibiting Factors

Working against the driving forces are a number of inhibiting forces shown in Exhibit VIII-117.

EXHIBIT VIII-117



- *Political instability*—Political turmoil will continue to have a negative affect on national development as the government must divert its efforts from economic development plans and priorities.
- *Protectionist policies*—Protectionist industrial policies are having an increasingly negative effect on the economy. Lack of success in resolving trade issues and resultant sanctions by the U.S. and other countries have been a contributor to the reduction of the real growth rate of the country.
- *Staff shortages*—Increasing shortages of staff inhibit development in highly technical areas such as systems software development. The lack of staff has led the government to identify technical education as a key priority.
- *Software piracy*—The piracy of software has had a significant effect on the market for software products and on the development of new software products. Although laws have been passed to prevent piracy, enforcement efforts have not yet had the desired result.

5. Leading Vendors

Nearly all leading international vendors are represented in Korea. IBM is generally considered the leader with an estimated 14% of the market, but there is no dominant player. Primary vendors include the following:

- IBM
- Fujitsu
- Prime
- Control Data Corporation
- Digital Equipment Corporation
- ECAD
- Harris Controls
- Rolm
- Sumitomo

6. Services Forecast

Exhibit VIII-118 shows that the market for information services in South Korea is comparatively small but growing rapidly. In 1989, the market is estimated to be approximately \$440 million. The growth rate is estimated to be approximately 32%—resulting in a \$1.8 billion market by 1994.

EXHIBIT VIII-118

Market Forecast—South Korea, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 17 | 20 | 46 | 18 |
| Network Services | 100 | 140 | 715 | 38 |
| Software Products | 135 | 185 | 825 | 35 |
| Turnkey Systems | 17 | 18 | 30 | 10 |
| Systems Integration | 18 | 20 | 44 | 17 |
| Professional Services | 51 | 60 | 135 | 18 |
| Total | 338 | 443 | 1,795 | 32 |

*Figures may not add due to rounding

Exhibit VIII-119 shows that the market for processing services is not excessively large, but is expected to show strong growth rates as an increasing number of medium-sized businesses seek processing capabilities.

- Within the processing services delivery mode, transaction services are expected to show the highest growth rate and to build on the national priority to develop a strong network capability.

Exhibit VIII-120 shows that network services in South Korea are small, but are expected show the highest growth rates over the next several years—from an estimated \$100 million in 1988 to more than \$700 million by 1994. The growth rate is expected to be approximately 38%.

EXHIBIT VIII-119

**Market Forecast, Processing Services
South Korea, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 11 | 13 | 31 | 18 |
| Systems Operations | 5 | 6 | 13 | 17 |
| Utility Processing | 1 | 1 | 1 | 12 |
| Other Processing | ** | ** | ** | - |
| Total | 17 | 20 | 46 | 18 |

*Figures may not add due to rounding

** Only minimum amounts known to exist for this category

EXHIBIT VIII-120

**Market Forecast, Network Services
South Korea, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 66 | 92 | 495 | 40 |
| Network Applications | 36 | 49 | 220 | 35 |
| Total | 102 | 141 | 715 | 38 |

*Figures may not add due to rounding

- The country has placed a high priority on the continued development of a comprehensive national public network capability. Success of the country's network-based services during the Olympics has set the stage for increasingly strong national services.
- Key to the growth of network services will be continued development of the national videotex system and national data base capabilities to serve a number of industries. Services such as EDI and E-mail are also expected to show strong growth.

Software products are also expected to show high growth over the next five years as industry increases its technological modernization. Exhibit VIII-121 shows that the market for software products is expected to grow from an estimated \$180 million in 1989 to more than \$820 million by 1994.

EXHIBIT VIII-121

Market Forecast, Software Products South Korea, 1989-1994

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 75 | 100 | 455 | 35 |
| Systems Software | | | | |
| Systems Control | 28 | 39 | 180 | 36 |
| Data Center Mgt. | 12 | 15 | 50 | 27 |
| Application Dev. | 21 | 29 | 145 | 38 |
| Total | 136 | 183 | 830 | 35 |

*Figures may not add due to rounding

- Within the software products delivery mode, both application and systems software are expected to be strong.
- Growth of application software will result primarily from the increased demand for mini and micro software to meet the needs of a growing number of small- and medium-sized companies that need processing capabilities.
- Growth of systems software will be driven by the increasing need of the larger companies to develop comprehensive systems to control increasingly complex organizations.

Exhibit VIII-122 illustrates that turnkey systems in South Korea are expected to show only moderate growth. The key reason is that companies in South Korea are focused increasingly on the implementation of mini and micro systems with custom-developed software. As in many Asian countries, western-developed packaged software is frequently not able to meet local needs.

EXHIBIT VIII-122

Market Forecast, Turnkey Systems South Korea, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 10 | 11 | 17 | 9 |
| Packaged Software | 3 | 4 | 5 | 8 |
| Custom Software | 1 | 1 | 2 | 14 |
| Other Professional Services | 3 | 3 | 6 | 17 |
| Total | 17 | 18 | 30 | 10 |

*Figures may not add due to rounding

Exhibit VIII-123 reveals that although opportunities for systems integration will grow and could become a key contributor in the future, the market is currently fairly small. The market is projected to grow from \$20 million in 1989 to approximately \$44 million in 1994, a growth rate of 17%.

- The key reason that the market is not currently higher is that many of the businesses have not focused their attention on development of information services for internal use. In many companies, information is processed manually by offices and departments. Little attention has been placed on the integration of requirements.
- However, the projected growth of 25% for professional services indicates the level of interest. Of the professional services figures, a high percentage is expected to be for consulting related to understanding how complex, internal systems could be of benefit.
- The market for systems integration could grow at a higher rate if the benefits of large, complex systems can be shown.

EXHIBIT VIII-123

**Market Forecast, Systems Integration
South Korea, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 8 | 8 | 13 | 9 |
| Packaged Software | 2 | 2 | 5 | 18 |
| Other Services | 2 | 2 | 2 | ** |
| Professional Services | 7 | 8 | 25 | 25 |
| Total | 18 | 20 | 44 | 17 |

*Figures may not add due to rounding

** Negligible growth noted

Exhibit VIII-124 shows that the market for professional services is expected to grow steadily at approximately 18%, from \$60 million in 1989 to \$140 million over the next five years.

EXHIBIT VIII-124

**Market Forecast, Professional Services
South Korea, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 11 | 13 | 33 | 20 |
| Education and Training | 8 | 8 | 14 | 10 |
| Software Development | 28 | 34 | 84 | 20 |
| Systems Operations | 4 | 4 | 7 | 10 |
| Total | 51 | 60 | 137 | 18 |

*Figures may not add due to rounding

- Within professional services, consulting and software should show strong growth as companies identify and take steps toward modernization and integration of their systems.

7. Market Entry/Expansion Considerations

Entry into the South Korean market can be difficult because the government protects favored industries. The two sectors for which there is demand and limited protectionism are software and professional services.

For the software industry, particularly systems software, there are a number of highly regarded distributors. Distribution agreements are the favored method of marketing.

For the professional services industry, significant investment is needed to establish a local reputation. Alliances with well-regarded companies are the most favored method of entering the market.

With network-based services tightly controlled, there is believed to be limited opportunity; however, the government has indicated interest in partnerships that will directly contribute to the growth of the national infrastructure.

Q**Mexico****1. Introduction**

Long an ally of the U.S., Mexico has sought in recent years to establish a unique economic identity that is less tied to the U.S. economy. With an economy that has been traditionally agrarian, Mexico continues to struggle to establish a diversified economic base from which to grow.

Although the overall situation has begun to look somewhat brighter over the past couple of years, significant time and effort will be needed for Mexico to assume an international leadership role. However, many Latin American countries are looking to Mexico as a leader in Latin America.

2. Economic and Political Setting

A key determinant of the development of the information services industry will be change in the political environment. Long plagued by government corruption, recent elections resulted in a more conservative regime that has committed to cleaning up the government.

Although time will be needed to assess the results of the efforts, early indications are that the cleanup is beginning to result in an increase in confidence by local and foreign investors.

National growth hinges on the country's ability to manage a high foreign debt (\$103 billion). Economic growth for 1988 was estimated to be a weak 0.4%. Growth is predicted to reach 5% by 1994, if debt repayment restructuring can be accomplished. Debt restructuring is crucial to repayment and the ability to stabilize the economy.

To demonstrate effort to stabilize the economy, the government has taken a number of steps. Wages have been frozen by agreement with business, labor, and the government. This has resulted in a reduction in the inflation rate from 159% in 1987 to 52% in 1988. Plans have been made to abolish 95% of the country's import duties over the next several years as part of Mexico's entry into the GATT (General Agreement on Trade and Tariffs).

Although there has been general acceptance of the country's efforts to establish economic stability, many observers indicate that only time will tell whether they will be successful. Previous efforts have met with only limited success.

3. Key Technology Trends

Exhibit VIII-125 shows key technology trends in Mexico; these trends center on three factors that are generally consistent with trends in other less developed countries.

EXHIBIT VIII-125

Key Technology Trends Mexico

- Microcomputer growth
- Industry-specific software
- Network growth

- *Microcomputer growth*—There is greater focus on microcomputers as the best solution for meeting the needs of small and medium-sized businesses.
- *Industry-specific software*—As in many countries, industry-specific applications are increasingly preferred over generic solution applications.
- *Network growth*—There is increasing emphasis on the development of nationwide networks. The government has recognized the need to improve the national telecommunications infrastructure.

4. Environmental Factors

a. Driving Forces

Driving forces to the development of the information services industry in Mexico include the following, shown in Exhibit VIII-126.

EXHIBIT VIII-126

Driving Forces—Mexico

- Trade liberalization
- U.S. influence
- Microcomputer growth
- Latin American entrée

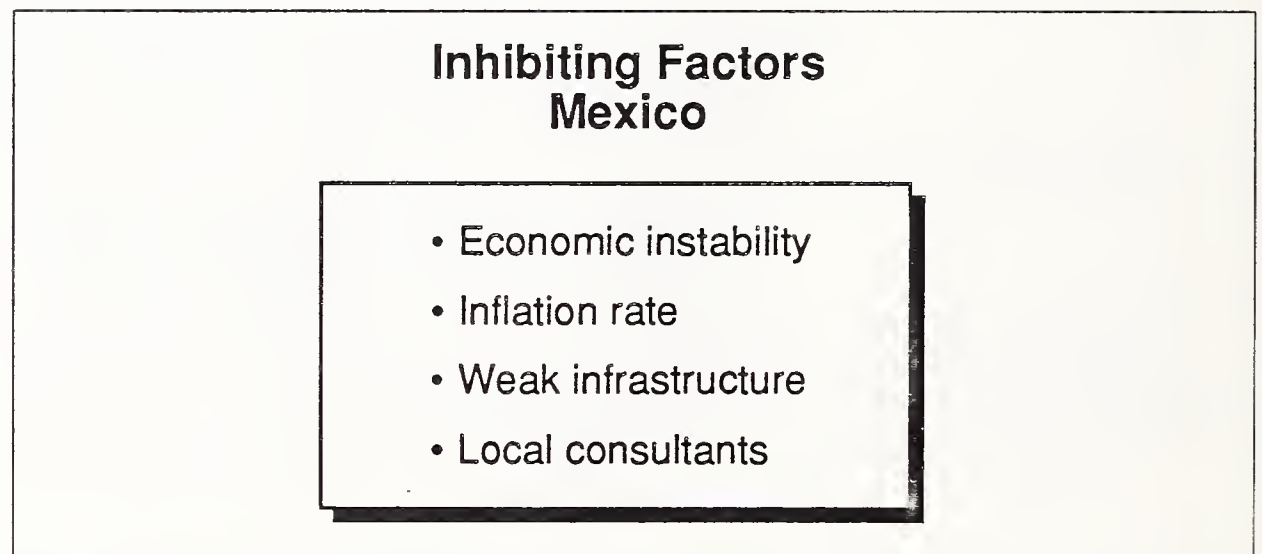
- *Trade liberalization*—Liberalization of trade policies and the reduction in licensing fees are expected to stimulate a greater rate of importation of information services technology.

- *U.S. influence*—Trends and directions in Mexico are strongly influenced by U.S. information services industry trends, which have a stimulating effect of the decisions on Mexican companies.
- *Microcomputer growth*—Continuing growth of lower-cost microcomputer products acts as an encouragement to small and medium-sized businesses to make greater use of information services solutions.
- *Latin American entrée*—An established market in Mexico is seen by many Latin American countries as an indication of a company's interest in Latin America. A number of South American firms are turning to Mexico as a source of supply and expertise.

b. Inhibiting Factors

Exhibit VIII-127 lists inhibiting forces.

EXHIBIT VIII-127



- *Economic instability*—A less than stable economy has had a debilitating effect on industrial growth. Future stability remains a question and will tend to slow growth.
- *Inflation rate*—Closely related to stability is the trend in inflation rates. A resurgence of inflation will slow growth in information services.
- *Weak infrastructure*—Overall, the national infrastructure is weak and not able to support extensive use of technology. A weak infrastructure has a tendency to reduce the use of information services.
- *Local consultants*—With minimal resources, many companies turn to local, poorly trained consultants that are not knowledgeable about the most up-to-date methods and procedures.

5. Leading Vendors

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

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

6. Services Forecast

Exhibit VIII-128 shows that the market for information services in Mexico is expected to grow at an annual rate of 18% for the next several years, from an estimated \$400 million in 1989 to \$940 million by 1994.

EXHIBIT VIII-128

Market Forecast—Mexico, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 90 | 100 | 160 | 10 |
| Network Services | 7 | 8 | 13 | 12 |
| Software Products | 125 | 155 | 425 | 23 |
| Turnkey Systems | 64 | 71 | 140 | 15 |
| Systems Integration | 7 | 8 | 17 | 17 |
| Professional Services | 64 | 75 | 185 | 20 |
| Total | 357 | 417 | 940 | 18 |

*Figures may not add due to rounding

- The market is believed to offer significant potential, but as with many Latin American countries, will require a more stable economy for the potential to be realized.

The market for processing services is expected to grow at a moderate rate (10% CAGR) from \$100 million to \$160 million over the next five years, as shown in Exhibit VIII-129.

EXHIBIT VIII-129

**Market Forecast, Processing Services
Mexico, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | | | | |
| Transaction Services | 18 | 20 | 41 | 15 |
| Systems Operations | 54 | 59 | 87 | 8 |
| Utility Processing | 14 | 16 | 28 | 12 |
| Other Processing | 4 | 4 | 6 | 8 |
| Total | 90 | 100 | 162 | 10 |

*Figures may not add due to rounding

- As in most countries, the key processing services requirement will be increasingly for transaction services, as the country begins to develop and expand its national network services capabilities.
- However, in Mexico utility processing is also expected to show growth. This growth results to a great extent from efforts of companies to develop in-house systems, frequently in anticipation of the availability of hardware and other support services.

The network services market is small and expected to remain small for at least the next several years. Exhibit VIII-130 illustrates that the total market is expected to grow from less than \$10 million in 1989 to slightly more than \$10 million in 1994.

- There is a high degree of interest in Mexico for network-based services. Foreign firms have an interest in E-mail and EDI services and there is interest in data base and other on-line services.
- Network services could grow at a higher rate near the end of the five-year period if the country is able to stabilize the economy and make sufficient investment to improve the overall network infrastructure in the country.

EXHIBIT VIII-130

Market Forecast, Network Services—Mexico, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 6 | 7 | 12 | 12 |
| Network Applications | 1 | 1 | 2 | 10 |
| Total | 7 | 8 | 13 | 12 |

*Figures may not add due to rounding

Software products, shown in Exhibit VIII-131, are in high demand in Mexico and are expected to grow approximately 23% per year (compounded) from \$153 million in 1989 to \$427 million by 1994.

EXHIBIT VIII-131

**Market Forecast, Software Products
Mexico, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 72 | 90 | 275 | 25 |
| Systems Software | | | | |
| Systems Control | 22 | 26 | 65 | 20 |
| Data Center Mgt. | 11 | 12 | 19 | 10 |
| Application Dev. | 21 | 25 | 68 | 22 |
| Total | 126 | 153 | 427 | 23 |

*Figures may not add due to rounding

- The highest demand is for applications software, which is generally in short supply due to high duties and tariffs. One report suggests that duties and tariffs can triple the cost of a program.

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

Turnkey systems are also expected to show strong growth, because of the number of growing companies that need short-term solutions. Exhibit VIII-132 illustrates that the market is expected to grow from \$70 million in 1989 to more than \$140 million by 1994.

EXHIBIT VIII-132

Market Forecast, Turnkey Systems Mexico, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 31 | 34 | 55 | 10 |
| Packaged Software | 15 | 16 | 37 | 18 |
| Custom Software | 7 | 8 | 23 | 22 |
| Other Professional Services | 11 | 13 | 28 | 17 |
| Total | 64 | 71 | 142 | 15 |

*Figures may not add due to rounding

- The greatest need is for customized software. However, as indicated by the growth rate of packaged software, there is greater acceptance of a packaged solution than in other countries.

There is currently little demand for systems integration services. The economy is small and fragmented; although growth is expected to be 17%, growth will be from only about \$10 million in 1989 to about \$20 million in 1994. Exhibit VIII-133 shows details.

- Although the market for systems integration services is small, a strong economy could result in significantly greater growth in the three- to five-year time frame. Greater growth could result from the needs of the emerging privatized industry.

The professional services market is expected to show considerably higher growth rates as companies search for alternatives to modernize

EXHIBIT VIII-133

**Market Forecast, Systems Integration
Mexico, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 3 | 3 | 6 | 12 |
| Packaged Software | 1 | 1 | 1 | 10 |
| Other Services | ** | ** | ** | - |
| Professional Services | 3 | 4 | 10 | 22 |
| Total | 7 | 8 | 17 | 17 |

*Figures may not add due to rounding

**Only minimal revenues known to exist for this submode

their industries. Overall, growth is expected to be from approximately \$75 million in 1989 to \$190 million in 1994, a growth rate of 20%. Exhibit VIII-134 illustrates these numbers.

EXHIBIT VIII-134

**Market Forecast, Professional Services
Mexico, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 22 | 26 | 81 | 25 |
| Education and Training | 8 | 9 | 19 | 15 |
| Software Development | 28 | 32 | 74 | 18 |
| Systems Operations | 6 | 7 | 12 | 12 |
| Total | 64 | 75 | 186 | 20 |

*Figures may not add due to rounding

- The key requirement for professional services is for consulting. The consulting market in Mexico is considered to be quiet and underdeveloped. Local consultants have little training and frequently provide poor information.
- The need for quality consulting service is expected to be greater as companies seek to modernize. Following years of neglect, major changes are needed in most major companies.

Growth of markets in Mexico is highly dependent on a stable political environment and economic development. Two to three years of stable economics and politics could result in higher growth rates than projected. However, a reversal of the current economic and political trends could result in a downturn or continued stagnation.

7. Market Entry/Expansion Considerations

With severe limitations in government spending (which has generally accounted for 25% of national spending), only limited growth is expected in large mainframes and high-end minicomputer systems for the foreseeable future. Key opportunities for companies entering or expanding in Mexico are in the microcomputer business.

- Opportunities also exist in consulting and after-sales support for companies willing to invest in development of qualified local staff.
- In the short term, a relationship with a local representative is expected to be the best method of entry. If progress continues to be made in economic stability, investment in establishing a well-trained local staff is expected to return significant benefit within the next three to five years.

R**The Netherlands****1. Introduction**

The Netherlands has a population of 15 million and is a founding member of the European Economic Community (EEC). The Netherlands' software and services market is fifth largest in Europe, with a total size of \$2.2 billion.

2. Economic and Political Setting

The Netherlands has the highest population density in Europe and a gross domestic product per capita of \$15,400. The Netherlands spends a higher proportion (over 25%) of its GDP on social services than does any other country in the EEC.

The economy grew 2.6% in 1988. The growth rate is projected to be 4.5% in 1989 and 3% in 1990; inflation is expected to be less than 1%. The Netherlands is running a current account surplus of around \$5 billion.

The political complexion of the government has changed after the September elections, but the Prime Minister remains the same. Elections were called after the ruling center-right Christian Democrat-Liberal coalition, led by Ruud Lubbers, collapsed over the financing of an ambitious national plan to reduce pollution.

As a result of the election, the Prime Minister remains the same, but the incorporation of the Labour party with the Christian Democrats means that the new government is more center-left as opposed to center-right.

State involvement in the economy is clearly very high, and despite some limited privatization at the beginning of the year, the emphasis now is likely to be more on spending money and less on cutting taxes and reducing the budget deficit.

The Dutch have a strong trading tradition, and a strong export-driven economy. They have been successful, for example, in making Rotterdam a major port of entry and thence the most important port in Europe, but attempts to make it an electronic gateway and European center have had only limited success.

The government has managed to control inflation by reaching a consensus with public-sector workers, but there is some doubt whether this squeeze can be maintained indefinitely.

The biggest companies in The Netherlands are the two Anglo-Dutch giants Royal Dutch Shell and Unilever, and Philips. Other companies in the European top 100 are Akzo and Gasunie. As a traditionally outward-

looking exporting country, The Netherlands is expected to benefit from the Single European Act; Dutch strength in transport services is particularly significant.

3. Services Forecast

Exhibit VIII-135 illustrates that the Dutch software and services market is forecast by INPUT to grow from \$2.7 billion in 1989 to \$6.2 billion by 1994. INPUT estimates that the average growth rate over this five-year period should be 18% per year.

EXHIBIT VIII-135

Market Forecast—Netherlands, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 365 | 395 | 500 | 5 |
| Network Services | 92 | 120 | 365 | 25 |
| Software Products | 640 | 795 | 1,905 | 19 |
| Turnkey Systems | 280 | 320 | 790 | 20 |
| Systems Integration | 60 | 78 | 230 | 24 |
| Professional Services | 850 | 1,000 | 2,385 | 19 |
| Total | 1,989 | 2,708 | 6,175 | 18 |

*Figures may not add due to rounding

The Netherlands market represents some 5% of the overall West European software and services market. Relative to the overall European software and services market, the professional services sector is particularly strong in the Netherlands.

Exhibits VIII-136 through VIII-141 provide a breakout of the services market for each of the delivery modes in the Netherlands.

EXHIBIT VIII-136

**Market Forecast, Processing Services
Netherlands, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | | | | |
| Transaction Services | 344 | 367 | 436 | 3 |
| Systems Operations | 23 | 28 | 64 | 18 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 65 | 395 | 500 | 6 |

*Figures may not add due to rounding

EXHIBIT VIII-137

**Market Forecast, Network Services
Netherlands, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|---------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Network Services | | | | |
| Electronic Information Services | 64 | 83 | 225 | 22 |
| Network Applications | 28 | 39 | 140 | 30 |
| Total | 92 | 122 | 365 | 22 |

*Figures may not add due to rounding

EXHIBIT VIII-138

**Market Forecast, Software Products
Netherlands, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Software Products | | | | |
| Application Software | 265 | 335 | 900 | 22 |
| Systems Software | 370 | 460 | 1,000 | 17 |
| Total | 635 | 795 | 1,900 | 19 |

*Figures may not add due to rounding

EXHIBIT VIII-139

**Market Forecast, Turnkey Systems
Netherlands, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|--------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Turnkey Systems | | | | |
| Equipment | 160 | 175 | 355 | 15 |
| Packaged Software | 85 | 99 | 295 | 24 |
| Custom Software | 21 | 25 | 71 | 23 |
| Other Professional Services | 16 | 21 | 71 | 28 |
| Total | 282 | 320 | 792 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-140

Market Forecast, Systems Integration Netherlands, 1989-1994

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 28 | 32 | 76 | 19 |
| Packaged Software | 2 | 5 | 14 | 24 |
| Other Services | 2 | 2 | 5 | 20 |
| Professional Services | 28 | 39 | 135 | 28 |
| Total | 61 | 78 | 229 | 24 |

*Figures may not add due to rounding

EXHIBIT VIII-141

Market Forecast, Professional Services Netherlands, 1989-1994

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 105 | 125 | 340 | 22 |
| Education and Training | 92 | 110 | 280 | 21 |
| Software Development | 640 | 755 | 1,730 | 18 |
| Systems Operations | 9 | 11 | 34 | 25 |
| Total | 846 | 1,001 | 2,384 | 19 |

*Figures may not add due to rounding

Although the Netherlands has managed to establish itself as the gateway to Europe for trade, it has not managed to put itself in the same key position for software and services. Like Belgium, the Netherlands tends to be too small to generate domestic vendors that can compete on a European scale.

The Dutch government has tried to attract foreign industry by setting very attractive corporate tax levels, even though personal tax levels are very high. This move has succeeded in bringing many traders to the Netherlands, including foreign software and services vendors.

The Netherlands' software and services market has high penetration by foreign vendors. INPUT estimates that some 22% of Dutch end-user revenues are controlled by U.S. vendors and some 15% by other European vendors. Domestic vendors therefore control only some 63% of the market.

Dutch vendors do export their products and services, but generally by following the traders and brokers that have established themselves around the ports of Rotterdam and Amsterdam.

These two ports tend to serve the hinterland of West Germany, and thus Dutch software and services have links to Germany. Through the free-trade area of the Benelux countries, Dutch vendors are also in the Belgian market, which, being some half the size of the market in the Netherlands, is concerned about an influx of Dutch competition.

In the area of networks services, the Dutch have and are still trying to emulate their success in computer software and services. Teleports are being developed, but as yet are not successful.

Many U.S. network vendors have taken advantage of low Dutch corporate taxes and have established major computing centers in the Netherlands. GEIS, EDS, and IBM all have major processing and network computing centers in the country.

4. Competitive Environment

The largest Dutch vendor is the domestic professional services company, Volmac. In 1988, Volmac generated some \$225 million in the Netherlands. IBM was the second largest software and services vendor (with some \$170 million), followed by Cap Gemini Sogeti.

The Netherlands is Cap Gemini Sogeti's largest market besides its home base in France. Cap Gemini did have two wholly owned subsidiaries in the Netherlands—Cap Gemini Nederlands and Pandata. In 1989, these two separately operated companies were merged. In total they generated \$110 million from the Dutch market.

Other major software and services vendors in the Netherlands are Raaet and Philips, fourth- and fifth-largest vendors respectively. Raaet delivers a wide range of products and services to both the Dutch and the Belgian markets—such as processing services, professional services, and turnkey systems.

S**New Zealand****1. Introduction**

A member of the British Commonwealth, New Zealand has long been considered to be generally removed from the mainstream of business.

With an economy based significantly on agriculture (primarily sheep and dairy products) and a strong orientation toward centralized social planning, there were few incentives for businesses to implement productivity improvement tools or to be creative. However, this situation has changed over the past several years.

2. Economic and Political Setting

With a population of 3.3 million and a per-capita GNP of approximately \$7,750, New Zealand has generally been characterized as having a centrally-oriented economy, with the government exerting strong direction over a predominantly private business sector.

Until 1984, the economy of New Zealand had been on a steady decline. Numerous changes have been made, and are being made, to reverse the trend, but a number of figures indicate that considerable effort is still needed.

As reported to the World Bank, for the period 1980-87, the average annual growth rate for the services sector was 2.1%. The rates for the agricultural, industrial, and manufacturing sectors were 3.1%, 4.0%, and 3.3% respectively. For the same period, the average annual rate of inflation was approximately 11.5%.

Continuation of high inflation and stagnant development led a newly-elected government to make the major changes shown in Exhibit VIII-142.

EXHIBIT VIII-142

**Key Economic Actions
New Zealand**

- Devalue New Zealand dollar
- Decontrol interest rates
- Reduce exchange controls
- Sales tax reduction
- Float New Zealand dollar

- The first change was a devaluation of the New Zealand dollar by 20% in 1984.
- The next was the decontrol of interest rates.
- This was followed by a gradual reduction of more than 50 years of exchange controls.
- The sales tax was reduced from 40% to 10%.
- Following these and other reforms, in 1985 the New Zealand dollar was permitted to float on world currency markets. The New Zealand dollar fell 10% against the U.S. dollar and has remained relatively stable since.

Results of political and economic reforms have begun to transform New Zealand into an increasingly free market economy. Inflation has been reduced and investment has begun to result in solid, repeatable growth.

A key indicator of the commitment of the government to a freer market and the increased use of technology was transformation of the national telecommunications monopoly into an unregulated, free-market business entity.

As of April 1989, nearly all regulations related to the provision of telecommunication services were lifted. Competition is open to all domestic and international organizations for the provision of services and equipment.

Long-term results of the changes are not expected for some time. However, early indications are that the changes are resulting in an overall revitalization of the economy. A question in the minds of many observers is whether the changes will result in any major changes in New Zealand's position in the world economy.

3. Key Technology Trends

Prior to the economic changes begun in 1984, the information services industry demonstrated little growth. There was little incentive to apply new tools and techniques. There was little incentive to become competitively productive.

As a result of the changes, a number of trends have begun to emerge. They are summarized in Exhibit VIII-143.

EXHIBIT VIII-143

Key Technology Trends New Zealand

- Increased use of productivity tools
- Increase use of 4GL and DBMS systems
- Increased mini/micro applications
- Reduced use of packaged systems
- Reduced use of service bureaus
- Increased use of consulting services

- *Productivity tools*—There has been an increase in the use of productivity tools for installed systems. With more emphasis on competitiveness, companies are beginning to make investments in tools to increase processing efficiency. The trend is expected to continue for some time.
- *4GL/DBMS systems*—There is an increasing interest in 4GL and DBMS systems. As a result of increased funds for investment, companies are beginning to make investments in new technologies.
- *Mini/Micro systems*—There has been a growing demand for minicomputer- and microcomputer-based applications. With the increasing capability of minis and micros, more organizations are investing in smaller computer systems.
- *Reduction in packaged systems*—With the increase in the number of mini- and microcomputer applications, there has been a decline in the use of packaged systems such as Symphony. Organizations are tending toward tailored applications as an alternative to generalized applications.
- *Reduced use of service bureaus*—New Zealand is following the worldwide trend in the reduced use of service bureaus for traditional processing services. As a result, service bureau companies are looking to new services such as videotex as new areas of opportunity.
- *Consulting services increase*—There has been significant increased use of consultancy services. Following year of neglect, organizations are turning to consulting services to assist in identifying and implementing enhanced systems and services.

The trend toward increased use of consultants, the focus on mini- and micro-based applications, and the use of productivity tools are expected to continue into the 1990s. Data indicate that significant effort is required to update or replace outdated systems.

4. Environmental Factors

a. Driving Forces

Exhibit VIII-144 shows several forces driving the changes currently taking place. To a great extent, they relate directly to the economic changes that have taken place. The forces are:

EXHIBIT VIII-144

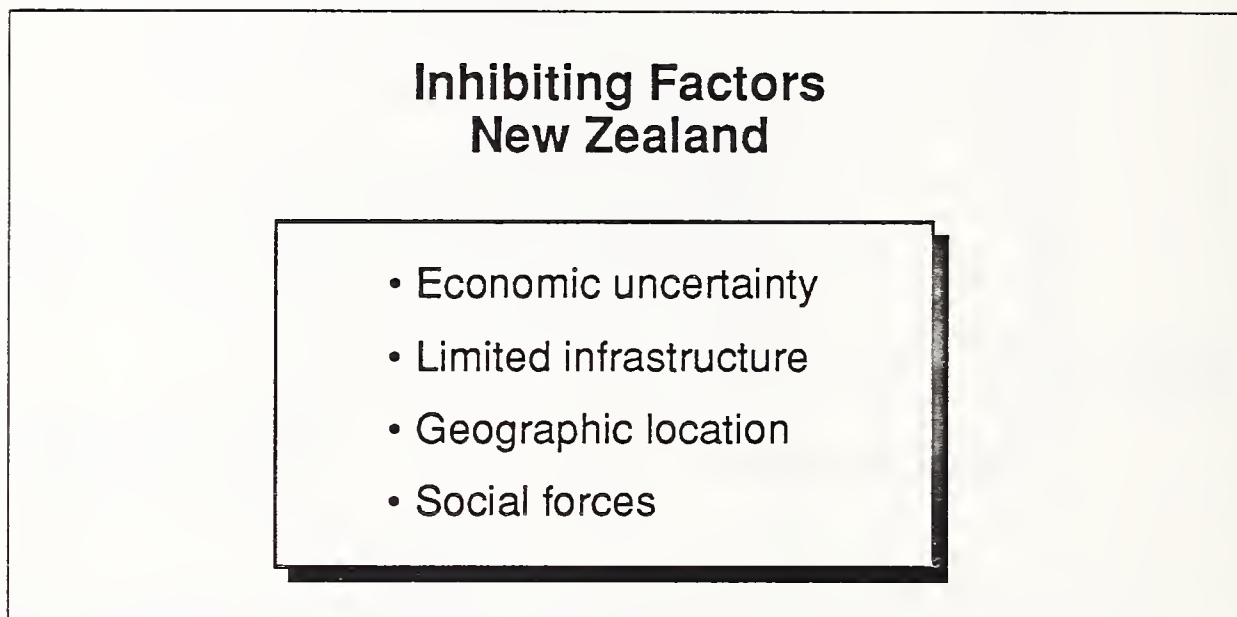


- *Economic/Political reform*—Reforms have begun to provide significant incentive for companies to invest in technology.
- *Limited labor supply*—As a result of neglect over the years, there is a need to make investment to upgrade skills. In addition, there is a need to turn to outside consultants to provide short-term expertise.
- *Pent-up demand*—Also as a result of neglect over the years, there is a pent-up demand to make changes to systems and services. Many organizations are beginning to make investments that they would not have considered several years ago.
- *Increased competitiveness*—Increased competition—resulting from a freer economy—is forcing organizations to become more competitive.
- *World economy*—Shifts in the world economy are driving the country to make changes. Until several years ago, there was little need for some of the changes that have been made. However, loss of product position for some of New Zealand's products forced the country to consider changes.

b. Inhibiting Factors

Although changes have stimulated growth of the information services industry, there are a number of inhibiting forces, shown in Exhibit VIII-145.

EXHIBIT VIII-145



- *Economic uncertainty*—Uncertainty about the effects of the changes are having an inhibiting effect on some companies. The uncertainty has resulted in some companies' adopting a wait-and-see attitude that reduces some levels of investment.
- *Limited infrastructure*—Due to the years of neglect and the focus on agriculture, there is only a small installed base of systems.
- *Geographic location*—New Zealand's location has a tendency to retard investment considerations.
- *Social focus*—The country has traditionally placed emphasis on the development of government-sponsored social systems. There is uncertainty about whether this focus will cause a drain on investment opportunities.

5. Leading Vendors

The information services industry is generally characterized by many smaller companies that hold specialty niches. This characterization is particularly true in the software services delivery mode where there are an estimated one hundred companies. However, there are several key vendors in a number of the subsectors:

- Leading Software Vendors
 - Computer Sciences of New Zealand
 - Control Data Corporation
 - Paxus Information Services Group
 - Progeni

- Leading Service Bureau Vendors
 - Government Computer Services
 - Datacom
 - Centron
 - CCL
 - Paxus

- Consulting Services
 - P A Management Consulting
 - Paxus
 - Azimuth Systems
 - Large Accounting Practices (International Firms)

6. Services Forecast

With the recent liberalization of government policies and the focus on privatization, the information services market in New Zealand is expected to grow at a steady rate of 20% for at least the next several years. Exhibit VIII-146 illustrates projected market growth from \$700 million in 1989 to \$1.7 billion in 1994.

EXHIBIT VIII-146

Market Forecast—New Zealand, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 120 | 140 | 370 | 22 |
| Network Services | 28 | 33 | 70 | 17 |
| Software Products | 175 | 195 | 345 | 12 |
| Turnkey Systems | 105 | 115 | 205 | 12 |
| Systems Integration | 31 | 37 | 84 | 18 |
| Professional Services | 115 | 160 | 595 | 30 |
| Total | 574 | 680 | 1,669 | 20 |

*Figures may not add due to rounding

- Review of the delivery mode summary of revenues indicates an industry composition in New Zealand that is different from that in many countries.
- Of particular note is that processing and professional services are growing at a higher rate than software products, which seem to dominate in many other countries.

Exhibit VIII-147 shows that processing services in New Zealand are projected to grow from an estimated \$140 million in 1989 to \$370 million in 1994, a growth rate of 22%.

EXHIBIT VIII-147

Market Forecast, Processing Services New Zealand, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 83 | 100 | 305 | 25 |
| Systems Operations | 18 | 21 | 36 | 12 |
| Utility Processing | 12 | 13 | 21 | 10 |
| Other Processing | 6 | 7 | 11 | 10 |
| Total | 119 | 140 | 373 | 22 |

*Figures may not add due to rounding

- Processing services have been strong in New Zealand for a number of years. New Zealand companies perform processing services for companies in both New Zealand and Australia.

Although the industry has peaked in the past several years, as it has elsewhere in the world, these services are expected to be in greater demand over the next several years as businesses become privatized and there is a greater short-term demand for processing.

Note is made that some of the revenues shown as a part of processing services may, in fact, be more properly shown as part of network services. Many of the services traditionally associated with network services

are performed by processing service companies and the splitting of the revenues may not have been precise.

Exhibit VIII-148 shows that network services in New Zealand are projected to grow at a rate of 17% for the next several years, from a low of \$30 million in 1989 to \$70 million in 1994.

EXHIBIT VIII-148

Market Forecast, Network Services—New Zealand, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Electronic Information Services | 22 | 26 | 56 | 17 |
| Network Applications | 6 | 7 | 14 | 15 |
| Total | 28 | 33 | 70 | 17 |

*Figures may not add due to rounding

Network services are expected to become increasingly important over the next several years as a result of privatization. An increasing number of companies are using network services to provide financial transaction (EFT, POS, ATM, etc.) and other (E-mail, EDI) services.

Until early 1988, the telecommunication services market was tightly controlled by the New Zealand Post Office. With the privatization of the telecommunications authority, all value-added services may be provided by private vendors.

Exhibit VIII-149 illustrates that software products are expected to show continued growth in New Zealand, but not to the extent in other countries. With basic needs generally satisfied, the market is expected to grow at a CAGR of 12%, from \$200 million in 1989 to \$350 million in 1994.

EXHIBIT VIII-149

**Market Forecast, Software Products
New Zealand, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 92 | 100 | 165 | 10 |
| Systems Software | | | | |
| Systems Control | 35 | 39 | 71 | 13 |
| Data Center Mgt. | 18 | 21 | 42 | 15 |
| Application Dev. | 31 | 35 | 70 | 15 |
| Total | 176 | 195 | 348 | 12 |

*Figures may not add due to rounding

- The key reason that software products are not growing faster is that the basic needs are generally satisfied. In addition, the country has an extensive set of unique national reporting requirements that cannot be satisfied by generally available application software.
- The growth in systems software will result from the need to develop more complex systems as privatization progresses and business develops.

The market for turnkey systems is expected to grow at a rate somewhat higher than that in the U.S., approximately 12%. The overall market for turnkey systems is expected to grow from an estimated \$120 million in 1989 to \$200 million in 1994 (Exhibit VIII-150).

- The primary requirement causing turnkey systems to grow will be the requirement for customized software to meet unique local requirements.

EXHIBIT VIII-150

**Market Forecast, Turnkey Systems
New Zealand, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 51 | 55 | 89 | 10 |
| Packaged Software | 27 | 29 | 47 | 10 |
| Custom Software | 9 | 11 | 26 | 20 |
| Other Professional Services | 18 | 21 | 45 | 17 |
| Total | 105 | 116 | 207 | 12 |

*Figures may not add due to rounding

The market for systems integration in New Zealand is small and expected to remain comparatively small for the next several years. The market is expected to grow from the current \$40 million to an estimated \$80 million by 1994, as shown in Exhibit VIII-151.

EXHIBIT VIII-151

**Market Forecast, Systems Integration
New Zealand, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 14 | 17 | 34 | 15 |
| Packaged Software | 3 | 4 | 7 | 15 |
| Other Services | 2 | 2 | 3 | 8 |
| Professional Services | 12 | 15 | 41 | 22 |
| Total | 31 | 37 | 84 | 18 |

*Figures may not add due to rounding

- The key requirement for systems integration services will be for professional services to assist companies in identifying advantages of developing new systems.
- The market for systems integration is expected to show somewhat higher growth rates near the end of the five-year period if the economy continues to expand and the benefits of privatization become evident.

Professional services are expected to show significant growth in New Zealand. Exhibit VIII-152 illustrates that needs in nearly all submodes will result in a growth rate of about 30%. The market will increase from \$160 million in 1989 to \$600 million in 1994.

EXHIBIT VIII-152

Market Forecast, Professional Services New Zealand, 1989-1994

| | Market Forecast* (\$ Millions) | | | |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Professional Services | | | | |
| Consulting | 24 | 35 | 160 | 35 |
| Education and Training | 14 | 19 | 70 | 30 |
| Software Development | 68 | 94 | 350 | 30 |
| Systems Operations | 11 | 13 | 20 | 10 |
| Total | 117 | 161 | 600 | 30 |

*Figures may not add due to rounding

- The fastest growing of professional services will be consulting. Growth will result from the expanding need to analyze how new systems can contribute to business growth.

Growth of the New Zealand market is highly dependent on the success of privatization and the government's emphasis on business expansion. Success could result in markets that are larger than expected. However, a return to the isolationist, socially-oriented national focus will cause the market to be considerably below projections.

7. Market Entry/Expansion Considerations

There are few barriers to entry into the New Zealand market. Many of the leading providers are foreign companies that have established New Zealand business operations.

However, users indicate a preference for local firms that have established a presence over a long period of time. Because of a preference for local firms, organizations considering entering the New Zealand market are advised to seek partnership arrangements to provide services that are not generally available.

T**Norway****1. Introduction**

Norway has a population of 4 million and is a member of the European Free Trade Association (EFTA). The Norwegian software and services market is the eleventh largest in Europe, with a size of \$940 million. Norway was due to join the EEC in 1973 but, by a close tally in a national referendum, the people voted to stay out.

2. Economic and Political Setting

Norway's gross domestic product per capita of \$21,400 is higher than that of West Germany, but prosperity has been based on oil and gas revenues from the North Sea, which have cushioned a fishing and shipping economy from the problems that have affected competitors.

The slump in oil prices caused Norway to have a very severe economic crisis in 1986, and signs of a recovery are only just beginning. Growth is 2%; inflation has slowly lowered from the near 7% of 1988. There are signs that the balance of trade will be in surplus in 1989 for the first time as Norway recovers from the record deficit of nearly \$6 billion in 1986.

The Norwegian Prime Minister Mrs. Gro Harlem Brundtland, presiding over a minority Labor government, surprisingly revived the private sector to bring about this recovery, but there are no clear signs that the recovery has been of electoral benefit. In the elections of September 1989, the Labor party's share of the vote went from 41% to 34%, a shift to the left. The electorate appears to resent the pain of the recovery, and the anti-EEC feeling is still strong. Besides the prospect of political instability, Norway's economic prospects are also very much uncertain.

The biggest Norwegian companies in the European top 100 are the two state-owned energy companies Statoil and Norsk Hydro.

3. Services Forecast

The Norwegian software and services market represents only some 2% of the West European market. Exhibit VIII-153 shows the INPUT forecast that the Norwegian market will grow from \$1.1 billion in 1989 to \$2.3 billion in 1994. The average growth rate over this five-year period is estimated at 15% per annum, one of the slowest in Europe.

Relative to the overall European software and services market, the Norwegian market is strong in processing services. This processing dominance is similar to the situation in other Scandinavian countries. Some 27% of the Norwegian market is accounted for by processing services, as opposed to the European average of 16%.

EXHIBIT VIII-153

Market Forecast—Norway, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 395 | 420 | 545 | 5 |
| Network Services | 27 | 37 | 125 | 27 |
| Software Products | 210 | 260 | 625 | 17 |
| Turnkey Systems | 125 | 145 | 370 | 21 |
| Systems Integration | 16 | 19 | 46 | 21 |
| Professional Services | 210 | 250 | 550 | 17 |
| Total | 985 | 1,131 | 2,261 | 15 |

*Figures may not add due to rounding

Of the other delivery modes, professional services is weak in Norway and represents only 22% of the overall market; the European average is 30%.

Exhibits VIII-154 through VIII-159 provide a breakdown of the market for services for each of the delivery modes for Norway.

EXHIBIT VIII-154

Market Forecast, Processing Services Norway, 1989-1994

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | | | | |
| Transaction Services | 390 | 415 | 530 | 5 |
| Systems Operations | 6 | 6 | 14 | 18 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 396 | 421 | 544 | 5 |

*Figures may not add due to rounding

EXHIBIT VIII-155

Market Forecast, Network Services—Norway, 1989-1994

| | Market Forecast* (\$ Millions) | | | |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Network Services | | | | |
| Electronic Information Services | 20 | 26 | 74 | 23 |
| Network Applications | 7 | 11 | 50 | 35 |
| Total | 27 | 37 | 124 | 29 |

*Figures may not add due to rounding

EXHIBIT VIII-156

**Market Forecast, Software Products
Norway, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 85 | 105 | 280 | 22 |
| Systems Software | 125 | 160 | 345 | 17 |
| Total | 210 | 265 | 625 | 19 |

*Figures may not add due to rounding

EXHIBIT VIII-157

**Market Forecast, Turnkey Systems
Norway, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 72 | 79 | 166 | 16 |
| Packaged Software | 39 | 45 | 136 | 25 |
| Custom Software | 9 | 11 | 33 | 24 |
| Other Professional Services | 8 | 9 | 33 | 30 |
| Total | 128 | 144 | 368 | 21 |

*Figures may not add due to rounding

EXHIBIT VIII-158

Market Forecast, Systems Integration Norway, 1989-1994

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 6 | 7 | 15 | 16 |
| Packaged Software | 1 | 1 | 3 | 24 |
| Other Services | 0 | 1 | 1 | 8 |
| Professional Services | 8 | 9 | 27 | 25 |
| Total | 15 | 18 | 46 | 24 |

*Figures may not add due to rounding

EXHIBIT VIII-159

Market Forecast, Professional Services Norway, 1989-1994

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 30 | 36 | 78 | 17 |
| Education and Training | 11 | 13 | 31 | 19 |
| Software Development | 170 | 200 | 440 | 17 |
| Systems Operations | 1 | 2 | 4 | 15 |
| Total | 213 | 251 | 553 | 17 |

*Figures may not add due to rounding

4. Competitive Environment

The Norwegian market is dominated by a limited number of large domestic vendors. The largest vendor is Kommunedata, with some \$100 million revenues in 1988, or some 13% of the total Norwegian market. Kommunedata is a cooperative of local government authorities and provides central processing services.

Fellsdata and IDA are the second- and third-largest vendors and also provide processing services, but for specific industrial markets. IBM is a major vendor in the Norwegian software and services market, as is the only Norwegian equipment vendor, Norsk Data.

Norsk Data generated some \$55 million from the Norwegian market in 1988. Norsk's prime delivery mode is turnkey systems. Norsk ran into serious financial problems in 1988 when end users demanded UNIX solutions.

As with other European equipment vendors that sell turnkey, Norsk delayed its decision to port its portfolio to UNIX as long as possible, and as a consequence lost market share and incurred heavy porting costs.

U

Other Asia

1. Introduction

For the purpose of INPUT's worldwide forecast, the Other Asia area consists mainly of China (PRC), Indonesia, Malaysia, the Philippines, Taiwan, and Thailand. The Other Asia area also includes Burma, Cambodia, Pakistan, Sri Lanka, and Vietnam, by virtue of their geographic location. Because these latter countries are believed to represent only minimal revenues, they are not addressed specifically.

The Other Asia area is believed to represent the next major area of economic development. With a population of 1.4 billion and a national interest in technology by nearly all developing countries in the area, the market for information services is virtually limitless.

2. Economic and Political Setting

The economic and political setting of the Other Asia area is extremely fragmented.

The area can be characterized as economically weak and as having only a limited technological infrastructure. Most of the countries in the Other Asia area must continually address the division of national resources between technology investment, which can aid industrial development, and developing basic national resources (such as through education).

Economic growth in the region will vary by country. A number of countries will continue to grow at rates that exceed the world average—5-6% or more. However, some countries will find it difficult to maintain their rates of growth without changes in political and economic structures.

Politically, the region appears to be reasonably stable; however, as evidenced by recent events in mainland China, situations can change quickly. In a number of countries, underlying weaknesses could result in rapid change.

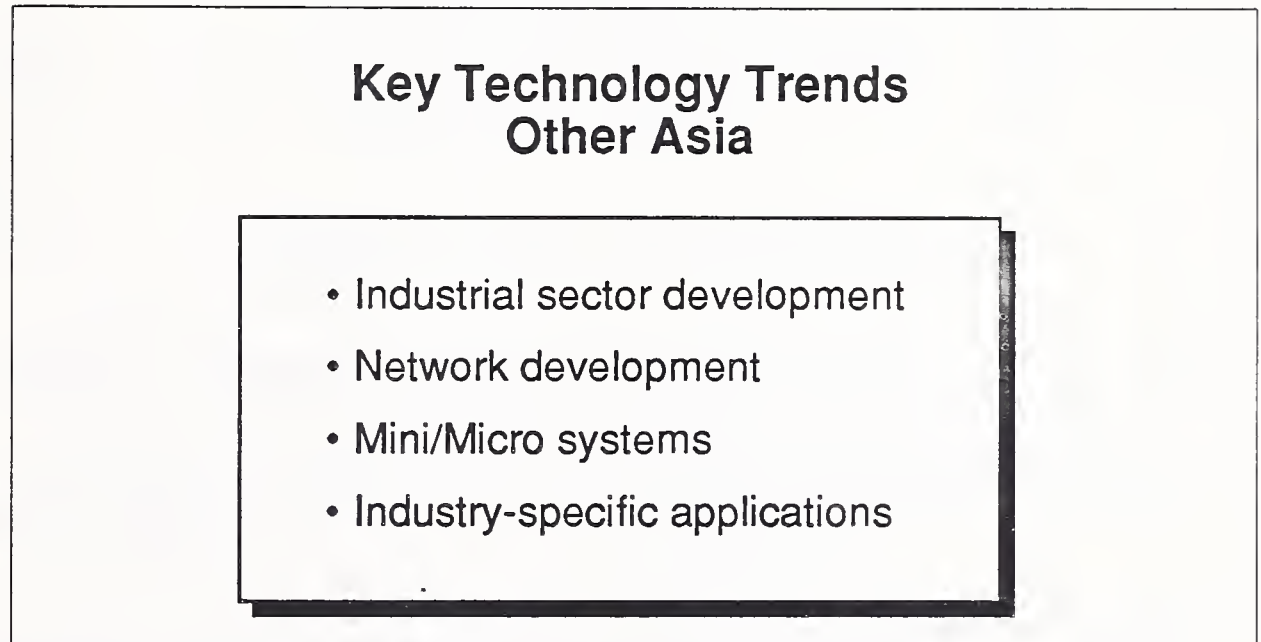
An example is the Bumiputra movement in Malaysia. While aspiring to ensure the incorporation of all Malaysians into the economic and political structure (Malaysian Chinese hold the majority of the wealth), the movement has fostered considerable resentment. Another example is the Communist insurgency in the Philippines, which could topple the current government.

A somewhat fragile political infrastructure suggests caution about making extensive, long-term commitments in many countries of the Other Asia area.

3. Key Technology Trends

Technology trends vary by country. However, several trends are common to the majority of the countries of the area as well as to many other developing countries of the world. Summarized in Exhibit VIII-160, the key trends include the following:

EXHIBIT VIII-160



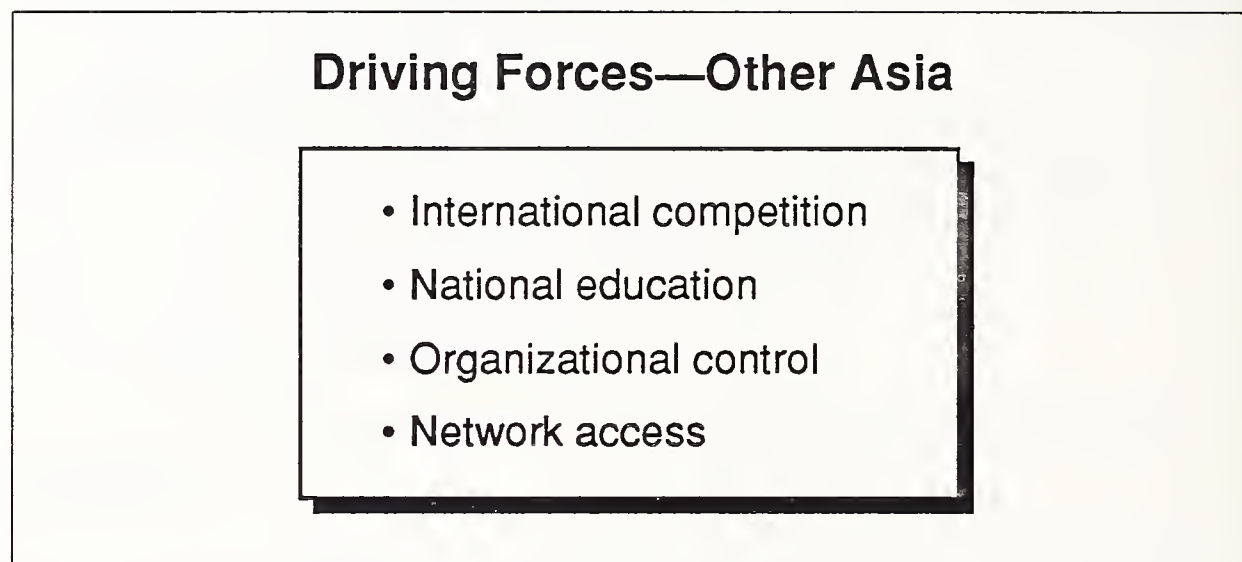
- *Industrial sector development*—Development of a competitive industrial infrastructure is a leading requirement of the majority of the countries in Asia. Having historically relied on low-cost labor, most countries recognize that development of their industrial sector is necessary to be able to compete in the next century. These countries also recognize that automation is necessary to the development of the industrial sector.
- *Network development*—The ability to communicate domestically and internationally is increasingly recognized as critical to a country's development. Recognizing this need, many countries are allocating increasing proportions of their national budgets to the development of national telecommunications networks and services.
- *Mini/Micro systems*—With comparatively small industrial organizations and increasingly powerful mini and micro systems, organizations in many countries are placing primary emphasis on the development of low-end systems.
- *Industry-specific applications*—Organizations are looking increasingly to industry-specific, mini/micro-based applications to manage their businesses. Specific applications are needed, as an alternative to integrated spreadsheet-type systems.

4. Environmental Factors

a. Driving Forces

Some driving forces are unique to a specific country; some are more universal. Exhibit VIII-161 illustrates forces that are common to all countries in the area.

EXHIBIT VIII-161

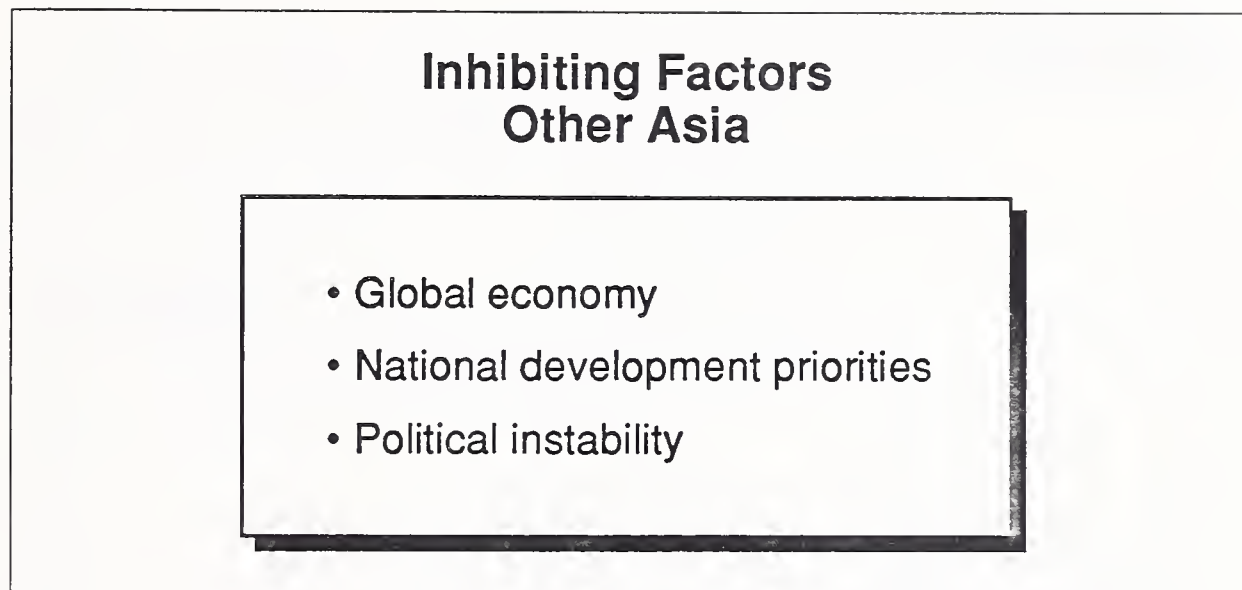


- *International competition*—Countries increasingly recognize that they must invest in technology if they are to be able to compete in the international business arena. Countries that continue to rely solely on low-cost labor as a national resource will not be competitive in the next century.
- *National education*—Education is increasingly important to be competitive. Many countries have placed primary emphasis on education as a means to increase their competitiveness, and consider technology as a means to educate the greatest number in the shortest period.
- *Organizational control*—As organizations increase their emphasis on industrial development, they recognize that information technology is necessary to control the enterprise. The increased size and complexity of organizations requires replacement of manual systems with automated systems.
- *Network access*—Communication with suppliers and customers domestically and globally is an increasingly significant need. The speed of competitive developments necessitates the ability to communicate quickly and effectively.

b. Inhibiting Factors

As with the driving forces, there are a number of inhibiting forces in each of the countries. Exhibit VIII-162 illustrates inhibiting forces considered critical to the success of information technology development in all of the countries in the area.

EXHIBIT VIII-162



- *Global economy*—With trade in natural resources or low-cost labor the primary source of revenues, most countries are heavily dependent on global economic trends. A global recession can adversely affect a country for a number of years, curtail national development projects, and impede the ability to invest in new technology.
- *National development priorities*—With limited national revenues to allocate, most countries have difficulty determining the best use of resources. Most countries recognize that technology investment will contribute to future development, but must continue to provide for national social requirements.
- *Political instability*—Political instability is a concern in many countries. Frequent change in government structure and direction has an adverse effect on investment. With each change, national priorities must be reassessed and new directions set. During the reassessment, few investments are made. In countries with frequent changes, foreign companies are frequently reluctant to make long-term investments.

5. Leading Vendors

In the majority of the Other Asia area, the leading vendors are large hardware manufacturers such as IBM, DEC, Wang, and NEC. Leaders in software include Ashton-Tate, Microsoft, and Cullinet. The leading providers of professional services are primarily the major professional services firms, such as the Big 8 from the United States and PRC from the United Kingdom.

6. Services Forecast

Exhibit VIII-163 shows that although the market for information services is small, the Other Asia area is expected to grow an estimated 20% per year for at least the next several years. Assuming continued stable and growing economies, the markets should grow from an estimated \$177 million in 1989 to \$447 million by 1994.

EXHIBIT VIII-163

Market Forecast—Other Asia/Pacific, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 11 | 12 | 19 | 10 |
| Network Services | 8 | 10 | 31 | 25 |
| Software Products | 98 | 120 | 340 | 23 |
| Turnkey Systems | 11 | 12 | 19 | 10 |
| Systems Integration | 5 | 6 | 9 | 10 |
| Professional Services | 15 | 17 | 27 | 10 |
| Total | 148 | 177 | 447 | 20 |

*Figures may not add due to rounding

Relative to the markets in the Other Asia area, please note the following:

- Although representing a small part of the overall market, the need for network services will create the highest growth rate (25%).
- Software products represent the largest portion of the market. This dominance is not expected to change for a number of years. There is an increasing need for software products for nearly all areas of the economy in most countries. However, the greatest need will be for industry-specific software.
- Due, primarily, to a lack of infrastructure, growth in other delivery modes is not expected to be as great. Most countries do not have a sufficiently large installed base to be able to support major information services investments. However, this situation could change in a number of countries.

- Indonesia, Malaysia, and Thailand are providing incentives for information technology investment and are aggressively encouraging information service investments.

7. Market Entry/Expansion Considerations

Entry into Asian markets can be a lengthy process. Even though many manufacturers have offices in the key countries, most successful companies align with organizations that have established relationships in a specific country.

A key to success in Asian markets is the ability to demonstrate a presence over the long term, which in turn requires a significant investment in staff. Historically, Asian firms have experienced dissatisfaction with foreign software firms that have not provided the support necessary to ensure product success.

For companies considering initiating or expanding operations, a strong business relationship with a local company is necessary to success.

V

Other Western
Europe**1. Introduction**

The market designated as Other Western Europe is a software and services market of \$470 million, and consists of three member countries of the European Economic Community: Eire (The Irish Republic), Greece, and Portugal. Greece and Portugal have populations of 10 million; Ireland has only 3.5 million.

2. Economic and Political Setting

Portugal is experiencing relatively high annual growth of between 3% and 4%, high inflation in excess of 12%, and a growing trade deficit.

Ireland is experiencing high economic growth at 4% (expected to reduce to 2%), moderate inflation at 4%, and a trade surplus.

The main problem in Ireland is a very high, very stubborn unemployment rate of nearly 20%. With a high standard of education, the fate of many Irish is to emigrate to other countries in Europe or to the United States.

The Greek economy is growing at around 3%, but the country has an inflation rate of nearly 14% and a growing trade deficit. Greece is also experiencing political instability.

3. Services Forecast

The size of the software and services industries in 1989 in these three countries is estimated to be \$290 million in Ireland, \$120 million in Portugal, and \$60 million in Greece.

As indicated in Exhibit VIII-164, the total market for Other Western Europe is expected to grow from \$480 million in 1989 to an estimated \$1.2 billion in 1994, an annual growth rate of 21%.

EXHIBIT VIII-164

Market Forecast—Other Western Europe, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 60 | 65 | 115 | 12 |
| Network Services | 15 | 20 | 75 | 29 |
| Software Products | 120 | 145 | 370 | 21 |
| Turnkey Systems | 85 | 100 | 245 | 20 |
| Systems Integration | 10 | 15 | 55 | 29 |
| Professional Services | 100 | 125 | 340 | 22 |
| Total | 390 | 470 | 1,200 | 21 |

*Figures may not add due to rounding

W**Singapore****1. Introduction**

In the approximately thirty years since its independence, Singapore has developed from a minor country with fewer than three million people on an island of approximately 200 square miles to a major trading nation. Singapore is a leading country in the Asia/Pacific area and vies with Hong Kong as the financial center of Southeast Asia.

2. Economic and Political Setting

With a per-capita income of nearly \$8,000, Singapore is one of the more developed countries in Asia and the leading country in Southeast Asia. Heavily tied to the economy of the United States, Singapore has had to rebound from a recessionary period in the mid-1980s.

Following austerity measures imposed by the government, the country has rebounded and is positioned for continued growth. In 1987, the economy had a real growth of approximately 7.9%. The trend of high growth is expected to continue for the next several years.

Politically, Singapore is one of the more stable countries in the region. However, there are recurring signs of difficulties that could affect the stability over the next several years.

Following years of a highly controlled environment, an increasing number of the growing, affluent middle class have been seeking an increased voice in the country's development policies and increased freedom. Suspension of distribution rights of several international newspapers has been seen by many people as unnecessary and counter to the best interests of the country.

A key event within the next few years will be the transition of power from Mr. Lee, who has maintained exceptionally strong control, to his successor. The ability of his successor to balance traditional policies and values with the changing values of the middle class will set the stage for continued growth or for a period of disruption in the development process.

3. Key Technology Trends

Exhibit VIII-165 shows several trends that are key to the development of the information services infrastructure in Singapore.

EXHIBIT VIII-165

Key Technology Trends Singapore

- Regional technology center
- Network services hub
- Software development center
- Supercomputing expertise
- High-technology manufacturing

- *Regional technology center*—With the stimulus of the government, Singapore has been working aggressively to become the technology center for Southeast Asia. Significant investment is being made in education and to provide the technological infrastructure to ensure the development process.
- *Network services hub*—As part of the overall development process, the government has pursue a policy of investment that will make the country a center for telecommunications-based services. A national objective is to replace Hong Kong as the center for telecommunications services.
- *Software development center*—The country has implemented policies to stimulate the development of the country as a center for Asian software development. Policies include preferential treatment to companies that establish software development centers in the country.
- *Supercomputing expertise*—The country has recently been working to establish itself as a center for the development of supercomputing expertise. Although a relatively recent development, the emphasis is expected to continue.
- *High-technology manufacturing*—The country continues to encourage and promote the growth of high-technology assembly and manufacturing operations.

4. Environmental Factors

a. Driving Forces

There are a number of forces driving development in Singapore. Several are directly related to the county's focus on developing a technologically sophisticated area.

EXHIBIT VIII-166

Driving Forces—Singapore

- Regional growth
- Educational quality
- Free-port country
- Technology development
- Software law

- *Regional growth*—Overall growth in the region has a significant effect on the overall growth of technology in Singapore. Considering Singapore's location and size, sustained growth would be difficult if the region were not growing.
- *Educational quality*—National emphasis on education and the resultant highly educated population has a significant effect on attracting high-technology firms to the country.
- *Free-port country*—As a free-port country, there are no duties or taxes on the importation of technology products. This stimulates the use of high technology.
- *Technology development*—The national focus on technology development has a stimulating effect on all aspects of business.
- *Software law*—The recent passing of a copyright law is having a beneficial impact on the use and development of software products. Piracy has been reduced and the government has indicated a commitment to ensuring compliance with the law.

b. Inhibiting Factors

While the driving forces currently dominate there are a number of factors that inhibit a greater rate of growth.

EXHIBIT VIII-167

Inhibiting Factors Singapore

- Labor costs
- Labor supply
- Geographic location
- Political transition

- *Labor costs*—Compared to costs in other countries in Southeast Asia, labor costs in Singapore have become quite high, forcing some companies to consider other countries as sources of labor for some types of manufacturing.
- *Labor supply*—As a small country, Singapore has a limited labor supply. This has had the effect of driving up costs. To meet the challenge, the country has placed increased attention on services that require a highly trained labor force.
- *Geographic location*—The location of the country has had a dampening effect on growth of the industry. The time and cost associated with accessing and maintaining the market have had the effect of reducing realization of the market potential.
- *Political transition*—Some observers have expressed concern over the political environment and the changes that will take place over the next several years. Although the environment is currently very stable, a new regime could reduce the desirability of the country as an investment location.

5. Leading Vendors

Virtually all major U.S. and European hardware, software, and service companies are represented in Singapore. The leading vendors include the following:

- IBM
- Hewlett-Packard
- NEC
- Wang

Other significant vendors include all U.S. and European consulting companies and the majority of network services companies. All compete in both the government and private sectors; however, the government does tend to favor European or Asian countries for many major contracts.

6. Services Forecast

The market for information services in Singapore is strong and is expected to continue to grow 19% per year for at least the next several years.

The dynamic growth rate of the information services market of Singapore would suggest that the growth rate for information services should be greater than it is. However, the local economy may be approaching saturation. As saturation draws near, growth must be derived from replacement and enhancements, as compared to new growth.

Saturation is not expected within the next several years. By then the political changes in Hong Kong could result in higher growth rates in Singapore. However, the ability of Singapore's economy to absorb new products should be carefully weighed when planning to expand business into this country.

Exhibit VIII-168 illustrates that the market for information services is expected to grow from an estimated \$480 million in 1989 to \$1.1 billion in 1994.

- The two largest markets are for software products and professional services. Together, they represent over 60% of the market.
- Software product development is a growing priority in Singapore. The government, through the National Computer Board, is placing increasing emphasis on the development of software expertise. Emphasis for national software development projects is on complex scientific systems related to supercomputing.
- Professional services, representing the second highest market category, are expected to grow at a rate of 25% per year for the next several years. The majority of this growth is attributable to growth in the market for software development.

7. Market Entry/Expansion Considerations

Entry and expansion into the information services market is relatively easy. There are few legal or financial restrictions. The majority of products are marketed through a large number of well-established distributors that have excellent reputations for service.

EXHIBIT VIII-168

Market Forecast—Singapore, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 110 | 125 | 220 | 12 |
| Network Services | 33 | 40 | 120 | 25 |
| Software Products | 128 | 150 | 360 | 18 |
| Turnkey Systems | 45 | 50 | 80 | 10 |
| Systems Integration | 17 | 20 | 51 | 20 |
| Professional Services | 78 | 98 | 300 | 25 |
| Total | 411 | 483 | 1,131 | 19 |

*Figures may not add due to rounding

However, two impediments are frequently voiced by product/service representatives in Singapore:

- As part of its educational focus, the country has developed a highly skilled and technically oriented labor force. As a result of the focus on technical detail, prospective end users will frequently favor provider representatives that are technically knowledgeable in their product or service. Representatives who can only discuss standardized product benefits will have a more difficult time in establishing markets.
- The country has sometimes been referred to as a black and white society. Stringent processes, procedures, and standards have been developed. As a result, finding acceptance for products or services that cross existing procedural or standard boundaries can be difficult. Frequently, significant additional time is required to gain acceptance.

X

Spain

1. Introduction

Spain has a population of 39 million and, with Portugal, is the latest (1986) addition to the European Economic Community (EEC). The Spanish software and services market is the fastest growing in Europe, \$1.5 billion and the eighth largest.

2. Economic and Political Setting

Spain has been a relatively poor country in Europe (GDP per capita of \$8,700), but has been experiencing sustained growth after the recession of the early eighties and record rates of foreign investment.

The economy grew 5% in 1989. The rate is projected to decline to 3.5% in 1990. Inflation—one of the highest rates in Europe—shrank to 5% in 1988 and is projected to be 3.5% by 1990. Unemployment still remains one of the highest in Europe, at over 20%.

Spain has a current trade deficit of \$3 billion, which is projected to increase to over \$12 billion by 1990. There are clear indications that the Spanish economy, like the British, has been overheating.

The Spanish center party (UCD), which had governed the country since the first free elections after the death of General Franco totally collapsed in the 1982 general election. In 1982 The Spanish Socialist Workers' Party took power under Felipe Gonzalez.

Despite the party's very leftist title, the government has conducted a very center-right economic policy. Apart from a very controversial nationalization of Spain's largest commercial conglomerate, Rumasa, little or no nationalization has taken place, and many parts of Rumasa were sold back to the private sector.

A weak and divided political opposition on the left and on the right have kept Mr. Gonzalez in power, but in the most recent elections, in October 1989, his party lost its overall majority by one seat. In view of the unpopular measures facing the government in order to deflate the economy, it is unlikely that an issue can be found to unite all the opposition parties, but the government has less room for maneuvering than before.

It is important to recognize that Spain is not a homogeneous country, and that over one-quarter of the population does not have the national language (Castilian Spanish) as its native tongue. Other regions speak Catalan Spanish, Galician Spanish, or Basque.

These regions tend to favor Europe as a means of becoming more independent from the central government. Not strictly a federation, Spain is a monarchy with a several autonomous regions. The most powerful

economy outside of the capital, Madrid, is that of Catalonia, whose capital is Barcelona. Catalonia has a regional government of center-right nationalists called *Convergencia i Unio*.

Spain has a predominance of small and medium-sized companies, especially in the regions. The two biggest Spanish companies in the European top 100 are INI and Repsol, both of which are state-owned.

Many structural changes are taking place in Spain in order to meet the challenge of the Single European Act. A significant amount of money is being spent on infrastructure, and the banks are being encouraged by the government to merge in order to compete with the larger French, German, and British banks.

The financial sector and the agricultural sector face 1992 with some confidence; the prospects for manufacturing are less certain.

3. Services Forecast

Although the Spanish software and services market in 1989 is estimated by INPUT to be only the seventh largest in Europe, by 1994 it should be the fifth largest.

INPUT forecasts that the Spanish market will enjoy the highest average growth rate (22%) in Western Europe over the period 1989 to 1994. Over this period this market should overtake the Swedish and Swiss markets. INPUT forecasts that the Spanish market should grow from \$1.5 billion in 1989 to \$4.0 billion by 1994, Exhibit VIII-169.

Exhibits VIII-170 through VIII-175 provide a breakdown of the market for services for each of the delivery modes in Spain.

EXHIBIT VIII-169

Market Forecast—Spain, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 200 | 225 | 410 | 13 |
| Network Services | 40 | 80 | 290 | 29 |
| Software Products | 355 | 445 | 1,200 | 22 |
| Turnkey Systems | 245 | 280 | 705 | 20 |
| Systems Integration | 40 | 54 | 180 | 27 |
| Professional Services | 350 | 440 | 1,250 | 23 |
| Total | 1,230 | 1,524 | 4,035 | 22 |

*Figures may not add due to rounding

EXHIBIT VIII-170

**Market Forecast, Processing Services
Spain, 1989-1994**

| Processing Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Transaction Services | 185 | 211 | 370 | 12 |
| Systems Operations | 12 | 15 | 37 | 20 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 197 | 226 | 407 | 13 |

*Figures may not add due to rounding

EXHIBIT VIII-171

Market Forecast, Network Services—Spain, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 31 | 60 | 182 | 25 |
| Network Applications | 10 | 20 | 108 | 40 |
| Total | 41 | 80 | 290 | 29 |

*Figures may not add due to rounding

EXHIBIT VIII-172

**Market Forecast, Software Products
Spain, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 130 | 165 | 500 | 25 |
| Systems Software | 225 | 280 | 700 | 20 |
| Total | 355 | 445 | 1,200 | 22 |

*Figures may not add due to rounding

EXHIBIT VIII-173

**Market Forecast, Turnkey Systems
Spain, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 140 | 155 | 315 | 16 |
| Packaged Software | 74 | 87 | 260 | 25 |
| Custom Software | 17 | 22 | 64 | 24 |
| Other Professional Services | 15 | 17 | 64 | 30 |
| Total | 246 | 281 | 703 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-174

**Market Forecast, Systems Integration
Spain, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 17 | 22 | 59 | 22 |
| Packaged Software | 2 | 3 | 11 | 29 |
| Other Services | 1 | 2 | 4 | 14 |
| Professional Services | 19 | 27 | 105 | 31 |
| Total | 40 | 54 | 178 | 27 |

*Figures may not add due to rounding

EXHIBIT VIII-175

**Market Forecast, Professional Services
Spain, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Professional Services | 348 | 437 | 1,251 | 23 |
| Consulting | 45 | 60 | 185 | 25 |
| Education and Training | 35 | 46 | 140 | 25 |
| Software Development | 260 | 320 | 900 | 23 |
| Systems Operations | 8 | 11 | 26 | 20 |
| Total | 348 | 437 | 1,251 | 23 |

*Figures may not add due to rounding

As in Italy, the Spanish software and services market is split geographically, with the government sector in one part of the country and the business sector in the other.

Government, banking, and multinational corporations are located in the center of the country, in Madrid. Business tends to be in the east, centered in Barcelona.

Major state-owned equipment vendors are also located in Madrid. Domestic private vendors, which tend to be numerous and small, are in and around Barcelona.

French vendors have seen the Spanish market as an easy target, that is significantly less advanced than France and dominated historically by a few major U.S. equipment vendors, such as IBM and NCR. Many larger French vendors have expanded into Spain by buying up domestic Spanish vendors.

4. Competitive Environment

IBM is the largest software and services vendor in Spain. IBM had revenues in 1988 of some \$140 million, or 12% of the total Spanish software and services market.

The largest domestic vendor is ENTEL, which is part owned by the state telephone company, Telefonica. ENTEL in turn owns 35% of Ibermatica, the leading Spanish professional services and software products vendor.

Of the French vendors involved in the Spanish market, CCS the second largest, independent company is owned by CISI; Sema Group owns Sema Metra Iberica; and GSI has a Spanish subsidiary, GSI Seresco. Compagnie Generale d'Informatique owns CGI Informatica.

INPUT estimates that the Spanish software and services market has the highest penetration by foreign vendors of all European markets. Some 36% of Spanish end-user revenues are judged to be controlled by U.S. vendors and some 28% by non-Spanish European vendors, leaving only about 36% of the market for domestic Spanish vendors.

Y

Sweden

1. Introduction

Sweden has a population of 8.4 million and is a member of the European Free Trade Association (EFTA). The Swedish software and services market is the sixth largest in Europe, with a size of \$1.6 billion.

2. Economic and Political Setting

Sweden is a rich country with a gross domestic product per capita of in excess of \$21,000. The economy grew 2.3% in 1988 and is projected to grow 1% in 1990. Inflation was 7% and is projected at 6.5% for 1990. Sweden has a current account deficit of \$2.5 billion. The deficit is expected to increase to nearly \$4 billion in 1990.

The political complexion of the government is left-of-center Social Democratic, led by Ingvar Carlsson. The Prime Minister has suggested that, faced with some of the most critical challenges in her history, Sweden might need a more broad-based government to arrive at greater consensus.

Sweden has traditionally been a slow, cautious and stable country—a model socialist state with cradle-to-grave social benefits and strict international neutrality.

Some critical decisions have to be faced, and some fast changes might be necessary. Sweden depends very much upon its relationship with the EEC; the trends toward liberalization within the EEC means that major changes might be necessary, even supposing that the strict neutrality objection could be overcome sufficiently for Sweden to apply for membership.

The EEC may no longer wish to provide the Swedes with the benefits of free trade without Sweden's having to support the costs of membership. The costs of the state welfare system are also beginning to present a significant strain on the economy. Some of Sweden's companies have even suggested a change of nationality if these issues cannot be resolved.

The biggest Swedish companies in the European top 100 are Volvo, Electrolux, and Saab-Scania. The Swedish-Swiss ABB Asea Brown Boveri is also in the top 100.

3. Services Forecast

The Swedish services market is the largest Scandinavian software and services market. It accounts for some 33% of the total revenue generated by the four Scandinavian countries.

Exhibit VIII-176 illustrates the INPUT forecast that the Swedish services market will grow from \$1.6 billion in 1989 to \$3.7 billion by 1994. The average growth rate over this five-year period is seen to be 18% per year. This is slightly less than the European average of 19%.

EXHIBIT VIII-176

Market Forecast—Sweden, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 365 | 395 | 535 | 6 |
| Network Services | 46 | 67 | 215 | 27 |
| Software Products | 345 | 430 | 1,080 | 20 |
| Turnkey Systems | 220 | 255 | 645 | 21 |
| Systems Integration | 28 | 35 | 120 | 27 |
| Professional Services | 385 | 465 | 1,115 | 19 |
| Total | 1,389 | 1,647 | 3,710 | 18 |

*Figures may not add due to rounding

As in the other Scandinavian markets, the Swedish market is especially strong in processing services, which represent some 24% of the market, as opposed to the European average of 15%.

Exhibits VIII-177 through VIII-182 provide a breakout of the market for services for each of the delivery modes in Sweden.

EXHIBIT VIII-177

**Market Forecast, Processing Services
Sweden, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | | | | |
| Transaction Services | 345 | 365 | 475 | 5 |
| Systems Operations | 23 | 27 | 61 | 18 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 368 | 392 | 536 | 6 |

*Figures may not add due to rounding

EXHIBIT VIII-178

Market Forecast, Network Services—Sweden, 1989-1994

| | Market Forecast* (\$ Millions) | | | |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Network Services | | | | |
| Electronic Information Services | 35 | 46 | 130 | 23 |
| Network Applications | 11 | 21 | 87 | 33 |
| Total | 46 | 67 | 217 | 26 |

*Figures may not add due to rounding

EXHIBIT VIII-179

**Market Forecast, Software Products
Sweden, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 135 | 175 | 485 | 23 |
| Systems Software | 210 | 260 | 595 | 18 |
| Total | 345 | 435 | 1,080 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-180

**Market Forecast, Turnkey Systems
Sweden, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 125 | 140 | 290 | 16 |
| Packaged Software | 67 | 79 | 240 | 25 |
| Custom Software | 15 | 20 | 58 | 24 |
| Other Professional Services | 13 | 15 | 58 | 31 |
| Total | 220 | 254 | 646 | 21 |

*Figures may not add due to rounding

EXHIBIT VIII-181

**Market Forecast, Systems Integration
Sweden, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 12 | 15 | 39 | 21 |
| Packaged Software | 2 | 2 | 7 | 29 |
| Other Services | 1 | 1 | 2 | 14 |
| Professional Services | 14 | 17 | 69 | 33 |
| Total | 29 | 35 | 117 | 27 |

*Figures may not add due to rounding

EXHIBIT VIII-182

**Market Forecast, Professional Services
Sweden, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 49 | 60 | 150 | 20 |
| Education and Training | 56 | 66 | 160 | 19 |
| Software Development | 280 | 335 | 800 | 19 |
| Systems Operations | 2 | 2 | 5 | 19 |
| Total | 387 | 463 | 1,115 | 19 |

*Figures may not add due to rounding

4. Competitive Environment

The Swedish market is dominated by domestic and other Scandinavian vendors.

The largest domestic Swedish vendor, Datema, was bought in late 1987 by the Finnish company Tietotehdas. However, this acquisition and the subsequent restructuring of Datema caused Tietotehdas serious financial problems in 1988, and software and services revenues of Datema in Sweden dropped from \$46 million in 1987 to \$23 million.

The Finnish equipment vendor Nokia Data has significant revenues in Sweden. In early 1988, Nokia Data was formed by the merger of the Data Division of the Swedish equipment manufacturer Ericsson and Nokia Information Systems of Finland. Nokia also bought Oy Dava Ab in Finland and EB-Ericsson in Norway.

As a result, in 1988 Nokia became an important middle-sized European equipment vendor. It specializes in turnkey systems in Scandinavia and throughout Europe. In Sweden, Nokia generates some \$38 million and so has now become the leading vendor in Sweden, partly as a result of the problems Datema has suffered.

Z**Switzerland****1. Introduction**

Switzerland has a population of 6.6 million and is a member of the European Free Trade Association (EFTA). The software and services market is the seventh largest in Europe, with a size of \$1.5 billion.

2. Economic and Political Setting

Switzerland has a gross domestic product per capita of \$27,600, making it one of the richest countries in the world, per capita. The economy is growing at an estimated 3.2%, with growth for 1990 projected to be 2.5%. Inflation was estimated to be 1.9% in 1988; a rate of 3% is estimated until 1990. Switzerland has a current trade surplus of around \$6 billion and an unemployment rate of under 1%.

Switzerland is a confederation governed by the same four-party coalition for thirty years. It is a crossroads for German, French, and Italian cultures, and has strong links with Germany and Austria.

Switzerland is traditionally stable and prosperous, but the Swiss franc, which has been one of the strongest currencies in the world, has recently shown a persistent decline in value.

There is some concern that the government needs to introduce more-dynamic change than has been usual. In the face of the Single European Act, the government faces some difficult choices. The need to integrate with Western Europe is offset by the traditional reasons for the country's prosperity: political neutrality and a separate banking system.

The biggest company in Switzerland, Nestle, has caused an upset by opening its stock to foreign ownership. Other Swiss companies and Swiss partnerships in the European top-100 are the Swedish-Swiss ABB Asea Brown Boveri, Ciba-Geigy, Migros, and Sandoz. Switzerland is strong in banking, pharmaceuticals, and manufacturing, especially machine tools.

3. Services Forecast

Exhibit VIII-183 shows that the Swiss software and services market is forecast by INPUT to grow from \$1.5 billion in 1989 to \$3.5 billion in 1994. INPUT estimates that the average growth rate over this five-year period will be 18% per year, slightly lower than the European average of 19%.

EXHIBIT VIII-183

Market Forecast—Switzerland, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 200 | 215 | 300 | 7 |
| Network Services | 53 | 82 | 245 | 24 |
| Software Products | 385 | 475 | 1,090 | 18 |
| Turnkey Systems | 305 | 345 | 865 | 20 |
| Systems Integration | 29 | 38 | 130 | 27 |
| Professional Services | 320 | 380 | 900 | 19 |
| Total | 1,292 | 1,535 | 3,530 | 18 |

*Figures may not add due to rounding

The breakdown of the Swiss market is similar to that of the West German market.

The Swiss market is strong in software products and turnkey systems. Relative to the overall European software and services market, these two delivery modes account for 53% of the overall Swiss software and services market, compared with 45% for these modes in Europe as a whole.

Exhibits VIII-184 through VIII-189 provide a breakdown of the market for services for each of the delivery modes in Switzerland.

EXHIBIT VIII-184

Market Forecast, Processing Services Switzerland, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 190 | 200 | 265 | 6 |
| Systems Operations | 12 | 15 | 35 | 19 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 202 | 215 | 300 | 7 |

*Figures may not add due to rounding

EXHIBIT VIII-185

Market Forecast, Network Services—Switzerland, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 47 | 71 | 180 | 21 |
| Network Applications | 6 | 12 | 65 | 40 |
| Total | 53 | 82 | 245 | 25 |

*Figures may not add due to rounding

EXHIBIT VIII-186

**Market Forecast, Software Products
Switzerland, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 125 | 155 | 420 | 22 |
| Systems Software | 260 | 320 | 670 | 16 |
| Total | 385 | 475 | 1,090 | 18 |

*Figures may not add due to rounding

EXHIBIT VIII-187

**Market Forecast, Turnkey Systems
Switzerland, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 175 | 190 | 390 | 16 |
| Packaged Software | 91 | 105 | 320 | 25 |
| Custom Software | 21 | 26 | 76 | 24 |
| Other Professional Services | 18 | 21 | 76 | 29 |
| Total | 305 | 342 | 861 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-188

**Market Forecast, Systems Integration
Switzerland, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 12 | 15 | 41 | 19 |
| Packaged Software | 2 | 2 | 9 | 34 |
| Other Services | 1 | 1 | 3 | 22 |
| Professional Services | 15 | 21 | 76 | 29 |
| Total | 30 | 39 | 129 | 28 |

*Figures may not add due to rounding

EXHIBIT VIII-189

**Market Forecast, Professional Services
Switzerland, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 40 | 46 | 120 | 21 |
| Education and Training | 59 | 71 | 180 | 20 |
| Software Development | 220 | 260 | 595 | 18 |
| Systems Operations | 1 | 2 | 3 | 20 |
| Total | 320 | 379 | 898 | 19 |

*Figures may not add due to rounding

4. Competitive Environment

The Swiss market is a combination of medium-to-small domestic vendors, plus U.S., West German, and French vendors.

The exception is Telekurs. This domestically owned company is a major European electronic information services vendor that sell on-line financial information, trading systems, and related professional services.

Telekurs is owned by an association of Swiss banks. It sells its electronic information services throughout European banking centers and is responsible for the Swiss computer center where all payment transfers between Swiss banks are executed.

Telekurs had some \$125 million in revenues in Switzerland in 1988 and represented some 9% of the total market. Major U.S. equipment vendors such as IBM, Digital, and Unisys are all important in the Swiss software and services market.

Cap Gemini Sogeti has had a subsidiary in Switzerland for some 20 years and generated some \$25 million from this market in 1988.

AA**Taiwan****1. Introduction**

Long viewed as an outcast stepchild of mainland China, Taiwan has emerged as a leading provider of technology in the Far East.

Until recently, the country maintained highly protectionist policies that restricted growth. However, since the late 1970s the country has increasingly sought opportunities to develop the technological infrastructure.

Projections are that Taiwan will continue its progress toward becoming a leading technology center in the Far East.

2. Economic and Political Setting

Isolationist since its break with mainland China, Taiwan has only recently begun to emerge as a participant in the world economy.

Following the direction set by the former government, the current government is expected to continue Taiwan's efforts to liberalize politically and economically. As part of the liberalization, Taiwan has been able to establish itself as one of the Four Tigers of Asia and is a leader in economic development.

For the period 1983-1987, Taiwan was able to maintain an average growth rate in GNP of 9.7%. In 1988, the rate dropped to 7%, but is expected to continue to exceed the world average of 4% for at least the next several years.

A key to Taiwan's ability to continue developing will be its relationship with the People's Republic of China (PRC). With the emergence of the PRC in the world political and economic order, Taiwan has been relegated to a lesser role. Although Taiwanese nationals see themselves as citizens of an independent country, international organizations such as the United Nations consider Taiwan to be a province of the PRC.

As it continues to develop as an independent country, Taiwan will certainly assume greater importance as a technological and economic center. However, if the country is realigned with the PRC, development could be slowed or directed into other areas.

3. Key Technology Trends

Exhibit VIII-190 shows key technology trends in Taiwan include the following:

EXHIBIT VIII-190

**Key Technology Trends
Taiwan**

- Factory automation
- Knowledge industry development
- Software development
- Network development

- *Factory automation*—Due to increasing price competition, industry is developing ways to be more cost-effective through the increased use of process controls and general automation of the factory process.
- *Knowledge industry development*—There is significant effort being placed on development of knowledge-based industries. Key to the development process are alliances that will transfer technology and raise the general level of education.
- *Software development*—A number of large and medium-sized firms are working to increase their participation in software development projects.
- *Network development*—Development of the country's national and international networking capabilities are of increasing importance in establishing connections with foreign customers and partners.

4. Environmental Factors

Exhibit VIII-191 shows key driving forces.

EXHIBIT VIII-191

Driving Forces—Taiwan

- Price/Wage competition
- Regional growth
- Industrial base development
- Regulatory liberalization

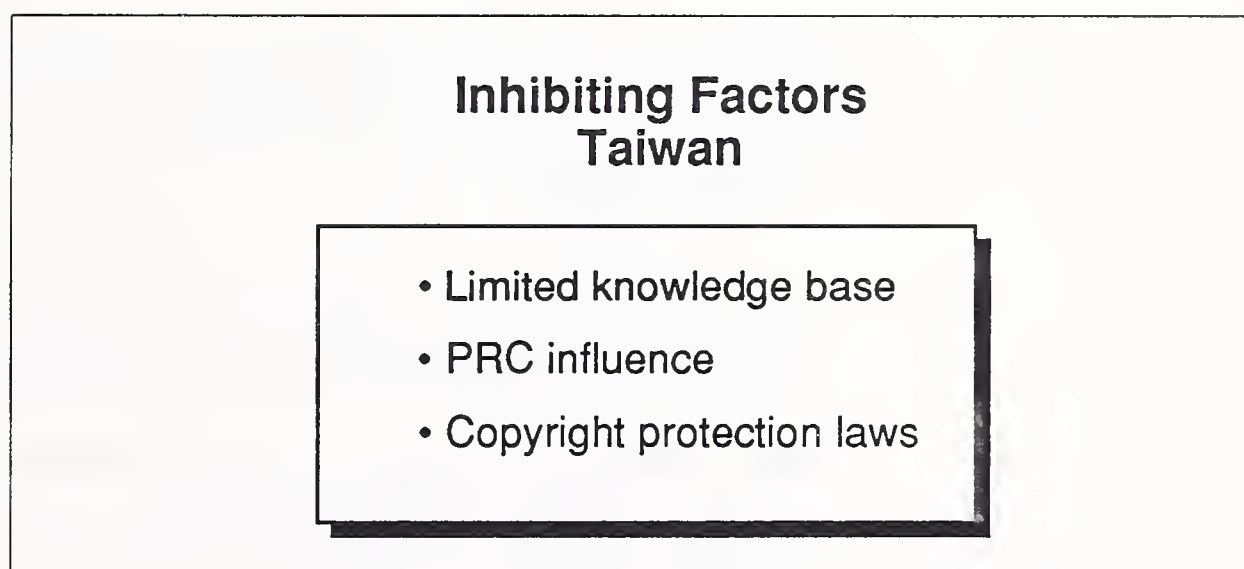
a. Driving Forces

- *Price/Wage competition*—Taiwan is under increasing pressure from other countries to be more price competitive. This pressure drives the need for more cost-effectiveness in product development.
- *Regional growth*—Regional growth is stimulating growth in all countries and industries in the region.
- *Industrial base development*—As are many countries in the Asia/Pacific area, Taiwan is moving aggressively to develop an industrial base.
- *Regulatory liberalization*—To stimulate investment from foreign firms, there have recently been steps taken to liberalize regulations in the financial services and telecommunications sectors.

b. Inhibiting Factors

Exhibit VIII-192 shows inhibiting factors.

EXHIBIT VIII-192



- *Limited knowledge base*—The country recognizes the need to upgrade the knowledge of its labor force to be able to compete successfully in the development and use of information technology services. In general, the country recognizes that it falls behind the level of expertise in other Asian countries.
- *PRC influence*—Taiwan's relationship with the PRC is of concern to some foreign companies. The future relationship between the countries is unknown; some countries are reluctant to make long-term commitments until the relationship becomes more clear.
- *Copyright protection laws*—Taiwan has consistently ignored international copyright protection laws and is a leader in piracy of hardware and software copyrights.

5. Leading Vendors

Leading hardware vendors include IBM and Unisys. In addition there are a number of high-technology circuit manufacturers located in Taiwan.

Notably lacking are software providers. Although Taiwan is working to develop its ability to develop software, companies are reluctant to move aggressively into a country where piracy so blatant.

The most well-known Taiwanese firm is Acer International, which is highly diversified. Starting as a producer of PC clones, Acer has branched out into software and services and has divisions in several countries.

6. Services Forecast

The demand for information services has grown rapidly over the past several years as the country began to expand its economic base from traditional labor-based to technology-based services.

As of the end of 1989, the market for information services in Taiwan is estimated to be slightly over \$300 million. With a growth rate of approximately 21%, the market will be \$780 million by 1994, as shown in Exhibit VIII-193.

As indicated in Exhibit VIII-194, the market for processing services is expected to grow at an estimated 16% annual rate to be driven significantly by increased requirements for transaction services.

- Although transaction services have traditionally been important, emphasis being placed on the development and enhancement of national network services is expected to stimulate the demand for on-line services.

EXHIBIT VIII-193

Market Forecast—Taiwan, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 51 | 59 | 125 | 16 |
| Network Services | 20 | 25 | 82 | 27 |
| Software Products | 64 | 80 | 245 | 25 |
| Turnkey Systems | 46 | 54 | 135 | 20 |
| Systems Integration | 10 | 12 | 28 | 19 |
| Professional Services | 64 | 74 | 165 | 18 |
| Total | 255 | 303 | 780 | 21 |

*Figures may not add due to rounding

EXHIBIT VIII-194

**Market Forecast, Processing Services
Taiwan, 1989-1994**

| Processing Services | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Transaction Services | 15 | 18 | 52 | 23 |
| Systems Operations | 26 | 29 | 50 | 12 |
| Utility Processing | 8 | 9 | 18 | 15 |
| Other Processing | 3 | 3 | 5 | 10 |
| Total | 52 | 59 | 124 | 16 |

*Figures may not add due to rounding

The concern for national network development will cause network services to grow at an estimated 27%—from \$25 million in 1989 to more than \$80 million in 1994. Exhibit VIII-195 illustrates this growth.

EXHIBIT VIII-195

Market Forecast, Network Services—Taiwan, 1989-1994

| Network Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Electronic Information Services | 17 | 21 | 73 | 28 |
| Network Applications | 3 | 4 | 9 | 20 |
| Total | 20 | 25 | 82 | 27 |

*Figures may not add due to rounding

- There is increasing interest in applications such as E-mail and EDI, but there are currently only a small number of companies that can effectively utilize these services.
- Although the application services will grow in importance, short-term emphasis will be on the development and use of electronic information services.

The need for software products is expected to grow substantially over the next several years as the economy develops. The software products market is expected to grow from an estimated \$80 million in 1989 to nearly \$250 million in 1994, as shown in Exhibit VIII-196.

- There is potential for the market to be even larger and to grow at an even faster rate; on the other hand, Taiwan is one of the primary centers of copyright infringement.
- Software is openly copied and sold under private labels. So are manuals and technical books. The prices are a fraction of the standard price.
- The country has begun to address the problem, but only limited progress has been made. To reduce the problem appreciably, as has been done with PCs, software providers will need to take direct action.

- Even considering the extent of software piracy, the market for applications software is expected to grow at nearly 28% for the next several years, as an increasing number of businesses need for PC-based applications.

EXHIBIT VIII-196

Market Forecast, Software Products Taiwan, 1989-1994

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 26 | 33 | 110 | 28 |
| Systems Software | | | | |
| Systems Control | 19 | 24 | 70 | 24 |
| Data Center Mgt. | 8 | 9 | 23 | 19 |
| Application Dev. | 11 | 13 | 41 | 26 |
| Total | 64 | 79 | 244 | 25 |

*Figures may not add due to rounding

Exhibit VIII-197 illustrates that the market for turnkey systems is expected to grow from an estimated \$54 million to more than \$135 million by 1994.

Two factors account for a growth rate of turnkey systems that is substantially higher than in other areas of the world.

- The first is the growing number of businesses that are in need of processing solutions.
- The second is the high interest in locally made equipment that can be acquired at a fraction of the cost of foreign equipment.
- The result is a growth rate for equipment that is considerably higher than in other parts of the world.

EXHIBIT VIII-197

Market Forecast, Turnkey Systems Taiwan, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 23 | 29 | 88 | 25 |
| Packaged Software | 11 | 12 | 19 | 10 |
| Custom Software | 4 | 5 | 10 | 17 |
| Other Professional Services | 8 | 9 | 19 | 15 |
| Total | 46 | 55 | 136 | 20 |

*Figures may not add due to rounding

Exhibit VIII-198 shows that the market for systems integration is small and is not expected to show significant growth for the next several years. Although there is great need for professional services to assist in identifying integration opportunities, there are few businesses that are sufficiently large to be able to warrant major systems integration efforts.

The market for professional services is expected to grow from an estimated \$74 million in 1989 to nearly \$170 million in 1994, as shown in Exhibit VIII-199. The greatest needs will be for consulting and software development to meet local needs.

7. Market Entry/Expansion Considerations

Entry into the Taiwanese market can be difficult. Governmental policies and procedures are lengthy and complex. In addition, there is a bias in favor of locally provided goods and services.

For providers of software, there is also a risk of finding key products copied and available at reduced prices shortly after introduction.

The least risky opportunities are for personal services, such as consulting. Entering the market through consulting services can provide a knowledge of the market and a means of building relationships, a key requirement for success in the country.

For vendors considering product opportunities, selection of a well-established company as a representative is recommended as the preferred approach.

EXHIBIT VIII-198

**Market Forecast, Systems Integration
Taiwan, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|-----------|-----------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 5 | 6 | 14 | 18 |
| Packaged Software | 1 | 1 | 2 | 9 |
| Other Services | 1 | 1 | 1 | 6 |
| Professional Services | 3 | 4 | 11 | 25 |
| Total | 10 | 12 | 28 | 19 |

*Figures may not add due to rounding

** Amounts less than \$10 million not shown. Refer to data base for specific data.

EXHIBIT VIII-199

**Market Forecast, Professional Services
Taiwan, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|-----------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 13 | 16 | 40 | 21 |
| Education and Training | 8 | 9 | 16 | 12 |
| Software Development | 38 | 44 | 100 | 18 |
| Systems Operations | 5 | 6 | 10 | 12 |
| Total | 64 | 74 | 167 | 18 |

*Figures may not add due to rounding

BB**United Kingdom****1. Introduction**

The United Kingdom has a population of 56 million and has been a member of the European Economic Community (EEC) since 1973. The U.K.'s software and services market is third largest in Europe, with a size of just over \$9.3 billion.

2. Economic and Political Setting

The United Kingdom has an average per capita income of \$14,300 which, with a population that is relatively large, makes the U.K. very important economically.

The United Kingdom economy has shown significant improvement during the past decade after a painful restructuring in some of the traditional manufacturing industries. An additional benefit is growth of the offshore oil industry. However, there are clear signs that the British economy has been overheating and may be on the brink of a recession.

From a growth rate of 4.6% in 1988, the forecast for 1990 has been progressively adjusted downward. Excluding oil, the growth forecast by the government in its autumn 1989 statement is for only three-quarters of one percent.

Interest rates have been raised progressively to counteract a spending boom and overheated economy to a base rate of 15%. Inflation is greater than 7%, higher than in most other European trading partners, and is projected to stay over 7% until it drops to 5% near the end of 1990.

The United Kingdom is running a record current account deficit of \$33 billion. Reduction by 25%, to \$25 billion, is expected in 1990.

The Conservative party has been in power for the last ten years. Prime Minister Margaret Thatcher has won three general elections in a row and is expected to lead her party into the next general election sometime before 1992.

However, there has been a strong revival by the main opposition—the Labour Party, which after an internal power struggle has moved back toward the political center and caused the collapse of the new center parties.

A significant feature of the last ten years has been a shift from the public to the private sector, including the privatization and liberalization of the telecommunications sector. This shift from public to private amounts to about 5% of the total gross domestic product.

There have undoubtedly been some major and real improvements in productivity in British industry. These gains are not always due to bankruptcy of the less-efficient companies during the severe recession at the beginning of the eighties.

Besides manufacturing, which represents about one-quarter of the economy, the United Kingdom has traditionally had a strong services sector, especially in finance (centered in London). The financial markets have also undergone a major transformation as a result of the deregulation in 1986—referred to as the big bang.

United Kingdom trade has shifted progressively toward Europe since the U.K. entered the European Economic Community. However, due to traditional cultural and language links, there continues to be important economic activity with other parts of the English-speaking world, such as the United States and Canada.

The biggest companies in the United Kingdom are Shell, British Petroleum, Unilever, British American Tobacco, the Electricity Council, Imperial Chemical Industries, and British Telecom. Shell and Unilever are Anglo-Dutch companies; British Telecom is the result of the privatization of the former state telephone company; and the Electricity Council is a public utility that is scheduled for privatization. Twenty-eight of the top-100 European companies are British.

The strong British services sector is expected to prosper as a result of the Single European Act, but there is some debate over the future of the manufacturing industry in the face of very strong German competition.

British manufacturing suffered a long and significant decline until the recent improvements; it remains to be seen whether those improvements are the start of a long-term revival, or just an aberration in a general decline.

3. Services Forecast

Exhibit VIII-200 shows that the U.K. software and services market is forecast by INPUT to grow from \$9.3 billion in 1989 to \$22.4 billion in 1994, an average growth rate of 19% per year. The U.K. has the third-largest software and services market, following France and West Germany.

EXHIBIT VIII-200

Market Forecast—United Kingdom, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|--------------|---------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 925 | 1,015 | 1,510 | 8 |
| Network Services | 705 | 925 | 2,475 | 22 |
| Software Products | 1,805 | 2,230 | 5,360 | 19 |
| Turnkey Systems | 1,560 | 1,760 | 4,330 | 20 |
| Systems Integration | 420 | 525 | 1,560 | 24 |
| Professional Services | 2,330 | 2,870 | 7,130 | 20 |
| Total | 7,745 | 9,325 | 22,365 | 19 |

*Figures may not add due to rounding

The U.K. is strong in organizational skills and individualism. Its vendors are strong in professional services, systems integration, and other services that need central management, such as systems operations (facilities management).

Exhibits VIII-201 through VIII-206 provide a breakdown of the market for services for each of the delivery modes in the United Kingdom.

EXHIBIT VIII-201

**Market Forecast, Processing Services
United Kingdom, 1989-1994**

| | Market Forecast* (\$ Millions) | | | |
|----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | | | | |
| Transaction Services | 785 | 835 | 1,015 | 4 |
| Systems Operations | 140 | 180 | 490 | 22 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 925 | 1,015 | 1,505 | 8 |

*Figures may not add due to rounding

EXHIBIT VIII-202

Market Forecast, Network Services—United Kingdom, 1989-1994

| | Market Forecast* (\$ Millions) | | | |
|---------------------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Network Services | | | | |
| Electronic Information Services | 525 | 705 | 1,720 | 20 |
| Network Applications | 180 | 220 | 755 | 28 |
| Total | 705 | 925 | 2,475 | 22 |

*Figures may not add due to rounding

EXHIBIT VIII-203

Market Forecast, Software Products United Kingdom, 1989-1994

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 605 | 770 | 2,150 | 23 |
| Systems Software | 1,200 | 1,460 | 3,215 | 17 |
| Total | 1,805 | 2,230 | 5,365 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-204

Market Forecast, Turnkey Systems United Kingdom, 1989-1994

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 895 | 965 | 1,950 | 15 |
| Packaged Software | 465 | 550 | 1,590 | 24 |
| Custom Software | 105 | 140 | 395 | 23 |
| Other Professional Services | 90 | 105 | 395 | 30 |
| Total | 1,555 | 1,760 | 4,330 | 20 |

*Figures may not add due to rounding

EXHIBIT VIII-205

**Market Forecast, Systems Integration
United Kingdom, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 180 | 215 | 515 | 19 |
| Packaged Software | 25 | 33 | 90 | 22 |
| Other Services | 13 | 16 | 33 | 15 |
| Professional Services | 200 | 260 | 920 | 29 |
| Total | 418 | 524 | 1,558 | 24 |

*Figures may not add due to rounding

EXHIBIT VIII-206

**Market Forecast, Professional Services
United Kingdom, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 320 | 400 | 1,130 | 23 |
| Education and Training | 245 | 295 | 795 | 22 |
| Software Development | 1,745 | 2,150 | 5,130 | 19 |
| Systems Operations | 16 | 25 | 74 | 28 |
| Total | 2,326 | 2,870 | 7,129 | 20 |

*Figures may not add due to rounding

The U.K. has the largest systems integration market in the whole of Europe, and also the leading network services market. The U.K. market leads Europe by 2 to 5 years, depending upon the country, in developing EDI and other network services.

Part of this lead is traceable to the influence of U.S. vendors in the U.K. Part is from the strength of the City of London after the Big Bang in 1986, which led to the rapid growth of financial electronic information services and currency trading systems.

INPUT forecasts that the growth of these two delivery modes in the U.K. will be slower than in Europe on average, but because of the lead that the U.K. has already built up, the U.K. will still stay the market leader in both through 1994.

Traditionally the U.K. has been the first step for many U.S. vendors in their move into Europe. The penetration of the U.K. market by U.S. vendors (30%) is second only to U.S. penetration in Spain. Other European vendors also are relatively important in the U.K.—other European vendors have an 8% market penetration.

Of the four major European economies—West Germany, France, the U.K., and Italy—the U.K. has by far the highest penetration by foreign vendors. INPUT estimates that only some 62% of the market is held by domestic vendors.

The reason for high penetration is partly the minimal language barrier between the U.S. and the U.K. The U.K. has also traditionally been a far more open market than many of its European counterparts. It has been easy to establish a local subsidiary in the U.K., or to acquire a U.K.-based company.

As a result, the U.K. is the most competitive and active computer software and services market in Europe.

4. Competitive Environment

Exhibit VIII-207 lists the top 10 software and services vendors as identified by INPUT in the U.K. market in 1988.

EXHIBIT VIII-207

Top Ten Vendors—United Kingdom, 1988

| Rank | Company | Market Share (Percent) | Estimated Revenues (\$ Millions) |
|------|-------------------|------------------------|----------------------------------|
| 1 | IBM | 7.0 | 545 |
| 2 | Reuters | 6.9 | 380 |
| 3 | ICL | 4.3 | 330 |
| 4 | McDonnell Douglas | 3.0 | 235 |
| 5 | Prime | 2.7 | 210 |
| 6 | SD-Scicon | 2.1 | 165 |
| 7 | Hoskyns | 2.1 | 160 |
| 8 | Sema | 1.9 | 150 |
| 9 | Istel | 1.7 | 130 |
| 10 | Unisys | 1.6 | 40 |
| | Other | 68.6 | 5,310 |
| | Total | 100.0 | 7,740 |

Totals do not equal 100 due to rounding

Four of the top U.K. vendors are U.S.-owned. IBM is the largest software and services vendor with 1988 revenues of \$545 million, or 7% of the overall U.K. market.

The U.K. is McDonnell Douglas Information Systems' most important European market, accounting for some 66% of McDonnell Douglas' European revenues, or some \$235 million in 1988. Similarly, the U.K. is Prime's main European market and accounts for some 40% of Prime's European revenues, or some \$210 million.

McDonnell Douglas sells a wide range of turnkey systems, such as in local government market sectors and CAD/CAM. Prime specializes in CAD/CAM and graphics-related turnkey systems.

U.K.-owned Reuters is Europe's largest electronic information services vendor. It specializes in on-line financial and trading systems.

Istel was formed from the U.K. car manufacturer Rover Group as BL Systems. Subsequently BL Systems became Istel through a management buyout. Although successful in the U.K., management realized that the company could never offer internationally competitive services on its own and in late 1989 accepted a bid by AT&T.

The leading U.K. network services vendor is INS, a joint venture between ICL and GEIS.

Hoskyns, the leading systems operations vendor in Europe, also changed ownership during 1989. Hoskyns was started up by John Hoskyns in 1964 and was acquired in the 1970s by Martin Marietta of the U.S. In 1988, Plessey bought 98% control of Hoskyns, but then ran into financial difficulties. In 1989, Hoskyns was acquired by a joint bid from GEC of the U.K. and Siemens of West Germany. GEC and Siemens each own 50%.

CC

United States

1. Introduction

The United States is the largest information services market available. At \$92 billion in 1989, the U.S. market controls 53% of worldwide expenditures. Although U.S. growth will slow somewhat in the next five years (15% CAGR), revenue potential is still greater here than anywhere else. Even secondary local markets in the U.S. will have more potential during the forecast period than will the national markets of many of the smaller developing countries.

Of course, the relative maturity of the U.S. market has allowed many vendors to flourish, so nearly all market sectors and niches are now quite crowded. New entry can be difficult without a superior product, a powerful sales and marketing channel, or both.

2. Economic and Political Setting

Economic forecasts for the U.S. call for slowing but still steady growth during the first half of the next decade. The nominal gross national product should increase between six and eight percent per year, with inflation composing 4.5% to 5.5% of that figure.

The overall U.S. market will grow at 15% CAGR during the forecast period; the prior year's forecast showed a comparable rate of 17%. This growth rate reflects several factors:

- Sheer size makes straight-line growth difficult to achieve.
- Declining equipment ship rates will have a dampening effect.
- Competition in some sectors will shift to a price orientation, thus reducing available revenues to vendors.

The open U.S. market will continue to attract overseas vendors, through acquisition or joint venture in most cases. Relative weakness of the U.S. dollar may boost the attractiveness of U.S. companies as acquisition targets.

For overseas and domestic acquirors, the make-versus-buy decision for new products and markets in the U.S. will continue to be answered with the "buy" decision for quicker entry into the U.S. markets.

Declining costs and high development costs of computer equipment are pushing equipment leaders such as IBM, Digital, and Unisys to target software and services markets as major components of profit and revenue growth in the 1990s.

These factors are summarized in Exhibit VIII-208.

EXHIBIT VIII-208

**Market Forecast—United States
Political/Economic Setting**

- Slow but steady growth, early 1990s
- Sheer size causes lower growth rates
 - 1988-1993 forecast: CAGR = 17%
 - 1989-1994 forecast: CAGR = 15%
- Declining shipment rates on equipment
- Profit/growth opportunities shift from equipment to software and services
- Increased competition from overseas vendors
- Continuing merger and acquisition activity

3. Key Technology Trends

Technology has always been a driving force behind the information services business, as vendors provide improved solutions to users hungry for a competitive advantage. In addition, the complexity of new technologies and the uncertainty concerning their application, will continue to provide a boost to consulting, education/training, and software development.

Some of the more promising technologies that will drive information systems markets are listed in Exhibit VIII-209. Of these, competitive processing (client-server model) may have the greatest impact as systems architectures and communications networks are reworked or replaced to take advantage of this emerging capability.

4. Environmental Factors**a. Driving Forces**

Forces driving the U.S. information services industry include the following. Exhibit VIII-210 shows these forces.

EXHIBIT VIII-209

**Market Forecast—United States
Trends and Influences**

- Emerging technologies drive information services growth
 - Cooperative processing
 - Image processing
 - Knowledge-based systems
 - C++ object-oriented languages
 - Multimedia systems
 - Graphical user interfaces

EXHIBIT VIII-210

Driving Forces—United States

- Shortened product life cycles
- User demand for more-sophisticated solutions
- Preference for total-solution vendors
- Vendor consolidation continues
- Growing (long-term) acceptance of standards
- Emergence of cooperative processing architectures, solutions
- IBM minority investment strategies
- Strong trend to "outsourcing"
- Lack of skilled in-house resources boosts systems integration and professional services

- Product life cycles in all industries are shortening. Fast time-to-market needs and competitive responses require effective information systems and services to assist these aims.

- As plain-vanilla software applications reach their limits of functionality, new and more complex solutions are being designed, envisioned and demanded by users.
- A strong preference is developing for total-solution vendors that can provide a broader range of planning support, integration, and maintenance services surrounding products.
- As competition increases and liquidity becomes a more difficult prospect for many entrepreneurs, mergers and acquisitions have become a more common practice and will continue into the mid-1990s as a significant impact on industry structure.
- Standards for systems software, communications protocols, graphical user interfaces, query languages, etc., are rapidly evolving; and users and vendors alike must consider the impact of standards.
- The aforementioned cooperative processing architectures are influencing new-product requirements for many software and service vendors, as this new opportunity rapidly emerges.
- IBM's minority investments in software and services companies are reconfiguring the industry and creating problems for other equipment manufacturers and software vendors not selected by IBM.
- The trend to outsourcing has re-emerged (one catalyst is the IBM-Kodak contract) and caused information systems managers to consider this alternative more closely as a cost-effective means of processing information.
- Lack of skilled in-house professionals is providing a significant boost to systems integration and professional services vendors.

b. Inhibiting Factors

As shown in Exhibit VIII-211, the healthy growth of the U.S. market is at least slightly constrained by the following factors:

- Crowded market niches create difficult conditions for smaller vendors or for those without product differentiation or market power, and cause price competition in many sectors.
- The long-term impact of standards will be positive for the industry. On a short-term basis, as standards evolution confuses users who cannot be sure which standards to embrace. This confusion in turn causes delays in procurements.

- Software complexity also creates user confusion as marketing programs by vendors become increasingly technical and differences become trivial.
- Users continue to lag behind vendors in their adoption of technology. Innovative solutions are being introduced more rapidly than many users can digest them.
- Declining shipment rates for new computers, especially in the main-frame family, have a direct impact on the growth of software products and turnkey systems markets.
- Sheer market size reduces the possibility of rapid growth—at \$92 billion in 1989, \$14 billion in new revenue must be generated in 1990 for a 15% growth rate.

EXHIBIT VIII-211

Inhibiting Factors—United States

- Crowded market niches, many competitors
- Emerging standards create short-term confusion
- Software complexity creates user confusion
 - Technical differentiation of products
 - Slow absorption by users
- Declining equipment shipment growth rates
- Sheer market size reduces growth rates (\$92 billion in 1989)

5. Leading Vendors

The 10 largest vendors in the U.S. information services markets are shown in Exhibit VIII-212. Because the total market share of the 10 is only 17%, this is obviously a fragmented market, although consolidation continues.

EXHIBIT VIII-212

Leading Vendors U.S. Information Market

| Vendors | Estimated Market Share, 1989 (Percent) |
|-------------------------|---|
| IBM | 6 |
| Electronic Data Systems | 2 |
| ADP | 2 |
| Computer Sciences | 1 |
| Digital Equipment | 1 |
| Control Data | 1 |
| UNISYS | 1 |
| McDonnell Douglas | 1 |
| Andersen Consulting | 1 |
| Equifax | 1 |

6. Services Forecast

The forecast for the total market, and for each delivery mode, is shown in Exhibit VIII-213.

Obviously, software products represent the largest of the delivery mode opportunities in the U.S., but significant revenue potential exists in all areas. For more detailed information on this forecast, readers are referred to INPUT's *Information Services Market Forecast, 1989-1994*. A more detailed forecast is shown in the appendix to this report.

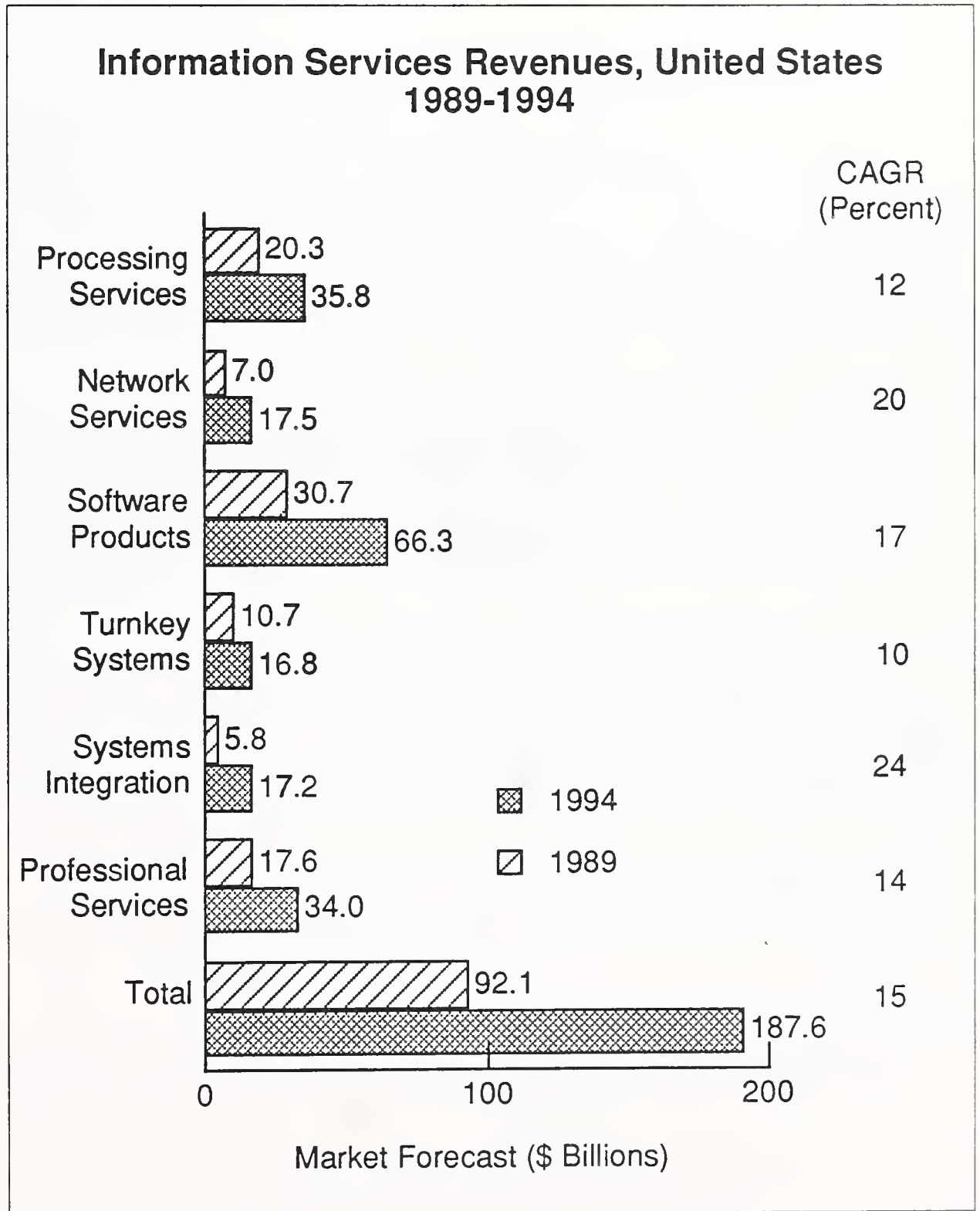
Processing services continue their steady growth, despite inroads from mini- and PC-based software products and turnkey systems. A recent interest in systems operations (facilities management) will help sustain this growth.

Network services are primarily driven by strong growth in electronic information services (data bases).

Systems integration has emerged as one of 1989's major news stories, with high levels of user interest, multiple vendor alliances, and a rapid rise in the number of system integration projects launched or planned.

Professional services benefit from the growing complexity of required solutions, a continuing shortage of skilled in-house personnel, and an undiminished maintenance load and application backlog in many installations. Consulting services are also driven by the need for strategic planning for new applications and systems.

EXHIBIT VIII-213



7. Market Entry/Expansion Considerations

Exhibit VIII-214 summarizes considerations for expanding participation in the U.S. market. Because of the crowded, very competitive sectors and niches, expansion now will come most easily through merger or acquisition, rather than through a "bootstrap" approach that builds a product and staff from the ground up.

EXHIBIT VIII-214

Market Entry Considerations United States

- Nearly all target markets have substantial competition, with entrenched leaders
- Alliances (with successful vendors) can expand offerings, open markets

The lure of the U.S. market continues to be strong for many overseas vendors, despite the competitive climate. Since the U.S. represents 53% of the worldwide total, even a small penetration of this market can often mean significant revenues and profits. Entry by European, Japanese, and other Pacific Rim vendors can be expected to continue.

DD**Venezuela****1. Introduction**

Despite a history of internal turmoil, Venezuela has been able to achieve a greater level of stability than many Latin American countries. Although the country is dominated by several influential families, elections every five years have created a stable political base. For the next few years economic and political developments are expected to continue along the lines of the past several years.

2. Economic and Political Setting

The economic and political setting in Venezuela can be best characterized as reasonably stable with moderate growth expected.

Since the upheavals of the 1960s, elections every five years have provided a base for peaceful successions of power. The current president has committed to promote programs that will encourage free enterprise. Early recognition and prompt action regarding possible illegal activities by the government's foreign exchange regulatory body are indicative of the government's commitment to a solid economic foundation.

Although Venezuela experienced an inflation rate of 30% in 1988, the overall economic growth of the country was estimated to be somewhat over 4% for the same year and thus exceeded those of many Latin American countries. Concurrently, there was an increase in imports and a decline in exports, resulting in a decline in the country's current trade account.

Recognizing the potential of further trade deficits, the government has taken steps to improve the current account balance. The country has adopted an exchange rate unification program that is expected to improve the country's relationship with multinational firms. Venezuela has plans to eliminate import monopolies and to increase competition among domestic businesses.

Overall, the economic and political situation appears to be stable, with continued moderate growth expected.

3. Key Technology Trends

Exhibit VIII-215 shows key trends in technology center around three major areas:

EXHIBIT VIII-215

Key Technology Trends Venezuela

- Microcomputer growth
- Computer education
- Industry-specific software

- *Microcomputer growth*—Significant emphasis is being placed on the use of microcomputers in small and medium-size firms.
- *Computer education*—The government is pursuing policies of implementing computers into the educational systems to ensure technology training. Most training is microcomputer based.
- *Industry-specific software*—As in many countries, there is an increasing need for industry-specific software for mini and micro computers.

4. Environmental Factors

Exhibit VIII-216 shows key driving forces include the following.

EXHIBIT VIII-216

Driving Forces—Venezuela

- Trade liberalization
- Economic reform

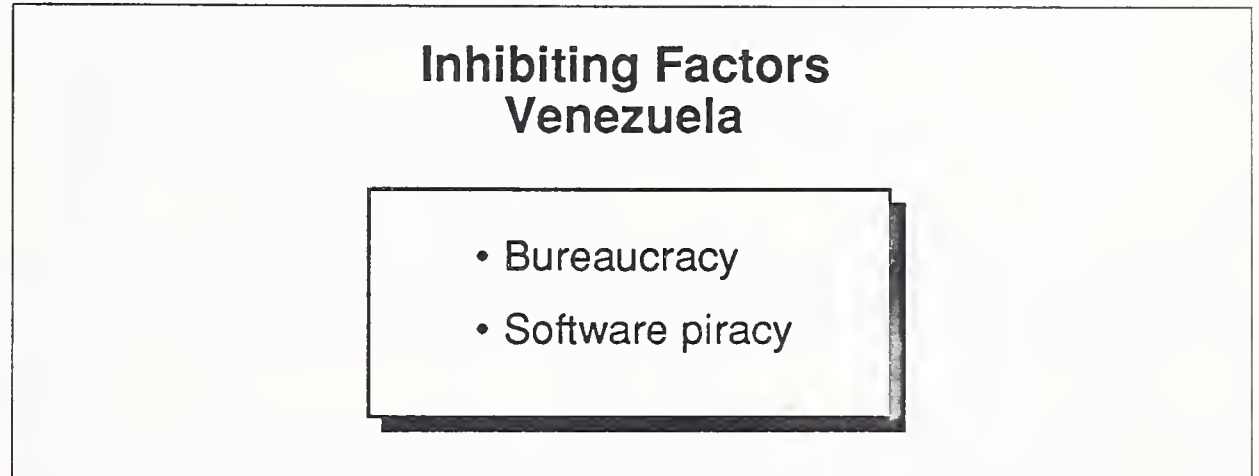
a. Driving Forces

- *Trade liberalization*—Liberalization of trade policy and a corresponding reduction in import monopolies are expected to stimulate the importation of technology.
- *Economic reform*—Focus on the stimulation of a free-enterprise marketplace is expected to increase the demands for technology-based products and services.

b. Inhibiting Factors

Exhibit VIII-217 shows key inhibiting forces which include the following:

EXHIBIT VIII-217



- *Bureaucracy*—A high level of bureaucracy has had a negative effect on the ability of business to move to a free-market economy and creates high cost for foreign companies.
- *Software piracy*—The lack of effective action against software piracy has reduced the market for mini and microcomputer software products.

5. Leading Vendors

The market in Venezuela is highly competitive. The skill level is high; a number of companies provide mainframe and microcomputer software for key industries, such as petroleum and finance.

Key foreign providers include IBM, Unisys, NCR, DEC, Apple, Wang, and Hitachi. In addition, there are a number of strong local software firms including, Comorop, Tercer Medio, Manapro, and Infotech. The Big 8 firms are well represented but have not achieved significant market share.

6. Services Forecast

Exhibit VIII-218 shows that the market for services in Venezuela is estimated to be slightly less than \$320 million. The services market is projected to grow at an estimated 16% CAGR, to more than \$650 million by 1994.

EXHIBIT VIII-218

Market Forecast—Venezuela, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | |
|-----------------------|-----------------------------------|------------|------------|-----------------------------|
| | 1988 | 1989 | 1994 | CAGR (Percent) 1989-1994 |
| Processing Services | 56 | 63 | 110 | 12 |
| Network Services | 11 | 12 | 19 | 10 |
| Software Products | 110 | 130 | 305 | 19 |
| Turnkey Systems | 33 | 36 | 58 | 10 |
| Systems Integration | 10 | 11 | 19 | 12 |
| Professional Services | 56 | 64 | 145 | 18 |
| Total | 276 | 316 | 656 | 16 |

*Figures may not add due to rounding

- As in many areas, the key area of opportunity will be for software products. Although there will be a demand for many types of mini- and micro-based products, the major requirement will be for educational software.
- The government of Venezuela has targeted education as a major initiative. As a result, computer-aided education products are receiving high interest.
- Professional services are also expected to have the second highest growth rate, driven by the need for consulting services to identify methods to make industry more cost-effective.
- Initial efforts to identify ways to improve business operations could result in increased systems integration opportunities; however, these opportunities are not expected to materialize for at least the next several years.

7. Market Entry/Expansion Considerations

Entering the Venezuelan market can be difficult. There are a wide range of regulations related to conducting business in the country and a number of import regulations that can make product entry difficult.

Business in the country is dominated by a small number of well-established families. Knowledge of the business community and local business culture is necessary for success.

Because time is required to understand the business environment and build relationships, entry through an established representative is recommended.

Key opportunities are expected to be in the areas of application software products related to education and professional services.

EE**West Germany****1. Introduction**

The Federal Republic of Germany is the most populous country in western Europe (61 million), and was a founding member of the European Economic Community (EEC). The West German software and services market is the second largest in Europe, with a total size of \$9.5 billion.

2. Economic and Political Setting

West Germany has the most powerful economy in Europe with a per capita income of \$19,600 and a total gross domestic product in excess of \$1,200 billion.

The West German economy is growing approximately 4% per year. It is projected to grow 3% in 1990. Inflation is expected to rise from less than 1%, but is still not expected to exceed 3%.

The West German economy has one of the world's healthiest trade surpluses outside Japan—\$48.5 billion in 1988 and perhaps \$60 billion by 1990.

The government tends to be either a center-right Christian Democrat and liberal Free Democrat coalition, or alternatively a center-left Social Democrat and Free Democrat coalition. At the moment the government is the former.

The most significant political changes to affect West Germany are now clearly taking place outside rather than inside the Federal Republic, as a result of the rapid collapse of the hard-line Communist governments in Eastern Europe. The reunification of Germany would potentially make the German market much more powerful than it already is; the political debate in the rest of Europe concerns when, how, or if reunification should come about.

The biggest companies in West Germany are Daimler Benz, Volkswagen, Siemens, Deutsche Bundespost, and VEBA. Twenty-nine of the top-100 European companies are in West Germany.

The principal strength of the economy is the manufacturing base. It is expected that this strength in manufacturing will benefit greatly from a single European market of 320 million people. The federal system of government makes the German market complex. Industries tend to collect in particular states; commerce is in the north, banking in the center, heavy industry in the west, and high technology in the center and south.

3. Services Forecast

The West German software and services market is the second largest such market in Europe. INPUT estimated that in 1989 West German software and services totalled some \$9.5 billion, or 19% of the overall West European software and services market. INPUT forecasts that this West German market should grow to \$21.5 billion by 1994, at an average compound growth rate of 18% per year. Exhibit VIII-219 illustrates INPUT's projection.

EXHIBIT VIII-219

Market Forecast—West Germany, 1989-1994

| Delivery Mode | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|--------------|---------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | 1,380 | 1,455 | 1,825 | 5 |
| Network Services | 305 | 440 | 1,450 | 27 |
| Software Products | 2,145 | 2,625 | 6,155 | 19 |
| Turnkey Systems | 2,150 | 2,405 | 5,585 | 18 |
| Systems Integration | 360 | 455 | 1,450 | 26 |
| Professional Services | 1,760 | 2,095 | 5,000 | 19 |
| Total | 8,100 | 9,475 | 21,465 | 18 |

*Figures may not add due to rounding

West Germans are very strong in engineering skills. This is reflected not only in West Germany's being the major manufacturing nation in Europe, but also in the West German software and services market being the leader in software products and turnkey systems.

These two delivery modes represent some 53% of the total West German market, compared with only 45% for the overall West European market. In both of these delivery modes, the West German market is the largest in Europe.

Exhibits VIII-220 through VIII-225 provide a breakdown of the West German market for services for each of the delivery modes.

EXHIBIT VIII-220

**Market Forecast, Processing Services
West Germany, 1989-1994**

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|-------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Processing Services | | | | |
| Transaction Services | 1,330 | 1,400 | 1,710 | 4 |
| Systems Operations | 47 | 54 | 115 | 16 |
| Utility Processing | - | - | - | - |
| Other Processing | - | - | - | - |
| Total | 1,377 | 1,454 | 1,825 | 5 |

*Figures may not add due to rounding

EXHIBIT VIII-221

Market Forecast, Network Services—West Germany, 1989-1994

| | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|---------------------------------|-----------------------------------|------|-------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Network Services | | | | |
| Electronic Information Services | 225 | 370 | 1,140 | 25 |
| Network Applications | 36 | 73 | 310 | 34 |
| Total | 261 | 440 | 1,450 | 27 |

*Figures may not add due to rounding

EXHIBIT VIII-222

**Market Forecast, Software Products
West Germany, 1989-1994**

| Software Products | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|----------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Application Software | 630 | 775 | 2,105 | 22 |
| Systems Software | 1,510 | 1,850 | 4,050 | 17 |
| Total | 2,140 | 2,625 | 6,155 | 19 |

*Figures may not add due to rounding

EXHIBIT VIII-223

**Market Forecast, Turnkey Systems
West Germany, 1989-1994**

| Turnkey Systems | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|--------------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 1,225 | 1,325 | 2,515 | 14 |
| Packaged Software | 645 | 745 | 2,065 | 23 |
| Custom Software | 150 | 190 | 505 | 21 |
| Other Professional Services | 130 | 145 | 505 | 28 |
| Total | 2,150 | 2,405 | 5,590 | 18 |

*Figures may not add due to rounding

EXHIBIT VIII-224

**Market Forecast, Systems Integration
West Germany, 1989-1994**

| Systems Integration | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|-----------------------|-----------------------------------|------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Equipment | 155 | 185 | 480 | 21 |
| Packaged Software | 21 | 28 | 88 | 26 |
| Other Services | 10 | 13 | 28 | 17 |
| Professional Services | 170 | 230 | 855 | 30 |
| Total | 356 | 456 | 1,451 | 26 |

*Figures may not add due to rounding

EXHIBIT VIII-225

**Market Forecast, Professional Services
West Germany, 1989-1994**

| Professional Services | Market Forecast* (\$ Millions) | | | CAGR (Percent) 1989-1994 |
|------------------------|-----------------------------------|--------------|--------------|-----------------------------|
| | 1988 | 1989 | 1994 | |
| Consulting | 215 | 255 | 610 | 19 |
| Education and Training | 315 | 365 | 875 | 19 |
| Software Development | 1,225 | 1,460 | 3,480 | 19 |
| Systems Operations | 8 | 10 | 31 | 26 |
| Total | 1,763 | 2,090 | 4,996 | 19 |

*Figures may not add due to rounding

The West German software and services market is especially strong in manufacturing systems and CAD/CAM. It is difficult for other European nations to sell software products in West Germany against domestic competition. However, West German end users have a very high regard for U.S. technical skills, and U.S. vendors have had great success in selling in Germany, especially CAD/CAM.

4. Competitive Environment

Exhibit VIII-226 lists the top 10 vendors as identified by INPUT in the West German software and services market.

EXHIBIT VIII-226

| Rank | Company | Market Share (Percent) | Estimated Revenues (\$ Millions) |
|------|-------------------|------------------------|----------------------------------|
| 1 | IBM | 9.3 | 750 |
| 2 | Nixdorf | 7.3 | 595 |
| 3 | Siemens | 7.0 | 570 |
| 4 | Datev | 3.2 | 260 |
| 5 | Mannesman Kienzle | 2.4 | 195 |
| 6 | Prime | 2.2 | 175 |
| 7 | Taylorix | 1.4 | 110 |
| 8= | Reuters | 1.1 | 90 |
| 8= | SAP | 1.1 | 90 |
| 10 | Fiducia | 1.0 | 85 |
| | Other | 64.0 | 5,180 |
| | Total | 100.0 | 8,100 |

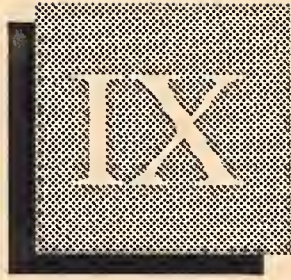
IBM is the leading software and services vendor. IBM's CAD/CAM and manufacturing software are strong in this market. Prime, the leading CAD/CAM vendor in Europe, is the sixth-leading vendor in West Germany.

West Germany has three important domestic equipment vendors. Siemens is the largest European-owned equipment vendor and is very strong in software products. Nixdorf and Mannesmann Kienzle both use turnkey systems as their prime delivery mode. Nixdorf is Europe's leading turnkey vendor, with total European turnkey revenues of some \$1 billion.

Many of the leading West German independent vendors have close financial links with their client bases. Datev, the fourth-largest West German independent, is a cooperative owned by German accountants and tax specialists, and provides central processing services for them. Many industrial enterprises and groupings have shares in domestic German software and services vendors.

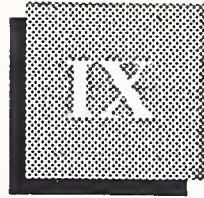
The West German market is difficult for foreign vendors to penetrate. The U.S. has been successful with certain types of software products and turnkey systems. European companies have achieved success in professional services and especially in systems integration. Cap Gemini Sogeti from France and SD-Scicon from the U.K. are very strong in the German systems integration market. Andersen Consulting, an American firm, has also been strong in this market.

The European Commission's 1992 initiative has already begun to open up high-value public-sector procurement tendering. All the leading EEC member states are allowing vendors from other EEC nations to tender freely. This opening has become a major export opportunity for European systems integrators, especially in West Germany.



Conclusions and Recommendations





Conclusions and Recommendations

A

Introduction

During the research and preparation of this report, a number of patterns emerged which could affect an organization's product or marketing strategy for international information services.

This section provides a summary of the key conclusions and a number of recommendations that are intended to maximize the investments made in international service provision.

In addition to these conclusions and recommendations, a section on market entry considerations is provided at the end of each country profile. The considerations reflect specific situations which exist in each country.

B

Conclusions

The following conclusions result from an assessment of research in all the countries and are intended to reflect a worldwide perspective. Listed in Exhibit IX-1, they are all considered to be of equal importance.

EXHIBIT IX-1

Key Conclusions

- Minis/Micros increasing importance
- Software dominant
- Industry-specific applications needed
- Software piracy an issue
- Networking a priority
- Quality important
- Software support important
- World economy dependence

- *Mini/Micro platforms*—Mini and micro systems are playing an increasingly important role in the worldwide development of information services.

As the micro-based systems increase their functionality, they approach that of mainframes of prior years. Their cost-effectiveness makes them particularly attractive in developing countries, where the size of businesses is comparatively small. They provide ample speed and capacity for most business functions.

In newly developing countries, there is increasing demand for mini- and micro-based software to manage growing businesses. In the absence of a global economic downturn, this demand is expected to continue for some time.

- *Software continues to be dominant*—As developed countries continue their efforts to become more competitive, they are looking increasingly for productivity-improvement products, and products that will tie the organization together. These considerations are driving the demand for products such as CASE, DBMS, and 4GL systems. This trend is not expected to abate for the next several years.
- *Industry-specific applications*—As countries develop and place increased emphasis on mini and micro systems and the primary processing platform, there is an increasing need for industry-specific software.

Generalized packages have been able to meet basic, initial needs, but as businesses grow, software that will meet specific requirements will be increasingly necessary.

- *Software piracy an issue*—Piracy of software has become an accepted practice in many countries. The practice is particularly prevalent in countries with severe import restrictions or where conducting business is difficult.

The problem is not expected to be resolved in the short term. Either individually or collectively, software providers will need to take action to prevent or forestall the copying of products.

- *Networking a priority*—Networking has become a universal priority. Nearly all countries recognize the value of national public networks and the services that can be provided with them. Authorities and service providers are expressing keen interest in products and services that will increase the use of public networks.

In addition to national networks, local-area networks (LANs) are becoming more important. As micro systems become a major processing platform, there will be increasing need for LANs to link the systems together.

- *Quality important*—The quality of software products is of greater importance in many countries. In the U.S., users have frequently been willing to accept software that had difficulties.

Support from primary providers has been increasingly good and in general has been readily available. In many countries, users will select a less functional product that is of higher quality, rather than a more functional, but inferior product.

- *Software support important*—Support of software products is increasingly important. Users in Kuala Lumpur expect to have the same level of support for U.S. products as users in Chicago. Support includes both problem resolution and new product releases.

Lack of vendor support has led users to seek software from local providers, to develop their own programs, or to accept responsibility for their own support. Accepting support responsibility reduces the cost-effectiveness of packages.

- *World economy dependence*—The successful globalization of products and services is highly dependent on the world economy.

With national economies becoming increasingly interdependent, economic difficulties in one country, particularly a major, developed country, have a direct effect on the ability of many countries to invest in new technology.

Service providers need to have investment strategies that will ensure a long term presence, with an ability to ride through temporary economic downturns. Reentry into a market is frequently more difficult than the initial entry, due to a loss of confidence in the vendor.

C

Recommendations

The following recommendations, in Exhibit IX-2, are intended as a general guide to building successful international product strategies.

- *Establish relationships*—In many countries of the world, relationships are more important than the quality of products.

Though the benefits of successful relationships are recognized by most organizations, their importance in many nonwestern societies cannot be overemphasized. Without good relationships, many businesses will not be successful.

- *Make long-term commitments*—Business development in many countries and areas of the world can be a lengthy process.

EXHIBIT IX-2

Key Recommendations

- Establish relationships
- Make long-term commitments
- Develop unique marketing strategies
- Develop country-specific pricing
- Be adaptable
- Be creative
- Bring added value

A return on investment of three to five years in a western country may take seven to ten years in many other countries. The generally-perceived reason for failure of some western service providers in Hong Kong is unrealistic expectations regarding the costs of conducting business and return on investment.

- *Develop unique marketing strategies*—Marketing strategies should be developed on a country-by-country basis. A marketing strategy should be developed only after there is a thorough understanding of the local economy and local marketing practices.
- *Develop country-specific pricing*—Product pricing should be developed in consideration of the uniqueness of each country.

Frequently, local businesses are willing to accept higher costs if there is an advantage in the form of a service that they are not able to receive from another provider.

- *Be adaptable*—Successful international companies must be able to adapt readily to local conditions and methods of business. Individuals and products must be able to fit into the local environment.

While many countries and businesses look to the U.S. and Europe for their products and services, there is an underlying resistance to accepting products that utilize only western concepts and procedures.

- *Be creative*—Products that are able to reflect local requirements and conditions will be more successful than generalized products.

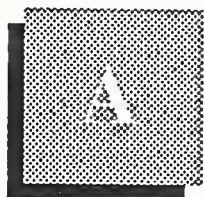
Traditional products and services are generally well-known and understood. Many countries and businesses are keenly interested in the 'next generation' of products. They have an interest in 'leapfrogging' ahead when they are preparing to make major investments.

- *Bring added value*—A key priority in many countries is the development of the local population. Plans and partnerships that will contribute to local development, though frequently more costly, will generally be well-received.



Definition of Terms

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Appendix: Definition of Terms

Appendix A contains the definitions used by INPUT to describe the information services industry.

- *Information Services* - Computer-related services involving one or more of the following:
 - Processing of computer-based applications using vendor computers (called "processing services")
 - Network-oriented services or functions such as value-added networks, electronic mail, electronic document interchange, on-line data bases, news data bases, and videotex
 - Products and services that assist users in performing functions on their own computers or vendor computers (called "software products" or "professional services")
 - Services that utilize a combination of hardware and software, integrated into a total system (called "turnkey systems" and/or "systems integration")

All user expenditures reported are "available" (i.e., noncaptive, as defined below).

A

User Expenditures

- *Noncaptive Information Services User Expenditures* - Expenditures for information services provided by a vendor that is not part of the same parent corporation as the user.
- *Captive Information Services User Expenditures* - Expenditures of users who are part of the same parent corporation as the vendor.

B

Delivery Modes

1. Processing Services

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

- *Transaction Processing Services* - Updates client-owned data files by entry of specific business activity, such as sales order, inventory receipt, cash disbursement, etc. Transactions may be entered in one of three modes:
 - Interactive - Characterized by the interaction of the user with the system, primarily for problem-solving timesharing, but also for data entry and transaction processing; the user is on-line to the program/files. Computer response is usually measured in seconds or fractions of a second.
 - Remote Batch - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements. Computer response is measured in minutes or hours.
 - Carry-in Batch - Where users deliver work to a processing services vendor
 - User Site Hardware Services (USHS) - Those offerings provided by processing services vendors that place programmable hardware at the user's site rather than at the vendor's data center. Some vendors in the federal government market provide this service under the label of distributed data services. USHS offers:
 - Access to a communications network
 - Access through the network to the RCS vendor's large computers
 - Local management and storage of a data base subset that will service local terminal users via the connection of a data base processor to the network
 - Significant software as part of the service
- *Utility Processing* - Vendor provides access to basic software tools, enabling users to develop their own problem solutions such as language compilers, assemblers, DBMSs, sorts, scientific library routines, and other systems software.
- *"Other" Processing Services* - Include computer output microfilm, other data output services, data entry services, disaster recovery and backup services.

- *Systems Operations (Processing)* - Also referred to as resource management, facilities management, or "COCO" (contractor-owned, contractor-operated). Systems control is the management of all or part of a user's data processing functions under a long-term contract of not less than one year. This would include remote computing and batch services. To qualify, the contractor must directly plan, control, operate, and own the facility provided to the user—either on-site, through communications lines, or in a mixed mode.

Processing services are further differentiated as follows:

- *Cross-industry* services involve the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but that cut across industry lines. Most general-ledger, accounts receivable, payroll, and personnel applications fall into this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific (see below).
- *Industry-specific* services provide processing for particular functions or problems unique to an industry or industry group. Specialty applications can be either business or scientific in orientation. Examples of industry-specific applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

2. Network Services

Network services include a wide variety of network-based functions and operations. Their common thread is that none of these functions could be performed without network involvement. Network services are divided into two major segments: network applications and electronic information systems.

a. Network Applications

The network applications segment is composed of three subsets:

- *Value-Added Networks (VANs)* - VANs typically involve common carrier network transmission facilities that are augmented with computerized switching. These networks have become associated with packet-switching technology because the public VANs that have received the most attention (e.g., Telenet and TYMNET) employ packet-switching techniques. However, other added data service features, such as store-and-forward message switching, terminal interacting, error detection and correction, and host computing interfacing, are of equal importance.

- *Electronic Data Interchange (EDI)* - EDI is application-to-application electronic communication between organizations, based on established business document standards.
- *Electronic Mail (E-Mail)* - Transmission of messages across an electronic mail network managed by a services vendor.

b. Electronic Information Services

Electronic information services are data bases that provide specific terminal-based inquiry such as stock prices, legal precedents, economic indicators, medical diagnosis, airline schedules, current news stories, automobile valuations, etc. Users typically inquire into and extract information from these data bases, but do not update them.

3. Software Products

This category includes user purchases of applications and systems software packages for in-house computer systems. Included are lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites.

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

There are several subcategories of software products, as indicated below.

a. Applications Software Products

Applications software products perform functions directly related to meeting users' business or organizational needs. The products can be:

- *Cross-Industry Products* - Used in multiple-industry applications as well as the federal government sector. Examples are payroll, inventory control, and financial planning.
- *Industry-Specific Products* - Used only in a specific industry sector, such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting, airline scheduling, material resource planning, and insurance claim management.

b. Systems Software Products

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

- *System Control Products* - These function during applications program execution to manage the computer system's resources. Examples include operation systems, communication monitors, emulators, spoolers, network control, library control, windowing, and access control.
- *Data Center Management Products* - Used by operations personnel to manage the computer system's resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, utilities, and capacity management.
- *Applications Development Products* - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include traditional programming languages, 4GLs, sorts, productivity aids, assemblers, compilers, data dictionaries, data base management systems, report writers, project control and CASE systems.

4. Turnkey Systems

A turnkey system is an integration of systems and applications software with CPU hardware and peripherals, packaged as a single application (or set of applications) solution. The value added by the vendor is primarily in the software and support. Most CAD/CAM systems and many small business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, or process control systems, nor does it include embedded computer resources for military applications. Turnkey systems may be either custom or packaged systems.

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

Turnkey systems revenue comes from two categories.

- *Industry-Specific Systems* - Systems that serve a specific function for a given industry sector, such as automobile dealer parts inventory, medical record keeping, or discrete manufacturing control systems.
- *Cross-Industry Systems* - Systems that provide a specific function that is applicable to a wide range of industry sectors, such as financial planning systems, payroll systems, or personnel management systems.

Revenue includes hardware, software, and support functions.

5. Systems Integration (SI)

Systems integration is a business offering that provides a complete solution to a complex information system, networking, or automation requirement through the custom selection and implementation of a variety of products and services.

A systems integrator is a business organization responsible for overall management of a systems integration contract and is the single point of contact to the buyer. It has responsibility for delivery of the specified system function and performance on schedule and at the contracted price.

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

- Program management, including subcontractor management
- Needs analysis
- Specification development
- Conceptual and detailed system design/architecture
- System component selection, modification, integration, and customization
- Custom software design and development
- Custom hardware design and development
- System implementation, cutover, test, and evaluation
- Life cycle support, including:
 - System documentation and user training
 - System operation and/or management
 - System maintenance
- Financing

6. Professional Services

This category includes consulting, education and training, software development, and systems operations as defined below:

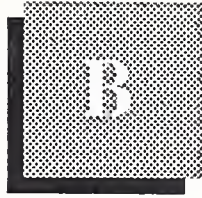
- *Software Development* - Development of a software system on a custom basis. It includes one or more of the following: user requirements definition, system design, contract programming, and documentation.

- *Education and Training* - Products and/or services related to information systems and services for the user, including computer-aided instruction (CAI), computer-based education (CBE), and vendor instruction of user personnel in operations, programming, and maintenance.
- *Consulting Services* - Information systems and/or services management consulting, project assistance (technical and/or management), feasibility analyses, and cost-effectiveness trade-off studies.
- *Systems Operations (Professional Services)* - This is a counterpart to systems operations (processing services), except the computing equipment is owned or leased by the client, not by the vendor. The vendor provides the staff to operate, maintain, and manage the client's facility.



Forecast Data Base





Appendix: Forecast Data Base

Appendix B of the Worldwide Market Forecast provides the detailed market forecast data for each country or geographic area included in the forecast.

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Argentina

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|------|----------------------|
| Total Argentina Information Services Market | 302 | 18 | 356 | 422 | 500 | 595 | 710 | 849 | 19 |
| Processing Services | 56 | 10 | 62 | 68 | 75 | 82 | 91 | 100 | 10 |
| - Transaction Processing Services | 11 | 13 | 12 | 14 | 16 | 18 | 20 | 23 | 13 |
| - Systems Operations | 28 | 9 | 31 | 33 | 36 | 40 | 43 | 47 | 9 |
| - Utility Processing | 11 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 10 |
| - Other Processing | 6 | 10 | 7 | 7 | 8 | 9 | 10 | 11 | 10 |
| Network/Electronic Information Services | 12 | 15 | 14 | 16 | 18 | 21 | 24 | 28 | 15 |
| - Electronic Information Services | 10 | 15 | 12 | 13 | 15 | 17 | 20 | 23 | 15 |
| - Network Applications | 2 | 14 | 2 | 3 | 3 | 3 | 4 | 4 | 14 |
| Application Software Products | 73 | 25 | 91 | 114 | 143 | 178 | 223 | 278 | 25 |
| Systems Software | 43 | 23 | 53 | 65 | 81 | 100 | 123 | 152 | 23 |
| - System Control Software | 26 | 25 | 33 | 41 | 51 | 63 | 79 | 99 | 25 |
| - Data Ctr. Mgt. | 4 | 12 | 4 | 5 | 6 | 6 | 7 | 8 | 12 |
| - Appl. Dev. | 13 | 23 | 16 | 20 | 24 | 30 | 37 | 45 | 23 |
| Turnkey Systems | 34 | 15 | 39 | 45 | 52 | 61 | 70 | 82 | 16 |
| - Equipment | 18 | 10 | 20 | 22 | 24 | 26 | 29 | 32 | 10 |
| - Packaged Software | 8 | 25 | 10 | 13 | 16 | 20 | 24 | 31 | 25 |
| - Custom Software | 6 | 15 | 7 | 8 | 9 | 10 | 12 | 14 | 15 |
| - Other Professional Svcs. | 2 | 20 | 2 | 3 | 3 | 4 | 5 | 6 | 20 |
| Systems Integration | 25 | 11 | 28 | 31 | 35 | 39 | 43 | 48 | 12 |
| - Equipment | 7 | 10 | 8 | 8 | 9 | 10 | 11 | 12 | 10 |
| - Packaged Software | 11 | 11 | 12 | 14 | 15 | 17 | 19 | 21 | 11 |
| - Other Services | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 4 |
| - Professional Services | 6 | 15 | 7 | 8 | 9 | 10 | 12 | 14 | 15 |
| Professional Services | 59 | 18 | 70 | 82 | 97 | 115 | 136 | 161 | 18 |
| - Consulting | 15 | 20 | 18 | 22 | 26 | 31 | 37 | 45 | 20 |
| - Education & Training | 10 | 18 | 12 | 14 | 16 | 19 | 23 | 27 | 18 |
| - Software Development | 32 | 18 | 38 | 45 | 53 | 62 | 73 | 86 | 18 |
| - Systems Operations | 2 | 5 | 2 | 2 | 2 | 2 | 3 | 3 | 5 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Australia

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Australia Information Services Market | 1,636 | 16 | 1,890 | 2,200 | 2,564 | 2,993 | 3,499 | 4,096 | 17 |
| Processing Services | 262 | 12 | 293 | 327 | 365 | 408 | 456 | 509 | 12 |
| - Transaction Processing Services | 170 | 12 | 190 | 213 | 239 | 267 | 300 | 336 | 12 |
| - Systems Operations | 55 | 10 | 61 | 67 | 73 | 81 | 89 | 97 | 10 |
| - Utility Processing | 13 | 8 | 14 | 15 | 16 | 18 | 19 | 21 | 8 |
| - Other Processing | 24 | 15 | 28 | 32 | 37 | 42 | 48 | 56 | 15 |
| Network/Electronic Information Services | 148 | 22 | 181 | 221 | 269 | 329 | 401 | 489 | 22 |
| - Electronic Information Services | 121 | 22 | 148 | 181 | 220 | 269 | 328 | 400 | 22 |
| - Network Applications | 27 | 22 | 33 | 40 | 49 | 60 | 73 | 89 | 22 |
| Application Software Products | 294 | 15 | 338 | 389 | 447 | 514 | 591 | 680 | 15 |
| - Sales/Lease | 235 | 12 | 270 | 311 | 357 | 411 | 472 | 543 | 15 |
| - Support/Maintenance | 59 | 12 | 68 | 78 | 90 | 103 | 119 | 137 | 15 |
| Systems Software | 278 | 12 | 310 | 355 | 406 | 464 | 531 | 608 | 14 |
| - System Control Software | 117 | 12 | 131 | 151 | 173 | 199 | 229 | 264 | 15 |
| - Data Ctr. Mgt. | 58 | 10 | 64 | 71 | 80 | 90 | 100 | 112 | 12 |
| - Appl. Dev. | 103 | 12 | 115 | 133 | 153 | 175 | 202 | 232 | 15 |
| Turnkey Systems | 196 | 11 | 217 | 244 | 274 | 309 | 348 | 393 | 13 |
| - Equipment | 96 | 8 | 104 | 114 | 125 | 138 | 152 | 167 | 10 |
| - Packaged Software | 49 | 10 | 54 | 59 | 65 | 72 | 79 | 87 | 10 |
| - Custom Software | 33 | 15 | 38 | 45 | 53 | 62 | 74 | 87 | 18 |
| - Other Professional Svcs. | 18 | 18 | 21 | 25 | 31 | 37 | 44 | 53 | 20 |
| Systems Integration | 131 | 21 | 158 | 191 | 231 | 280 | 340 | 412 | 21 |
| - Equipment | 59 | 19 | 70 | 84 | 99 | 118 | 141 | 168 | 19 |
| - Packaged Software | 13 | 18 | 15 | 18 | 21 | 25 | 30 | 35 | 18 |
| - Other Services | 8 | 11 | 9 | 10 | 11 | 12 | 13 | 15 | 11 |
| - Professional Services | 51 | 25 | 64 | 80 | 100 | 125 | 156 | 195 | 25 |
| Professional Services | 327 | 20 | 394 | 474 | 571 | 689 | 832 | 1,004 | 21 |
| - Consulting | 69 | 25 | 86 | 108 | 135 | 168 | 211 | 263 | 25 |
| - Education & Training | 39 | 20 | 47 | 56 | 67 | 81 | 97 | 116 | 20 |
| - Software Development | 190 | 20 | 228 | 274 | 328 | 394 | 473 | 567 | 20 |
| - Systems Operations | 29 | 12 | 32 | 36 | 41 | 46 | 51 | 57 | 12 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Austria

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|-------|-------|-------|-------|----------------------|
| Total Austria Information Services Market | 665 | 18 | 785 | 918 | 1,077 | 1,268 | 1,498 | 1,775 | 18 |
| Processing Services | 120 | 9 | 130 | 137 | 145 | 153 | 162 | 171 | 6 |
| - Transaction Processing Services | 116 | 8 | 125 | 132 | 138 | 145 | 152 | 160 | 5 |
| - Systems Operations | 4 | 25 | 5 | 6 | 7 | 8 | 10 | 11 | 18 |
| Network/Electronic Information Services | 25 | 48 | 37 | 46 | 57 | 72 | 91 | 116 | 26 |
| - Electronic Information Services | 22 | 50 | 33 | 40 | 48 | 58 | 71 | 86 | 21 |
| - Network Applications | 3 | 33 | 4 | 6 | 9 | 13 | 20 | 30 | 50 |
| Software Products | 203 | 22 | 247 | 291 | 344 | 407 | 481 | 568 | 18 |
| - Systems Software | 137 | 21 | 166 | 192 | 223 | 259 | 300 | 348 | 16 |
| - Applications Software | 66 | 23 | 81 | 99 | 121 | 148 | 180 | 220 | 22 |
| Turnkey Systems | 147 | 14 | 167 | 200 | 240 | 289 | 348 | 420 | 20 |
| - Equipment | 84 | 10 | 92 | 107 | 123 | 142 | 164 | 190 | 16 |
| - Packaged Software | 44 | 18 | 52 | 65 | 81 | 100 | 125 | 156 | 25 |
| - Custom Software | 10 | 30 | 13 | 16 | 20 | 24 | 30 | 37 | 23 |
| - Other Professional Services | 9 | 11 | 10 | 13 | 17 | 22 | 29 | 37 | 30 |
| Systems Integration | 14 | 36 | 19 | 24 | 30 | 37 | 47 | 59 | 25 |
| - Equipment | 6 | 33 | 8 | 9 | 11 | 13 | 16 | 19 | 19 |
| - Packaged Software | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 24 |
| - Other Services | 0 | 100 | 1 | 1 | 1 | 1 | 2 | 2 | 14 |
| - Professional Services | 7 | 29 | 9 | 12 | 15 | 20 | 27 | 35 | 31 |
| Professional Services | 156 | 18 | 184 | 219 | 261 | 311 | 370 | 441 | 19 |
| - Consulting | 20 | 20 | 24 | 29 | 35 | 43 | 51 | 62 | 21 |
| - Education & Training | 22 | 18 | 26 | 32 | 39 | 47 | 58 | 70 | 22 |
| - Software Development | 113 | 17 | 132 | 156 | 184 | 218 | 257 | 304 | 18 |
| - Systems Operations | 1 | 100 | 2 | 2 | 3 | 3 | 4 | 4 | 18 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Belgium

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Belgium Information Services Market | 1,206 | 19 | 1,435 | 1,692 | 2,001 | 2,373 | 2,822 | 3,362 | 19 |
| Processing Services | 193 | 6 | 204 | 214 | 225 | 237 | 250 | 264 | 5 |
| - Transaction Processing Services | 173 | 5 | 181 | 187 | 193 | 199 | 205 | 212 | 3 |
| - Systems Operations | 20 | 15 | 23 | 27 | 32 | 38 | 45 | 53 | 18 |
| Network/Electronic Information Services | 49 | 39 | 68 | 85 | 105 | 131 | 164 | 205 | 25 |
| - Electronic Information Services | 36 | 31 | 47 | 57 | 70 | 85 | 103 | 126 | 22 |
| - Network Applications | 13 | 62 | 21 | 27 | 36 | 47 | 61 | 79 | 30 |
| Software Products | 371 | 23 | 456 | 543 | 647 | 772 | 921 | 1,099 | 19 |
| - Systems Software | 213 | 23 | 262 | 307 | 359 | 420 | 491 | 574 | 17 |
| - Applications Software | 158 | 23 | 194 | 237 | 289 | 352 | 430 | 525 | 22 |
| Turnkey Systems | 139 | 16 | 161 | 193 | 232 | 280 | 338 | 408 | 21 |
| - Equipment | 79 | 11 | 88 | 102 | 118 | 137 | 158 | 183 | 16 |
| - Packaged Software | 42 | 19 | 50 | 62 | 78 | 97 | 121 | 151 | 25 |
| - Custom Software | 10 | 30 | 13 | 16 | 20 | 24 | 30 | 37 | 23 |
| - Other Professional Services | 8 | 25 | 10 | 13 | 17 | 22 | 29 | 37 | 30 |
| Systems Integration | 49 | 28 | 63 | 78 | 96 | 120 | 148 | 185 | 24 |
| - Equipment | 21 | 24 | 26 | 31 | 37 | 43 | 52 | 61 | 19 |
| - Packaged Software | 3 | 33 | 4 | 5 | 6 | 8 | 9 | 11 | 24 |
| - Other Services | 1 | 100 | 2 | 2 | 3 | 3 | 3 | 4 | 14 |
| - Professional Services | 24 | 29 | 31 | 40 | 51 | 66 | 84 | 108 | 28 |
| Professional Services | 405 | 19 | 484 | 580 | 695 | 834 | 1,000 | 1,200 | 20 |
| - Consulting | 54 | 22 | 66 | 82 | 102 | 126 | 157 | 195 | 24 |
| - Education & Training | 32 | 19 | 38 | 46 | 56 | 67 | 81 | 99 | 21 |
| - Software Development | 317 | 19 | 377 | 449 | 534 | 635 | 756 | 899 | 19 |
| - Systems Operations | 2 | 50 | 3 | 4 | 4 | 5 | 6 | 8 | 20 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Brazil

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Brazil Information Services Market | 892 | 19 | 1,061 | 1,275 | 1,534 | 1,850 | 2,237 | 2,709 | 21 |
| Processing Services | 114 | 10 | 126 | 139 | 154 | 171 | 190 | 211 | 11 |
| - Transaction Processing Services | 23 | 12 | 26 | 30 | 34 | 39 | 45 | 52 | 15 |
| - Systems Operations | 57 | 10 | 63 | 69 | 76 | 83 | 92 | 101 | 10 |
| - Utility Processing | 22 | 9 | 24 | 26 | 28 | 31 | 34 | 37 | 9 |
| - Other Processing | 12 | 10 | 13 | 15 | 16 | 18 | 19 | 21 | 10 |
| Network/Electronic Information Services | 47 | 18 | 55 | 65 | 76 | 90 | 106 | 125 | 18 |
| - Electronic Information Services | 38 | 18 | 45 | 53 | 62 | 74 | 87 | 103 | 18 |
| - Network Applications | 9 | 16 | 10 | 12 | 14 | 16 | 19 | 22 | 16 |
| Application Software Products | 208 | 25 | 260 | 325 | 406 | 508 | 635 | 793 | 25 |
| Systems Software | 188 | 23 | 231 | 283 | 346 | 423 | 518 | 634 | 22 |
| - System Control Software | 113 | 25 | 141 | 172 | 210 | 256 | 313 | 382 | 22 |
| - Data Ctr. Mgt. | 19 | 15 | 22 | 25 | 29 | 33 | 38 | 44 | 15 |
| - Appl. Dev. | 56 | 22 | 68 | 85 | 107 | 133 | 167 | 208 | 25 |
| Turnkey Systems | 111 | 15 | 128 | 151 | 178 | 211 | 252 | 302 | 19 |
| - Equipment | 56 | 10 | 62 | 68 | 75 | 82 | 90 | 99 | 10 |
| - Packaged Software | 27 | 25 | 34 | 43 | 55 | 71 | 91 | 116 | 28 |
| - Custom Software | 20 | 15 | 23 | 28 | 33 | 40 | 48 | 57 | 20 |
| - Other Professional Svcs. | 8 | 20 | 10 | 12 | 15 | 19 | 23 | 29 | 25 |
| Systems Integration | 45 | 12 | 50 | 58 | 67 | 77 | 90 | 104 | 16 |
| - Equipment | 21 | 10 | 23 | 26 | 29 | 32 | 36 | 41 | 12 |
| - Packaged Software | 4 | 11 | 4 | 5 | 6 | 7 | 8 | 9 | 15 |
| - Other Services | 2 | 4 | 2 | 2 | 2 | 2 | 3 | 3 | 6 |
| - Professional Services | 18 | 15 | 21 | 25 | 30 | 36 | 43 | 52 | 20 |
| Professional Services | 179 | 18 | 211 | 254 | 306 | 370 | 446 | 540 | 21 |
| - Consulting | 46 | 20 | 55 | 69 | 86 | 108 | 135 | 168 | 25 |
| - Education & Training | 28 | 16 | 32 | 38 | 45 | 53 | 63 | 74 | 18 |
| - Software Development | 98 | 18 | 116 | 139 | 167 | 200 | 240 | 288 | 20 |
| - Systems Operations | 7 | 5 | 7 | 8 | 8 | 9 | 9 | 9 | 5 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Canada

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Canada Information Services Market | 2,904 | 20 | 3,473 | 4,158 | 4,984 | 5,981 | 7,187 | 8,647 | 20 |
| Processing Services | 461 | 19 | 548 | 651 | 775 | 922 | 1,097 | 1,305 | 19 |
| - Transaction Processing Services | 355 | 20 | 426 | 511 | 613 | 736 | 883 | 1,060 | 20 |
| - Systems Operations | 37 | 15 | 43 | 49 | 56 | 65 | 74 | 86 | 15 |
| - Utility Processing | 46 | 15 | 53 | 61 | 70 | 80 | 93 | 106 | 15 |
| - Other Processing | 23 | 15 | 26 | 30 | 35 | 40 | 46 | 53 | 15 |
| Network/Electronic Information Services | 75 | .17 | 88 | 103 | 121 | 142 | 167 | 197 | 17 |
| - Electronic Information Services | 60 | 15 | 69 | 79 | 91 | 105 | 121 | 139 | 15 |
| - Network Applications | 15 | 25 | 19 | 24 | 30 | 37 | 46 | 58 | 25 |
| Application Software Products | 450 | 15 | 518 | 595 | 684 | 787 | 905 | 1,041 | 15 |
| - Sale/Lease | 360 | 15 | 414 | 476 | 548 | 630 | 724 | 833 | 15 |
| - Support/Maintenance | 90 | 15 | 104 | 119 | 137 | 157 | 181 | 208 | 15 |
| Systems Software | 437 | 20 | 524 | 630 | 756 | 907 | 1,089 | 1,308 | 20 |
| - System Control Software | 166 | 19 | 198 | 235 | 280 | 333 | 396 | 471 | 19 |
| - Data Ctr Mgt. | 184 | 20 | 221 | 265 | 318 | 382 | 458 | 549 | 20 |
| - Appl. Dev. | 87 | 22 | 106 | 129 | 158 | 193 | 235 | 287 | 22 |
| Turnkey Systems | 216 | 15 | 248 | 286 | 329 | 378 | 434 | 500 | 15 |
| - Equipment | 76 | 15 | 87 | 101 | 116 | 133 | 153 | 176 | 15 |
| - Packaged Software | 93 | 15 | 107 | 123 | 141 | 163 | 187 | 215 | 15 |
| - Custom Software | 37 | 15 | 43 | 49 | 56 | 65 | 74 | 86 | 15 |
| - Other Professional Svcs. | 10 | 15 | 12 | 13 | 15 | 17 | 20 | 23 | 15 |
| Systems Integration | 496 | 25 | 619 | 773 | 967 | 1,211 | 1,517 | 1,904 | 25 |
| - Equipment | 198 | 23 | 244 | 300 | 368 | 453 | 557 | 686 | 23 |
| - Packaged Software | 25 | 22 | 31 | 37 | 45 | 55 | 68 | 82 | 22 |
| - Other Services | 99 | 20 | 119 | 143 | 171 | 205 | 246 | 296 | 20 |
| - Professional Services | 174 | 30 | 226 | 294 | 382 | 497 | 646 | 840 | 30 |
| Professional Services | 769 | 21 | 928 | 1,120 | 1,353 | 1,635 | 1,978 | 2,394 | 21 |
| - Consulting | 192 | 25 | 240 | 300 | 375 | 469 | 586 | 732 | 25 |
| - Education & Training | 53 | 18 | 63 | 74 | 87 | 103 | 121 | 143 | 18 |
| - Software Development | 478 | 20 | 574 | 688 | 826 | 991 | 1,189 | 1,427 | 20 |
| - Systems Operations | 46 | 12 | 52 | 58 | 65 | 72 | 81 | 91 | 12 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Denmark

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Denmark Information Services Market | 1,088 | 14 | 1,245 | 1,443 | 1,681 | 1,964 | 2,305 | 2,715 | 17 |
| Processing Services | 366 | 2 | 374 | 395 | 418 | 443 | 468 | 496 | 6 |
| - Transaction Processing Services | 359 | 2 | 365 | 385 | 405 | 427 | 450 | 475 | 5 |
| - Systems Operations | 7 | 29 | 9 | 11 | 13 | 15 | 18 | 21 | 19 |
| Network/Electronic Information Services | 35 | 40 | 49 | 62 | 79 | 100 | 126 | 161 | 27 |
| - Electronic Information Services | 27 | 22 | 33 | 41 | 50 | 62 | 77 | 96 | 24 |
| - Network Applications | 8 | 100 | 16 | 21 | 28 | 37 | 49 | 65 | 32 |
| Software Products | 250 | 23 | 308 | 369 | 443 | 532 | 639 | 768 | 20 |
| - Systems Software | 152 | 23 | 187 | 221 | 260 | 307 | 362 | 427 | 18 |
| - Applications Software | 98 | 23 | 121 | 149 | 183 | 225 | 277 | 341 | 23 |
| Turnkey Systems | 165 | 14 | 188 | 226 | 271 | 327 | 394 | 477 | 20 |
| - Equipment | 94 | 11 | 104 | 120 | 139 | 161 | 186 | 215 | 16 |
| - Packaged Software | 49 | 18 | 58 | 73 | 91 | 113 | 142 | 177 | 25 |
| - Custom Software | 12 | 25 | 15 | 18 | 23 | 28 | 35 | 43 | 23 |
| - Other Professional Services | 10 | 10 | 11 | 14 | 19 | 25 | 33 | 43 | 31 |
| Systems Integration | 19 | 16 | 22 | 27 | 34 | 42 | 52 | 65 | 24 |
| - Equipment | 8 | 13 | 9 | 11 | 13 | 15 | 18 | 22 | 19 |
| - Packaged Software | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 24 |
| - Other Services | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 14 |
| - Professional Services | 9 | 22 | 11 | 14 | 18 | 23 | 30 | 38 | 28 |
| Professional Services | 253 | 20 | 304 | 364 | 436 | 522 | 625 | 748 | 20 |
| - Consulting | 36 | 19 | 43 | 53 | 65 | 81 | 100 | 123 | 23 |
| - Education & Training | 11 | 18 | 13 | 16 | 19 | 22 | 26 | 32 | 20 |
| - Software Development | 205 | 20 | 246 | 293 | 349 | 415 | 494 | 588 | 19 |
| - Systems Operations | 1 | 100 | 2 | 2 | 3 | 4 | 4 | 5 | 22 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Eastern Europe

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|------|------------------------|------|------|------|------|------|------|----------------------|
| Total Eastern Europe Information Services Market | 90 | 14 | 110 | 120 | 140 | 160 | 180 | 200 | 14 |
| Processing Services | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Network/Electronic Information Services | * | * | * | * | * | * | * | * | * |
| Applications Software Products | 50 | 15 | 50 | 60 | 70 | 80 | 90 | 110 | 15 |
| Systems Software | 20 | 10 | 20 | 20 | 20 | 30 | 30 | 30 | 10 |
| Turnkey Systems | 10 | 15 | 10 | 10 | 10 | 20 | 20 | 20 | 15 |
| Systems Integration | * | * | * | * | * | * | * | * | * |
| Professional Services | 10 | 15 | 20 | 20 | 20 | 20 | 30 | 30 | 15 |

* Negligible market

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Finland

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|-------|-------|-------|-------|-------|----------------------|
| Total Finland Information Services Market | 782 | 21 | 944 | 1,105 | 1,297 | 1,528 | 1,805 | 2,140 | 18 |
| Processing Services | 217 | 10 | 238 | 254 | 272 | 291 | 312 | 336 | 7 |
| - Transaction Processing Services | 201 | 8 | 218 | 231 | 244 | 258 | 273 | 289 | 6 |
| - Systems Operations | 16 | 25 | 20 | 24 | 28 | 33 | 39 | 47 | 19 |
| Network/Electronic Information Services | 26 | 42 | 37 | 47 | 59 | 74 | 94 | 118 | 26 |
| - Electronic Information Services | 19 | 21 | 23 | 29 | 36 | 45 | 56 | 69 | 25 |
| - Network Applications | 7 | 100 | 14 | 18 | 23 | 30 | 38 | 49 | 28 |
| Software Products | 198 | 32 | 262 | 314 | 378 | 454 | 545 | 655 | 20 |
| - Systems Software | 124 | 23 | 152 | 179 | 211 | 249 | 294 | 346 | 18 |
| - Applications Software | 74 | 49 | 110 | 135 | 166 | 204 | 251 | 309 | 23 |
| Turnkey Systems | 120 | 15 | 138 | 166 | 199 | 240 | 289 | 349 | 20 |
| - Equipment | 69 | 9 | 75 | 87 | 101 | 117 | 135 | 157 | 16 |
| - Packaged Software | 36 | 19 | 43 | 54 | 67 | 83 | 104 | 130 | 25 |
| - Custom Software | 8 | 50 | 12 | 15 | 18 | 22 | 26 | 32 | 22 |
| - Other Professional Services | 7 | 14 | 8 | 10 | 14 | 18 | 24 | 31 | 31 |
| Systems Integration | 9 | 33 | 12 | 15 | 19 | 24 | 30 | 39 | 26 |
| - Equipment | 4 | 25 | 5 | 6 | 7 | 9 | 11 | 14 | 22 |
| - Packaged Software | 0 | 100 | 1 | 1 | 1 | 2 | 2 | 2 | 20 |
| - Other Services | * | * | * | * | * | * | * | 1 | 14 |
| - Professional Services | 5 | 20 | 6 | 8 | 10 | 13 | 17 | 22 | 29 |
| Professional Services | 212 | 21 | 257 | 309 | 371 | 446 | 535 | 643 | 20 |
| - Consulting | 30 | 23 | 37 | 45 | 54 | 66 | 79 | 96 | 21 |
| - Education & Training | 12 | 17 | 14 | 17 | 20 | 24 | 28 | 34 | 19 |
| - Software Development | 168 | 21 | 203 | 244 | 292 | 351 | 421 | 505 | 20 |
| - Systems Operations | 2 | 50 | 3 | 4 | 5 | 6 | 7 | 8 | 23 |

* Negligible market

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

France

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|--------|------------------------|--------|--------|--------|--------|--------|--------|----------------------|
| Total France Information Services Market | 10,135 | 19 | 12,059 | 14,272 | 16,948 | 20,186 | 24,109 | 28,868 | 19 |
| Processing Services | 1,681 | 3 | 1,729 | 1,798 | 1,873 | 1,955 | 2,045 | 2,145 | 4 |
| - Transaction Processing Services | 1,550 | 1 | 1,573 | 1,613 | 1,655 | 1,697 | 1,741 | 1,786 | 3 |
| - Systems Operations | 131 | 19 | 156 | 184 | 218 | 257 | 304 | 359 | 18 |
| Network/Electronic Information Services | 510 | 32 | 672 | 833 | 1,032 | 1,280 | 1,587 | 1,969 | 24 |
| - Electronic Information Services | 313 | 34 | 420 | 515 | 631 | 773 | 947 | 1,160 | 23 |
| - Network Applications | 197 | 28 | 252 | 318 | 402 | 507 | 641 | 809 | 26 |
| Software Products | 2,783 | 23 | 3,417 | 4,082 | 4,880 | 5,837 | 6,986 | 8,367 | 20 |
| - Systems Software | 1,655 | 22 | 2,011 | 2,353 | 2,753 | 3,221 | 3,769 | 4,411 | 17 |
| - Applications Software | 1,128 | 25 | 1,406 | 1,729 | 2,127 | 2,616 | 3,217 | 3,957 | 23 |
| Turnkey Systems | 1,071 | 16 | 1,242 | 1,483 | 1,773 | 2,124 | 2,549 | 3,065 | 20 |
| - Equipment | 611 | 12 | 683 | 786 | 904 | 1,041 | 1,198 | 1,378 | 15 |
| - Packaged Software | 321 | 20 | 385 | 478 | 593 | 736 | 913 | 1,134 | 24 |
| - Custom Software | 75 | 32 | 99 | 122 | 149 | 183 | 225 | 276 | 23 |
| - Other Professional Services | 64 | 17 | 75 | 97 | 126 | 164 | 213 | 276 | 30 |
| Systems Integration | 328 | 25 | 411 | 524 | 669 | 855 | 1,094 | 1,403 | 28 |
| - Equipment | 141 | 20 | 169 | 207 | 253 | 309 | 378 | 463 | 22 |
| - Packaged Software | 20 | 20 | 24 | 31 | 40 | 51 | 65 | 84 | 28 |
| - Other Services | 10 | 20 | 12 | 14 | 17 | 20 | 24 | 28 | 18 |
| - Professional Services | 157 | 31 | 206 | 272 | 359 | 475 | 627 | 829 | 32 |
| Professional Services | 3,762 | 22 | 4,588 | 5,553 | 6,721 | 8,135 | 9,847 | 11,920 | 21 |
| - Consulting | 409 | 23 | 503 | 603 | 724 | 869 | 1,043 | 1,252 | 20 |
| - Education & Training | 315 | 20 | 378 | 461 | 562 | 686 | 837 | 1,020 | 22 |
| - Software Development | 3,006 | 22 | 3,667 | 4,437 | 5,368 | 6,496 | 7,860 | 9,511 | 21 |
| - Systems Operations | 32 | 28 | 41 | 52 | 66 | 84 | 107 | 136 | 27 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Hong Kong

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|-------|----------------------|
| Total Hong Kong Information Services Market | 322 | 21 | 389 | 475 | 581 | 713 | 878 | 1,084 | 23 |
| Processing Services | 64 | 10 | 71 | 78 | 86 | 95 | 104 | 115 | 10 |
| - Transaction Processing Services | 32 | 11 | 36 | 39 | 44 | 49 | 54 | 60 | 11 |
| - Systems Operation | 16 | 9 | 17 | 19 | 21 | 23 | 25 | 27 | 9 |
| - Utility Processing | 10 | 10 | 11 | 12 | 13 | 15 | 16 | 18 | 10 |
| - Other Processing | 6 | 10 | 7 | 7 | 8 | 9 | 10 | 11 | 10 |
| Network/Electronic Information Services | 19 | 20 | 23 | 28 | 34 | 41 | 50 | 61 | 22 |
| - Electronic Information Services | 8 | 19 | 10 | 12 | 14 | 17 | 21 | 26 | 22 |
| - Network Applications | 11 | 20 | 13 | 16 | 20 | 24 | 29 | 36 | 22 |
| Application Software Products | 60 | 30 | 78 | 101 | 132 | 171 | 223 | 290 | 30 |
| Systems Software | 58 | 25 | 72 | 90 | 112 | 140 | 175 | 218 | 25 |
| - System Control Software | 29 | 27 | 37 | 47 | 59 | 75 | 96 | 122 | 27 |
| - Data Ctr. Mgt. | 17 | 20 | 20 | 24 | 29 | 35 | 42 | 51 | 20 |
| - Appl. Dev. | 12 | 25 | 15 | 19 | 23 | 29 | 37 | 46 | 25 |
| Turnkey Systems | 29 | 11 | 32 | 37 | 43 | 50 | 57 | 66 | 15 |
| - Equipment | 14 | 10 | 15 | 18 | 21 | 25 | 30 | 35 | 18 |
| - Packaged Software | 7 | 10 | 8 | 8 | 9 | 10 | 11 | 12 | 10 |
| - Custom Software | 5 | 15 | 6 | 7 | 8 | 9 | 10 | 12 | 15 |
| - Other Professional Svcs. | 3 | 15 | 3 | 4 | 5 | 5 | 6 | 7 | 15 |
| Systems Integration | 16 | 20 | 19 | 23 | 28 | 33 | 40 | 49 | 21 |
| - Equipment | 8 | 20 | 10 | 12 | 14 | 17 | 20 | 24 | 20 |
| - Packaged Software | 2 | 12 | 2 | 3 | 3 | 3 | 4 | 4 | 12 |
| - Other Services | 2 | 8 | 2 | 2 | 3 | 3 | 3 | 3 | 8 |
| - Professional Services | 4 | 28 | 5 | 7 | 8 | 11 | 14 | 18 | 28 |
| Professional Services | 76 | 24 | 95 | 118 | 147 | 183 | 228 | 285 | 25 |
| - Consulting | 15 | 30 | 20 | 25 | 33 | 43 | 56 | 72 | 30 |
| - Education & Training | 9 | 19 | 11 | 13 | 15 | 18 | 21 | 26 | 19 |
| - Software Development | 46 | 25 | 58 | 72 | 90 | 112 | 140 | 175 | 25 |
| - Systems Operations | 6 | 14 | 7 | 8 | 9 | 10 | 11 | 12 | 12 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

India

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|------|----------------------|
| Total India Information Services Market | 106 | 33 | 141 | 188 | 251 | 338 | 456 | 617 | 34 |
| Processing Services | 11 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 10 |
| Network/Electronic Information Services | 4 | 18 | 5 | 6 | 7 | 8 | 10 | 12 | 20 |
| Applications Software Products | 27 | 35 | 36 | 49 | 66 | 90 | 121 | 163 | 35 |
| Systems Software | 16 | 30 | 21 | 27 | 35 | 46 | 59 | 77 | 30 |
| Turnkey Systems | 6 | 30 | 8 | 10 | 13 | 17 | 22 | 29 | 30 |
| Systems Integration | * | * | * | * | * | * | * | * | * |
| Professional Services | 42 | 40 | 59 | 82 | 115 | 161 | 226 | 316 | 40 |

* Negligible market

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Italy

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|--------|--------|----------------------|
| Total Italy Information Services Market | 4,783 | 21 | 5,804 | 6,908 | 8,243 | 9,858 | 11,816 | 14,192 | 20 |
| Processing Services | 763 | 10 | 837 | 902 | 975 | 1,055 | 1,144 | 1,243 | 8 |
| - Transaction Processing Services | 681 | 8 | 738 | 784 | 832 | 883 | 937 | 994 | 6 |
| - Systems Operations | 82 | 21 | 99 | 119 | 143 | 172 | 207 | 248 | 20 |
| Network/Electronic Information Services | 227 | 40 | 319 | 392 | 483 | 596 | 735 | 909 | 23 |
| - Electronic Information Services | 177 | 40 | 248 | 300 | 362 | 438 | 529 | 639 | 21 |
| - Network Applications | 50 | 42 | 71 | 93 | 121 | 158 | 207 | 270 | 31 |
| Software Products | 1,746 | 24 | 2,164 | 2,611 | 3,152 | 3,807 | 4,602 | 5,566 | 21 |
| - Systems Software | 987 | 23 | 1,217 | 1,436 | 1,695 | 2,001 | 2,361 | 2,786 | 18 |
| - Applications Software | 759 | 25 | 947 | 1,175 | 1,457 | 1,807 | 2,241 | 2,779 | 24 |
| Turnkey Systems | 451 | 16 | 522 | 619 | 736 | 877 | 1,046 | 1,250 | 19 |
| - Equipment | 256 | 12 | 287 | 328 | 375 | 429 | 491 | 561 | 14 |
| - Packaged Software | 135 | 19 | 160 | 198 | 244 | 302 | 373 | 461 | 24 |
| - Custom Software | 32 | 34 | 43 | 52 | 64 | 77 | 94 | 114 | 22 |
| - Other Professional Services | 28 | 14 | 32 | 41 | 53 | 69 | 89 | 114 | 29 |
| Systems Integration | 142 | 20 | 170 | 217 | 278 | 356 | 458 | 589 | 28 |
| - Equipment | 60 | 18 | 71 | 87 | 106 | 130 | 159 | 195 | 22 |
| - Packaged Software | 7 | 29 | 9 | 12 | 15 | 20 | 27 | 35 | 31 |
| - Other Services | 4 | 25 | 5 | 6 | 7 | 8 | 9 | 11 | 16 |
| - Professional Services | 71 | 20 | 85 | 113 | 149 | 198 | 263 | 348 | 33 |
| Professional Services | 1,454 | 23 | 1,792 | 2,166 | 2,619 | 3,167 | 3,831 | 4,636 | 21 |
| - Consulting | 199 | 23 | 245 | 304 | 376 | 467 | 579 | 717 | 24 |
| - Education & Training | 106 | 24 | 131 | 163 | 202 | 251 | 312 | 387 | 24 |
| - Software Development | 1,128 | 23 | 1,388 | 1,665 | 1,997 | 2,396 | 2,875 | 3,449 | 20 |
| - Systems Operations | 21 | 33 | 28 | 35 | 43 | 53 | 66 | 82 | 24 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Japan

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|--------|------------------------|--------|--------|--------|--------|--------|--------|----------------------|
| Total Japan Information Services Market | 18,770 | 16 | 21,685 | 25,560 | 30,226 | 35,860 | 42,679 | 50,952 | 19 |
| Processing Services | 4,910 | 11 | 5,438 | 6,101 | 6,854 | 7,708 | 8,676 | 9,774 | 12 |
| - Transaction Processing Services | 3,191 | 10 | 3,510 | 3,931 | 4,403 | 4,931 | 5,523 | 6,186 | 12 |
| - Systems Operations | 1,031 | 15 | 1,186 | 1,363 | 1,568 | 1,803 | 2,074 | 2,385 | 12 |
| - Utility Processing | 246 | -5 | 234 | 222 | 211 | 200 | 190 | 181 | -5 |
| - Other Processing | 442 | 15 | 508 | 585 | 672 | 773 | 889 | 1,022 | 15 |
| Network/Electronic Information Services | 605 | 22 | 739 | 902 | 1,100 | 1,342 | 1,637 | 1,997 | 22 |
| - Electronic Information Services | 484 | 22 | 591 | 721 | 880 | 1,073 | 1,309 | 1,597 | 22 |
| - Network Applications | 121 | 22 | 148 | 181 | 220 | 269 | 328 | 400 | 22 |
| Applications Software Products | 1,115 | 15 | 1,282 | 1,475 | 1,696 | 1,950 | 2,243 | 2,579 | 15 |
| - Sale/Lease | 892 | 15 | 1,026 | 1,180 | 1,357 | 1,560 | 1,794 | 2,064 | 15 |
| - Support/Maintenance | 223 | 15 | 256 | 295 | 339 | 390 | 449 | 516 | 15 |
| Systems Software | 1,065 | 15 | 1,226 | 1,421 | 1,650 | 1,919 | 2,237 | 2,612 | 16 |
| - System Control Software | 405 | 15 | 466 | 536 | 616 | 708 | 815 | 937 | 15 |
| - Data Ctr Mgt. | 447 | 12 | 501 | 561 | 628 | 703 | 788 | 882 | 12 |
| - Appl. Dev. | 213 | 22 | 260 | 325 | 406 | 508 | 634 | 793 | 25 |
| Turnkey Systems | 2,695 | 11 | 2,994 | 3,363 | 3,790 | 4,286 | 4,864 | 5,542 | 13 |
| - Equipment | 943 | 10 | 1,037 | 1,141 | 1,255 | 1,381 | 1,519 | 1,671 | 10 |
| - Packaged Software | 1,159 | 8 | 1,252 | 1,352 | 1,460 | 1,577 | 1,703 | 1,839 | 8 |
| - Custom Software | 135 | 15 | 155 | 183 | 216 | 255 | 301 | 355 | 18 |
| - Other Professional Svcs. | 458 | 20 | 550 | 687 | 859 | 1,073 | 1,342 | 1,677 | 25 |
| Systems Integration | 1,480 | 23 | 1,817 | 2,236 | 2,758 | 3,412 | 4,231 | 5,260 | 24 |
| - Equipment | 651 | 19 | 775 | 922 | 1,097 | 1,305 | 1,554 | 1,849 | 19 |
| - Packaged Software | 133 | 18 | 157 | 185 | 219 | 258 | 304 | 359 | 18 |
| - Other Services | 104 | 11 | 115 | 128 | 142 | 158 | 175 | 195 | 11 |
| - Professional Services | 592 | 30 | 770 | 1,000 | 1,301 | 1,691 | 2,198 | 2,857 | 30 |
| Professional Services | 6,900 | 19 | 8,189 | 10,062 | 12,377 | 15,242 | 18,790 | 23,187 | 23 |
| - Consulting | 1,394 | 25 | 1,743 | 2,178 | 2,723 | 3,403 | 4,254 | 5,318 | 25 |
| - Education & Training | 836 | 15 | 961 | 1,106 | 1,271 | 1,462 | 1,681 | 1,934 | 15 |
| - Software Development | 4,043 | 18 | 4,771 | 5,963 | 7,454 | 9,318 | 11,647 | 14,559 | 25 |
| - Systems Operations | 627 | 14 | 715 | 815 | 929 | 1,059 | 1,207 | 1,376 | 14 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

South Korea

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|-------|-------|-------|----------------------|
| Total South Korea Information Services Market | 340 | 30 | 443 | 581 | 765 | 1,013 | 1,348 | 1,800 | 32 |
| Processing Services | 17 | 18 | 20 | 24 | 28 | 33 | 39 | 46 | 18 |
| - Transaction Processing Services | 11 | 19 | 13 | 16 | 19 | 22 | 26 | 31 | 19 |
| - Systems Operations | 5 | 17 | 6 | 7 | 8 | 9 | 11 | 13 | 17 |
| - Utility Processing | 1 | 12 | 1 | 1 | 1 | 1 | 1 | 1 | 12 |
| - Other Processing | 0.2 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| Network/Electronic Information Services | 102 | 38 | 141 | 195 | 270 | 373 | 516 | 715 | 38 |
| - Electronic Information Services | 66 | 40 | 92 | 129 | 181 | 254 | 355 | 497 | 40 |
| - Network Applications | 36 | 35 | 49 | 66 | 89 | 120 | 161 | 218 | 35 |
| Applications Software Products | 75 | 35 | 101 | 137 | 185 | 249 | 336 | 454 | 35 |
| Systems Software | 61 | 35 | 82 | 111 | 150 | 203 | 275 | 373 | 35 |
| - System Control Software | 28 | 38 | 39 | 53 | 71 | 97 | 132 | 180 | 36 |
| - Data Ctr. Mgt. | 12 | 27 | 15 | 19 | 25 | 31 | 40 | 50 | 27 |
| - Appl. Dev. | 21 | 36 | 29 | 39 | 54 | 75 | 104 | 143 | 38 |
| Turnkey Systems | 17 | 10 | 18 | 20 | 22 | 25 | 27 | 30 | 10 |
| - Equipment | 10 | 9 | 11 | 12 | 13 | 14 | 15 | 17 | 9 |
| - Packaged software | 3 | 10 | 4 | 4 | 4 | 5 | 5 | 5 | 8 |
| - Custom Software | 3 | 15 | 3 | 3 | 4 | 5 | 5 | 6 | 17 |
| - Other Professional Svcs. | 1 | 12 | 1 | 1 | 1 | 1 | 2 | 2 | 14 |
| Systems Integration | 18 | 15 | 20 | 23 | 27 | 32 | 37 | 44 | 17 |
| - Equipment | 8 | 9 | 8 | 9 | 10 | 11 | 12 | 13 | 9 |
| - Packaged Software | 2 | 20 | 2 | 2 | 3 | 3 | 4 | 5 | 18 |
| - Other Services | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 |
| - Professional Services | 7 | 25 | 8 | 10 | 13 | 16 | 20 | 25 | 25 |
| Professional Services | 51 | 18 | 60 | 70 | 83 | 98 | 116 | 137 | 18 |
| - Consulting | 11 | 20 | 13 | 16 | 19 | 23 | 27 | 33 | 20 |
| - Education & Training | 8 | 10 | 8 | 9 | 10 | 11 | 12 | 14 | 10 |
| - Software Development | 28 | 20 | 34 | 40 | 48 | 58 | 70 | 84 | 20 |
| - Systems Operations | 4 | 10 | 4 | 5 | 5 | 6 | 6 | 7 | 10 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Mexico

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|------|------------------------|------|------|------|------|------|------|----------------------|
| Total Mexico Information Services Market | 358 | 16 | 414 | 486 | 572 | 674 | 798 | 947 | 18 |
| Processing Services | 90 | 11 | 100 | 110 | 121 | 133 | 147 | 162 | 10 |
| - Transaction Processing Services | 18 | 12 | 20 | 23 | 27 | 31 | 35 | 41 | 15 |
| - Systems Operations | 54 | 10 | 59 | 64 | 69 | 75 | 81 | 87 | 8 |
| - Utility Processing | 14 | 12 | 16 | 18 | 20 | 22 | 25 | 28 | 12 |
| - Other Processing | 4 | 8 | 4 | 5 | 5 | 5 | 6 | 6 | 8 |
| Network/Electronic Information Services | 7 | 10 | 8 | 9 | 10 | 11 | 12 | 13 | 12 |
| - Electronic Information Services | 6 | 10 | 7 | 7 | 8 | 9 | 10 | 12 | 12 |
| - Network Applications | 1 | 8 | 1 | 1 | 1 | 1 | 2 | 2 | 10 |
| Application Software Products | 72 | 25 | 90 | 113 | 141 | 176 | 220 | 275 | 25 |
| Systems Software | 54 | 17 | 63 | 75 | 89 | 106 | 127 | 152 | 19 |
| - System Control Software | 22 | 18 | 26 | 31 | 37 | 45 | 54 | 65 | 20 |
| - Data Ctr. Mgt. | 11 | 8 | 12 | 13 | 14 | 16 | 17 | 19 | 10 |
| - Appl. Dev. | 21 | 20 | 25 | 31 | 38 | 46 | 56 | 68 | 22 |
| Turnkey Systems | 64 | 11 | 71 | 82 | 94 | 108 | 124 | 142 | 15 |
| - Equipment | 31 | 10 | 34 | 38 | 41 | 45 | 50 | 55 | 10 |
| - Packaged Software | 15 | 8 | 16 | 19 | 23 | 27 | 31 | 37 | 18 |
| - Other Prof. Svcs. | 7 | 20 | 8 | 10 | 13 | 15 | 19 | 23 | 22 |
| - Custom Software | 11 | 15 | 13 | 15 | 17 | 20 | 24 | 28 | 17 |
| - Other Professional Svcs. | 7 | 20 | 8 | 10 | 13 | 15 | 19 | 23 | 22 |
| Systems Integration | 7 | 14 | 8 | 9 | 10 | 12 | 14 | 17 | 17 |
| - Equipment | 3 | 10 | 3 | 4 | 4 | 5 | 5 | 6 | 12 |
| - Packaged Software | 1 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 10 |
| - Other Services | * | * | * | * | * | * | * | * | * |
| - Professional Services | 3 | 20 | 4 | 4 | 5 | 7 | 8 | 10 | 22 |
| Professional Services | 64 | 17 | 75 | 90 | 108 | 129 | 155 | 186 | 20 |
| - Consulting | 22 | 20 | 26 | 33 | 41 | 52 | 64 | 81 | 25 |
| - Education & Training | 8 | 18 | 9 | 11 | 12 | 14 | 17 | 19 | 15 |
| - Software Development | 28 | 16 | 32 | 38 | 45 | 53 | 63 | 74 | 18 |
| - Systems Operations | 6 | 14 | 7 | 8 | 9 | 10 | 11 | 12 | 12 |

* Negligible market

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Middle East/Africa

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|------|------------------------|------|------|-------|-------|-------|-------|----------------------|
| Total Middle East/Africa Information Services Market | 620 | 24 | 767 | 955 | 1,196 | 1,507 | 1,910 | 2,435 | 26 |
| Processing Services | 198 | 17 | 232 | 271 | 317 | 371 | 434 | 508 | 17 |
| Network/Electronic Information Services | 19 | 10 | 21 | 23 | 25 | 28 | 31 | 34 | 10 |
| Applications Software Products | 130 | 35 | 176 | 238 | 321 | 433 | 585 | 789 | 35 |
| Systems Software | 56 | 10 | 62 | 68 | 75 | 82 | 90 | 99 | 10 |
| Turnkey Systems | 74 | 20 | 89 | 107 | 128 | 153 | 184 | 221 | 20 |
| Systems Integration | 19 | 10 | 21 | 23 | 25 | 28 | 31 | 34 | 10 |
| Professional Services | 124 | 35 | 167 | 226 | 305 | 412 | 556 | 751 | 35 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Netherlands

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Netherlands Information Services Market | 2,289 | 19 | 2,713 | 3,181 | 3,741 | 4,411 | 5,213 | 6,176 | 18 |
| Processing Services | 367 | 8 | 395 | 413 | 432 | 453 | 475 | 500 | 5 |
| - Transaction Processing Services | 344 | 7 | 367 | 380 | 393 | 407 | 421 | 436 | 3 |
| - Systems Operations | 23 | 22 | 28 | 33 | 39 | 46 | 54 | 64 | 18 |
| Network/Electronic Information Services | 92 | 33 | 122 | 152 | 189 | 236 | 294 | 367 | 25 |
| - Electronic Information Services | 64 | 30 | 83 | 101 | 124 | 151 | 184 | 225 | 22 |
| - Network Applications | 28 | 39 | 39 | 51 | 65 | 85 | 110 | 142 | 30 |
| Software Products | 638 | 24 | 794 | 945 | 1,125 | 1,340 | 1,597 | 1,904 | 19 |
| - Systems Software | 372 | 23 | 459 | 537 | 627 | 733 | 857 | 1,002 | 17 |
| - Applications Software | 266 | 26 | 335 | 408 | 498 | 607 | 739 | 901 | 22 |
| Turnkey Systems | 283 | 14 | 322 | 384 | 459 | 550 | 659 | 792 | 20 |
| - Equipment | 161 | 10 | 177 | 203 | 234 | 269 | 309 | 356 | 15 |
| - Packaged Software | 85 | 17 | 99 | 123 | 153 | 190 | 236 | 294 | 24 |
| - Custom Software | 21 | 19 | 25 | 31 | 38 | 47 | 58 | 71 | 23 |
| - Other Professional Services | 16 | 31 | 21 | 27 | 34 | 44 | 56 | 71 | 28 |
| Systems Integration | 60 | 30 | 78 | 97 | 120 | 149 | 185 | 231 | 24 |
| - Equipment | 28 | 14 | 32 | 38 | 45 | 54 | 64 | 76 | 19 |
| - Packaged Software | 2 | 150 | 5 | 6 | 8 | 9 | 12 | 14 | 24 |
| - Other Services | 2 | 0 | 2 | 2 | 3 | 3 | 4 | 5 | 20 |
| - Professional Services | 28 | 39 | 39 | 50 | 64 | 82 | 105 | 135 | 28 |
| Professional Services | 849 | 18 | 1,002 | 1,191 | 1,416 | 1,684 | 2,003 | 2,382 | 19 |
| - Consulting | 106 | 19 | 126 | 154 | 187 | 228 | 278 | 339 | 22 |
| - Education & Training | 92 | 17 | 108 | 130 | 158 | 190 | 230 | 278 | 21 |
| - Software Development | 642 | 18 | 757 | 893 | 1,054 | 1,244 | 1,467 | 1,732 | 18 |
| - Systems Operations | 9 | 22 | 11 | 14 | 17 | 21 | 27 | 34 | 25 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

New Zealand

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|-------|-------|-------|----------------------|
| Total New Zealand Information Services Market | 576 | 18 | 682 | 808 | 962 | 1,152 | 1,386 | 1,677 | 20 |
| Processing Services | 119 | 18 | 140 | 169 | 206 | 250 | 305 | 372 | 22 |
| - Transaction Processing Services | 83 | 20 | 100 | 125 | 156 | 195 | 243 | 304 | 25 |
| - Systems Operations | 18 | 15 | 21 | 23 | 26 | 29 | 33 | 36 | 12 |
| - Utility Processing | 12 | 10 | 13 | 15 | 16 | 18 | 19 | 21 | 10 |
| - Other Processing | 6 | 10 | 7 | 7 | 8 | 9 | 10 | 11 | 10 |
| Network/Electronic Information Services | 28 | 17 | 33 | 38 | 44 | 52 | 60 | 70 | 17 |
| - Electronic Information Services | 22 | 17 | 26 | 30 | 35 | 41 | 48 | 56 | 17 |
| - Network Applications | 6 | 15 | 7 | 8 | 9 | 10 | 12 | 14 | 15 |
| Applications Software Products | 92 | 10 | 101 | 111 | 122 | 135 | 148 | 163 | 10 |
| Systems Software | 84 | 12 | 94 | 107 | 122 | 140 | 160 | 182 | 14 |
| - System Control Software | 35 | 10 | 39 | 44 | 49 | 56 | 63 | 71 | 13 |
| - Data Ctr. Mgt. | 18 | 15 | 21 | 24 | 27 | 31 | 36 | 42 | 15 |
| - Appl. Dev. | 31 | 12 | 35 | 40 | 46 | 53 | 61 | 70 | 15 |
| Turnkey Systems | 105 | 10 | 116 | 130 | 146 | 164 | 184 | 207 | 12 |
| - Equipment | 51 | 8 | 55 | 61 | 67 | 73 | 81 | 89 | 10 |
| - Packaged Software | 27 | 8 | 29 | 32 | 35 | 39 | 43 | 47 | 10 |
| - Custom Software | 18 | 15 | 21 | 24 | 28 | 33 | 39 | 45 | 17 |
| - Other Professional Svcs. | 9 | 18 | 11 | 13 | 15 | 18 | 22 | 26 | 20 |
| Systems Integration | 31 | 21 | 37 | 44 | 52 | 61 | 72 | 84 | 18 |
| - Equipment | 14 | 19 | 17 | 19 | 22 | 25 | 29 | 34 | 15 |
| - Packaged Software | 3 | 18 | 4 | 4 | 5 | 5 | 6 | 7 | 15 |
| - Other Services | 2 | 11 | 2 | 2 | 3 | 3 | 3 | 3 | 8 |
| - Professional Services | 12 | 25 | 15 | 18 | 22 | 27 | 33 | 41 | 22 |
| Professional Services | 117 | 37 | 161 | 208 | 270 | 351 | 458 | 597 | 30 |
| - Consulting | 24 | 47 | 35 | 48 | 64 | 87 | 117 | 158 | 35 |
| - Education & Training | 14 | 35 | 19 | 25 | 32 | 42 | 54 | 70 | 30 |
| - Software Development | 68 | 38 | 94 | 122 | 159 | 206 | 268 | 348 | 30 |
| - Systems Operations | 11 | 15 | 13 | 14 | 15 | 17 | 19 | 20 | 10 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Norway

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Norway Information Services Market | 990 | 14 | 1,133 | 1,290 | 1,475 | 1,694 | 1,953 | 2,261 | 15 |
| Processing Services | 397 | 6 | 421 | 443 | 466 | 490 | 516 | 543 | 5 |
| - Transaction Processing Services | 391 | 6 | 415 | 436 | 457 | 480 | 504 | 529 | 5 |
| - Systems Operations | 6 | 0 | 6 | 7 | 8 | 10 | 12 | 14 | 18 |
| Network/Electronic Information Services | 27 | 37 | 37 | 47 | 60 | 76 | 97 | 124 | 27 |
| - Electronic Information Services | 20 | 30 | 26 | 32 | 40 | 49 | 60 | 74 | 23 |
| - Network Applications | 7 | 57 | 11 | 15 | 20 | 27 | 37 | 50 | 35 |
| Software Products | 212 | 24 | 262 | 312 | 371 | 442 | 526 | 627 | 19 |
| - Systems Software | 127 | 24 | 158 | 185 | 216 | 252 | 295 | 345 | 17 |
| - Applications Software | 85 | 22 | 104 | 127 | 155 | 189 | 231 | 282 | 22 |
| Turnkey Systems | 128 | 12 | 144 | 173 | 209 | 252 | 304 | 368 | 21 |
| - Equipment | 72 | 10 | 79 | 92 | 106 | 123 | 143 | 166 | 16 |
| - Packaged Software | 39 | 15 | 45 | 56 | 70 | 87 | 109 | 136 | 25 |
| - Custom Software | 9 | 22 | 11 | 14 | 17 | 21 | 26 | 33 | 24 |
| - Other Professional Services | 8 | 13 | 9 | 12 | 15 | 20 | 26 | 33 | 30 |
| Systems Integration | 15 | 20 | 18 | 22 | 26 | 32 | 38 | 47 | 21 |
| - Equipment | 6 | 17 | 7 | 8 | 9 | 11 | 13 | 15 | 16 |
| - Packaged Software | 1 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 24 |
| - Other Services | 0 | 100 | 1 | 1 | 1 | 1 | 1 | 1 | 8 |
| - Professional Services | 8 | 13 | 9 | 11 | 14 | 18 | 22 | 27 | 25 |
| Professional Services | 211 | 19 | 251 | 294 | 344 | 403 | 472 | 552 | 17 |
| - Consulting | 30 | 20 | 36 | 42 | 49 | 57 | 67 | 78 | 17 |
| - Education & Training | 11 | 18 | 13 | 15 | 18 | 22 | 26 | 31 | 19 |
| - Software Development | 169 | 18 | 200 | 234 | 274 | 321 | 375 | 439 | 17 |
| - Systems Operations | 1 | 100 | 2 | 2 | 3 | 3 | 3 | 4 | 15 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Other Asia/Pacific

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|------|----------------------|
| Total Other Asia/ Pacific Information Services Market | 148 | 19 | 177 | 212 | 254 | 306 | 370 | 447 | 20 |
| Processing Services | 11 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 10 |
| Network/Electronic Information Services | 8 | 25 | 10 | 13 | 16 | 20 | 24 | 31 | 25 |
| Applications Software Products | 60 | 25 | 75 | 94 | 117 | 146 | 183 | 229 | 25 |
| Systems Software | 38 | 20 | 46 | 55 | 66 | 79 | 95 | 113 | 20 |
| Turnkey Systems | 11 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 10 |
| Systems Integration | 5 | 10 | 6 | 6 | 7 | 7 | 8 | 9 | 10 |
| Professional Services | 15 | 10 | 17 | 18 | 20 | 22 | 24 | 27 | 10 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Other Western Europe

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|------|------------------------|------|------|------|------|------|-------|----------------------|
| Total Other Western Europe Information Services Market | 390 | 21 | 471 | 565 | 680 | 819 | 989 | 1,198 | 21 |
| Processing Services | 60 | 8 | 65 | 73 | 82 | 91 | 103 | 115 | 12 |
| - Transaction Processing Services | 55 | 7 | 59 | 66 | 73 | 81 | 90 | 100 | 11 |
| - Systems Operations | 5 | 20 | 6 | 7 | 9 | 10 | 12 | 15 | 20 |
| Network/Electronic Information Services | 15 | 40 | 21 | 27 | 35 | 45 | 57 | 74 | 29 |
| - Electronic Information Services | 14 | 14 | 16 | 20 | 25 | 32 | 40 | 50 | 25 |
| - Network Applications | 1 | 400 | 5 | 7 | 9 | 13 | 18 | 25 | 38 |
| Software Products | 120 | 21 | 145 | 174 | 210 | 253 | 306 | 370 | 21 |
| - Systems Software | 80 | 25 | 100 | 117 | 137 | 161 | 188 | 220 | 17 |
| - Applications Software | 40 | 13 | 45 | 57 | 73 | 93 | 118 | 150 | 27 |
| Turnkey Systems | 85 | 18 | 100 | 119 | 142 | 170 | 204 | 245 | 20 |
| - Equipment | 50 | 10 | 55 | 63 | 73 | 83 | 96 | 110 | 15 |
| - Packaged Software | 25 | 20 | 30 | 37 | 47 | 58 | 72 | 90 | 25 |
| - Custom Software | 6 | 33 | 8 | 10 | 12 | 15 | 18 | 23 | 23 |
| - Other Professional Services | 4 | 75 | 7 | 9 | 11 | 14 | 18 | 22 | 26 |
| Systems Integration | 10 | 50 | 15 | 19 | 25 | 32 | 41 | 54 | 29 |
| - Equipment | 4 | 50 | 6 | 8 | 10 | 12 | 16 | 20 | 27 |
| - Packaged Software | 1 | 0 | 1 | 1 | 2 | 2 | 3 | 4 | 29 |
| - Other Services | | | | | | | | 1 | 14 |
| - Professional Services | 5 | 60 | 8 | 10 | 14 | 18 | 23 | 30 | 30 |
| Professional Services | 100 | 25 | 125 | 153 | 186 | 227 | 278 | 340 | 22 |
| - Consulting | 15 | 33 | 20 | 24 | 29 | 35 | 41 | 50 | 20 |
| - Education & Training | 6 | 17 | 7 | 9 | 12 | 15 | 19 | 25 | 29 |
| - Software Development | 77 | 23 | 95 | 116 | 142 | 174 | 213 | 260 | 22 |
| - Systems Operations | 2 | 50 | 3 | 3 | 4 | 4 | 5 | 5 | 11 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

**Other Latin
America**

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|-------|----------------------|
| Total Other Latin America Information Services Market | 400 | 18 | 471 | 556 | 659 | 783 | 933 | 1,115 | 19 |
| Processing Services | 60 | 5 | 63 | 66 | 69 | 73 | 77 | 80 | 5 |
| Network/Electronic Information Services | 12 | 10 | 13 | 15 | 16 | 18 | 19 | 21 | 10 |
| Applications Software Products | 120 | 25 | 150 | 188 | 234 | 293 | 366 | 458 | 25 |
| Systems Software | 80 | 20 | 96 | 115 | 138 | 166 | 199 | 239 | 20 |
| Turnkey Systems | 80 | 15 | 92 | 106 | 122 | 140 | 161 | 185 | 15 |
| Systems Integration | 8 | 8 | 9 | 9 | 10 | 11 | 12 | 13 | 8 |
| Professional Services | 40 | 20 | 48 | 58 | 69 | 83 | 100 | 119 | 20 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Singapore

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|-------|----------------------|
| Total Singapore Information Services Market | 413 | 17 | 483 | 571 | 675 | 800 | 950 | 1,131 | 19 |
| Processing Services | 112 | 12 | 125 | 140 | 157 | 176 | 197 | 221 | 12 |
| Network/Electronic Information Services | 33 | 20 | 40 | 50 | 62 | 77 | 97 | 121 | 25 |
| Applications Software Products | 66 | 18 | 78 | 93 | 112 | 135 | 161 | 194 | 20 |
| Systems Software | 62 | 18 | 73 | 86 | 102 | 120 | 142 | 167 | 18 |
| Turnkey Systems | 45 | 10 | 50 | 54 | 60 | 66 | 72 | 80 | 10 |
| Systems Integration | 17 | 20 | 20 | 24 | 29 | 35 | 42 | 51 | 20 |
| Professional Services | 78 | 25 | 98 | 122 | 152 | 190 | 238 | 298 | 25 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Spain

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Spain Information Services Market | 1,229 | 24 | 1,522 | 1,843 | 2,236 | 2,717 | 3,308 | 4,035 | 22 |
| Processing Services | 198 | 14 | 226 | 254 | 286 | 322 | 363 | 409 | 13 |
| - Transaction Processing Services | 186 | 13 | 211 | 236 | 265 | 296 | 332 | 372 | 12 |
| - Systems Operations | 12 | 25 | 15 | 18 | 22 | 26 | 31 | 37 | 20 |
| Network/Electronic Information Services | 41 | 95 | 80 | 103 | 133 | 171 | 222 | 289 | 29 |
| - Electronic Information Services | 31 | 94 | 60 | 75 | 93 | 117 | 146 | 182 | 25 |
| - Network Applications | 10 | 100 | 20 | 28 | 39 | 55 | 77 | 108 | 40 |
| Software Products | 355 | 25 | 445 | 542 | 661 | 806 | 983 | 1,200 | 22 |
| - Systems Software | 224 | 25 | 281 | 337 | 404 | 485 | 582 | 698 | 20 |
| - Applications Software | 131 | 25 | 164 | 205 | 257 | 321 | 402 | 502 | 25 |
| Turnkey Systems | 246 | 14 | 280 | 336 | 403 | 485 | 584 | 706 | 20 |
| - Equipment | 140 | 10 | 154 | 178 | 205 | 237 | 274 | 317 | 16 |
| - Packaged Software | 74 | 18 | 87 | 109 | 135 | 168 | 209 | 261 | 25 |
| - Custom Software | 17 | 29 | 22 | 27 | 34 | 42 | 52 | 64 | 24 |
| - Other Professional Services | 15 | 13 | 17 | 22 | 29 | 38 | 49 | 64 | 30 |
| Systems Integration | 39 | 38 | 54 | 68 | 87 | 110 | 141 | 179 | 27 |
| - Equipment | 17 | 29 | 22 | 27 | 33 | 40 | 49 | 59 | 22 |
| - Packaged Software | 2 | 50 | 3 | 4 | 5 | 6 | 8 | 11 | 29 |
| - Other Services | 1 | 100 | 2 | 2 | 3 | 3 | 3 | 4 | 14 |
| - Professional Services | 19 | 42 | 27 | 35 | 47 | 61 | 80 | 105 | 31 |
| Professional Services | 350 | 25 | 437 | 540 | 666 | 822 | 1,014 | 1,251 | 23 |
| - Consulting | 47 | 28 | 60 | 75 | 94 | 117 | 147 | 183 | 25 |
| - Education & Training | 36 | 28 | 46 | 58 | 72 | 90 | 112 | 140 | 25 |
| - Software Development | 259 | 24 | 321 | 395 | 485 | 596 | 733 | 902 | 23 |
| - Systems Operations | 8 | 32 | 11 | 13 | 15 | 18 | 22 | 26 | 20 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Sweden

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Sweden Information Services Market | 1,398 | 18 | 1,645 | 1,922 | 2,253 | 2,651 | 3,129 | 3,704 | 18 |
| Processing Services | 367 | 7 | 393 | 417 | 443 | 471 | 501 | 534 | 6 |
| - Transaction Processing Services | 344 | 6 | 366 | 385 | 405 | 427 | 449 | 473 | 5 |
| - Systems Operations | 23 | 17 | 27 | 32 | 37 | 44 | 52 | 61 | 18 |
| Network/Electronic Information Services | 46 | 45 | 67 | 84 | 107 | 135 | 171 | 217 | 27 |
| - Electronic Information Services | 35 | 31 | 46 | 56 | 69 | 86 | 105 | 130 | 23 |
| - Network Applications | 11 | 91 | 21 | 28 | 37 | 49 | 66 | 87 | 33 |
| Software Products | 347 | 25 | 433 | 519 | 623 | 748 | 898 | 1,078 | 20 |
| - Systems Software | 210 | 24 | 260 | 307 | 362 | 427 | 504 | 594 | 18 |
| - Applications Software | 137 | 26 | 173 | 213 | 261 | 321 | 394 | 484 | 23 |
| Turnkey Systems | 222 | 14 | 253 | 304 | 366 | 441 | 532 | 644 | 21 |
| - Equipment | 127 | 9 | 139 | 161 | 186 | 216 | 250 | 290 | 16 |
| - Packaged Software | 67 | 18 | 79 | 99 | 123 | 153 | 191 | 238 | 25 |
| - Custom Software | 15 | 33 | 20 | 25 | 31 | 38 | 47 | 58 | 24 |
| - Other Professional Services | 13 | 15 | 15 | 20 | 26 | 34 | 44 | 58 | 31 |
| Systems Integration | 29 | 21 | 35 | 44 | 56 | 72 | 92 | 117 | 27 |
| - Equipment | 12 | 25 | 15 | 18 | 22 | 27 | 32 | 39 | 21 |
| - Packaged Software | 2 | 0 | 2 | 3 | 3 | 4 | 6 | 7 | 29 |
| - Other Services | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 14 |
| - Professional Services | 14 | 21 | 17 | 23 | 30 | 40 | 52 | 69 | 33 |
| Professional Services | 387 | 20 | 464 | 553 | 659 | 785 | 935 | 1,114 | 19 |
| - Consulting | 49 | 22 | 60 | 72 | 86 | 104 | 124 | 149 | 20 |
| - Education & Training | 56 | 18 | 66 | 79 | 94 | 112 | 133 | 159 | 19 |
| - Software Development | 280 | 20 | 336 | 400 | 476 | 566 | 674 | 801 | 19 |
| - Systems Operations | 2 | 0 | 2 | 2 | 3 | 3 | 4 | 5 | 19 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

Switzerland

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|-------|-------|-------|-------|-------|----------------------|
| Total Switzerland Information Services Market | 1,291 | 19 | 1,532 | 1,800 | 2,121 | 2,506 | 2,967 | 3,522 | 18 |
| Processing Services | 200 | 8 | 215 | 229 | 245 | 262 | 280 | 300 | 7 |
| - Transaction Processing Services | 188 | 6 | 200 | 212 | 224 | 237 | 251 | 265 | 6 |
| - Systems Operations | 12 | 25 | 15 | 18 | 21 | 25 | 30 | 35 | 19 |
| Network/Electronic Information Services | 53 | 57 | 83 | 102 | 127 | 158 | 197 | 246 | 24 |
| - Electronic Information Services | 6 | 100 | 12 | 17 | 24 | 33 | 46 | 65 | 40 |
| - Network Applications | 47 | 51 | 71 | 86 | 103 | 125 | 151 | 182 | 21 |
| Software Products | 386 | 23 | 474 | 559 | 660 | 780 | 921 | 1089 | 18 |
| -Systems Software | 262 | 21 | 318 | 369 | 428 | 496 | 576 | 668 | 16 |
| -Applications Software | 124 | 26 | 156 | 190 | 232 | 283 | 345 | 421 | 22 |
| Turnkey Systems | 304 | 13 | 344 | 412 | 495 | 595 | 716 | 864 | 20 |
| - Equipment | 174 | 10 | 191 | 220 | 254 | 294 | 339 | 391 | 15 |
| - Packaged Software | 91 | 17 | 106 | 132 | 165 | 206 | 257 | 321 | 25 |
| - Custom Software | 21 | 24 | 26 | 32 | 40 | 49 | 61 | 76 | 24 |
| - Other Professional Services | 18 | 17 | 21 | 27 | 35 | 46 | 59 | 76 | 29 |
| Systems Integration | 30 | 30 | 39 | 49 | 63 | 79 | 101 | 128 | 27 |
| - Equipment | 12 | 25 | 15 | 18 | 22 | 27 | 33 | 41 | 22 |
| - Packaged Software | 2 | 0 | 2 | 3 | 4 | 5 | 6 | 9 | 34 |
| - Other Services | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 22 |
| - Professional Services | 15 | 40 | 21 | 27 | 35 | 46 | 59 | 76 | 29 |
| Professional Services | 318 | 18 | 377 | 448 | 532 | 632 | 752 | 894 | 19 |
| - Consulting | 40 | 15 | 46 | 56 | 67 | 81 | 98 | 118 | 21 |
| - Education & Training | 59 | 20 | 71 | 85 | 103 | 124 | 149 | 179 | 20 |
| - Software Development | 218 | 19 | 259 | 306 | 361 | 426 | 503 | 594 | 18 |
| - Systems Operations | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 20 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Taiwan

| Delivery Mode | 1988* | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|--|-------|------------------------|------|------|------|------|------|------|----------------------|
| Total Taiwan Information Services Market | 255 | 19 | 303 | 365 | 440 | 532 | 645 | 783 | 21 |
| Processing Services | 51 | 15 | 59 | 68 | 79 | 92 | 107 | 124 | 16 |
| - Transaction Processing Services | 15 | 20 | 18 | 23 | 28 | 34 | 42 | 52 | 23 |
| - System Operations | 26 | 12 | 29 | 32 | 36 | 40 | 45 | 50 | 12 |
| - Utility Processing | 8 | 15 | 9 | 10 | 12 | 13 | 15 | 18 | 15 |
| - Other Processing | 3 | 10 | 3 | 3 | 3 | 4 | 4 | 5 | 10 |
| Network/Electronic Information Services | 20 | 24 | 25 | 31 | 40 | 51 | 64 | 82 | 27 |
| - Electronic Information Services | 17 | 25 | 21 | 27 | 35 | 45 | 57 | 73 | 28 |
| - Network Applications | 3 | 18 | 4 | 4 | 5 | 6 | 7 | 9 | 20 |
| Application Software Products | 26 | 28 | 33 | 42 | 53 | 68 | 88 | 112 | 28 |
| Systems Software | 38 | 22 | 47 | 58 | 71 | 88 | 108 | 134 | 23 |
| - System Control Software | 19 | 26 | 24 | 30 | 37 | 46 | 57 | 70 | 24 |
| - Data Ctr. Mgt. | 8 | 18 | 9 | 11 | 13 | 16 | 19 | 23 | 19 |
| - Appl. Dev. | 11 | 22 | 13 | 17 | 21 | 26 | 33 | 41 | 25 |
| Turnkey Systems | 46 | 18 | 54 | 65 | 78 | 93 | 112 | 135 | 20 |
| - Equipment | 23 | 25 | 29 | 36 | 45 | 56 | 70 | 88 | 25 |
| - Packaged Software | 11 | 8 | 12 | 13 | 14 | 16 | 17 | 19 | 10 |
| - Custom Software | 8 | 15 | 9 | 11 | 12 | 14 | 16 | 19 | 15 |
| - Other Professional Svcs. | 4 | 15 | 5 | 5 | 6 | 7 | 9 | 10 | 17 |
| Systems Integration | 10 | 19 | 12 | 14 | 17 | 20 | 24 | 28 | 19 |
| - Equipment | 5 | 20 | 6 | 7 | 8 | 10 | 12 | 14 | 18 |
| - Packaged Software | 1 | 9 | 1 | 1 | 1 | 1 | 2 | 2 | 9 |
| - Other Services | 1 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 6 |
| - Professional Services | 3 | 25 | 4 | 5 | 6 | 7 | 9 | 11 | 25 |
| Professional Services | 64 | 16 | 74 | 87 | 102 | 121 | 142 | 167 | 18 |
| - Consulting | 13 | 20 | 16 | 19 | 23 | 28 | 33 | 40 | 21 |
| - Education & Training | 8 | 12 | 9 | 10 | 11 | 13 | 14 | 16 | 12 |
| - Software Development | 38 | 16 | 44 | 52 | 61 | 72 | 85 | 101 | 18 |
| - Systems Operations | 5 | 12 | 6 | 6 | 7 | 8 | 9 | 10 | 12 |

* Some totals will not add due to rounding

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

U.K.

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|--------|--------|--------|--------|--------|----------------------|
| Total U.K. Information Services Market | 7,738 | 21 | 9,325 | 11,060 | 13,148 | 15,663 | 18,696 | 22,359 | 19 |
| Processing Services | 926 | 10 | 1,016 | 1,089 | 1,173 | 1,269 | 1,380 | 1,509 | 8 |
| - Transaction Processing Services | 787 | 6 | 836 | 869 | 904 | 940 | 977 | 1,016 | 4 |
| - Systems Operations | 139 | 29 | 180 | 220 | 269 | 329 | 402 | 492 | 22 |
| Network/Electronic Information Services | 705 | 31 | 926 | 1,125 | 1,369 | 1,666 | 2,030 | 2,476 | 22 |
| - Electronic Information Services | 525 | 34 | 705 | 843 | 1,008 | 1,204 | 1,440 | 1,721 | 20 |
| - Network Applications | 180 | 23 | 221 | 282 | 361 | 462 | 590 | 754 | 28 |
| Software Products | 1,804 | 24 | 2,228 | 2,653 | 3,161 | 3,768 | 4,493 | 5,361 | 19 |
| - Systems Software | 1,197 | 22 | 1,458 | 1,708 | 2,000 | 2,342 | 2,743 | 3,213 | 17 |
| - Applications Software | 607 | 27 | 770 | 946 | 1,161 | 1,425 | 1,750 | 2,148 | 23 |
| Turnkey Systems | 1,557 | 13 | 1,762 | 2,102 | 2,511 | 3,006 | 3,603 | 4,327 | 20 |
| - Equipment | 893 | 8 | 967 | 1,113 | 1,281 | 1,474 | 1,696 | 1,951 | 15 |
| - Packaged Software | 467 | 18 | 549 | 679 | 840 | 1,039 | 1,285 | 1,590 | 24 |
| - Custom Software | 107 | 30 | 139 | 171 | 211 | 259 | 319 | 393 | 23 |
| - Other Professional Services | 90 | 19 | 107 | 139 | 180 | 233 | 303 | 393 | 30 |
| Systems Integration | 418 | 25 | 524 | 650 | 807 | 1,003 | 1,249 | 1,557 | 24 |
| - Equipment | 180 | 18 | 213 | 254 | 303 | 362 | 432 | 516 | 19 |
| - Packaged Software | 25 | 32 | 33 | 40 | 49 | 60 | 74 | 90 | 22 |
| - Other Services | 13 | 23 | 16 | 18 | 21 | 25 | 28 | 33 | 15 |
| - Professional Services | 200 | 31 | 262 | 337 | 433 | 556 | 714 | 918 | 29 |
| Professional Services | 2,328 | 23 | 2,869 | 3,441 | 4,128 | 4,952 | 5,942 | 7,131 | 20 |
| - Consulting | 320 | 26 | 402 | 494 | 608 | 748 | 919 | 1,131 | 23 |
| - Education & Training | 246 | 20 | 295 | 360 | 439 | 535 | 652 | 795 | 22 |
| - Software Development | 1,746 | 23 | 2,148 | 2,556 | 3,043 | 3,622 | 4,311 | 5,131 | 19 |
| - Systems Operations | 16 | 56 | 25 | 31 | 39 | 48 | 59 | 74 | 24 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

U.S.

| Growth Delivery Mode | 1988 | 88-89 (%) | 1989 | 1990 | 1991 | 1992 | CAGR 1993 | 1994 | 89-94 (%) |
|---|--------|-----------|--------|---------|---------|---------|-----------|---------|-----------|
| Total Information Services Industry | 78,696 | 17 | 92,119 | 105,560 | 121,730 | 139,700 | 161,600 | 187,615 | 15 |
| Processing Services | 18,125 | 12 | 20,325 | 22,670 | 25,340 | 28,377 | 31,849 | 35,837 | 12 |
| - Transaction Processing Services | 12,030 | 11 | 13,345 | 14,630 | 16,064 | 17,655 | 19,435 | 21,440 | 10 |
| - Utility Processing Services | 900 | -5 | 855 | 906 | 961 | 1,018 | 1,079 | 1,144 | 6 |
| - Other Processing Services | 1,560 | 15 | 1,794 | 2,027 | 2,291 | 2,589 | 2,925 | 3,305 | 13 |
| - Systems Operations | 3,635 | 19 | 4,331 | 5,107 | 6,024 | 7,715 | 8,410 | 9,945 | 18 |
| Network/Electronic Information Services | 5,700 | 22 | 6,974 | 8,378 | 10,077 | 12,098 | 14,537 | 17,448 | 20 |
| Electronic Information Services | 4,460 | 22 | 5,457 | 6,538 | 7,830 | 9,336 | 11,117 | 13,186 | 19 |
| - On-line Data Bases | 4,010 | 22 | 4,897 | 5,828 | 6,930 | 8,216 | 9,727 | 11,476 | 18 |
| - News | 450 | 25 | 560 | 710 | 900 | 1,120 | 1,390 | 1,710 | 25 |
| Network Applications | 1,240 | 22 | 1,516 | 1,840 | 2,247 | 2,763 | 3,420 | 4,263 | 23 |
| - Value Added-Networks | 690 | 12 | 773 | 912 | 1,076 | 1,270 | 1,498 | 1,768 | 18 |
| - EDI | 190 | 48 | 282 | 414 | 570 | 750 | 990 | 1,350 | 37 |
| - Electronic Mail | 360 | 28 | 462 | 514 | 601 | 743 | 932 | 1,145 | 20 |
| Applications Software Products | 13,335 | 20 | 15,950 | 18,220 | 21,215 | 23,870 | 27,475 | 31,840 | 15 |
| - Mainframe | 4,400 | 11 | 4,820 | 5,215 | 5,990 | 6,005 | 6,445 | 6,930 | 8 |
| - Minicomputer | 4,310 | 15 | 4,940 | 5,485 | 6,080 | 6,740 | 7,485 | 8,360 | 11 |
| - Workstation/PC | 4,625 | 34 | 6,190 | 7,520 | 9,145 | 11,125 | 13,545 | 16,550 | 22 |
| Systems Software | 12,095 | 22 | 14,811 | 17,447 | 20,601 | 24,386 | 28,945 | 34,455 | 18 |
| - Mainframe | 5,965 | 15 | 6,858 | 7,811 | 8,898 | 10,136 | 11,547 | 13,155 | 14 |
| - Minicomputer | 4,050 | 19 | 4,804 | 5,624 | 6,586 | 7,717 | 9,046 | 10,610 | 17 |
| - Workstation/PC | 2,080 | 51 | 3,149 | 4,012 | 5,117 | 6,533 | 8,352 | 10,690 | 28 |
| Turnkey Systems | 9,620 | 10 | 10,705 | 11,675 | 12,790 | 13,980 | 15,335 | 16,820 | 10 |
| - Equipment | 5,195 | 9 | 5665 | 6,020 | 6,395 | 6,850 | 7,360 | 7,790 | 7 |
| - Packaged Software | 2,120 | 11 | 2,355 | 2,615 | 2,940 | 3,280 | 3,670 | 4,110 | 12 |
| - Custom Software | 770 | 25 | 965 | 1,140 | 1,330 | 1,490 | 1,685 | 2,000 | 16 |
| - Other Professional Services | 1,535 | 12 | 1,720 | 1,900 | 2,125 | 2,360 | 2,620 | 2,920 | 12 |
| Systems Integration | 4,801 | 21 | 5,797 | 7,157 | 8,878 | 10,920 | 13,680 | 17,165 | 24 |
| - Equipment | 2,126 | 19 | 2,523 | 3,055 | 3,730 | 4,480 | 5,490 | 6,890 | 22 |
| - Packaged Software | 425 | 18 | 500 | 600 | 720 | 865 | 1,060 | 1,320 | 21 |
| - Other Services | 325 | 11 | 361 | 408 | 460 | 520 | 590 | 675 | 13 |
| - Professional Services | 1,925 | 25 | 2,413 | 3,094 | 3,968 | 5,055 | 6,540 | 8,280 | 28 |
| Professional Services | 15,020 | 17 | 17,558 | 20,015 | 22,830 | 26,065 | 29,780 | 34,000 | 14 |
| - Consulting | 3,018 | 20 | 3,622 | 4,273 | 5,043 | 5,950 | 7,021 | 8,285 | 18 |
| - Education & Training | 1,819 | 18 | 2,146 | 2,447 | 2,789 | 3,180 | 3,625 | 4,133 | 14 |
| - Software Development | 8,780 | 16 | 10,185 | 11,509 | 13,005 | 14,696 | 16,606 | 18,765 | 13 |
| - Systems Operations | 1,403 | 14 | 1,605 | 1,783 | 1,992 | 2,237 | 2,527 | 2,869 | 12 |

**Information Services Industry User Expenditure Forecast
By Delivery Mode, 1989-1994
(\$ Millions)**

Venezuela

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|------|------------------------|------|------|------|------|------|------|----------------------|
| Total Venezuela Information Services Market | 278 | 14 | 317 | 367 | 425 | 492 | 570 | 662 | 16 |
| Processing Services | 56 | 12 | 63 | 70 | 79 | 88 | 99 | 111 | 12 |
| Network/Electronic Information Services | 11 | 10 | 12 | 13 | 15 | 16 | 18 | 19 | 10 |
| Applications Software Products | 70 | 18 | 83 | 99 | 119 | 143 | 171 | 206 | 20 |
| Systems Software | 42 | 15 | 48 | 56 | 65 | 75 | 87 | 101 | 16 |
| Turnkey Systems | 33 | 10 | 36 | 40 | 44 | 48 | 53 | 58 | 10 |
| Systems Integration | 10 | 10 | 11 | 12 | 14 | 15 | 17 | 19 | 12 |
| Professional Services | 56 | 15 | 64 | 76 | 90 | 106 | 125 | 147 | 18 |

Information Services Industry User Expenditure Forecast By Delivery Mode, 1989-1994 (\$ Millions)

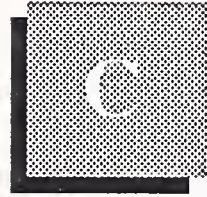
West Germany

| Delivery Mode | 1988 | Growth 88-89 (%) | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | CAGR 89-94 (%) |
|---|-------|------------------------|-------|--------|--------|--------|--------|--------|----------------------|
| Total West Germany Information Services Market | 8,097 | 17 | 9,476 | 11,092 | 13,024 | 15,340 | 18,120 | 21,465 | 18 |
| Processing Services | 1,379 | 5 | 1,453 | 1,519 | 1,588 | 1,662 | 1,741 | 1,824 | 5 |
| - Transaction Processing Services | 1,332 | 5 | 1,399 | 1,456 | 1,516 | 1,578 | 1,642 | 1,710 | 4 |
| - Systems Operations | 47 | 15 | 54 | 63 | 73 | 85 | 98 | 114 | 16 |
| Network/Electronic Information Services | 305 | 45 | 441 | 559 | 709 | 899 | 1,142 | 1,450 | 27 |
| - Electronic Information Services | 269 | 37 | 368 | 461 | 578 | 725 | 909 | 1,140 | 25 |
| - Network Applications | 36 | 103 | 73 | 97 | 130 | 174 | 232 | 311 | 34 |
| Software Products | 2,145 | 22 | 2,627 | 3,112 | 3,689 | 4,373 | 5,187 | 6,155 | 19 |
| - Systems Software | 1,513 | 22 | 1,850 | 2,164 | 2,532 | 2,961 | 3,464 | 4,052 | 17 |
| - Applications Software | 632 | 23 | 777 | 948 | 1,157 | 1,412 | 1,724 | 2,104 | 22 |
| Turnkey Systems | 2,150 | 12 | 2,407 | 2,838 | 3,353 | 3,968 | 4,704 | 5,586 | 18 |
| - Equipment | 1,225 | 8 | 1,324 | 1,505 | 1,711 | 1,945 | 2,211 | 2,513 | 14 |
| - Packaged Software | 645 | 16 | 746 | 914 | 1,121 | 1,375 | 1,686 | 2,067 | 23 |
| - Custom Software | 150 | 28 | 192 | 233 | 282 | 342 | 415 | 503 | 21 |
| - Other Professional Services | 130 | 12 | 145 | 186 | 238 | 306 | 392 | 503 | 28 |
| Systems Integration | 357 | 28 | 456 | 573 | 721 | 909 | 1,147 | 1,450 | 26 |
| - Equipment | 155 | 21 | 187 | 226 | 272 | 329 | 397 | 479 | 21 |
| - Packaged Software | 21 | 33 | 28 | 35 | 44 | 56 | 70 | 88 | 26 |
| - Other Services | 10 | 30 | 13 | 15 | 18 | 21 | 24 | 28 | 17 |
| - Professional Services | 171 | 33 | 228 | 297 | 387 | 504 | 656 | 855 | 30 |
| Professional Services | 1,761 | 19 | 2,092 | 2,491 | 2,964 | 3,529 | 4,200 | 5,000 | 19 |
| - Consulting | 215 | 19 | 256 | 305 | 363 | 432 | 513 | 611 | 19 |
| - Education & Training | 313 | 17 | 365 | 435 | 518 | 617 | 735 | 876 | 19 |
| - Software Development | 1,225 | 19 | 1,461 | 1,739 | 2,068 | 2,460 | 2,927 | 3,482 | 19 |
| - Systems Operations | 8 | 25 | 10 | 13 | 16 | 20 | 25 | 31 | 26 |



Currency Conversion Factors





Appendix: Currency Conversion Factors

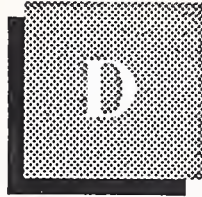
Appendix C provides a listing of the currency conversion factors used to convert from local currencies to U.S. dollars. For Europe, the factors were derived from the International Monetary Fund. They are the average rates for the second quarter 1989. The factors for other countries were derived from the Wall Street Journal's World Value of the Dollar as of August 4, 1989.

| Country | Currency | Value |
|----------------|----------------|----------|
| Argentina | Austral | 653.00 |
| Australia | Dollar | 1.30 |
| Austria | Schilling | 13.60 |
| Belgium | Franc | 40.50 |
| Brazil | Cruzado | 2.30 |
| Canada | Dollar | 1.20 |
| Denmark | Krone | 7.53 |
| Finland | Markka | 4.32 |
| France | Franc | 6.55 |
| Germany, West | Mark | 1.93 |
| Hong Kong | Dollar | 7.80 |
| India | Rupee | 16.60 |
| Italy | Lira | 1,409.00 |
| Japan | Yen | 138.00 |
| Korea, South | Won | 668.00 |
| Mexico | Peso | 2,515.00 |
| Netherlands | Guilder | 2.18 |
| New Zealand | Dollar | 1.70 |
| Norway | Krone | 7.00 |
| Singapore | Dollar | 1.90 |
| South Africa | Rand | 4.20 |
| Spain | Peseta | 121.00 |
| Sweden | Krona | 6.55 |
| Switzerland | Franc | 1.70 |
| Taiwan | Dollar | 25.70 |
| United Kingdom | Pound Sterling | 1.60 |
| Venezuela | Bolivar | 36.80 |



GDP Growth/Consumer Price Projections





Appendix: GDP Growth/Consumer Price Projections

Appendix D provides data about changes in Gross Domestic Product and consumer prices. The data is provided in two sections.

Exhibit D-1 provides summary data about the real economic growth and changes in consumer prices in major, developed countries. The section shows the real growth in GDP for 1988 and a forecast for 1989 and 1990.

For consumer prices, the section provides the actual changes in consumer prices for 1988, an estimate for 1989, and an estimate of average annual changes for the period 1990-1994.

Exhibit D-2 provides summary data about the real economic growth and changes in consumer prices in developing and less developed countries. The section shows the real growth in GDP for 1988 and a forecast for 1989 and 1990.

For consumer prices, the section provides an estimate of the changes in consumer prices for 1988 and a forecast of change for the years 1989 and 1990.

Note that a projection of changes in consumer prices for periods beyond 1990 are generally not available due to the potentially high volatility of the economy in many of the countries. Likewise, actual data for 1988 is frequently lacking, due to the delay in reporting data to the World Bank.

Data for the United States, which was used as the basis for the World-wide Forecast, is provided in Chapter I.

Data for the developed and developing countries are shown in the accompanying Exhibits D-1 and D-2.

EXHIBIT D-1

GDP/Consumer Price Growth—Europe

| Country | Percent | | | | | |
|----------------|-----------------|-------|-------|------------------------|-------|-------|
| | Real GDP Growth | | | Consumer Price Changes | | |
| | 1988A | 1989F | 1990F | 1988A | 1989E | 1990E |
| Austria | 4.2 | 3.0 | 2.0 | 2.0 | 2.8 | 3.0 |
| Belgium | 3.8 | 3.0 | 2.5 | 1.2 | 2.9 | 3.5 |
| Denmark | -0.2 | 0.5 | 1.5 | 4.6 | 5.0 | 6.0 |
| Finland | 5.2 | 3.5 | 2.5 | 5.0 | 6.0 | 6.0 |
| France | 3.6 | 3.0 | 2.7 | 2.7 | 3.6 | 3.3 |
| West Germany | 3.4 | 3.2 | 2.8 | 1.2 | 3.0 | 2.5 |
| Greece | 3.7 | 2.5 | 2.0 | 13.5 | 13.0 | 12.5 |
| Ireland | 1.0 | 4.0 | 3.0 | 2.1 | 3.6 | 4.0 |
| Italy | 3.9 | 3.0 | 2.3 | 5.1 | 6.5 | 6.0 |
| Netherlands | 2.6 | 3.2 | 3.0 | 0.6 | 1.1 | 2.5 |
| Norway | 2.0 | 3.0 | 2.0 | 6.7 | 4.5 | 4.0 |
| Portugal | 4.2 | 3.3 | 3.0 | 9.7 | 12.0 | 10.0 |
| Spain | 5.0 | 4.3 | 3.5 | 4.8 | 6.5 | 5.5 |
| Sweden | 2.1 | 1.8 | 1.0 | 5.8 | 7.0 | 6.7 |
| Switzerland | 3.0 | 2.3 | 2.0 | 1.9 | 2.8 | 2.5 |
| United Kingdom | 4.5 | 2.5 | 2.5 | 4.9 | 7.8 | 6.0 |

A = Actual
 E = Estimate
 F = Forecast

EXHIBIT D-2

GDP/Consumer Price Growth—Other Countries

| Country | Percent | | | | | |
|-------------|-------------------|-------|-------|------------------------|---------|-------|
| | Real GDP Growth | | | Consumer Price Changes | | |
| | 1988E | 1989F | 1990F | 1988E | 1989F | 1990F |
| Argentina | 0.0 | -5.5 | - | 343.0 | 1,000.0 | - |
| Australia | 3.9 ¹ | 3.0 | 1.2 | 7.2 | 7.0 | 8.0 |
| Brazil | 0.3 | 0.0 | - | 603.0 | 750.0 | - |
| Canada | 4.5 ¹ | 2.7 | 1.5 | 4.0 | 5.5 | 5.0 |
| Hong Kong | 7.5 | 5.8 | - | 7.5 | 10.0 | - |
| India | 10.5 | 5.0 | - | 9.4 | 10.0 | - |
| Japan | 5.7 ¹ | 4.7 | 3.7 | 0.7 | 3.0 | 3.0 |
| South Korea | 11.5 | 7.5 | - | 7.1 | 6.5 | - |
| Mexico | 0.4 | 1.5 | - | 114.0 | 25.0 | - |
| New Zealand | -1.0 ¹ | 0.5 | 2.0 | 6.3 | 4.8 | 4.0 |
| Singapore | 11.0 | 8.0 | - | 1.5 | 2.5 | - |
| Taiwan | 7.3 | 6.5 | - | 1.2 | 4.5 | - |
| Venezuela | 4.2 | -2.5 | - | 29.5 | 85.0 | - |

E = Estimate

F = Forecast

1 = Actual

