INPUT

MARKET FORECAST

European Market Forecast for Computer Software and Services

1993-1998

Market Analysis Programme – Europe

NOVEMBER 1993

EUROPEAN MARKET FORECAST FOR COMPUTER SOFTWARE AND SERVICES

1993-1998

INPUT®

London • Paris • Frankfurt • San Francisco • New York • Washington D.C. • Tokyo

INPUT®

INTERNATIONAL IT INTELLIGENCE SERVICES

Clients make informed decisions more quickly and economically by using INPUT's services. Since 1974, information technology (IT) users and vendors throughout the world have relied on INPUT for data, research, objective analysis and insightful opinions to prepare their plans, market assessments and business directions, particularly in computer software and services.

Contact us today to learn how your company can use INPUT's knowledge and experience to grow and profit in the revolutionary IT world of the 1990s.

SUBSCRIPTION SERVICES

- **Information Services Markets**
  - Worldwide and country data
  - Vertical industry analysis
- **Systems Integration and Business Process Re-engineering**
- **Client/Server Applications and Directions**
- **IT Outsourcing Opportunities and Analysis**
- **Information Services Vendor Profiles and Analysis**
- **EDI/Electronic Commerce**
- **U.S. Federal Government IT Markets**
- **IT Customer Services Directions**
- **Multimedia Opportunities**

SERVICE FEATURES

Research-based reports on trends, etc. (Over 100 in-depth reports a year)

Frequent bulletins on events, issues, etc.

5-year market forecasts

Competitive analysis

Access to experienced consultants

Immediate answers to questions

DATABASES

- **Software and Services Market Forecasts**
- **Software and Services Vendors**
- **U.S. Federal Government**
  - Procurement Plans (PAR)
  - Forecasts
  - Awards (FAIT)
- **Commercial Application LEADS**

CUSTOM PROJECTS

For Vendors—analyze:

- **Market strategies and tactics**
- **Product/service opportunities**
- **Customer satisfaction levels**
- **Competitive positioning**
- **Acquisition targets**

For Buyers—evaluate:

- **Specific vendor capabilities**
- **Outsourcing options**
- **Systems plans**
- **Peer position**

OTHER SERVICES

Presentations to user groups, planning meetings, etc.

Acquisition/partnership searches

Newsletters

INPUT WORLDWIDE

Frankfurt
Sudetenstraße 9
D-35428 Langgöns-Niederkleen
Germany
Tel. +49 (0) 6447-7229
Fax +49 (0) 6447-7327

London
17 Hill Street
London W1X 7FB
England
Tel. +44 (0) 71 493-9335
Fax +44 (0) 71 629-0179

New York
400 Frank W. Burr Blvd.
Teaneck, NJ 07666
U.S.A.
Tel. 1 (201) 801-0050
Fax 1 (201) 801-0441

Paris
24, avenue du Recteur Poincaré
75016 Paris
France
Tel. +33 (1) 46 47 65 65
Fax +33 (1) 46 47 69 50

San Francisco
1881 Landings Drive
Mountain View
CA 94043-0848
U.S.A.
Tel. 1 (415) 961-3300
Fax 1 (415) 961-3966

Tokyo
Saida Building, 4-6,
Kanda Sakuma-cho
Chiyoda-ku, Tokyo 101
Japan
Tel. +81 3 3864-0531
Fax +81 3 3864-4114

Washington, D.C.
1953 Gallows Road
Suite 560
Vienna, VA 22182
U.S.A.
Tel. 1 (703) 847-6870
Fax 1 (703) 847-6872

M&S 459/01 12/93

Abstract

This report is a summary of the research and analysis carried out by INPUT into the Computer Software and Services Industry in Western Europe.

The report examines the performance, status and growth potential of the computer software and services market. Forecasts are included for the Western European country markets of France, Germany, the United Kingdom, Italy, Sweden, Norway, Denmark, Finland, the Netherlands, Belgium, Switzerland, Austria, Spain, Portugal, Greece and Ireland.

The computer software and services industry is defined by INPUT as comprising eight major sectors - processing services, turnkey systems, applications software products, system software products, professional services, network services, systems operations and systems integration. These different sectors, or delivery modes, are further sub-divided into 24 subsectors for forecasting and analysis by country within the report.

Each sector is examined with respect to major trends, market dynamics and issues. Estimates of sector and country market growths are given together with annual size estimates up to 1998. Leading vendors are identified for each country and for each sector in Europe overall. In addition there is an analysis of the major country markets by vertical industry sector.

All the sectors are examined more fully and with more detailed commentary in separately published INPUT research programmes and reports.

Research by
INPUT
17 Hill Street
Mayfair
London W1X 7FB
United Kingdom

Published by
INPUT
1881 Landings Drive
Mountain View, CA 94043-0848
United States of America

Information Services Market Analysis Programme - Europe

The European Market Forecast for Computer Software and Services, 1993-1998

IEU-MMF • 567 • 1993

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

V

Table of Contents (continued)

Table of Contents (continued)

Appendixes

Exhibits

Exhibits (continued)

IV

Exhibits (continued)

Exhibits (continued)

V

Exhibits (continued)

V

Exhibits (continued)

V

Exhibits (continued)

V

Exhibits (continued)

V

Exhibits (continued)

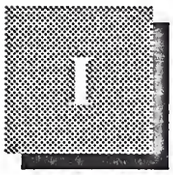
V

Exhibits (continued)

V

Exhibits (continued)

Exhibits (continued)



Introduction

This forecast is produced as one of a series in INPUT's Software and Services Planning Services for the computer software and services industry in Europe.

The forecast is an overview of the whole European market designed to assist vendors in:

- Identifying new industry or cross-industry market opportunities
- Quantifying market sizes and shares
- Obtaining insights into trends in market growth or decline

A

Scope of the Report

These forecasts represent an on-going analysis of software and services markets by industry and cross-industry sectors in major European countries. Spending on software and services is related back to anticipated changes in the level of overall IT budgets.

The market is analysed by industry sectors, cross-industry sectors and by generic product sectors. The delivery modes in all three categories are added together to provide the delivery mode forecasts for each country.

1. Industry sectors

The sectors forecast for each major country include:

- Discrete Manufacturing
- Process Manufacturing
- Transportation
- Utilities
- Telecommunications
- Retail Distribution
- Wholesale Distribution
- Banking and Finance
- Insurance

- Healthcare
- Education
- Local Government
- National Government
- Business Services
- Other Sectors

For each of these industry sectors there is a forecast of the delivery modes specific to that sector:

- Professional services
- Systems integration
- Systems operations
- Transaction processing services
- Network services
- Applications software
- Turnkey systems

The full definition of each sector is given in INPUT's *"Definition of Terms"* publication.

For each of the industry sectors there is also a forecast of the IT budget, including both internal and external IT-related spending. This is split into:

- Equipment sales - expenditure on hardware products

- Equipment services - expenditure on equipment maintenance and environmental services

- Software products - all expenditure on systems software products and applications software product licences

- Software services - all expenditure on other services such as the service elements of professional services, systems integration, systems operation, processing services, network services, turnkey systems, and systems software products and applications software product support services.

- Communications - all expenditure on IT-related telecommunications equipment or services.

- Facilities - IT budget expenditure on overheads such as space, heating, lighting, furniture, vehicles, etc.

- Staff - direct in-house staff costs including any temporary contract labour

2. Cross-industry sectors

- Accounting
- Education & Training
- Engineering & Scientific
- Human Resources
- Office Systems
- Planning & Analysis
- Other Cross-Industry

For each of the cross-industry sectors there is a forecast of the delivery modes unique to that sector:

- Transaction processing services
- Applications software
- Turnkey systems

3. General sectors

Certain sectors or sub-sectors are considered independent of any industry or cross-industry influence. These are:

- System Software Products
- General utility processing services
- General electronic information services

Together these forecasts add up to form the basis for INPUT's traditional market segmentation of nine delivery modes:

- Professional services
- Systems integration
- Systems operations
- Processing services
- Network services
- Systems software
- Applications software
- Turnkey systems
- Equipment services

Detailed industry by industry forecasts are given for Europe (east and west combined), for France, Germany, Italy, the United Kingdom, and for the rest of Europe as a whole.

Software and services continue to attract widespread vendor attention. This report is designed to assist vendors in achieving a consolidated view of each market in Europe. It should be read in conjunction with other INPUT reports in order to identify key market and product trends, vendor strategies and opportunities.

The report provides market sizes for 1992 with forecasts for each year from 1993 through 1998.

Elsewhere INPUT has analysed delivery modes in the European country markets of Sweden, Norway, Denmark, Finland, the Netherlands, Belgium, Switzerland, Austria, Spain, Portugal, Greece, Ireland and Central and Eastern Europe. Industry sector analyses are not available for these countries.

B
Methodology

INPUT's methodology for market analysis and forecasting remains the same as has been used in past years. Vendors and users are surveyed to determine what is being spent on software and services and to anticipate the likely trends in both the short and long term.

1. Sources

This report is based principally on research activities conducted by INPUT during 1993:

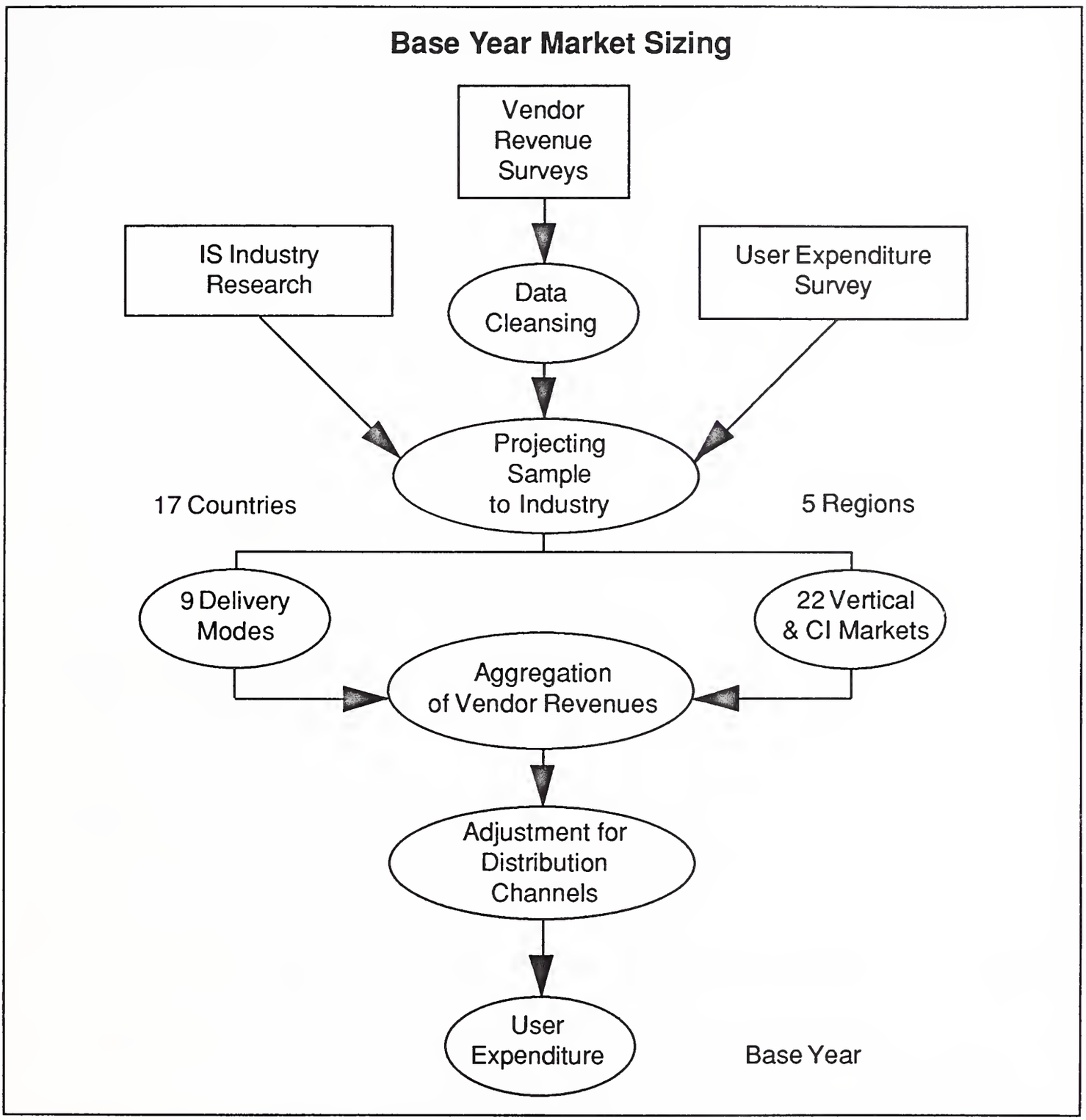
- A vendor research programme of over 500 interviews with key software and services vendors across Europe.
- A further 1,000 vendor and user interviews across all European market sectors to determine trends and opinions.
- INPUT's continuous analysis of the delivery modes and vertical industry sectors comprising the computer software and services market.
- INPUT's research programme into the customer services and user satisfaction in the European market place.

Additionally INPUT's extensive library and data-base of information relating to the software and services industry was used.

2. Market Sizing

The process used to establish the market size in 1992 (total user spending last year) is shown in Exhibit I-1.

EXHIBIT I-1



INPUT determines previous-year software and services revenues for the 17 countries, 9 delivery modes and 22 vertical and cross-industry sectors for hundreds of vendors operating in European markets. This is accomplished through interviews, use of public data such as press articles and annual company reports, and estimates by INPUT consultants.

The country, industry sector, delivery mode and sub-sector revenues of each vendor are recombined to ensure that there is no double counting or overlap for example between countries. Only revenue derived from within a country are included in the vendor's revenues for that country.

Many vendors publish accounts which do not coincide with the end of the calendar-year. INPUT adjusts these to represent those likely to be achieved within the calendar year for consistency.

The initial local currency data from the vendors analysed is projected to represent the revenues of the entire country market based on INPUT's view of the contribution to be expected from the remaining minor vendors.

Adjustments are made to eliminate errors due to distribution channel overlap or mark-up and to ensure that captive market information is excluded. Captive markets are those revenues which a vendor receives from within the vendor's parent group of companies.

Demographic data have also been used to validate the market sizes. INPUT uses such sources as "Panorama of EC Industry" published by the European Commission, to check trends in sector expenditures and employee levels in different industries.

The end result is a base year (in this case 1992) software and services market figure representing user expenditure for each of the market sectors or delivery modes analysed in each country.

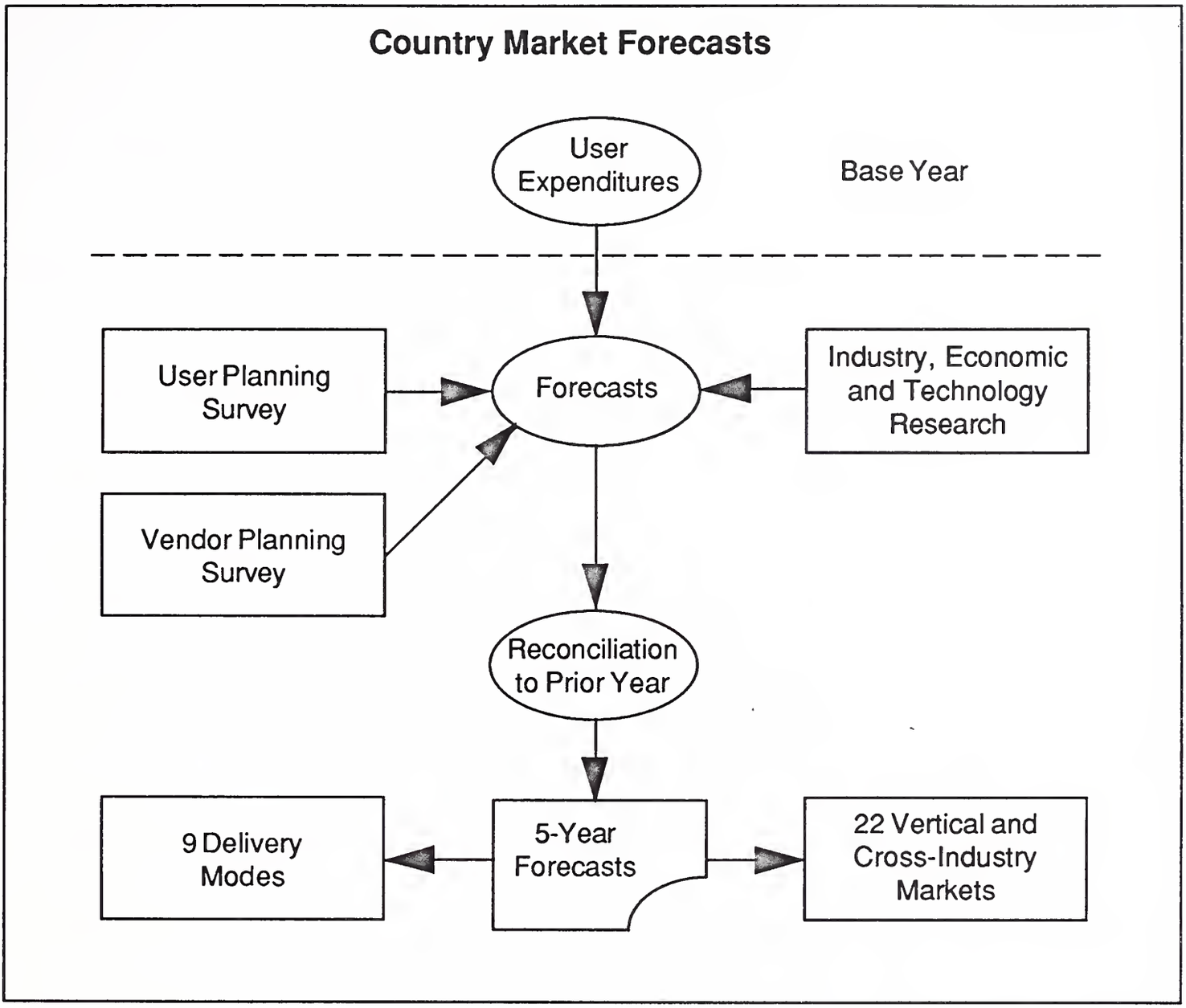
3. Market Forecasts

In the forecasting step, shown in Exhibit I-2, INPUT surveys IS executives and finance directors to determine their projected expenditure levels.

The market model which forms the basis for the forecasts includes adjustments for predicted inflation rates for each country.

Economic growth assumptions for each country and for each major industry sector are also factored in to the forecasts.

EXHIBIT I-2



In addition further vendor interviews are conducted to establish their opinion of the market and the key opportunities.

Finally INPUT consultants add their judgement to the resulting projections, testing the results to ensure they are reasonable. In particular this phase produces consolidated forecasts for the whole of each country by consolidating industry forecasts, and then for Europe by combining the forecasts from each subsector.

C
Report Structure

The remaining chapters of this report are structured in the following way:

- Chapter II is an executive overview offering a concise summary of the contents of the entire report.

- Chapter III describes INPUT's assessment of the dimensions of the main constituent sectors of the European software and services market. It lists the forecasts for Europe as a whole, by delivery mode, by subsector, and the split by country. It describes the economic and exchange rate assumptions used in formulating the market forecasts. It also lists the European leading vendors and their market shares and addresses some of the major issues impacting the market environment.

- Chapter IV provides a sector by sector analysis in more detail for the eight main market sectors.

- Chapter V provides a country by country commentary and analysis of the dynamics of each. It also identifies the leading vendors and their attributable revenues during 1992.

- Appendix A provides detailed definitions used by INPUT to categorise and analyse the activities in each market sector.

- Appendix B lists related INPUT reports in the series.

- Appendix C shows the reconciliation between last year's European forecast and this one.

- Appendix D shows the number of vendors included in the research sample for each country.

- Appendix E lists the inflation, exchange rate, and GDP assumptions used to compile the report.

D

Related INPUT Research Programmes and Reports

The following reports contain detailed analysis of each market sector, offering commentary and recommendations for vendors active in each sector. Further commentary and analysis of each market sector identified in this report may be read in the full reports listed below:

1. Market Sector Reports

- *SI Market Analysis & Forecast, 1993-1998*
- *Outsourcing Market Analysis and Forecasts*
- *Market Forecast Database, 1993-1998*
- *Industry Sector Forecast Database, 1993-1998*
- *Market Sector Analysis and Forecasts, 1993-1998*

2. Industry Sector Reports

- *European Software and Services Market, 1992-1997—Insurance Sector*
- *European Software and Services Market, 1992-1997—Banking and Finance Sector*
- *European Software and Services Market, 1992-1997—Discrete Manufacturing Sector*
- *European Software and Services Market, 1992-1997—Process Manufacturing Sector*
- *European Software and Services Market, 1992-1997—Retail and Wholesale Distribution Sector*
- *European Software and Services Market, 1992-1997—Transportation Sector*
- *European Software and Services Market, 1992-1997—National Governments Sector*

3. Market Trend Reports

- *Leading Applications Driving Systems Integration Projects*
- Client/Server Integration Services
- Procurement Approaches to Systems Integration
- Opportunities in Re-Engineering
- Methods for Successful Systems Integration Projects
- Systems Integration Opportunities in Downsizing

- Business Operations Outsourcing
- Outsourcing - Client Satifsfaction
- Outsourcing Opportunities in Government
- Outsourcing Systems Operations
- Outsourcing Network Management & Operations
- Outsourcing Applications Management
- Outsourcing Desk Top Services

- Client/Server - Service Opportunities
- IS Consulting - Competitive Perspective
- Professional Services - Re-Focus for the '90s
- Database Migration - The Skills Barrier

- Environmental Services
- Outsourcing Repair Services
- Vendor Structures for Professional Services
- Open Systems Services - Challenges & Strategies
- Vendor Service Strategies
- User Trends & Issues
- Impact of Downsizing on CS Markets

4. Vendor Profile Reports

- *Analytical profiles of leading independent software and service vendors in Europe*

II

Executive Overview

A

Industry Outlook - Focus on Market Share and Profit

The market for software and services has changed dramatically under the influence of economic recession throughout Europe. Market pressures on all types of organisations are resulting in users increasing their IS buying power but not their budgets. Vendors are having to reshape and reposition their businesses in order to compete in an almost static market.

Software and services revenue growth now means winning market share. Profit now means reducing the cost base. Only half the Top 30 vendors in Europe made a profit in 1992. The situation may well be worse for 1993. The winners seem likely to be those who invest well in marketing and channel partnerships. The leading PC software vendors provide a role model.

Some of the important trends revealed by INPUT's European research are shown below in Exhibit II-1.

EXHIBIT II-1

Key Industry Trends Software and Services Europe

- Business process re-engineering drives IS projects
- IS departments treat users as clients/customers
- New software product pricing stimulates growth and profit
- Services winners focus on vendor and customer interfaces

User demand is firmly set on gaining a rapid return on investment and on purchased solutions. The industry's focus on solutions is not new. But there has been criticism that many IS solutions for business left the automated company locked into its old outdated business processes. Rather than automating a solution, IS had been used to automate the problem.

It is therefore refreshing to see the interest stirred up by management consultants promoting business process re-engineering (BPR). INPUT's research indicates that BPR is becoming a primary driving force for changes to IS strategy and for systems integration projects. It is understandable that several major equipment vendors have launched management consultancy units in the past year as they attempt to influence business needs for IS.

As user managements excercise their IS buying power, so IS managements are learning to treat users as customers. It is becoming clear that IS departments must start to emulate the professionalism of software and service vendors if they are to survive the current trends to downsize or outsource IS departments.

There are strong moves among the mid-range and mainframe software vendors to re-work their pricing policies. High prices are under threat both from user dissatisfaction and from desktop vendors. User population pricing is normal practice for PC and UNIX software. As these vendors move their attention towards the datacentres, software prices can be expected to fall still further. The software product industry will inevitably follow the equipment vendors in having to re-structure and downsize.

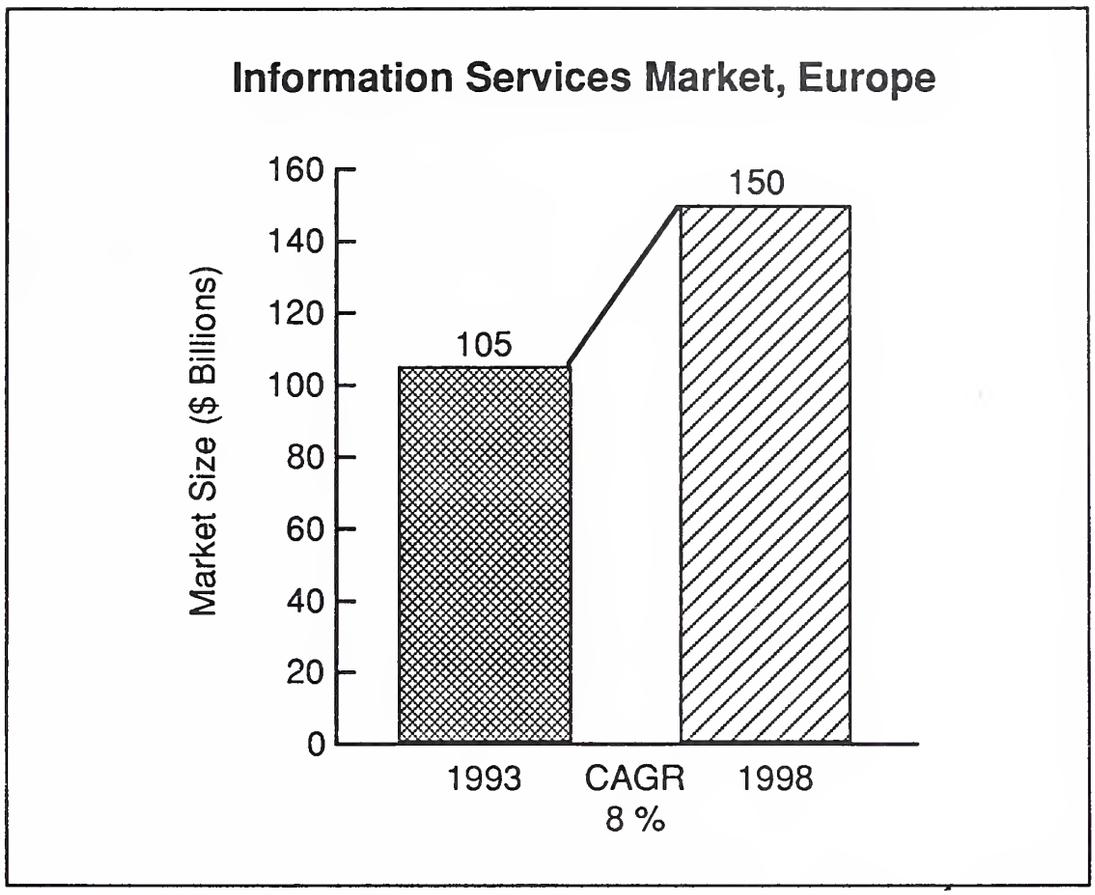
Just as much re-structuring is taking place in the services sector. Services vendors are working closely with partners to deliver best practice and best-of-breed solutions. The cost and risk of developing dedicated custom software usually cannot be justified. The management of partner interfaces, the relationship with customers or suppliers, will become the key factor distinguishing the successful vendors in the 1990s.

B

Overall Market Forecasts - Recovery May Be Slow

INPUT estimates that the overall computer information services market in Europe was $100 billion in 1992, including $22 billion attributed to equipment services. As Exhibit II-4 illustrates, the overall market is expected to grow from $105 billion (ECU 83 billion) in 1993 to $150 billion (ECU 127 billion) in 1998, despite the current economic recession and reduced confidence in the industry.

EXHIBIT II-2

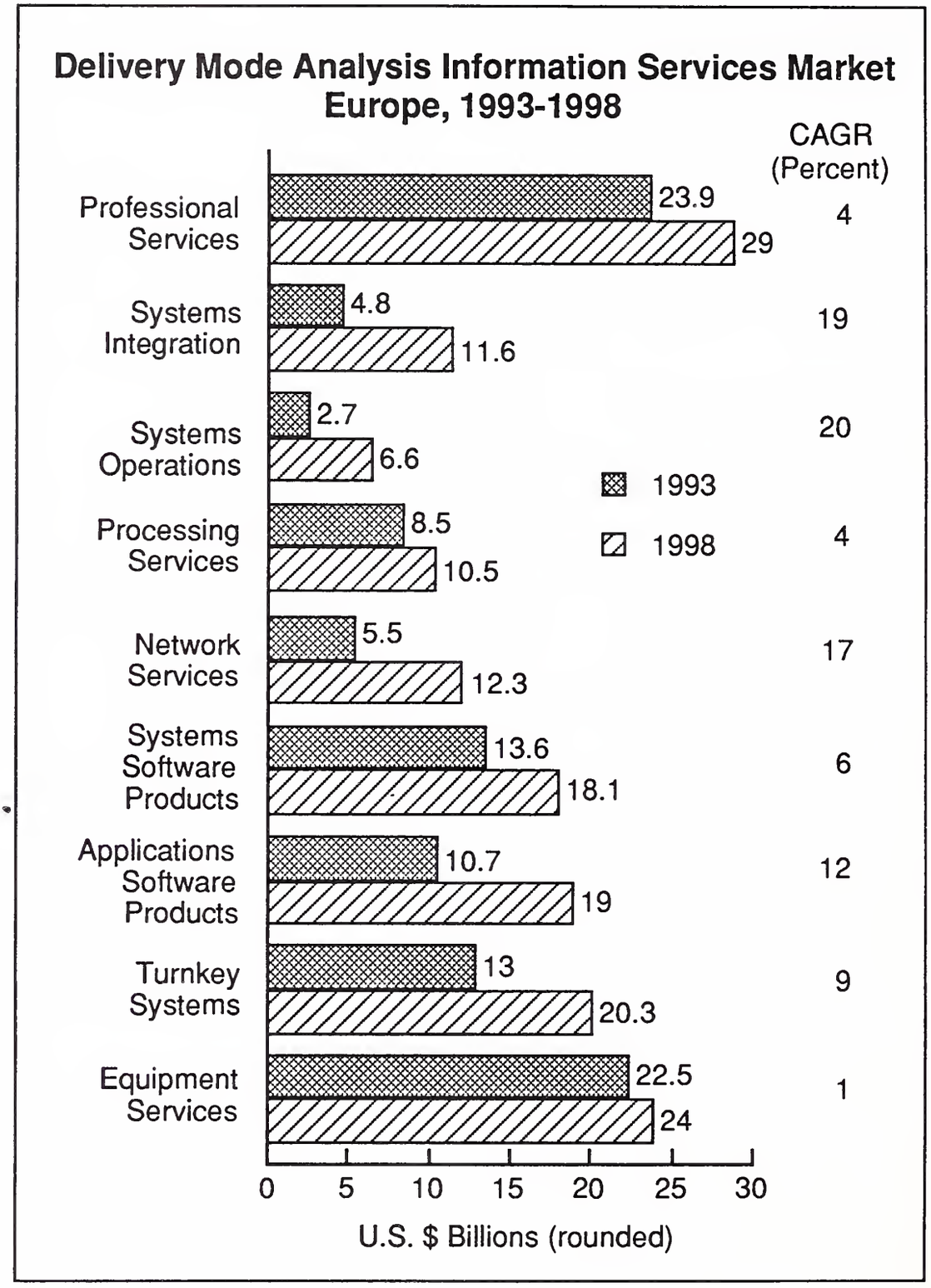


This forecast represents a compound annual growth rate (CAGR) of 8%, down 1% from last year's forecast. This growth includes the predicted effects of inflation country by country around Europe - see Appendix E for assumptions.

Each of the contributing delivery modes is summarised later in this chapter. A full market analysis for each sector is available in related INPUT reports. The effects of the forecast and the relative sizes of the sectors is illustrated in Exhibit II-7. [Equipment Services, Systems Operations and Systems Integration are reported in detail in related INPUT research reports and continuous information programmes.]

In most of the following tables, the term "Information Services" is used to describe the whole market. "Software and Services" totals are also quoted which exclude Equipment Services, allowing the reader to make comparisons with previous versions of this reference book.

EXHIBIT II-3



C

Major Country Markets - Cultural Differences Prevail

France continues as the largest European market. In 1992, France accounted for 23% of all information services user expenditure in Europe. Exhibit II-10 illustrates the size and growth of the major country and regional markets. France, Germany, the United Kingdom and Italy together accounted for 69% of the overall market in 1992.

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

The size of the French market has led to the French being the largest European vendors as they vie with U.S. vendors for market share. Seven of the Top 30 vendors are French, one less than last year, and twelve are U.S. in origin, one more than in 1991.

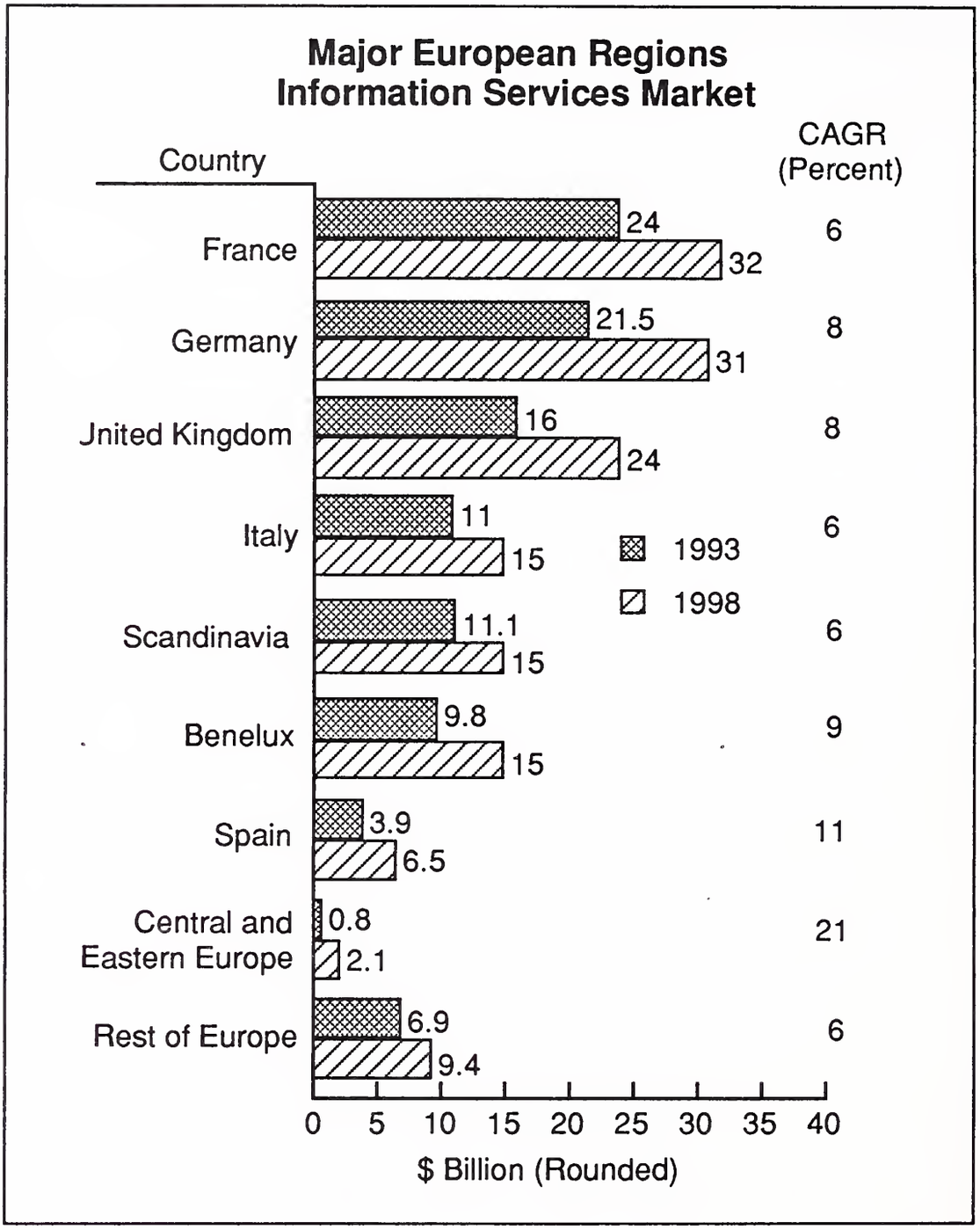
Of the other European software and services markets shown in Exhibit II-11, the four Scandinavian countries accounted for some 11% of the total in 1992. They exhibit one of the slowest rates of growth principally due to the high proportion of processing services in these countries.

The Netherlands, Belgium and Luxemburg - Benelux - account for 8% of the European total with a good forecast growth rate of 9% per annum from 1993 to 1998.

Central and Eastern Europe can be seen as a completely under-developed market for software and services. Many systems integration contracts were placed in 1992 and 1993 as the countries begin to put in western-style commercial infrastructures. Although there are some local advanced software skills - often developed on pirated software - the lack of available funding is a major constraint to more rapid business development for vendors.

Spain, at 11%, has one of the fastest growing markets, but economic hardship means it is not as attractive as it was at the start of the 1990s. Among the remaining five countries (identified as Rest of Europe in the Exhibit II-12). On average these countries will grow at the same rate as the total European market. Since they tend to have high inflation rates this implies generally low real growth.

EXHIBIT II-4



D

Professional Services - Growth at a Record Low

Disillusion with the value of past spending on IT has been heightened by the tough economic climate in Europe. The IT industry is seen to have failed to deliver the benefits promised. The once healthy growth of professional services in the computer business has stopped in its tracks. Cap Gemini Sogeti, the largest such vendor in Europe, saw its first ever loss and revenues fell 17% in 1992 in France, its home market.

Exhibit II-5 shows the forecast for the component parts of the professional services sector. Aggregate growth is predicted at an all time low of 4% CAGR, near zero in real terms with inflation removed.

Professional services vendors and IT departments face similar challenges. Their staple activity, application software development, is being replaced by requirements for other skills as users demand faster results and direct business benefits.

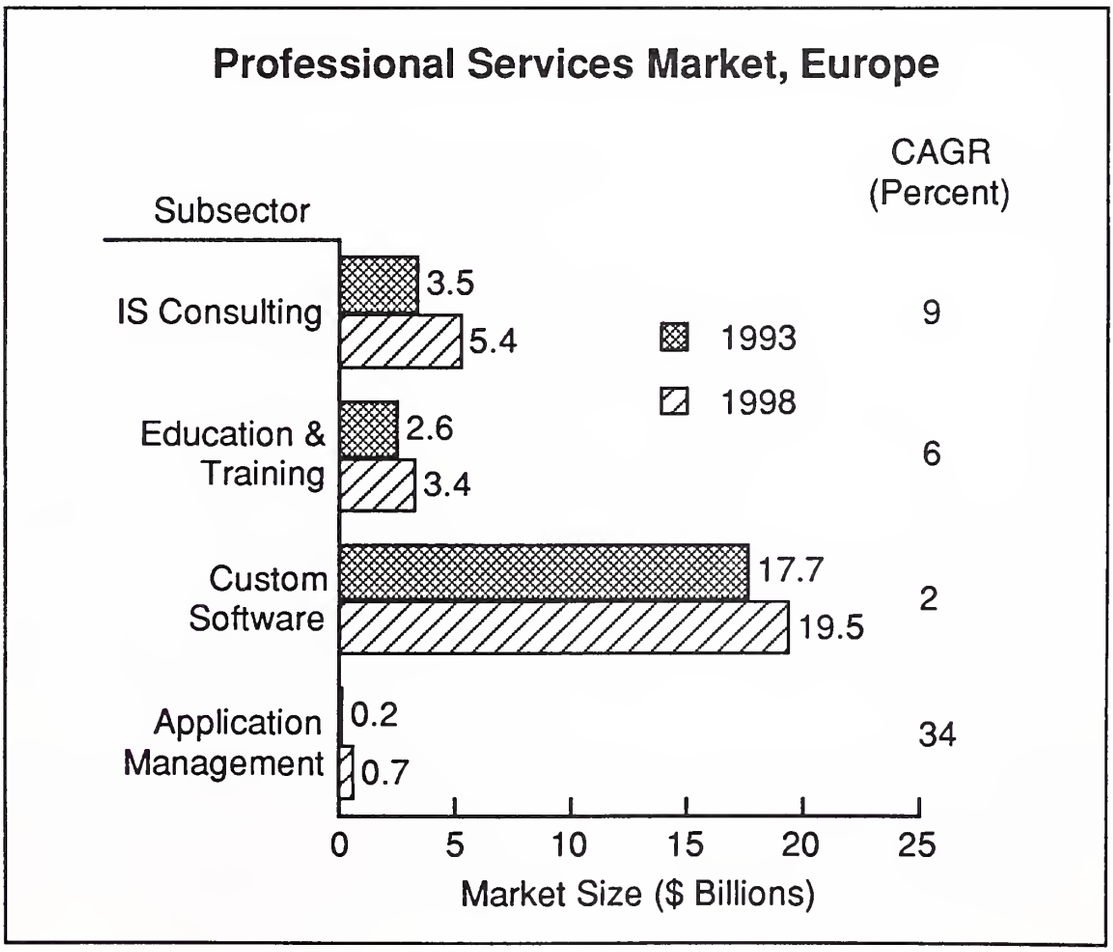
The focus of IT requirements is now firmly on meeting end-user business needs including results in short time scales. As a result, services demand is polarising towards managing the "old" better and implementing the "new" faster:

- managing existing systems and user demands more cost effectively
- building new business solutions more rapidly.

This is creating high growth opportunities in key service areas such as application management and systems integration, as well as stimulating the market for software products.

These fundamental changes are presenting a major challenge to professional services vendors as new opportunities emerge outside the traditional business of custom software development.

EXHIBIT II-5



The IS consulting sector was static during 1992, but is expected to recover as clients begin to invest again in strategic projects. The past year has seen several major equipment vendors set up management consulting units, but these are not likely to impact the market for several years.

The training market has been constrained by the effects of recession, of low staff turnover and of improved use of technology. PC and open systems product training has performed well, but traditional IS training for mainframe and mini environments has fallen off badly.

The custom software sector which includes contract labour and software development projects has suffered from the tendency of users to buy ready-made solutions. Many vendors are re-positioning their traditional development services to cater for new demands such as application management and rapid application development (RAD).

In-house IS departments have limited resources for these new demands. Already in-house spending on new applications is less than the spending on purchased solutions. INPUT estimates that $40 billion will be spent on software products and professional services in Europe during 1993. In contrast around $30 billion will be spent on development projects using in-house staff.

- The on-going support of older legacy software systems typically uses up 65% of the available people in an IS department. This compares to a far lower percentage of staff active on such work in a professional services vendor. Vendors who can lower these costs for users are finding a very large market opportunity in application management.

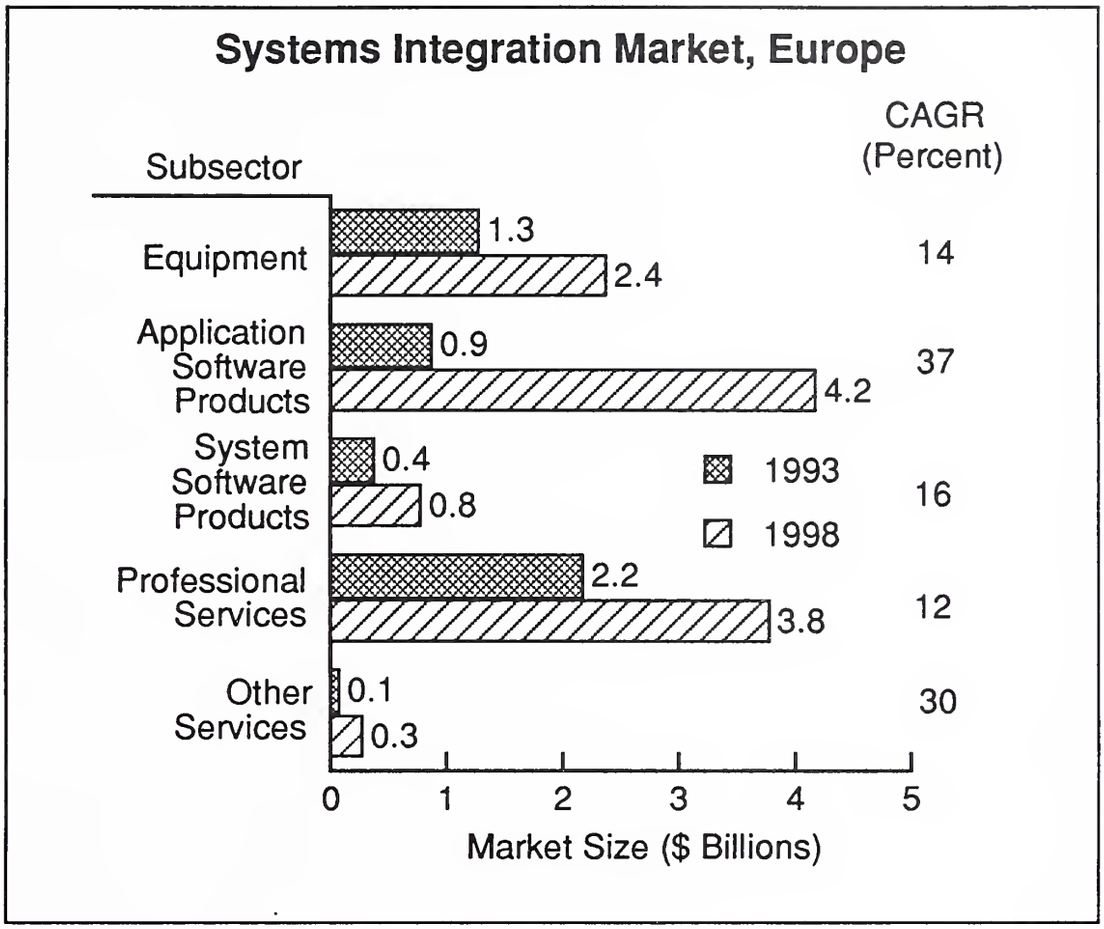
E

Systems Integration - Changing Demands Sustain Growth

Although the overall level of growth in software and services has decreased considerably over the past few years, the systems integration market has maintained consistently high growth. During 1993, INPUT estimates that the European systems integration market will grow 17%, much higher than general professional services. (See Exhibit II-6.)

Full market analysis is available in INPUT Europe's *Systems Integration Market* report which is available separately or as part of a continuous research programme.

EXHIBIT II-6



The high level of growth has been driven by users' increasing propensity to sub-contract major projects and an increasing desire for fixed price contracts rather than time and material based services.

The question now is whether or not this comparatively high level of growth can be expected to continue. INPUT forecasts that it will. The major factors which will drive this growth are:

- Project focus becomes client/server component integration
- Transportation and utilities sectors provide new opportunities
- Central and Eastern Europe is a high growth region

One factor in the development of the systems integration market has been changing user attitudes towards the subcontracting of large systems development projects. The management culture of organisations is also changing as organisations adopt higher levels of decentralisation and transfer decision-making to local business units.

These cultural changes are now being complemented by a shift in technology. The result is that systems integration projects are evolving from large bespoke systems development projects to projects based on client/server architecture and oriented around the assembly of standard software products and kernels.

The main change expected over the next five years is the rapid growth in the use of application software products and kernels as the basis of systems integration projects. Overall, including both systems software and application software, the software products component of the systems integration market is expected to increase from 26% to 43% of the market value over the next five years. At the same time, the market's dependence on professional services is expected to decline from 45% to 33%.

Another of the main trends in the systems integration market is vendors' increasing specialisation by industry sub-sector. To be successful, this strategy depends on access to appropriate software products. Access to software products not only demonstrates a vendor's experience in the sector, but also offers the client increased flexibility and reduced project costs and timescales.

The pattern of demand in the commercial sector is beginning to change. Traditionally the commercial systems integration market has been dominated by projects in the financial services and manufacturing sectors. However, there are now signs of the demand from these two sectors stagnating and new sectors such as utilities, transportation, and distribution are assuming a greater importance in the systems integration market.

Sectors such as retail and transportation have been comparatively low investors in the past. However, these traditional low investors are often characterised by the highly distributed nature of their operations. The advent of client/server architectures has led such organisations to perceive that information technology and communications have now matured to the stage where they can provide real business benefits.

The demand for systems integration projects by country or region is also becoming more volatile. Firstly, this is a reaction to the changing economic circumstances of the major economies. Until 1992, the German economy, and the German systems integration market, was viewed with considerable optimism by vendors. This view has now changed with vendors expecting low growth in the German systems integration market over the next few years. In contrast, the systems integration market in the United Kingdom which has been depressed in recent years, is now the source of renewed optimism.

Secondly, there is the emergence of significant new markets such as Central and Eastern Europe. The systems integration market in Central and Eastern Europe is expected to be the fourth largest market, and to be two-thirds the size of the German market, by 1998.

The Eastern European systems integration market is created upon new infrastructures being formed in support of changing central government, banking and telecommunications operation in this region. Major beneficiaries have been the equipment vendors such as Groupe Bull, Unisys and ICL.

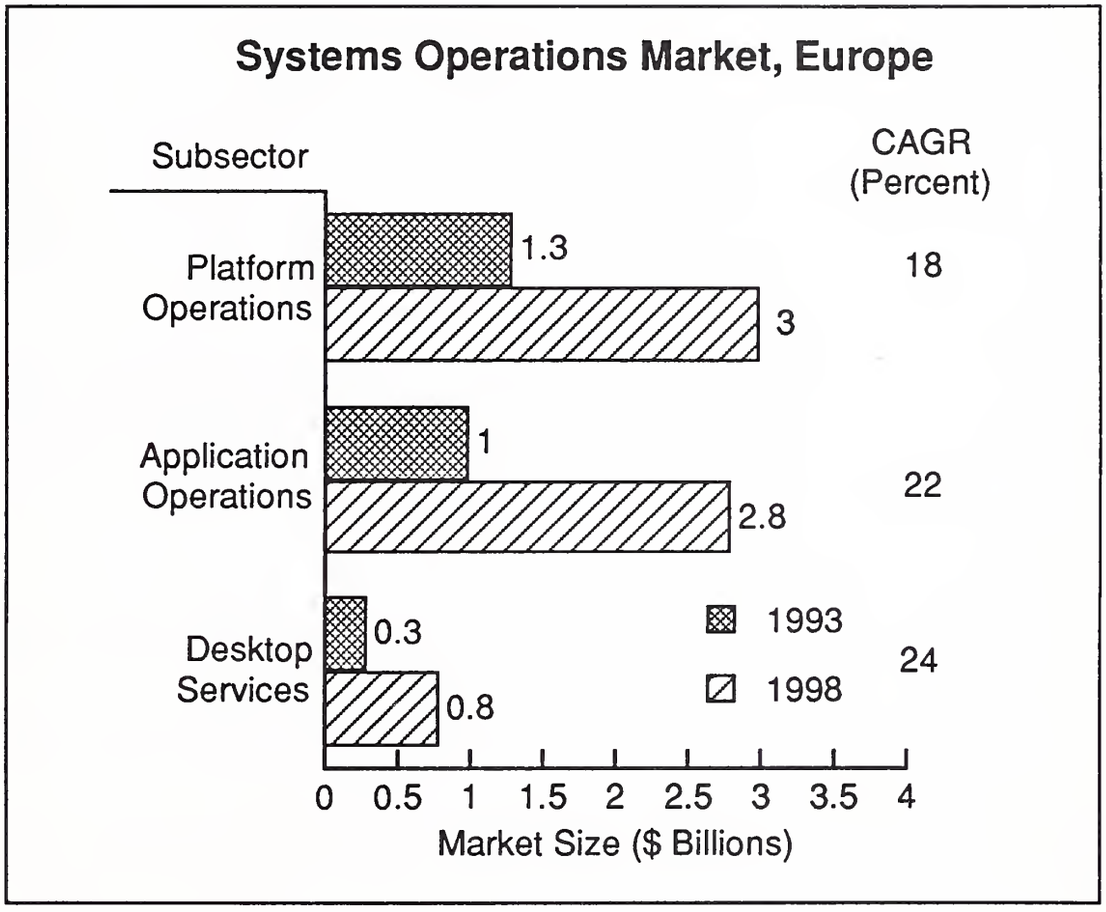
F

Systems Operations - Segmentation Poses Challenge

The outsourced systems operations market in Europe continues to grow rapidly, and high levels of growth are expected to continue into the future. The forecast for the European outsourcing market is shown in Exhibit II-7. Overall the market will grow at 20% CAGR from $2.7 billion in 1993, to $6.6 billion in 1998.

Full market analysis is available in INPUT Europe's *Outsourcing Information Systems Market* report which is available separately or as part of a continuous research programme.

EXHIBIT II-7



It is often assumed that high levels of market growth mean an undemanding market where every vendor is profitable and market entry is comparatively simple. However, this is not the case in the European outsourced systems operations market.

The European outsourcing market is segmenting into distinct platform operations and applications operations sectors, each with its own success criteria and dominant vendors. In addition, vendors are facing the challenge of delivering support services to clients operating distributed IS architectures. This segmentation is creating difficulties for vendors offering generalised outsourcing services. To be successful, vendors need to focus on either the platform operations or the applications operations segment.

The platform operations segment is forecast to show the lowest growth over the next five years. It is also an extremely competitive market, now becoming dominated by a small number of vendors in each country.

Throughout Europe, the platform operations segment offers very low margins, particularly in the early years of contracts. This market is becoming a very challenging one for vendors as a small number of vendors drive down their costs of operation and become very price-competitive. It is necessary for the senior management of these organisations to be content to operate at very low profit margins while their market position/dominance is being established.

The platform operations segment is largely held by European vendors such as Hoskyns - a subsidiary of Cap Gemini Sogeti, and debis Systemhaus. However, vendors of U.S. origin have been particularly successful over the last year in winning major applications operations contracts.

While platform operations emphasises cost reduction as the rationale for outsourcing IS functions, applications operations concentrates on demonstrating business value, that is, the increased effectiveness of IS' contribution to business goals once it is outsourced. Applications operations contracts provide the vendor with considerably higher level of profit than platform operations contracts.

The most successful vendors in winning large applications operations contracts over the last year have been EDS, Perot Systems, and CSC. Their approach may now be copied by a number of European outsourcing vendors.

INPUT has consistently predicted that outsourcing will develop in three stages:

- Firstly by outsourcing IS infrastructure management such as the operation of data centres
- Secondly by the combination of management by external vendors of both systems development and IS infrastructures
- Thirdly by the outsourcing of complete business functions of which IS is merely a part.

Indeed in Europe, applications operations is forecast to grow more rapidly than platform operations over the next five years as organisations increasingly accept the virtues of outsourcing systems development. In other instances, the outsourcing of complete business functions (business operations) has also begun.

However, many organisations are still at the stage of outsourcing their IS infrastructure management. Even here, there is increased emphasis on the management of corporate networks and desktop services.

So far this challenge has been most successfully met by the large PC dealers. The ability to supply desktop services and outsourced network management will be a critical factor in retaining current platform operations clients, as they downsize to a client/server environment.

The United Kingdom is the most developed outsourcing market in Europe, and will continue to develop rapidly. The market in the U.K. is being further stimulated by the pressure on local and central government to implement compulsory competitive tendering and market testing, respectively.

Adoption of outsourcing in Germany is beginning and the German outsourcing market is forecast to accelerate over the next five years. In Germany, the manufacturing sector is one of the most enthusiastic early adopters of outsourcing. However, the adoption of outsourcing by industry varies widely from country to country. For example, in the United Kingdom and Italy, government - both national and local - is a very important sector. In France, the distribution and transportation sectors have shown a high propensity to adopt outsourcing.

G

Processing Services - Innovation in Germany

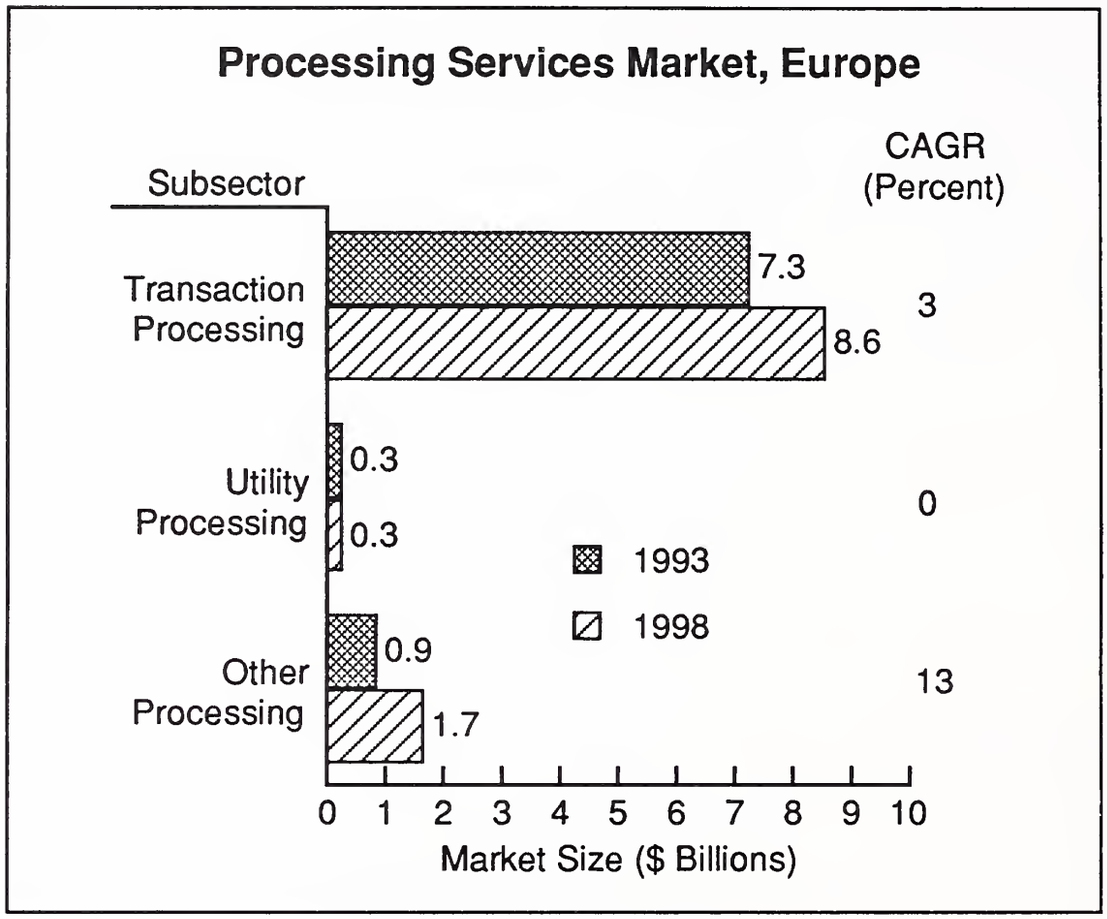
Compared to other software and associated service markets, processing services have been the least affected by the continued general business recession. Small business failures have been reducing the client base for many vendors. But this has been largely counteracted by an increase in outsourcing as organisations seek to reduce or fix their IS (information services) costs.

Specialised applications continue to evolve to offer vendors some important opportunities which are likely to result in overall zero real growth - an annual average rate of 4%, split as shown in Exhibit II-8.

Germany has experienced a strong resurgence of interest in processing services due to the initiative of SAP. SAP is a highly successful German vendor of integrated business application software products. Their mainframe and mini product lines R/2 and R/3 have proved so popular that processing service vendors are now selling them as a service to customers who do not want the expense or risk of implementing them in-house. This has rapidly developed into a potential DM 100M market in Germany.

Key opportunities for processing services vendors also lie in developing critical applications skills in areas such as payroll and credit card processing and offering specialised services like disaster recovery support.

EXHIBIT II-8



Economic recession in all European countries is leading to high levels of business failure. This is losing many processing services vendors significant numbers of their smaller clients as they go out of business. However, recession also feeds the trend to outsource more IS activities as companies review the financial savings to be gained from buying-in services rather than using in-house resources. There are many more potential clients now ready to listen to a sound financial case for using external processing services.

H

Network Services - Networked Businesses Create High Growth

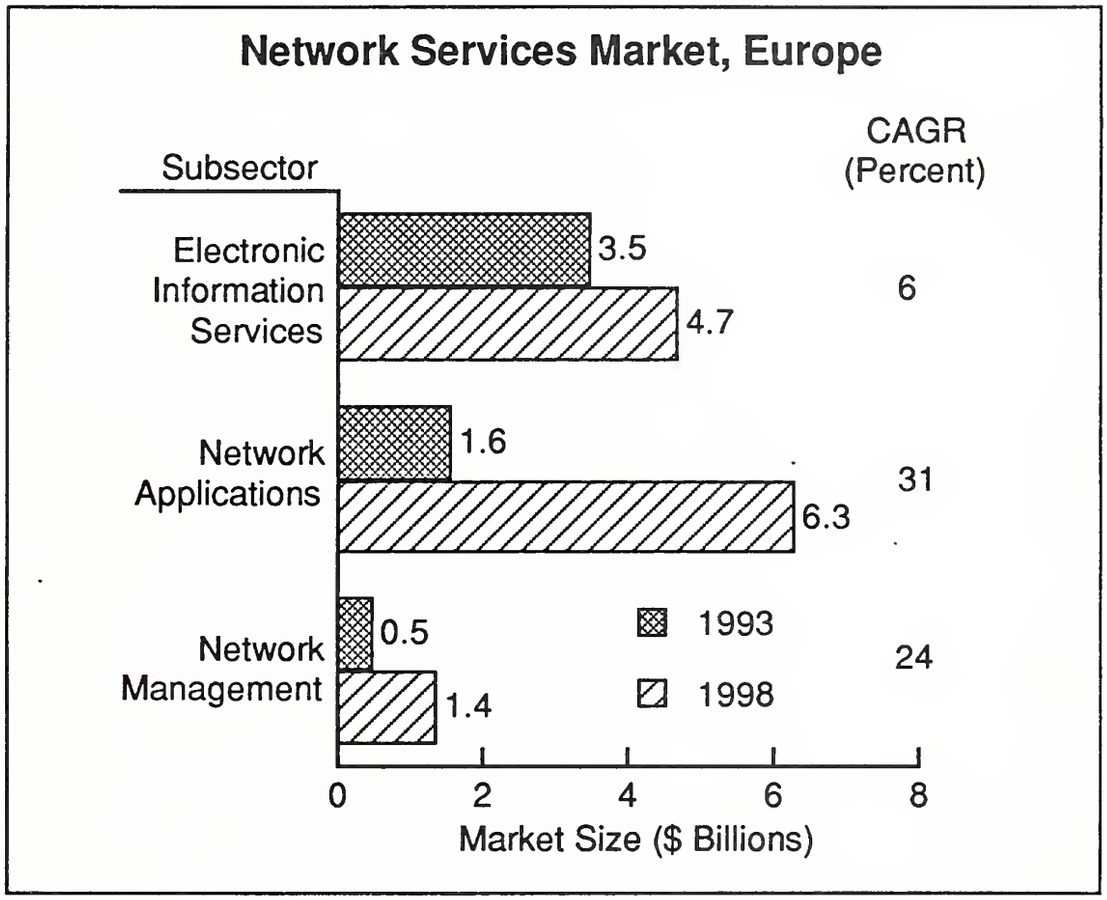
The use of network services is both a natural progression from private networking and an increasingly available and attractive option for organisations with new data networking requirements.

The corporate data network is no longer the sole realm of technical experts. Particularly in a recessionary environment it is becoming viewed both as a financial burden and a valued business asset. Increasingly, organisations are taking stock of their corporate networking costs and investigating alternative means of satisfying their networking needs.

As a result of these changing user attitudes to the network and emerging new business practices, for example electronic commerce, the network services sector overall will continue to grow in value well into the decade, at an average rate per year of 17%.

INPUT defines the network services market into a number of component sectors. The formal definition of network services shows a market which is comprised of two principal subsectors, Network Applications and Electronic Information Services. Exhibit II-9 shows the components of these subsectors.

EXHIBIT II-9



The electronic information (EI) market is currently the largest sector of the network services market and, after some hesitation in 1991 and 1992, will continue to grow in size over the forecast period. It includes information delivered via CD-ROM, a market which could accellerate rapidly over the next five years. Generally the greater maturity of the EI market will create slow growth. Reuters is the market leader by a wide margin in Europe.

The network applications market includes EMail, EDI, and VANS, which are all proving very active markets, and will show strong growth for the next five years.

Network management is following the lead of other outsourcing markets. Vendors are assuming full responsibility for managing networks on behalf of clients, as the clients realise that this is a very specialist though business critical skill.

The financial institutions, which traditionally have spent highly on telecommunications and have been the main markets for private network equipment manufacturers, have not been attracted as much as has been hoped by vendors on network services. The financial institutions are proving very conservative in their use of Third Party network services, and in the UK in particular are attempting to offer their own EDI services to generate revenue from their networks, rather than spend heavily on third party services.

The government and distribution industry sectors will show amongst the greatest growth in the use of network services over the next five years. The distribution and manufacturing sectors use network services predominantly in the field of EDI. This usage is set to increase, particularly in the distribution sector for higher levels of international traffic usage.

I

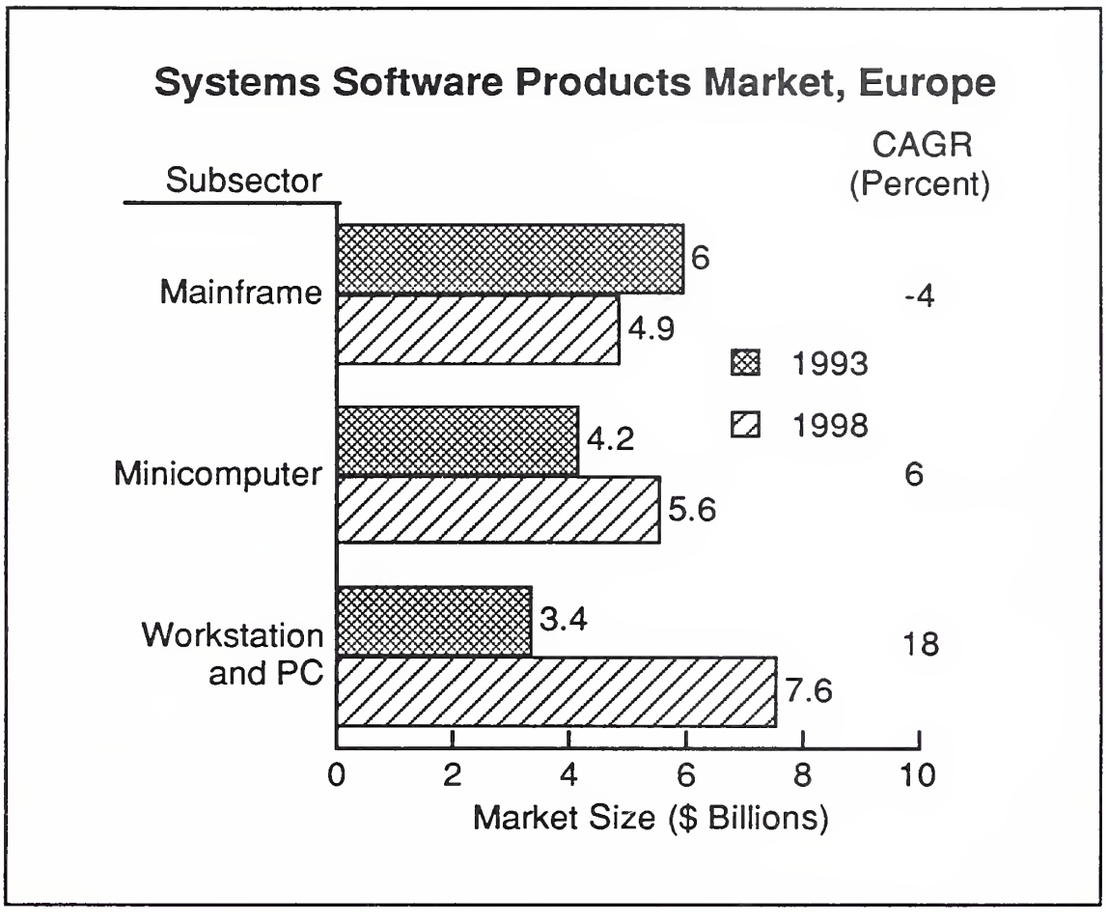
System Software Products - RDMBSs and Performance Tools in Demand

After a decade of high growth, the systems software products sector has now slowed as a result of the decline of the computer equipment market. This is largely caused by downsizing - the selection of lower cost minicomputers and workstation platforms to replace larger equipment configurations. The systems software product market in total is forecast to grow at 6% CAGR from $13.6 billion in 1993 to $18.1 billion in 1998.

Reduced IS purchasing power has resulted in a relatively saturated systems software market and substantial pressure on vendors to reduce prices. In the search for flexible application solutions there is still high demand for relational database management systems (RDBMS). IS management with restricted budgets are also spending on performance management tools for getting better value out of existing systems.

Both the systems software products sector and the applications software products sector have achieved remarkable growth over the last ten years. From under one billion US dollars in sales in 1979, the industry achieved over $18 billion by 1989 having averaged a growth rate in excess of 30% per annum throughout the decade. As shown in Exhibit II-10 a much lower growth expectation is now forecast over across all equipment platforms.

EXHIBIT II-10



Prices are expected to fall further, so that although the trend to client/server is creating demand for larger numbers of licences, the overall value of the market will grow only slowly.

The competitive nature of the market can best be seen in the server sector. Both the traditional mainframe software vendors and the PC software vendors are re-engineering their offerings for the server market. The traditional vendors will be challenged on pricing, the PC vendors will be challenged on sales and support channels.

J

Applications Software Products - Major Vendors Switch to Open Platforms

Over the past two years every major application software product vendor has adopted an open systems strategy. Open systems have been popular for about ten years in Europe, but it took the spending crisis in the mainframe sector to stimulate this reaction from the lead vendors. 1992 was generally not a good year for mainframe applications and this market is expected to continue shrinking.

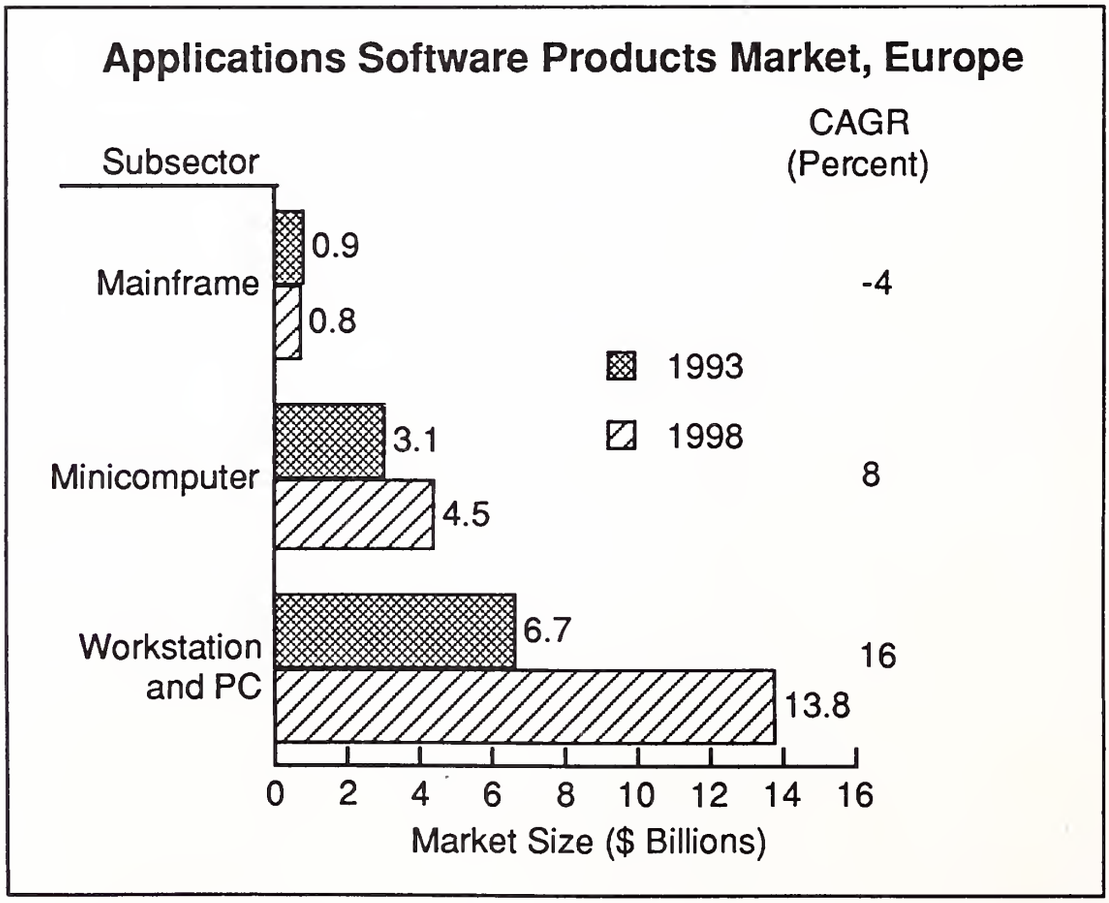
The applications software product market in total is forecast to grow at 12% from $10.7 billion in 1993 to $19 billion in 1998. Exhibit II-11 shows the analysis of the applications software products market by equipment platform type. It is clear from this analysis that a much greater opportunity exists for smaller systems, both in respect to relative size and relative growth rates.

This forecast is clearly based on an expectation of continued downsizing by users, who are choosing smaller systems, IBM RS/6000s or AS/400s instead of 3090s, for example, and a continued trend towards distributed processing systems. The increasing costs and shortages of skilled programmers, and the increasing need for speedier applications implementation, reinforce the rationale for selecting applications software products in preference to adopting the luxury of custom written systems. The lower cost profile of smaller systems accelerates this trend.

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

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

EXHIBIT II-11



Within Europe the largest individual country market is France which accounts for approximately one quarter of the entire applications software products market. The UK is the second largest market representing about one fifth of the total. Germany has a relatively low market share (17%) in comparison to the size of its economy. This can largely be attributed to the German preference for the turnkey system delivery mode for an application solution.

K

Turnkey Systems - Bundled Systems Grow Slower

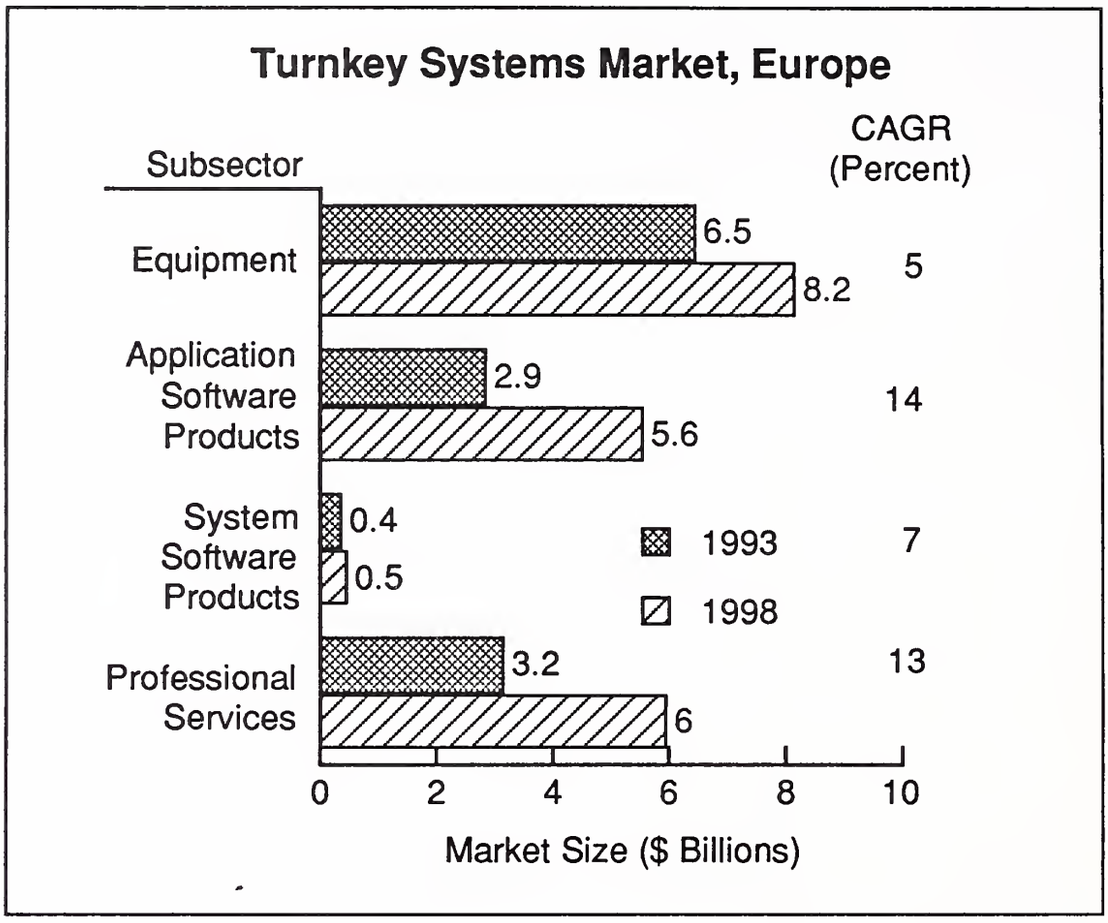
Value-added resellers (VARs) are a key channel to market for vendors of system components. They are also the market's primary source of turnkey or packaged systems. Turnkey systems are defined as complete systems that combine the equipment platform and the applications software products together with any necessary professional services for customisation and installation support.

The growth of turnkey solutions is lower than that of application software products on their own. The reason for this is that a lot of equipment is now priced as a commodity. Customers can get as good a price as (sometimes better than) the VAR. VARs can no longer make much money on the hardware, they add their value in software and services. If they exclude the equipment INPUT no longer considers the business as a turnkey system.

Exhibit II-12 shows the market analysis and forecast for each component of the European turnkey systems sector. Valued at $13 billion in 1993 it will grow at 9% CAGR to $20 billion by 1988. It is anticipated that the improving cost/performance of new equipment platforms will continue to depress the equipment proportion of turnkey systems overall. The increasing power of workstations/PC's in particular will have the overall effect of driving this sector of the market at the highest rate, 21% per annum.

As can be seen in Exhibit II-12 the customisation element of turnkey systems is forecast to grow. This is being driven by the need for delivering specific client benefits, albeit based upon a standard applications product. Strong demand is also expected for additional professional services such as consultancy and education and training, vital to secure successful implementation of the system in the user environment.

EXHIBIT II-12



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

L

Equipment Services - Maintenance Revenues Fall

During the 1980s, Customer Services organisations became acclimatised to operating as independent profit centres quite separate from the sales organisations of their parent companies. Throughout this period they developed a wide portfolio of services products and service lines in both the remedial and non-remedial service sectors.

The challenge they have had to face since the onset of recession in the early 1990s has been to adapt their service portfolio for the open systems environment. The first half of the present decade has been mostly dedicated to making this transition. This migration of focus, away from the proprietary and product-orientated past and towards an open and service business orientated future, is by no means complete:

- Users are themselves still inexperienced in knowing what to ask for

- Vendors have still a long way to go before they feel comfortable with the range of services they can offer with confidence.

INPUT detects the first signs of success in making the transition on the part of vendors such as Digital, ICL and Getronics. Other vendors such as Granada, Hewlett-Packard, IBM, Olivetti and Thomainfor would appear to be still in the middle of the transition, while many of the smaller and more specialised customer services organisations either have not started or do not see any great need to exaggerate the change process into a major objective.

Exhibit II-40 shows the market analysis and forecast for the two components of the European equipment services sector. Valued at $22.5 billion in 1993 it will grow at only 1% CAGR to $24 billion by 1988.

Full market analysis is available in INPUT Europe's *Customer Services Market* report which is available separately or as part of a continuous research programme. This aims to aid suppliers making this transition by providing the quantitative data relating to the growth of the market in different sectors - both within the traditional customer services arena and in its relation to other adjoining IT services sectors. Key issues are:

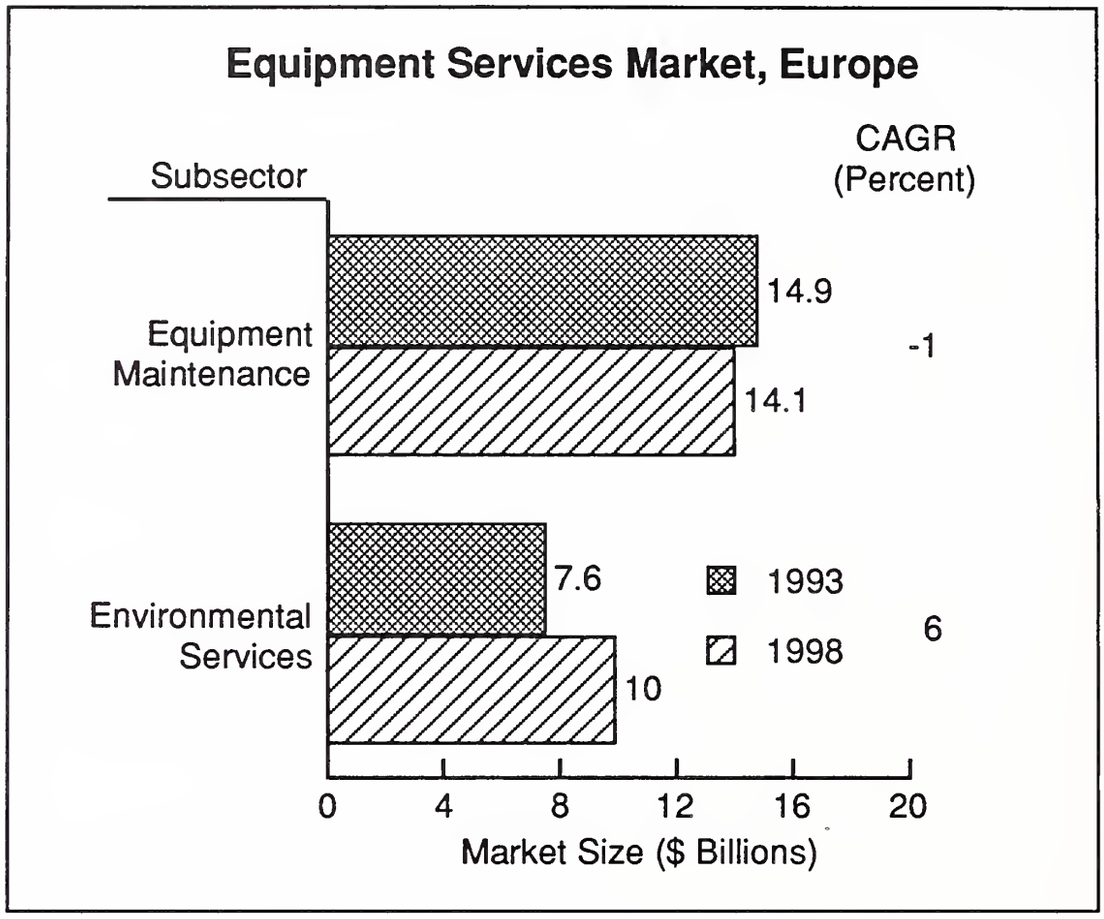
- Growth is forecast to be low (in single figures) but steady over the next five years.

- Hardware service markets are being prevented from falling into catastrophic decline by the increasing use of integrated hardware/software contracts.

- Service vendors are beginning to realise that as more systems become either business or mission critical, users will value service as a means of supporting their front-line staff. They are less willing to pay to maintain equipment perceived to be intrinsically reliable.

- There is an increasing need to address the newly emerging project services markets, represented by environmental, network and other professional services opportunities.

EXHIBIT II-13



Examples of environmental services include fitting out computer rooms, cabling, networks, and the buildings containing the systems. It also covers environmental planning and audit services. The majority of these services are currently provided by contractors from outside the IT industry.

Demand for third party maintenance has now moved on to multi-vendor maintenance, where a single vendor is sought to support a variety of equipment and software from a mix of suppliers. Several of the leading equipment manufacturers are now exploring this market opportunity, with Digital taking a lead in strongly marketing its capablility.

M

Leading Vendors - U.S. Software Product Vendors Increase Share

The top ten vendors of information services in Europe are listed in Exhibit II-14. The sector revenues include total estimates for all nine INPUT delivery modes (equipment services are included again this year). The combined revenues of these top ten represented nearly 28% of the total European spending in 1992.

EXHIBIT II-14

Leading Vendors Information Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues* ($ billions)	Market Share (Percent)
1	IBM	U.S.	9.80	9.8
2	Digital	U.S.	3.40	3.4
3	Siemens-Nixdorf	Germany	3.20	3.2
4	Cap Gemini Sogeti	France	2.10	2.1
5	Bull	France	1.90	1.9
6	ICL (Fujitsu)	U.K.	1.80	1.8
7	Olivetti	Italy	1.75	1.8
8	Reuters	U.K.	1.35	1.4
9	Unisys	U.S.	1.30	1.3
10	Microsoft	U.S.	1.30	1.3
	Total Listed		28	28
	Total Market		100	100

* Information services includes equipment services

The equipment vendors listed are all lifting their software and services revenues to counter falling equipment sales. Some of this is achieved by financial engineering and some by genuine new business. These vendor revenues were significantly revised by INPUT in 1993. In particular this list includes equipment service revenues.

As the largest systems vendor in Europe, IBM strengthened its lead in the information services market in 1992. It did particularly well increasing revenues from systems integration, operational support and environmental services. INPUT re-assessed Digital's information services revenue across Europe, especially revising up estimates for systems integration, software products and support services. SNI formed a new systems integration subsidiary and re-organised to better deliver its product and service capabilities to industry markets.

CGS has grown their business almost entirely by acquiring market leaders around Europe. Organic growth was probably below zero in 1992. These revenues include those of Cap Programator in Sweden and Cap Volmac in the Netherlands. To attain its global ambitions, CGS will need several more similar alliances. Sogeti has also acquired and grown a portfolio of management consulting companies, known as Gemini Consulting, to deepen their resources when offering a full range of services.

Revenues from all CGS's 1991 acquisitions are included in the analysis in Exhibit II-15. which excludes equipment vendors and equipment service revenues.

EXHIBIT II-15

Leading Independent Vendors Software and Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues* ($ billions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	2.10	2.7
2	Reuters	U.K.	1.35	1.7
3	Microsoft	U.S.	1.30	1.6
4	Andersen Consulting	U.S.	1.05	1.3
5	Finsiel	Italy	0.87	1.1
6	EDS	U.S.	0.83	1.1
7	Computer Associates	U.S.	0.71	0.9
8	Sema Group	France	0.65	0.8
9	AT&T	U.S.	0.63	0.8
10	Datev	Germany	0.55	0.7
	Total Listed		10	13
	Total Market		78	100

* Software and services excludes equipment services

Reuters is a very strong market leader in providing electronic information services and the turnkey systems to support them in the customer's premises.

Microsoft has more influence on the market than its revenues suggest, if only because its products are sold through practically every other vendor in the market. It has lowered its growth expectations for 1993, but is still likely to move up the rankings in 1993.

Andersen Consulting grew by 30% in 1991 but reports much slower growth in 1992. Their successful strategy of organic growth has been fuelled by valuable account management by senior partners and by an aggressive graduate recruitment and in-house training programme. Germany, Spain and the U.K. are their primary European markets. Their position as management consultants who additionally offer a full range of IT services has given them a unique edge with many clients. As a worldwide player they rank in the top three.

Out of the top 30 independent vendors, there are ten U.S., nine French, three German, two U.K., two Netherland, and only one Italian. The U.S. vendors are well positioned for new pan-European business compared to the vast majority of European vendors who tend to have a national base and limited international operations.

The 1990's will undoubtedly see still more consolidation and concentration in the European computer software and services industry. As the technology and the market demand ever broader mixes of special skills, partnerships and mergers will continue to reshape and polarise the industry into those offering multinational capability and those who are leaders in their own specialist niches.

The equipment vendors pose the most significant threat to the traditional independent professional service vendors during the 1990s. The slow demise of demand for custom software development requires all service vendors to re-position themselves to tackle the bridge to business processes and the fast-changing technical complexities of distributed systems.

N

Industry Market Opportunities

INPUT's breakdown of the 1992 European software and servces market by industrial sector is shown in Exhibit II-16.

INPUT estimates that manufacturing is no longer the most important sector in terms of overall European user expenditures. The largest sector is now financial services: the sum of insurance, banking and finance. Manufacturing sector spending has shrunk from 16% last year to 14% of the total market this year.

In terms of potential future growth, process manufacturing offers the most promise, with food, drink and drugs subsectors high on the list for investment. Utilities, government, banking and transport also have better than average growth potential.

Trade barriers were removed between EC countries in 1993. This has had no observabale effect on the market except perhaps to stimulate the tramsportation sector. Undoubtedly it did stimulate considerable re-structuring through take-overs, mergers and sell-offs, but few vendors in the software and service business responded with any urgency to a short timetable.

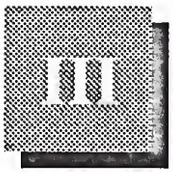
However, it has changed the buying expectations of many multi-national customers who now plan to implement standard application solutions throughout their European or global operations. Naturally they place a lot of emphasis on the delivery of satisfactory support on this scale.

Those smaller vendors who wish to participate in this multinational market will rely on effective business partnerships with vendors or consortia who already operate on a pan-European basis.

EXHIBIT II-16

Industry Sector Analysis Information Services Europe, 1993

Market Sector	Market Size ($ M)	Percent of Total
Total Information Services Market	105,000	100
Industry Sector Total	59,900	57
Manufacturing	14,200	14
Financial Services	15,700	15
Services	6,200	6
Distribution	4,600	4
National Government	4,850	5
Local Government	3,850	4
Other Sectors	10,500	10
Cross-Industry Sectors	6,200	6
System Software Products	13,600	13
Equipment Services	22,500	21
Others	2,600	2
Total Software and Services	82,500	79



Market Overview and Forecasts

A
Fierce Competition in Europe

1. Return To Modest Growth Predicted

IS investment is now 40% of European spending on capital goods. As a result the growth of the IS industry is tied closely to overall economic conditions. The weak growth prospects for nearly all European countries overshadow the market stimulous created by rapid advances in computer technology.

Software and services vendors are only going to squeeze more from Europe's static IS budgets at the expense of reduced spending elsewhere. In Europe only sixteen of the Top 30 such vendors made a profit in 1992.

In these latest forecasts for the European software and services markets, INPUT anticipates an all-time low growth of 6% during 1993. As recession eases average growth will rise to average 9% per year over the next five years.

For this market growth to happen, Europe must spend less on hardware, less on computer facilities and less on internal IS staff. In other words the trends to downsize, to consolidate data centres, to buy-in software solutions and to outsource computer operations and support must continue or accelerate.

The challenge for the IS industry is to regain its profitability in a fiercely competitive market moving rapidly to client/server architectures.

Exhibit III-1 shows the relative sizes of the equipment, software and services markets in Europe and their predicted growth rates. These growth rates include inflation, so most countries will experience real negative growth in 1993.

EXHIBIT III-1

IS Market Forecast, Europe

Sector	$ Billions (rounded)				
	1992	92-93 (%)	1993	93-98 CAGR(%)	1998
Equipment Sales	56	-7	52	-3	45
Equipment Services	22	2	22	1	24
Software Products	25	6	26	11	43
Other Services	46	5	48	9	73
IS Spend Total	150	0	150	4	185

Note: All numbers are rounded after growth rates have been calculated.

2. Key Vendor Issues

a. Lead Vendors Increase Share

The Top 50 software and services vendors in Europe increased their collective market share in 1992 by 3% to 43%. This was achieved through a combination of business acquisitions and organic growth. The bulk of professional services growth was accounted for by acquisition. In contrast software product vendors achieved their growth largely organically.

Overall the Top 50 collectively increased their software and services revenues 16% in 1992. The software and services market itself grew 6% in 1992 (using constant 1992 dollar exchange rates). In effect the group of vendors not in the Top 50 experienced zero software and services revenue growth in 1992.

Four major groups of vendors vie for market share in software and services:

- equipment vendors like Digital,
- professional services vendors like Sema,
- software product vendors such as Oracle, and
- network service vendors such as AT&T.

Few changes have occurred in the Top 30 vendor rankings. But the software products vendors are collectively growing much faster than their services competitors.

As a group the equipment vendors in the Top 50 only grew their software and services revenues by 8%. They lost ground to the professional services companies and to the software products vendors. The network services vendors held their own against the rest of the Top 50. Exhibit III-2 summarises the changes for each of these vendor sub-groups during 1992. The whole Top 50 grew by 16% from $29.3 billion in 1991 to $33.9 billion in 1992.

EXHIBIT III-2

Top 50 Software and Services Growth

Group Revenues by Vendor Group	1991 $ B	1992 $ B	Growth (%)
Equipment Vendors	13.8	14.9	8
Professional Services	9.0	10.8	21
Software Products	3.4	4.5	31
Network Services	2.8	3.2	14

b. Equipment Vendors

For several years many of the leading equipment vendors have declared their intentions of re-orienting their business away from equipment manufacture and towards the software and services market. How are they getting on? According to INPUT's analysis of their European revenue streams in 1992 the answer varies considerably from vendor to vendor. Overall there is a strong trend to increase software and services revenue particularly for those faced with a shrinking share of the hardware market.

The change or metamorhosis is taking place through two destinct activities. The first is a form of financial engineering. The second is genuine development of new business revenues.

The financial engineering within equipment vendors has taken the form of unbundling software and services from hardware prices and costs. Reducing equipment prices have been achieved by separating out the charges for software and for supporting services and increasing these prices to reflect the customer's perception of their value rather than their cost. So, as hardware prices fell there was a significant increase in the spend on software and services. The open systems movement had a large role to play in this re-balancing of IS spend as it has encouraged hardware price wars. Examples of unbundled software and services are:

- operating systems software
- systems software options
- systems software support
- pre-sales systems engineering
- system performance audits

Genuine development of new software and services business takes the form of various types of diversification. Here the vendors are looking for a larger share of their customer's IS spend. This can be for services not previously bought. Or it can be as a prime contractor for products and services bought from a variety of sources. For example the traditional equipment vendors are making investments in:

- cable network design and installation
- disaster recovery services
- multi-vendor maintenance
- systems integration capabilities
- outsourced systems operations
- management consultancy.

The large equipment vendors have all had a strong focus on only developing their software and services business. But their efforts as a group have been countered by the difficulties faced by some of their competitors. Computervision, Intergraph and Wang have all recorded significant revenue falls. McDonnell Douglas sold off some of its European systems integration and CAD business, following this in 1993 with a management buyout of its European operations.

c. Professional Services Vendors

Among the professional services vendors Andersen Consulting and Datev were the only two to achieve healthy growth wholely organically. All the rest built up revenue primarily through acquisition programmes. This implies that of the 21% revenue growth recorded by professional service vendors in the Top 50 approximately 18% was the result of acquisitions and only 3% due to organic expansion.

d. Software Product Vendors

The software product vendors in the Top 50 have also been building market share. But organic growth is a much more dominant element in their 1992 growth with the chief exception of Computer Associates. As a group these vendors improved revenues by 31% during 1992. Only 2% was directly the result of acquisitions the remaining 29% being organic.

The strongest contributors to this growth are the brand-leading PC software products, relational database management software, and performance enhancing mini and mainframe software products.

Merchant software vendors threaten to encroach on other vendors market shares as they all line up tocompete in the server marketplace.

e. Network Services Vendors

Within the Network Services Vendor group the Top 50 range from AT&T through Reuters to GEIS. The telecom companies have achieved nearly all their presence in the European market by acquisition, with France Telecom and AT&T leading in this activity. Overall these large networking vendors have yet to succeed on a large scale in the European software and services sector, representing only 9% of the Top 50's total revenues.

3. Industry Driving Forces

Three topics stand out as major driving forces for change in the software and services sector in Europe - open systems client/server, systems consolidation and outsourcing:

a. Open Systems Client/Server

Out of the need to both exploit and control desktop computing has come the adoption of client-server principles and technology, where computing applications work is shared between the desktop computer and specialist servers on networks. The timing of this new wave of technology has coincided with the availability of many open system standards and low cost products. The development and implementation of client-server based application solutions will undoubtedly provide the majority of opportunities for software and service vendors over the next decade.

b. Systems Consolidation

The underlying trend of systems consolidation could restore confidence in centralised IS products and services on open system platforms. For example, strategists at Amdahl, the mainframe systems vendor, believe that UNIX will become well established in all large data centres during the 1990's. Such a conclusion would ensure that IS departments remain major purchasers of software and services in spite of the recent losses of purchasing authority to end-user management.

One of the best documented IS trends recently has been the downsizing phenmoenon. This has been seen as the ability to achieve results by more quickly by implementing new or replacement applications on smaller cheaper systems. The economic pressure to reduce IS spending and get better value for money has also resulted in significant downsizing among the vendors themselves.

Less obvious but as important as downsizing is the trend to consolidate systems and resources. In contrast to downsizing, which usually leads to a fragmentation of IS resources over many different systems, consolidation leads to the rationalising of resources. Dispersed resources such as staff, systems, or software are concentrated in fewer centres. Savings, for example, come from economies of scale, improved management control of expenditures, and reduced numbers of boxes and licences.

Outsourcing of systems operations is also a form of consolidation. The vendor takes advantage of critical mass to offer a cost reduction to the customer when running his datacentre or network for him.

These two processes, downsizing and consolidation, have direct parallels in the behaviour of organisations. Businesses are continually changing to improve either their effectiveness or their efficiency. Downsizing - often motivated by user frustration and the need for flexibility - is the normal outcome of a desire to improve effectiveness. The opposite swing of the pendulum is consolidation - the result of a need to improve efficiency and productivity. In general these phases will alternate with each other.

Recent research by INPUT in Europe revealed that UNIX is the most preferred software environment - despite the continuous ebb and flow of the political and technical power struggle between Novell, COSE and Microsoft. The software environments currently implemented at the departmental server today and for the next few years will gradually become consolidated into datacentres or their equivalent.

The end result of this process of downsizing and consolidation is that the IS infrastructure (networked open system servers) built up to support the end-user (clients) will inevitably support UNIX.

Consolidation also means that IS management will retain their role as specialist purchasers for their organisations' IS infrastructure. This is good news for both software and service vendors who have found their sales costs rising as IS purchasing power moves steadily away from IS to end-user management. However the IS professionals have now become the target not only of the datacentre vendors but also to the desktop vendors.

c. Outsourcing

As industry and commerce become increasingly competitive and markets become more global many companies question their need to employ staff for non-core functions. The alternative is to outsource such functions to other businesses, preferably for a reduction in overall cost or an improvement in service.

Within the information services sector the most significant outsourcing trend to occur recently has been that of systems operations - the passing over of responsibility for the (facility) management of previously in-house computer operations and/or applications to a third party vendor. The major advantage for vendor and user alike is that contracts for such services imply a long term relationship during which both parties financially benefit through economies of scale and forward planning.

The next major trend is the outsourcing of desktop services. Several contracts have been placed recently for the support and maintenance of the whole variety of desktop systems such as PC's, workstation, printers and office servers, plus the systems and applications software being used. As business critical systems become more distributed, purchasing decisions tend also to move away from the central IS function and become distributed. The vendor of comprehensive desktop services to such distributed systems may become very influential in future system decisions compared to a vendor only supporting the central IS systems.

B

Forecasts for Computer Software and Services, 1993-1998

The forecast data provided in this report is based on research conducted during 1993. Previous INPUT research was also considered. Market development for the 1992-1993 period was evaluated from in-depth face to face, mail and telephone interviews with senior executives in user and vendor organisations. The analysis was supported by other public domain information sources.

Each sector (delivery mode) was analysed by subsector, by country and in many cases within vertical industry markets.

The forecasts cover the period 1993-1998 (including actuals for 1992) and assess end-user expenditures. Forecasts are made in local currency for each country and then converted into U.S. dollars and European Community ECUs for aggregation and comparative purposes.

Owing to the unpredictability of international exchange rates, the U.S. dollar and ECU conversion rates used for all the forecasts have been taken as an average rate for 1992. These are listed in Appendix E.

In addition, the forecasts have been expressed in actual monetary terms. For the benefit of the reader, the average inflation rates used for all West European countries have also been included in Appendix E.

Exhibit III-3 shows INPUT's forecast for the total European information services market, which now includes equipment services. It is expected to grow from $105 billion (ECU 83 billion) in 1993 to $151 billion (ECU 120 billion) by 1998, a compound annual growth rate of 8%.

EXHIBIT III-3

Information Services—Europe, 1993-1998

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Professional Services	23,300	23,900	24,700	4	29,000
Systems Integration	4,050	4,750	5,600	19	11,550
Systems Operations	2,150	2,650	3,100	20	6,600
Processing Services	8,250	8,450	8,700	4	10,500
Network Services	4,900	5,500	6,400	17	12,300
System Software Products	12,900	13,600	14,400	6	18,100
Applications Software Products	9,800	10,700	11,800	12	19,000
Turnkey Systems	12,600	13,000	13,900	9	20,300
Equipment Services	21,900	22,500	23,100	1	24,000
Total (rounded)	100,000	105,000	112,000	8	151,000
Total (excluding Equipment Services)	78,000	82,600	88,600	9	127,400

The development of each of the nine delivery modes as defined by INPUT is shown in the same exhibit, and in detail in the next chapter. Professional services joins the processing services sectro as the slowest growing sectors at 4% per annum on average over the five year period. Systems operations has the highest predicted growth at 20% per annum during the same period.

Software products are not gaining market share over services in the way predicted in previous reports. Price competition is expected to counter the increase in product volumes resulting in overall growth just below the whole market average. Systems software is expected to perform particularly badly even though there are many innovative product areas in this sector. Applications software products and turnkey systems are expected to experience difficult growth as the market continues to downsize. Volumes will be grow rapidly but revenues will be held back by pricing pressures.

Professional services continues to represent about one third of the whole market, with consulting and training both suffering particularly from financial cuts in times of recession. The fall in demand for contract staff (body-shopping) has significantly lowered growth expectations in professional services.

The European forecasts are shown in ECUs in Exhibit III-4.

EXHIBIT III-4

Information Services—Europe, 1993-1998

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Professional Services	18,400	18,900	19,500	4	22,900
Systems Integration	3,200	3,750	4,450	20	9,150
Systems Operations	1,700	2,100	2,450	20	5,200
Processing Services	6,500	6,650	6,850	5	8,300
Network Services	3,900	4,400	5,000	17	9,800
System Software Products	10,200	10,700	11,400	6	14,300
Applications Software Products	7,800	8,400	9,300	12	15,000
Turnkey Systems	10,000	10,300	11,000	9	16,000
Equipment Services	17,300	17,800	18,200	1	19,000
Total (rounded)	79,000	83,000	88,000	8	120,000
Total (excluding Equipment Services)	61,700	65,200	70,000	9	100,700

Exhibit III-5 provides a forecast for each country, showing its local currency forecast converted into U.S. dollars. The leading country is clearly France, but it is now expected to lose some ground to Germany and the U.K. over the next five years. At 8% growth, Germany has fallen behind Spain which is now the fastest growing of the larger markets in Europe. The small market in Central and Eastern Europe promises to grow at 20% to 30%. Scandinavia and France can expect some of the slowest growth rates to 1998.

EXHIBIT III-5

Information Services Market, Comparative Country Markets, Europe

Country	U.S.$ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	100,000	105,000	110,000	8	150,000
France	23,000	24,000	25,000	6	32,000
Germany	20,500	21,500	22,500	8	31,000
United Kingdom	15,500	16,000	17,000	8	24,000
Italy	10,500	11,000	11,500	6	15,000
Sweden	4,200	4,500	4,900	7	6,400
Denmark	2,500	2,700	2,850	6	3,500
Norway	2,200	2,300	2,400	5	3,000
Finland	1,450	1,550	1,600	4	1,850
Netherlands	6,000	6,400	7,000	9	9,900
Belgium	3,200	3,400	3,700	8	5,100
Switzerland	3,700	4,000	4,200	8	5,900
Austria	1,750	1,900	2,050	7	2,650
Spain	3,600	3,900	4,300	11	6,500
Portugal	280	320	370	15	660
Greece	320	370	420	15	740
Ireland	660	710	760	8	1,050
Central and Eastern Europe	670	820	950	21	2,100

The same forecasts are shown in ECU's in Exhibit III-6.

EXHIBIT III-6

Information Services Market, Comparative Country Markets, Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	79,000	83,000	88,000	8	120,000
France	18,000	19,000	20,000	6	25,500
Germany	16,000	17,000	18,000	8	24,500
United Kingdom	12,500	12,500	13,500	8	19,000
Italy	8,400	8,700	9,000	6	12,000
Sweden	3,300	3,600	3,800	7	5,000
Denmark	2,000	2,100	2,250	6	2,750
Norway	1,700	1,800	1,900	5	2,350
Finland	1,200	1,250	1,300	4	1,500
Netherlands	4,800	5,100	5,500	9	7,900
Belgium	2,500	2,700	2,950	8	4,000
Switzerland	2,950	3,100	3,300	8	4,700
Austria	1,400	1,500	1,600	7	2,100
Spain	2,850	3,100	3,400	11	5,100
Portugal	225	255	295	15	530
Greece	255	290	330	15	580
Ireland	520	560	600	8	830
Central and Eastern Europe	530	640	750	21	1,700

Exhibit III-7 analyses the European market for software and services into major industry sectors, cross industry sectors and generic software and service markets. The two leading industry sectors are discrete manufacturing and banking/finance. Together these industry sectors account for 20% of the European market or 36% of the industry sector market total. However this means that these sectors are more saturated in terms of IS investment.

INPUT has identified that sectors with very dispersed businesses as particularly suitable for client/server solutions. This includes transportation and retail distribution. Such sectors have benn low investors in IS in the past as the technology has been more suited to centralised operations.

EXHIBIT III-7

Information Services Business Sector Analysis, Europe, 1993

Market Sector	Market Size ($ Millions)	Percent Of Total
Total Information Services	105,000	100
Industry Sectors Total	59,900	57
Discrete Manufacturing	9,500	9
Process Manufacturing	4,700	4
Transportation	3,300	3
Utilities	2,350	2
Telecommunications	1,900	2
Retail Distribution	2,100	2
Wholesale Distribution	2,500	2
Banking & Finance	11,800	11
Insurance	3,950	4
Healthcare	3,150	3
Education	950	1
Local Government	3,850	4
Central Government	4,850	5
Business Services	3,000	3
Other Industries	2,050	2
Cross-Industry Sectors Total	6,200	6
Accounting	1,150	1
Education & Training	180	0
Engineering & Scientific	360	0
Human Resources	740	1
Office Systems	1,100	1
Planning & Analysis	950	1
Other Cross-Industry	540	1
Generic Sectors Total	38,600	37
Equipment Services	22,500	21
System Software Products	13,600	13
Utility and Other Processing	1,200	1
Other Electronic Info Services	1,400	1

C

The Competitive Environment

INPUT's analysis of the leading vendors in software and services across Europe is shown in Exhibit III-8. The nationality of the parent company is shown alongside the estimated revenues attributable to the vendor from free-market business within Europe.

All the major equipment vendors have implemented further re-organisations in Europe through 1992/93 in order to emphasise their capabilities as software and service providers and increase the profit contribution from these activities. Hardware prices and revenues have generally fallen faster than the vendors can reduce their overhead costs. Restructuring of these businesses is still a high priority for equipment vendors.

EXHIBIT III-8

Leading Vendors, Software and Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	6,640	8.5
2	Cap Gemini Sogeti	France	2,080	2.7
3	Digital	U.S.	2,010	2.6
4	Siemens-Nixdorf	Germany	1,890	2.4
5	Reuters	U.K.	1,350	1.7
6	Microsoft	U.S.	1,280	1.6
7	Andersen Consulting	U.S.	1,050	1.3
8	Olivetti	Italy	1,020	1.3
9	ICL (Fujitsu)	U.K.	950	1.2
10	Bull	France	895	1.1
11	Finsiel	Italy	865	1.1
12	EDS	U.S.	830	1.1
13	Computer Associates	U.S.	710	0.9
14	Sema Group	France	650	0.8
15	AT&T	U.S.	625	0.8
16	Unisys	U.S.	615	0.8
17	Datev	Germany	550	0.7
18	Sligos	France	510	0.7
19	Oracle	U.S.	480	0.6
20	GSI	France	475	0.6
21	SAP	Germany	440	0.6
22	Axime	France	410	0.5
23	Raet	Netherlands	390	0.5
24	HP	U.S.	370	0.5
25	BSO Origin	Netherlands	345	0.4
26	CGI	France	340	0.4
27	Intergraph	U.S.	325	0.4
28	Software AG	Germany	320	0.4
29	Dun & Bradstreet	U.S.	310	0.4
30	Lotus	U.S.	300	0.4
	Total Listed		29,025	37.2
	Total Market		78,000	100.0

Excluding the equipment vendors gives the list in Exhibit III-9 of top thirty independent software and service vendors active in Europe for 1992.

EXHIBIT III-9

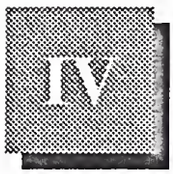
Leading Independent Vendors Software and Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	2,080	2.7
2	Reuters	U.K.	1,350	1.7
3	Microsoft	U.S.	1,280	1.6
4	Andersen Consulting	U.S.	1,050	1.3
5	Finsiel	Italy	870	1.1
6	EDS	U.S.	830	1.1
7	Computer Associates	U.S.	710	0.9
8	Sema Group	France	650	0.8
9	AT&T	U.S.	625	0.8
10	Datev	Germany	550	0.7
11	Sligos	France	510	0.7
12	Oracle	U.S.	480	0.6
13	GSI	France	475	0.6
14	SAP	Germany	440	0.6
15	Axime	France	410	0.5
16	Raet	Netherlands	390	0.5
17	BSO Origin	Netherlands	345	0.4
18	CGI	France	340	0.4
19	Software AG	Germany	320	0.4
20	Dun & Bradstreet	U.S.	310	0.4
21	Lotus	U.S.	300	0.4
22	Syseca	France	300	0.4
23	FTLIS Telecom	France	290	0.4
24	Novell	U.S.	285	0.4
25	Logica	U.K.	260	0.3
26	Telerate	U.S.	245	0.3
27	Telekurs	Switzerland	240	0.3
28	Data Sciences	U.K.	235	0.3
29	GEIS	U.S.	235	0.3
30	Getronics	Netherlands	235	0.3
	Total Listed		16,630	21.3
	Total Market		78,000	100.0

IBM is the largest vendor of computers in Europe, by far, and as a result is also the largest vendor of software and services. In most countries it has implemented re-training programmes to move staff from back-office jobs into front-line service roles. Its systems integration business in Europe has been centrally co-ordinated for five years and has grown extremely rapidly winning multi-national bids. Across all its businesses IBM has been investing in partnerships, particularly small equity holdings, with other vendors who are key either to future industry sector business, product development or new technology.

As it grows a whole range of professional services IBM is increasingly seen by independent vendors as a potential competitor as well as a partner. In terms of longer term market share, INPUT judges IBM to be a considerable threat to the traditional independent service vendors.

Cap Gemini Sogeti has a clear size and geographic advantage over its European rivals now. But it is finding the market tough right across Europe. Its market share in France fell in 1992. Its recent acquisitions in Sweden, Netherlands and Germany have all downsized somewhat in the restructuring. A new top management team and new policies such as signing up software product marketing agreements should limit the damage caused by continued recession and reduced demand for custom development projects in Europe.



Market Sector Analysis

This chapter describes the European software and services market in terms of nine different delivery modes or market sectors, as defined by INPUT. Each sector of the market is described in terms of the major driving forces and trends. Forecasts of the sub-modes that make up each delivery mode are provided for Europe during the period 1993 to 1998. Comparisons are provided between countries and the leading vendors for each sector are identified.

A
Professional Services

1. Market Overview and Structure

The professional services market is the largest sector of the information services business in Europe. It accounted for over 23% of the total European market in 1992, valued by INPUT at $23.3 billion, and approximately equal to the applications and systems software products sectors combined.

INPUT divides the professional services market into four sub-segments:

- *Information systems consultancy:* has enjoyed the benefit of the growing awareness, especially among business managers at Board level in user organisations, of the critical impact of IS strategy on the success of their business strategy. But the recession has severely curtailed the high growth in this sector, as clients postpone their use of consultants except for critical cost-saving applications. The expected short term result is a growth of only 11% in IS consultancy between 1991 and 1992 potentially recovering a little to 12% in the period to 1997.

- *Custom software development:* is the largest sub-segment in the software and services market, representing over 25% of the European total. It includes both project-related and skill-related (body-shopping) contracts. This segment covers all the activities related to custom software projects, from defining requirements through to testing and modification. The major segment trends include:

- Adoption of blueprint or kernel application packages to form a consistent basis for custom developments;

- Widespread use of software platforms such as relational databases, 4GLs and structured design tools;

- Improved quality and project control through use of CASE tools, standards and structured methodologies;

- Function rich application packages are replacing wholly custom built software.

- *Education and training,*: while perceived as a high priority by users, still receives a relatively low budget allocation. This year the position has very significantly worsened. Users have come under pressure to cut costs, staff turnover (and therefore recruitment) has fallen to an all-time low, and new technologies are reducing training costs. The market segment is expected to grow by an average of only 6% per year.

The key findings from INPUT's study of this sector are: recession has severely reduced growth, user training is polarising into simple end-user skills and complex technical skills, training is moving to the workplace, and technology is lowering the cost of training.

- *Applications management/maintenance:* separately identified for 1992, the professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.

Software maintenance is a heavy load on any long-established IS department - updating applications and systems software written years ago in an effort to keep pace with changing business needs. INPUT estimates that 65% of IS budgets are consumed in this activity alone. This is a major opportunity for both service and product vendors, but remains largely untapped as a market.

2. Market Size and Growth, 1993-1998

As shown in Exhibit II-1, INPUT expects the European professional services market to reach $39 billion by 1998, maintaining an average compound annual growth rate (CAGR) of 4%. This is down from last year's forecast of $40 billion and CAGR of 9% with users spending less on contract staff and consulting projects.

EXHIBIT IV-1

Professional Services Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	3,180	3,460	3,760	9	5,410
Education & Training	2,490	2,620	2,750	6	3,430
Custom Software	17,500	17,700	17,900	2	19,500
Application Management	125	170	225	34	725
Total (Rounded)	23,300	23,900	24,700	4	29,000

Exhibit IV-3 shows the user expenditure forecast when local currencies are converted to ECU.

EXHIBIT IV-2

Professional Services Market (ECU) Europe

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	2,510	2,740	2,970	9	4,270
Education & Training	1,970	2,070	2,170	6	2,710
Custom Software	13,800	14,000	14,200	2	15,400
Application Management	100	140	180	32	570
Total (Rounded)	18,400	18,900	19,500	4	22,900

Exhibit IV-3 shows the user expenditure, country by country, when converted from local currencies into U.S. dollars. It shows quite clearly the predominance of France in the professional services sector in Europe with 29% of the whole market.

EXHIBIT IV-3

Professional Services, Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	23,500	24,000	24,500	4	29,000
France	6,900	7,300	7,500	2	8,100
Germany	3,300	3,300	3,400	3	3,900
United Kingdom	3,100	2,900	2,850	-1	2,800
Italy	2,600	2,550	2,550	3	3,000
Sweden	1,500	1,600	1,700	6	2,150
Denmark	490	520	540	7	710
Norway	470	490	520	6	650
Finland	300	330	340	5	420
Netherlands	1,700	1,800	1,900	7	2,600
Belgium	870	940	1,000	7	1,350
Switzerland	660	680	720	8	1,000
Austria	310	330	360	6	450
Spain	760	820	890	9	1,250
Portugal	43	52	61	16	105
Greece	79	89	105	16	185
Ireland	155	160	170	8	240
Central and Eastern Europe	52	62	72	18	140

The market in France is greater than that of Germany and the United Kingdom combined. France has had the benefit of nearly two decades of very strong professional services development. Many companies which were originally spin-off DP departments from large commercial or industrial groups, have established their total independence over the years. In contrast this trend has been more limited in the UK and is only now being considered more seriously by large companies in Germany.

The market split is derived by converting local currencies in to ECU for Exhibit IV-4.

EXHIBIT IV-4

Professional Services, Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	18,500	19,000	19,500	4	23,000
France	5,500	5,800	5,900	2	6,400
Germany	2,600	2,600	2,650	3	3,000
United Kingdom	2,450	2,300	2,250	-1	2,250
Italy	2,050	2,000	2,000	3	2,400
Sweden	1,200	1,250	1,350	6	1,700
Denmark	380	410	430	7	560
Norway	370	390	410	6	510
Finland	250	265	275	5	340
Netherlands	1,350	1,450	1,500	7	2,050
Belgium	690	740	800	7	1,050
Switzerland	520	540	570	8	790
Austria	245	260	280	6	360
Spain	600	650	710	9	1,000
Portugal	34	41	48	16	85
Greece	62	71	82	16	145
Ireland	120	130	135	8	190
Central and Eastern Europe	41	49	57	18	110

3. Market Dynamics

Independent professional service vendors face a tidal wave of change. The rising popularity of "standard" software packages and the resulting decrease in demand for custom software development is changing the role of the professional service vendor.

As competition between professional services vendors increases and real growth rates slow, so it becomes more important for vendors to have a clear position in the market. The threats to traditional professional services vendors from management consultancies, the major equipment manufacturers and the larger software product vendors require reaction and change. The implications of new platform technologies, methodologies and the resulting powerful applications software portfolios must be carefully considered. The large majority of vendor revenue growth recorded in 1992 was the result of acquisitions rather than higher user spending.

The industry can look forward to a continuing period of consolidations, takeovers and partnerships in the fight for maximum profit and market share. Fuelled by the unchanged trend to outsource more and more IS activities, the fight looks worth winning. The large U.S. vendors are poised to acquire even greater market shares in Europe, while the Japanese are still reviewing their strategies, and the Europeans find the national characteristics of their neighbours a deterrent.

Demand for professional services slackened markedly during 1990-1992. INPUT concludes that growth will be much more closely tied to economic performance than in the past, and will reflect the recessionary pressures looming over Europe.

The opportunities being offered to professional services vendors can be summarised as:

- Contracting out is still a strong growing trend
- Scarce business/technical skills are sought outside
- Demand for open client/server solutions creates opportunities for winning new clients
- Software maintenance is largely untapped, too costly and in-house

The industry is seeing the benefit of many client organisations turning away from their in-house corporate services and contracting out projects of high complexity or needing scarce skills (there are exceptions like the Defence sector or the French Banks who have cut back on external spend). This trend seems to be part of the general swing towards decentralisation of business

management. It is matched by user concern to get their own management attention back onto their core competence of running and developing their own business, rather than becoming experts in the field of complex computer systems.

The difficulties of recruiting IS experts persist particularly in the area of relational databases and UNIX. Looking outside for an ever wider array of skills is becoming accepted business practice - to the lasting benefit of those professional services vendors who can establish and keep a high quality reputation for delivering results on time and to budget.

The fast flow of new software technology and software engineering methodologies continues to force a rapid pace of change on users and vendors alike. Many leading software and services vendors have introduced application architectures for the 1990's to guide developers and keep them loyal. The battleground for vendor preference has clearly shifted away from hardware platforms and towards software platforms. The task for service vendors is to move their customers' preferences beyond hardware and software supply - to their preferred service vendor.

4. Competitive Environment

The market is becoming increasingly competitive. Healthy growth in the past attracted many new market entrants. Recession then reduced market growth. Companies already in the market work to increase their presence. U.S. equipment vendors such as IBM, Unisys and Digital are aggressively moving into professional services in their search for profit growth and account control as hardware profit margins fall.

Software vendors such as Computer Associates and Oracle have also set their sights on professional services as an essential part of their product mix to support key account development strategies. PC software vendors rely more heavily on their channel partners to provide depth of support. Consultancy companies, traditionally strong in the IS side of management consultancy continue to extend their capabilities into full IS project management and implementation.

Acquisition strategies are still well in evidence in the professional services market. Cap Gemini Sogeti, in acquiring a controlling interest in the U.K.'s Hoskyns, Sweden's Programator, Volmac in the Netherlands, and a joint venture with Debis Systemhaus in Germany, has now established itself as commanding leader of the independent vendors in all the major European markets.

EXHIBIT IV-5

Leading Vendors, Professional Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	1,285	5.5
2	Cap Gemini Sogeti	France	1,270	5.5
3	Andersen Consulting	U.S.	560	2.4
4	Digital	U.S.	505	2.2
5	Finsiel	Italy	480	2.1
6	Olivetti	Italy	410	1.8
7	Sema Group	France	360	1.5
8	Unisys	U.S.	245	1.1
9	CGI	France	215	0.9
10	EDS	U.S.	195	0.8
	Total Listed		5,525	23.7
	Total Market		23,300	100.0

IBM rose to the top of the list in 1991. The nature of IBM's professional services is largely the area of operational support services. Cap Gemini Sogeti revenues include the contribution from Programator and Volmac, but they only have a minority share of CAP debis in Germany so these are excluded.

INPUT estimates there are over 9,000 vendors in this sector with revenues over $100,000. There is still considerable scope for consolidation in the industry, with Finsiel having by far the smallest Pan-European presence of the top five. Among the Top 30 vendors American and French vendors each account for one third of the leading vendor revenues with the U.S.-owned vendors growing their share year-on-year.

B

Systems Integration

1. Market Overview and Structure

INPUT estimates that the European systems integration market will be worth $11.5 billion by 1998, as shown in Exhibit IV-4. Despite the overall level of growth in software and services decreasing considerably over the past few years, the systems integration market has maintained consistently high growth.

Systems integration provides the ability to create a solution that integrates disparate environments. It has three key aspects distinguishing it from other modes of delivering systems solutions.

- The multi-technology nature of systems integration enables the appropriate technical skills to be applied to the system, typically systems integration projects are complex, involving more than one technology.

- Systems integration is a custom solution with the contractor generally taking responsibility for integrating the system into the user environment.

- Systems integration vendors take management responsibility for the delivery of the system usually at a fixed price with penalties for project overruns.

Projects that satisfy these three conditions and thus qualify for inclusion tend to be large, expensive and multi-vendor in nature. The components of the systems integration sector can be analysed into four distinct groups:

- Systems Equipment
- Application software products
- Systems software products
- Professional services
- Other Services

This service delivery mode thus includes equipment wherever it is included as part of the overall systems integration contract. Both systems and applications software products are also likely to be represented in a systems integration contract as well as processing and network services which are included in the other services sector. Professional services is the most important sector in any systems integration contract ranging from consulting though software design and development services to the key project management services responsible for delivering the complete system solution. Also included in other services would be such post-implementation support as testing, client staff training, documentation and operation and maintenance of the developed system for a specified period of time.

Generally, systems integration projects are bound at the start by the selection of the successful bidder and at the end by the acceptance of the new system by the client. The close relationship established between the vendor and the contractor can lead to sales of additional products or services unrelated to the project, but these opportunities have been explicitly excluded by INPUT in the development of the forecast.

Critical to the approach from both the client's and the vendor's perspectives is the sharing or total transfer of responsibility (and risk) for the successful development of the system from the client organisation to the vendor(s). In exchange for assuming the risk of contracting to deliver the desired solution on time and within budget, the integrator receives not only project management fees from the client but also markups covering products or services being subcontracted.

2. Market Size and Growth, 1993-1998

While European professional services revenues, particularly in areas such as custom software development and education and training, exhibited continued low growth in 1992, systems integration managed to defy the recession, with growth of 17%. This trend is forecast to continue in the future with systems integration growth of 19% per annum over the next five years, see Exhibit IV-6 This is nearly five times the rate forecast for professional services.

EXHIBIT IV-6

Systems Integration Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded) 1992	1993	1994	93-98 CAGR (%)	1998
Equipment	1,110	1,280	1,450	14	2,440
Application Software Products	725	855	1,170	37	4,150
System Software Products	320	380	440	16	800
Professional Services	1,820	2,150	2,430	12	3,830
Other Services	90	90	120	30	340
Total (Rounded)	4,050	4,750	5,600	19	11,500

- Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-7.

EXHIBIT IV-7

Systems Integration Market (ECU) Europe

Subsector	ECU Million (Rounded) 1992	1993	1994	93-98 CAGR (%)	1998
Equipment	880	1,010	1,150	14	1,930
Application Software Products	575	675	925	37	3,285
System Software Products	250	305	350	16	635
Professional Services	1,440	1,700	1,920	12	3,030
Other Services	70	70	95	31	270
Total (Rounded)	3,200	3,750	4,450	20	9,150

Exhibit IV-8 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The U.K. market is the largest country market for systems integration in Europe, accounting for some 25% of the total in 1992. The four leading country markets - Germany, France, the U.K. and Italy - accounted for 71% of the total European systems integration market in 1992.

EXHIBIT IV-8

Systems Integration, Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	4,100	4,800	5,600	19	11,500
France	900	1,050	1,300	21	2,750
Germany	620	710	800	13	1,300
United Kingdom	1,000	1,150	1,400	22	3,100
Italy	330	380	430	17	830
Sweden	88	100	125	22	270
Denmark	57	65	79	20	160
Norway	41	47	55	17	105
Finland	48	56	67	22	150
Netherlands	185	220	260	20	540
Belgium	135	155	180	15	310
Switzerland	160	185	210	15	370
Austria	37	42	47	14	81
Spain	180	215	265	22	590
Portugal	11	13	16	20	33
Greece	7	8	10	18	19
Ireland	10	11	13	20	27
Central and Eastern Europe	250	330	38		

Exhibit IV-9 shows the same breakdown in ECUs.

EXHIBIT IV-9

Systems Integration, Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	3,200	3,800	4,500	20	9,200
France	720	840	1,000	21	2,200
Germany	490	560	630	13	1,050
United Kingdom	810	920	1,100	22	2,500
Italy	260	300	340	17	660
Sweden	69	79	97	22	215
Denmark	45	51	63	20	130
Norway	32	37	44	17	81
Finland	39	46	54	22	120
Netherlands	145	175	205	20	430
Belgium	105	125	145	15	250
Switzerland	125	145	165	15	290
Austria	29	33	37	14	64
Spain	145	170	205	22	460
Portugal	9	11	12	20	26
Greece	5	6	8	18	15
Ireland	8	9	10	20	21
Central and Eastern Europe	195	255	295	22	70

3. Market Dynamics

The main factors fuelling growth are:

- project focus has become client/server component integration
- the transportation and utilities market sectors are providing new opportunities
- Central and Eastern Europe and Spain are both high growth regions for systems integration

One factor in the development of the systems integration market has been changing user attitudes towards the subcontracting of large systems development projects. The management culture of organisations is also changing as organisations adopt higher levels of decentralisation and transfer decision-making to local business units.

These cultural changes are now being complemented by a shift in technology. The result is that systems integration projects are evolving from large bespoke systems development projects to projects based on client/server architecture and oriented around the assembly of standard software products and kernels.

New technologies such as imaging also have a key role to play in facilitating business process re-engineering. Since the in-house IS department is likely to have had limited exposure to the application of these technologies, assistance is likely to be sought from external vendors.

External assistance is also frequently required where users are adopting open systems and client/server architectures, especially if these are to be integrated with existing systems still based on a range of proprietary equipment.

The majority of systems integration projects are now based around open systems equipment. Projects based predominantly around Unix mid-range systems are estimated to account for over a third of systems integration activity, while PC Lan based projects account for approximately a quarter of the market.

These proportion can be expected to increase in the future, though mainframe based projects will remain an important component of the systems integration market where high throughout OLTP systems are required. Projects based around proprietary mid-range systems are now a minor part of the systems integration market, with only the IBM AS/400 retaining any real credibility in the marketplace.

The other major trend is the growth in importance of senior executives and end-user departmental management in systems integration project procurement. While this trend is a major stimulant for the systems integration market, it also presents challenges for the majority of vendors who continue to be perceived as technologists rather than business advisers. To meet this challenge, vendors are establishing their own management consultancy capabilities and are seeking to transform the skills of their major account managers.

Another of the main trends in the systems integration market is vendors' increasing specialisation by industry sub-sector. To be successful, this strategy depends on access to appropriate software products. Access to software products not only demonstrates a vendor's experience in the sector, but also offers the client increased flexibility and reduced project costs and timescales.

Traditionally the commercial systems integration market has been dominated by projects in the financial services and manufacturing sectors. However there are now signs of the demand from these two sectors stagnating and new sectors such as utilities, transportation, and distribution are assuming a greater importance in the systems integration market.

4. Competitive Environment

The leading systems integration companies in Europe are listed in Exhibit IV-10.

EXHIBIT IV-10

Leading Vendors, Systems Integration Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	750	18.5
2	Andersen Consulting	U.S.	390	9.6
3	Cap Gemini Sogeti	France	390	9.6
4	Digital	U.S.	280	6.9
5	Bull	France	215	5.3
6	EDS	U.S.	200	4.9
7	Sema Group	France	135	3.3
8	ICL (Fujitsu)	U.K.	130	3.2
9	Siemens-Nixdorf	Germany	130	3.2
10	Olivetti	Italy	85	2.1
	Total Listed		2,705	66.8
	Total Market		4,050	100.0

The demand for systems integration projects by country or region is also becoming more volatile. Firstly this is a reaction to the changing economic circumstances of the major economies. Until 1992, the German economy, and the German systems integration market, was viewed with considerable optimism by vendors. This view has now changed with vendors expecting comparatively low growth in the German systems integration market over the next few years. In contrast, the systems integration market in the United Kingdom, which has been depressed in recent years, is now the source of renewed optimism. In addition there is the emergence of significant new markets such as Central and Eastern Europe.

C
Systems Operations

1. Market Overview and Structure

Systems Operations has expanded during the past year into a broadly accepted buying mode within the IS industry. The overall market for Systems Operations is growing at 20% per annum across Europe and is forecast to reach $6.6 billion by 1998.

The older definitions of processing operations and professional services operations have given way to a new segmentation based on the package of service delivered rather than on the rather arbitrary criterion of host system ownership. INPUT's four sub-sectors are:

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

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

- *Network Management* - The vendor assumes full data communications systems. This may also include the voice communications of the client.

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

Although this market is dominated by mainly national firms serving their individual local markets, we are starting to see the development of groups with pan-European capability in the form of:

- CGS and Debis Systemhaus, who are leaders in the UK and Germany respectively

- EDS with its takeover of SD-Scicon whose French subsidiary GFI is a leader in France.

Throughout Europe, the information services market has been depressed during 1991 and 1992 and this has continued into 1993. This has been due to a combination of the recession and senior executives' concerns that information systems have historically failed to deliver any lasting business benefits. Accordingly senior managers have turned their attention to improving the effectiveness of their IS systems while simultaneously reducing their organisation's IS spending.

Improved effectiveness is being tackled by strategies such as:

- Business process re-engineering
- Devolution of IS responsibility to business unit/departmental management.

Cost reduction is being tackled by strategies such as:

- Downsizing
- Increased use of standard application software products
- Outsourcing.

In addition the recession is forcing a number of major organisations to enhance their core business focus. As a result such organisations are seeking to simplify the management of their enterprises and reduce their IS costs by outsourcing systems operations functions.

INPUT has consistently predicted that outsourcing will develop in three stages:

- Firstly by outsourcing IS infrastructure management such as the operation of data centres

- Secondly by the combination of management by external vendors of both systems development and IS infrastructures

- Thirdly by the outsourcing of complete business functions of which IS is merely a part.

Indeed in Europe, applications operations is forecast to grow more rapidly than platform operations over the next five years as organisations increasingly accept the virtues of outsourcing systems development.

2. Market Size and Growth, 1993-1998

Exhibit IV-11 shows the forecast growth in systems operations by market segment.

EXHIBIT IV-11

Systems Operations Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	1,160	1,340	1,520	18	3,030
Application Operations	810	1,040	1,270	22	2,760
Desktop Services	210	275	335	24	800
Total (Rounded)	2,150	2,650	3,100	20	6,600

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-12.

EXHIBIT IV-12

Systems Operations Market (ECU) Europe

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	910	1,060	1,200	18	2,400
Application Operations	640	820	1,000	22	2,190
Desktop Services	165	220	265	24	635
Total (Rounded)	1,700	2,100	2,450	20	5,200

Exhibit IV-13 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The U.K. market is the largest country market for systems operations in Europe, accounting for some 35% of the total in 1992. France is the other major European market accounted for 23% of the total systems operations market in 1992.

EXHIBIT IV-13

Systems Operations Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	2,150	2,650	3,100	20	6,600
France	540	630	710	19	1,500
Germany	200	250	295	22	670
United Kingdom	750	920	1,100	22	2,450
Italy	220	255	300	18	600
Sweden	59	120	140	16	250
Denmark	25	30	37	19	72
Norway	29	35	41	18	79
Finland	36	42	50	17	93
Netherlands	110	140	160	18	310
Belgium	73	84	97	17	185
Switzerland	39	45	51	14	87
Austria	14	16	19	16	33
Spain	41	48	56	18	110
Portugal	2	2	3	19	6
Greece	3	3	4	16	7
Ireland	7	8	12	28	29
Central and Eastern Europe	9	14	19	47	95

Exhibit IV-14 shows the same breakdown in ECUs.

EXHIBIT IV-14

Systems Operations Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	1,700	2,100	2,450	20	5,200
France	430	500	570	19	1,200
Germany	155	195	235	22	520
United Kingdom	590	730	880	22	1,950
Italy	175	205	240	18	470
Sweden	46	93	110	16	195
Denmark	20	24	29	19	57
Norway	23	28	33	18	62
Finland	30	34	41	17	75
Netherlands	89	110	125	18	245
Belgium	58	67	77	17	145
Switzerland	31	36	41	14	69
Austria	11	13	15	16	26
Spain	32	38	44	18	86
Portugal	2	2	2	19	4
Greece	3	3	3	16	6
Ireland	5	7	9	28	23
Central and Eastern Europe	7	11	15	47	75

3. Market Dynamics

In 1992, it is estimated that "infrastructure management" in the form of platform operations, network management, and desktop services accounted for approximately 70% of the systems operations market. The proportion of the systems operations market accounted for by these services is expected to remain roughly constant through to 1997.

This is because organisations typically show a greater propensity to outsource their infrastructure management than their systems development activities. For example, organisations such as ICI, BP, and the UK Inland Revenue (Tax Department) are outsourcing all or major elements of their IS infrastructure. Outsourcing of their systems development activities may follow but is clearly a lesser priority.

However there will be a change in emphasis within the nature of the "infrastructure management" task during the period 1993-1998. This will take the form of decreased emphasis on mainframe data centre management and increased emphasis on activities such as network management and desktop services. Correspondingly the equipment being managed by the vendor will increasingly be sited on user premises rather than consolidated into vendor data centres.

The platform operations market is also being boosted by transition outsourcing as companies undergo a change in technology and request systems operations vendors to manage their "old" systems while the new systems are under development.

It is important to bear in mind that the adoption of outsourcing by industry varies widely from country to country.

For example, in the United Kingdom and Italy, government, both national and local, is a very important sector. In France, the distribution and transportation sectors have shown a high propensity to adopt outsourcing. In Germany it is the manufacturing sector which is turning to outsourcing.

In response to high market growth, and facing the threat from the major systems vendors such as IBM and Digital, the established systems operations vendors are endeavouring to broaden their geographic coverage and take on a more pan-European role.

At present, systems operations account for 3% of external software and services spending across Europe. However a better measure of systems operations' market potential is the total spent by organisations across Europe on all IS related activities, including equipment purchase and employment of in-house IS staff, for example. Against this measure, systems operations had achieved a market penetration in Europe of only 1%, in 1992.

In the U.K. the overall penetration of the total IS market is forecast to increase from 1% in 1992 to 5% in 1998. Because of the low level of current market penetration and the United Kingdom's comparatively high propensity to outsource compared to the other major European countries, growth in systems operations in the United Kingdom over the next five years is forecast to remain comparatively high.

The strength of the recession remains a major factor in determining the rate of adoption of systems operations in each national market. So far, German industry has shown little inclination to outsource, but this attitude is expected to gradually change as economic pressures increase.

4. Competitive Environment

The leading vendors in the European systems operations market are listed in Exhibit IV-15.

Until recently, the systems operations market had been largely dominated by national suppliers, such as:

- Hoskyns in the United Kingdom
- GSI in France
- Alldata and tds in Germany
- Finsiel in Italy
- RAET and Volmac in the Netherlands.

However many of the leading vendors are now seeking to expand their presence in systems operations across Europe.

EXHIBIT IV-15

Leading Vendors Systems Operations Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	EDS	U.S.	260	12.1
2	Cap Gemini Sogeti	France	160	7.4
3	AT&T	U.S.	135	6.3
4	Finsiel	Italy	105	4.9
5	Digital	U.S.	90	4.2
6	GSI	France	85	4.0
7	CSC	U.S.	80	3.7
8	Sema Group	France	75	3.5
9	ICL (Fujitsu)	U.K.	60	2.8
10	Andersen Consulting	U.S.	50	2.3
	Total Listed		1,100	51.2
	Total Market		2,150	100.0

EDS has dramatically strengthened its position in outsourcing in Europe with the acquisition of SD-Scicon, and hence GFI. This has been sufficient to promote EDS to market leader in both the overall European systems operations market and in France.

AT&T Istel has recently acquired Dataid in France and is expected to make further acquisitions in the future to give the company a greater pan-European presence in systems operations and other markets.

Overall it is likely that further mergers and partnerships will take place amongst the European systems operations vendor community in order to strengthen market position.

D
Processing Services

1. Market Overview and Structure

INPUT splits this delivery mode into three subsectors:

- *Transaction Processing:* Client uses vendor-provided information systems - including hardware, software and/or data networks - at vendor site or customer site, to process transactions and update client data bases.

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

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

Outsourced systems operations (often called facilities management) used to be a subsector of this market, but is now reported on as a sector in its own right.

2. Market Size and Growth, 1993-1998

During the 1980's growth in the processing services sector averaged only 11% per annum against a rate of 25% for the total software and services industry. Despite this relatively lower rate of growth the processing services sector is still a substantial business area and is set to maintain a strong market presence but without any real growth over the next five years, as is shown in Exhibit IV-16.

EXHIBIT IV-16

Processing Services Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	7,150	7,250	7,400	3	8,550
Utility Processing	275	275	275	0	280
Other Processing	800	900	1,010	13	1,670
Total (Rounded)	8,250	8,450	8,700	4	10,500

Exhibit IV-17 gives the same consolidated figures for the whole European market, but in ECUs.

EXHIBIT IV-17

Processing Services Market (ECU) Europe

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	5,650	5,750	5,850	3	6,750
Utility Processing	220	220	215	0	220
Other Processing	630	710	790	13	1,320
Total (Rounded)	6,500	6,650	6,850	5	8,300

Exhibit IV-18 provides an analysis of the comparative size of the constituent country markets for the overall processing services delivery mode.

EXHIBIT IV-18

Processing Services Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	8,300	8,500	8,700	4	10,500
France	1,650	1,700	1,750	2	1,900
Germany	1,550	1,550	1,650	10	2,450
United Kingdom	780	840	910	8	1,250
Italy	870	870	890	4	1,050
Sweden	440	460	450	-1	430
Denmark	510	500	490	-2	460
Norway	520	540	540	0	550
Finland	205	200	190	-5	155
Netherlands	540	560	580	4	670
Belgium	245	245	250	1	260
Switzerland	310	330	350	7	450
Austria	175	175	180	2	190
Spain	285	300	320	6	400
Portugal	21	25	29	16	51
Greece	42	47	51	10	77
Ireland	66	66	65	-1	63
Central and Eastern Europe	14	17	21	36	79

Exhibit IV-19 provides the same country by country analysis, but in ECUs.

3. Market Dynamics

Opportunities for delivering an information system business solution as a processing service are most likely to have the following characteristics:

- the need for a rapid response to changing conditions;
- flexibility in delivering the service to end-users;
- a need for customisation to meet a variety of different requirements;
- a need for the vendor to take responsibility for the service.

EXHIBIT IV-19

Processing Services Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	6,500	6,700	6,900	5	8,300
France	1,350	1,350	1,350	2	1,500
Germany	1,200	1,250	1,300	10	1,950
United Kingdom	620	660	720	8	980
Italy	680	690	700	4	820
Sweden	350	360	360	-1	340
Denmark	400	400	390	-2	360
Norway	410	420	420	0	430
Finland	165	160	155	-5	125
Netherlands	430	440	460	4	530
Belgium	195	195	195	1	205
Switzerland	245	260	275	7	360
Austria	135	140	140	2	150
Spain	225	240	250	6	310
Portugal	17	20	23	16	41
Greece	34	37	41	10	61
Ireland	52	52	51	-1	50
Central and Eastern Europe	11	13	17	36	62

The more customised the application, the more industry specific it is, then the more flexible the vendor must be in the approach to supplying the service and supporting the client. The greater the effectiveness of the vendor in achieving this, the higher the level of client acceptance. In consequence the processing service is less vulnerable to replacement by some other approach.

The principal driving forces of the processing services sector can be summarised as:

- the inertia of current users who are content to stay with the convenience of the existing service;
- the need for a time critical solution that can not be met in-house;
- the development of processing services as a result of increased interest and acceptance of the concept of "outsourcing";
- innovation and specialisation on the part of processing services vendors who can as a result offer superior capabilities than available in-house. Disaster recovery services would be a particular example of specialisation.

The principal inhibiting forces acting on the processing services sector can be summarised as:

- the further development of mini, micro and workstation application platforms undermining the cost performance capability of a processing service.
- the cost of market entry as a processing services vendor is relatively high and this combined with the image of the sector as "old-fashioned" has affected both the demand and supply side of the equation;
- user concerns for control and security for their applications is also an important consideration in inhibiting demand.

However, specific applications knowledge and experience has emerged as perhaps the key competitive differentiator for a processing services vendor.

A good example of this is the emergence of a new application driven market in Germany. SAP's integrated suite of business applications is now being successfully offered to clients who do not want to carry the full costs of implementing it on an in-house machine.

4. Competitive Environment

The processing services environment in Europe is characterised by its composition as a set of individual national markets each with its own leading vendors. The more northern countries have larger processing services markets than those in the south of Europe.

Only two vendors can be considered as operating on a truly pan-European scale and these two, IBM and GEIS, occupy leading positions in the market. The list of ten leading processing services vendors is provided in Exhibit IV-20.

EXHIBIT IV-20

Leading Vendors Processing Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	Datev	Germany	385	4.7
2	Sligos	France	210	2.5
3	Finsiel	Italy	180	2.2
4	IBM	U.S.	160	1.9
5	Axime	France	115	1.4
6	Raet	Netherlands	115	1.4
7	Telekurs	Switzerland	115	1.4
8	GSI	France	95	1.2
9	EDS	U.S.	85	1.0
10	Fiducia	Germany	85	1.0
	Total Listed		1,545	18.7
	Total Market		8,250	100.0

Datev grew its revenues by 20% in 1992. The largest processing services vendor in Europe it operates entirely within the German market thus underlining the fragmented nature of the European market. Of the top 30 vendor's revenues, German owned companies account for some 25% of the total.

E

Network Services

1. Market Overview and Structure

The network services sector, although offering many high growth market opportunities, operates within a potentially chaotic and confused environment as national and international vendors stake out their positions in newly deregulated markets. At the same time the business environment is becoming more competitive and consequently the application of networked electronic intelligence becomes increasingly important as a strategic business tool.

These factors are creating a market that will continue to grow at around 17% per annum to reach an annual value of $12 billion by 1998.

One of the most important aspects in an analysis of the network services market is to define its component sectors as precisely as possible. In INPUT's definition, network services are comprised of three principal subsectors, electronic information services, network applications and network management:

- *Electronic Information (EI):* services are on-line data bases and news services.
- *Network Applications:* includes the following:
  - Value added network services which are network transport services supplied in addition to the provision of basic network transmission facilities.
  - Electronic Data Interchange (EDI).
  - Electronic Mail (E-Mail).
  - Other network services like videotex services.
- *Network Management:* The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. (This was reported in systems operations in the 1992 report.)

2. Market Size and Growth, 1993-1998

The market forecast for the network services sector in Europe is shown in Exhibit IV-21. This market has been created out of the much heralded convergence of computer and communications technology. It is differentiated from other adjacent markets by the fact that the network is mandatory for its delivery.

EXHIBIT IV-21

Network Services Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	3,240	3,470	3,690	6	4,700
Network Applications	1,290	1,610	2,090	31	6,300
Network Management	375	460	575	24	1,350
Total (Rounded)	4,900	5,500	6,400	17	12,300

Exhibit IV-22 shows the same forecasts converted from the local currencies of 16 countries into the common European currency - ECU.

EXHIBIT IV-22

Network Services Market (ECU) Europe

Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	2,560	2,740	2,920	6	3,710
Network Applications	1,020	1,270	1,660	31	4,980
Network Management	300	370	460	24	1,070
Total (Rounded)	3,900	4,400	5,000	17	9,800

The overall dominance of the network services sector by the major country economies is shown in Exhibit IV-23.

EXHIBIT IV-23

Network Services Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	4,900	5,500	6,400	17	12,500
France	1,250	1,450	1,700	18	3,300
Germany	910	1,000	1,150	17	2,200
United Kingdom	1,200	1,350	1,550	17	2,900
Italy	430	480	540	16	1,000
Sweden	125	145	180	20	370
Denmark	89	105	120	17	225
Norway	62	67	74	13	125
Finland	48	54	60	9	83
Netherlands	220	255	310	23	710
Belgium	135	150	170	13	280
Switzerland	150	175	200	20	420
Austria	65	72	82	14	140
Spain	155	175	205	16	370
Portugal	8	11	14	33	46
Greece	14	16	20	22	43
Ireland	17	20	24	19	49
Central and Eastern Europe	3	5	6	46	33

The UK represents the largest individual country market in Europe due to the predominance of Electronic Information Services (EI) delivered to the London based financial markets. Higher growth in this sector is now being experienced in other centres, notably in France and Germany as a result of financial deregulation.

Exhibit IV-24 shows the same forecasts converted from local currencies to the common European currency - ECU.

EXHIBIT IV-24

Network Services Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	3,900	4,400	5,000	17	9,800
France	1,000	1,150	1,350	18	2,650
Germany	720	790	900	17	1,750
United Kingdom	950	1,050	1,200	17	2,300
Italy	340	380	430	16	790
Sweden	98	115	140	20	290
Denmark	70	82	95	17	180
Norway	48	53	58	13	99
Finland	39	44	49	9	67
Netherlands	175	200	245	23	560
Belgium	105	120	135	13	225
Switzerland	120	135	160	19	330
Austria	51	57	64	14	110
Spain	120	140	160	16	290
Portugal	7	9	11	33	36
Greece	11	13	15	22	35
Ireland	13	16	19	19	39
Central and Eastern Europe	2	4	5	46	26

3. Market Dynamics

The strong impetus towards deregulation of national telecommunications monopolies in Europe has led to the opening up of many new network services. However, the relative level of development of that technology and the developing nature of liberalisation conspire to create a potentially chaotic and confused environment for both users and vendors.

A major driving force in the network services arena is the increasingly competitive nature of the economic environment within which organisations must operate. In this situation networked electronic intelligence is becoming increasingly important as a strategic tool. The wide availability of powerful personal computers with communications capabilities and the increasing acceptance of open systems standards in place of proprietary offerings are also factors supporting greater interest in and use of network services.

Within the network applications sector the two principal area of activity are represented by VAN's and Electronic Mail. The highest expectations for growth lie in the area of E-Mail and EDI and these service sub-sectors are anticipated to grow at in excess of thirty percent per annum over the next five years. Users will increasingly seek to utilise third-party vendor network services for access to foreign subsidiaries and access to suppliers and customers in a speedy, efficient and secure fashion. The needs cannot all be met by private network services.

With 41% of the market, the predominance of the banking and finance sector is clear. The strength of electronic information services (EI) to the banking and finance sector is the key determinant of this position. The insurance sector accounts for only five percent of the total market.

The second largest individual sector is that of distribution where EFTPOS (Electronic Funds Transfer at Point of Sale) and EDI represent two key sectors. The French market is the most developed for EFTPOS within Europe where it has been centred on the use of intelligent (chip based) cards pioneered by Bull and adopted by all the major French banks. EFTPOS has had a somewhat hesitant start in the UK market where insufficiently attractive terms to retailers have hindered progress. Germany has been a long way behind other major countries in the adoption of EFTPOS, again due to a failure to offer sufficiently attractive terms to the retail sector. This situation is likely to change over the next few years as new initiatives get underway.

4. Competitive Environment

Within the network services sector different types of vendors compete within the two major sub-sectors of network applications and electronic information services. Accordingly the leading vendors in each of these areas are listed separately. For network applications the leaders are listed in Exhibit IV-5.

The network applications services sector is populated by vendors from a number of different backgrounds. The main ones are:

- Specialist independent network vendors like GE Information Services and Infonet.

- Telecommunications companies like BT/Tymnet, France Telecom and Deutsche Telekom.

Vendors that have a considerable level of activity in other areas of the computer services business are also active in the network applications area. GSI, the large French owned software and services company is the leading example from this group. Sligos, France Telecom's Telesystemes and AT&T Istel can also be cited in this category.

EXHIBIT IV-25

Leading Vendors Network Application Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	145	8.7
2	Infonet	Belgium	125	7.5
3	GEIS	U.S.	105	6.3
4	AT&T	U.S.	100	6.0
5	BT	U.K.	80	4.8
6	GSI	France	55	3.3
7	Sligos	France	50	3.0
8	Digital	U.S.	45	2.7
9	France Telecom	France	45	2.7
10	Bull	France	40	2.4
	Total Listed		790	47.6
	Total Market		1,650	100.0

The electronic information services leaders are listed in Exhibit IV-6. This sector is led by the providers of financial data, namely Reuters, Extel and Telerate. Reuters is by far the largest vendor in the market and accounts for 32% of the subsector. Reuters is the market leader in electronic information services (EI) in France, Germany, the UK and Italy.

EXHIBIT IV-26

Leading Vendors Electronic Information Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	Reuters	U.K.	1,035	31.9
2	Telerate	U.S.	245	7.6
3	Dun & Bradstreet	U.S.	175	5.4
4	Telekurs	Switzerland	120	3.7
5	Citicorp	U.S.	95	2.9
6	DAFSA	France	75	2.3
7	Extel	U.K.	70	2.2
8	Mead	U.S.	55	1.7
9	ADP Financial	U.S.	50	1.5
10	France Telecom	France	45	1.4
	Total Listed		1,965	60.6
	Total Market		3,240	100.0

F

Systems Software Products

1. Market Overview and Structure

After a decade of high growth the systems software products sector is now slowing as a result of the decline of the computer equipment market, largely caused by downsizing, the selection of lower cost minicomputers and work-station platforms to replace purchases of larger equipment configurations, and a rebellion by mainframe users unwilling to pay continually escalating prices for system software.

Five independent vendors now rank among the top ten vendors in Europe, in a market traditionally dominated by computer manufacturers. The equipment vendors are struggling to increase software revenues in the face of rapidly falling hardware prices and margins. Nevertheless, growth will generate a systems software products market worth $18 billion in 1998.

The systems software products sector is made up of three categories: applications development tools, operations management tools and systems control products.

Application development tools: are used to prepare applications by assisting in the process of their design, programming, testing and related functions. This category, thus, includes traditional programming languages, 4GLs, data dictionaries, data base management systems, CASE tools, and other development productivity aids. Also included are graphical user interfaces and system utilities that are directly invoked by an applications program.

Operations management tools: provide assistance to manage computer and network systems and operating personnel more efficiently. The category includes mainframe job scheduling and accounting systems, disk/tape systems and performance-monitoring and tuning systems.

System control products: are primarily supervisory programs that deliver the computer and network resources to the application through automatic management and allocation. These products include operating systems, emulators, network control products, library control, access control and spoolers.

2. Market Size and Growth, 1993-1998

The market forecast for the total European systems software products market is shown in Exhibit IV-27. In terms of equipment platform subsectors, the highest market growth is expected to be in the workstation/PC subsector, the lowest in the mainframe subsector—a forecast consistent with the continuing trend of downsizing.

The workstation/PC portion of the systems software products market was only 16% in 1989 but is projected to increase to a 42% share by 1998. The mainframe sector is now predicted to be the smallest individual sector of the market by 1998. This growth pattern fundamentally reflects user downsizing of equipment needs to gain the cost/performance benefits of smaller systems. It also reflects increasing use of networking and the client/server co-operative processing solutions that will make downsizing a practical step in many applications. In the future, mainframes will be increasingly reserved for large data management tasks, compute-intensive scientific, batch and high throughput transaction processing applications as well as for wide-area network intelligent switching and management.

The pace of product introductions, particularly in the area of client/server processing has greatly exceeded the rate at which standards-making bodies function. The consequent introduction of *de facto* standards for networking, graphic user interfaces and other programming interfaces, has caused considerable user confusion which is delaying more rapid acceptance of products.

EXHIBIT IV-27

Systems Software Products (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	5,990	6,000	5,970	-4	4,880
Minicomputer	4,050	4,230	4,470	6	5,630
Workstation and PC	2,880	3,360	3,950	18	7,630
Total (Rounded)	12,900	13,600	14,400	6	18,100

The same forecast is shown in Exhibit IV-28 but in ECUs, a result of converting and totalling the local currency forecasts for each country.

EXHIBIT IV-28

Systems Software Products (ECU) Europe

Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	4,730	4,740	4,720	-4	3,860
Minicomputer	3,200	3,340	3,530	6	4,450
Workstation and PC	2,280	2,650	3,120	18	6,030
Total (Rounded)	10,200	10,700	11,400	6	14,300

Exhibit IV-29 shows the country analysis of the European market.

EXHIBIT IV-29

Systems Software Products Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	13,000	13,500	14,500	6	18,000
France	2,900	3,000	3,200	5	3,900
Germany	3,200	3,300	3,500	5	4,200
United Kingdom	1,750	1,800	1,950	7	2,600
Italy	1,600	1,700	1,800	6	2,250
Sweden	360	390	420	6	520
Denmark	275	295	330	7	400
Norway	205	215	225	6	280
Finland	170	170	170	1	180
Netherlands	690	720	760	6	970
Belgium	410	440	470	6	600
Switzerland	520	540	550	5	700
Austria	260	275	290	6	360
Spain	430	460	500	9	720
Portugal	30	35	41	17	77
Greece	49	55	62	15	110
Ireland	100	105	110	6	140
Central and Eastern Europe	48	58	73	29	210

The forecast largely follows the expected fortunes of the hardware platforms within each country. Finland shows the lowest growth primarily due to the effects of recession and the strong competitive pressure on pricing. These are the lowest growth rates recorded by INPUT for software products since it began its European researches during the 1970s.

The same country by country forecast is shown in Exhibit IV-30 but in ECUs.

EXHIBIT IV-30

Systems Software Products Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	10,000	10,500	11,500	6	14,500
France	2,300	2,400	2,500	5	3,100
Germany	2,500	2,600	2,700	5	3,300
United Kingdom	1,400	1,450	1,550	7	2,050
Italy	1,250	1,350	1,400	6	1,750
Sweden	285	310	330	6	410
Denmark	220	230	255	7	320
Norway	160	170	180	6	220
Finland	140	140	140	1	150
Netherlands	550	570	610	6	760
Belgium	330	350	370	6	470
Switzerland	410	430	440	5	560
Austria	205	215	230	6	285
Spain	340	360	390	9	570
Portugal	24	28	32	17	61
Greece	39	44	49	15	87
Ireland	79	83	87	6	110
Central and Eastern Europe	38	46	58	29	165

3. Market Dynamics

The market for UNIX systems software products is now established as a fast-growing opportunity within the European minicomputer and workstation/PC sectors. The market for UNIX systems software is expected to grow at an average 30% per year to 1998.

The principal reason for this rapid growth has been the *de facto* adoption of UNIX as the prime open operating system standard by equipment vendors. The economics of computer system development and fragmented market shares of most proprietary operating systems, has led to a polarisation around three fundamental *de-facto* standards:

- IBM systems.
- UNIX systems.
- DOS/Windows.

The Microsoft Windows NT product has raised considerable interest among buyers, but will find it difficult to displace UNIX as the preferred server operating system in Europe.

UNIX does, however, have its limitations and these lie primarily in the areas of large scale data processing and high integrity on-line transaction processing (OLTP). However, UNIX is being driven towards use in the OLTP sector by the growth of networking. Standards organisations such as X/Open and OSF have recognised the need for transaction processing support in UNIX and this is likely to give support to the wider adoption of products like AT&T's Tuxedo.

Systems management became a key opportunity area during 1992, largely due to the pressure on IS to get the absolute maximum out of their existing IT investments. Performance measurement and tuning tools proved very popular. Over the next two years, tools for simplifying network management will also find a ready market.

Those downsizing from mainframe environments are now realising that there is shortage of management tools in the UNIX and networked PC sector. Security, safety, recovery, back-up and reconfiguration - watchwords for all mainframe operations - are now showing up as deficiencies in downsized systems and impacting information quality.

The applications development tools sector is projected to be the fastest growing segment in the systems software product market.

As the complexity of the software product development requirements increases, so further demand for more automated software product support is created. The endorsement of CASE by IBM, through its introduction of AD/Cycle, helped to legitimise the market for integrated tool sets. IBM's inability to deliver AD/Cycle's central repository is speeding up the move to networked and distributed software development.

The area of distributed databases will be an important factor in this sector of the market, particularly, as relational database architectures are demanded by users. Realistically, these systems will still present complex implementation problems. IBM's road map - Information Warehouse with DRDA - is expected to encourage this trend to networked integration, even though such monolythic architecture is not likely to prove widely popular.

Additionally the relational database market is being challenged by the development of object oriented technology. The major claims being made for object orientation are re-use of software, the ease of maintaining applications and the level of reliability. Some world class software product vendors - Oracle, Ingres and Software AG, are now moving into this area previously occupied solely by small start-up organisations.

Overall 4GL's have not met the applications development expectations made for them. Some consolidation of the product market is expected.

4. Competitive Environment

The close relationship between systems software products and the equipment platforms is that they drive polarises the competitive environment into two groups, equipment vendors and independent vendors. The equipment vendors still dominate the whole sector with six out of the leading ten vendors for the market overall. Exhibit IV-31 shows the list of the top ten vendors ranked by European systems software revenues.

IBM dominates this market with a share of over one-quarter of the total. This position is related to IBM's predominant position in the mainframe market with the large proportion of the total market still accounted for by the mainframe sector.

EXHIBIT IV-31

Leading Vendors Systems Software Products Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	3,785	29.3
2	Microsoft	U.S.	740	5.7
3	Digital	U.S.	715	5.5
4	Siemens-Nixdorf	Germany	550	4.3
5	Bull	France	410	3.2
6	Oracle	U.S.	385	3.0
7	ICL (Fujitsu)	U.K.	380	2.9
8	Computer Associates	U.S.	335	2.6
9	Novell	U.S.	285	2.2
10	Software AG	Germany	260	2.0
	Total Listed		7,845	60.8
	Total Market		12,900	100.0

G

Application Software Products

1. Market Overview and Structure

The application software product market was valued at $9.8 billion for 1992. Over the period 1993 to 1998, this market sector is forecast to grow on average at 12% per annum, down 2% on last year's forecast. While this rate of growth is substantially lower than the 35% per annum achieved by application software products over the period 1979 to 1989, it is still significantly higher than the average growth forecast for the total software and services industry over the same period.

INPUT defines the software applications product market as comprising two types of products:

- *Industry-Specific Application Software Products* - Software products that perform functions related to solving business or organisational needs unique to a specific vertical market and sold to that market only. Examples include: demand deposit accounting, MRPII, medical record-keeping, automobile dealer parts inventory, etc.

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

INPUT's market sizing and forecasting for applications software products are based on user purchases or licence fees for application software products for use on in-house computer systems. Where installation and support is handled by the software products vendor, INPUT includes this revenue in the software products delivery mode. When work on packages is carried out by third parties independently under a separate contract, this revenue is allowed for in the professional services delivery mode.

The slowdown in market growth is caused by a number of factors of which the most significant are:

- Economic environment slowdown
- Downsizing and its impact on software product pricing
- Price competition as customer expectations and budgets are lowered

The general slowdown in the rate of growth can partly be attributed to the recession in the overall economy. However, a far more significant factor is that of the downsizing phenomenon. Downsizing is fundamentally driven by the large differences in price/performance between, at one extreme, main-

frames, and at the other workstations and PCs. This price performance difference, of the order of 200 times, combined with open software standards, leads to totally new system architecture possibilities that are radically altering the market for software products.

However, there are also a number of important factors stimulating growth in the application software product market. Firstly, users are increasingly recognising the benefits of using application software products even for their core systems where many major users have previously insisted on developing their own software. Taking into account the cost of developing bespoke systems and the timescales involved - not to mention the increasing complexity of doing so in distributed, object-oriented environments - the switch to standard products will continue to gain momentum.

Secondly the move to open systems promises to shorten the installed life-time of application software products. Open systems offer the promise of greater freedom to discard application software products and select new ones as the business requirements change.

Thirdly, the traditional pricing strategy for software has been based on the performance and price of the central processor(s). The larger the processor, the higher the software price. 1993 has seen this traditional pricing strategy coming under increasing user pressure for charges to reflect usage and value to the user.

2. Market Size and Growth, 1993-1998

The total applications software products market is analysed into three subsectors related to equipment platforms: mainframe, mini and workstation/PC. This analysis is illustrated in Exhibit IV-8, and shows the forecast growth rates for each of these sectors.

Exhibit IV-32 clearly indicates the much greater opportunity available for smaller systems, both in respect of relative size and relative growth rates. The higher growth rates expected for smaller systems, notably the workstation/PC sector, can be attributed to the general trend towards downsizing systems. Additionally, the cost level of smaller systems emphasises the need to utilise standard applications package products rather than to implement costly custom written systems.

EXHIBIT IV-32

Applications Software Products (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	990	945	895	-4	770
Minicomputer	3,040	3,080	3,250	8	4,510
Workstation and PC	5,800	6,650	7,650	16	13,750
Total (Rounded)	9,800	10,700	11,800	12	19,000

The same forecast is shown in ECUs in Exhibit IV-33.

EXHIBIT IV-33

Applications Software Products (ECU) Europe

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	785	745	710	-4	610
Minicomputer	2,400	2,430	2,570	8	3,560
Workstation and PC	4,600	5,250	6,050	16	10,850
Total (Rounded)	7,800	8,400	9,300	12	15,000

Additional factors determining these different growth rates include:

- The move towards distributed systems possibly using client/server architecture rather than centralised systems.
- The movement towards international standards, open systems that in effect provide a more stable environment within which software developers can operate.
- The trend towards the use of graphical user interfaces, making it easier for software developers to market standard applications.

Exhibit IV-34 shows the country analysis of the European market.

The largest individual country market is France, representing over one-quarter of the entire market in 1992; Germany is the second-largest country market, accounting for some 18% of the European total. The relatively low market share for Germany is witness to the strong turnkey systems market there which represents the favoured delivery mode for applications solutions.

EXHIBIT IV-34

Application Software Products Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	9,800	10,500	12,000	12	19,000
France	2,750	2,800	2,850	6	3,800
Germany	1,950	2,150	2,500	17	4,700
United Kingdom	1,050	1,100	1,200	11	1,800
Italy	1,300	1,450	1,600	13	2,650
Sweden	320	370	420	13	690
Denmark	225	250	285	13	460
Norway	180	205	230	12	370
Finland	150	165	175	7	230
Netherlands	620	700	790	13	1,300
Belgium	370	430	490	14	840
Switzerland	310	350	390	14	660
Austria	160	185	210	13	340
Spain	300	350	400	16	740
Portugal	16	20	24	22	53
Greece	28	34	42	23	94
Ireland	76	87	98	14	165
Central and Eastern Europe	69	80	94	16	165

The same forecast, converted from local currencies, is shown in ECUs in Exhibit IV-35.

EXHIBIT IV-35

Application Software Products Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	7,800	8,400	9,300	12	15,000
France	2,150	2,200	2,250	6	3,000
Germany	1,550	1,700	1,950	17	3,700
United Kingdom	810	860	950	11	1,450
Italy	1,000	1,150	1,250	13	2,100
Sweden	245	290	330	13	540
Denmark	180	200	225	13	360
Norway	140	160	180	12	290
Finland	125	135	145	7	190
Netherlands	490	560	630	13	1,050
Belgium	295	340	390	14	660
Switzerland	245	275	310	14	520
Austria	125	145	165	13	270
Spain	240	275	320	16	580
Portugal	13	16	19	22	42
Greece	22	27	33	23	75
Ireland	60	68	78	14	130
Central and Eastern Europe	55	63	74	16	130

3. Market Dynamics

Significant trends within the application software product sector include the moves towards:

- greater information sharing across applications
- more widespread adoption of UNIX
- greater use of networking
- graphical user interfaces
- increasing information sharing across workgroups.

Users are increasingly looking for better integration and data sharing between applications, and so vendors of application solutions are frequently in the process of integrating their one-off applications into integrated product groups. This often involves underpining the various application software products with a common relational database.

Related trends are the adoption of UNIX by users and much greater user of networking. Open systems and UNIX provide a common platform which facilitates the integration of applications, while networking is often the mechanism for both information sharing across applications and information sharing across workgroups. As users move to flatter organisational structures, the sharing of common data between departments and functions is rising in importance.

The use of graphical user interfaces no longer applies solely to vendors of personal computer software but is also being adopted by vendors who traditionally targeted mainframes and minicomputers. These vendors are now often launching UNIX versions of their application software products, incorporating the use of client/server architecture and graphical user interfaces. For example, SAP has based its new R/3 product on these technologies and object-oriented programme development.

4. Competitive Environment

The leading application software product vendors in Europe are listed in Exhibit IV-13. United States owned software product companies are strongly represented in this list with seven in the leading ten. These U.S.-owned companies tend to have a relatively strong and growing position in a number of European countries, in contrast to the European vendors who tend to have a significant market only in their own national home base. SAP is the only European multinational application software product vendor operating on the same scale as IBM, Lotus or Computer Associates.

This situation is reflected in the relatively fragmented nature of the market, the leading ten vendors only accounting for some 22% of the total market. However, this sector is gradually becoming more concentrated as acquisitions continue at a rapid pace. All the large independent software vendors listed are active in acquiring smaller vendors. The driving forces are either to gain access to new/popular PC or client/server technology, or to acquire existing channels to market, in order to improve competitive position.

IBM is by far the largest equipment vendor represented in this market. IBM has a range of applications software products developed both internally and by third parties. Digital, despite its position as the second largest equipment vendor to IBM, is not well represented in the applications software products market. Digital's primary application products are cross-industry office based products. In most industry-specific areas, Digital uses third-party independent

vendors to supply applications products; this is notable in the manufacturing sector. In addition, IBM has embarked on an extensive policy of taking minority shareholdings in a number of application software product vendors, for example, QSP, to extend its application coverage in each vertical market.

EXHIBIT IV-36

Leading Vendors Application Software Products Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	Microsoft	U.S.	510	5.2
2	Lotus	U.S.	290	3.0
3	SAP	Germany	260	2.7
4	Computer Associates	U.S.	250	2.6
5	IBM	U.S.	215	2.2
6	Wordperfect	U.S.	185	1.9
7	Olivetti	Italy	125	1.3
8	ICG	France	120	1.2
9	AT&T	U.S.	100	1.0
10	GSI	France	90	0.9
	Total Listed		2,145	21.9
	Total Market		9,800	100.0

The leading pan-European independent software application vendors are largely U.S.-owned - for example, Lotus, which is still reputed to hold 70% of the world market for spreadsheet application products, and Computer Associates (CA) which is the largest independent vendor of both applications and systems software. Products account for almost two-thirds of CA's entire revenues. CA has a strong market position in Europe serving a variety of application areas and providing software products across all of IBM's equipment platforms. Perhaps a significant advantage to CA is its ability to supply both systems and applications products at a computer system installation. CA is renowned for its growth by acquisition strategies.

Microsoft's key application products are MS Word, Excel and the integrated packaged named Works. For Microsoft, applications software product sales are growing faster than systems software products; applications products now account for over 50% of their total revenues.

H

Turnkey Systems

1. Market Overview and Structure

The turnkey market was valued at $12.6 billion for Europe in 1992, and is forecast to grow to $13.0 billion in 1993, a 3% growth rate. INPUT forecasts that this market sector should grow on average at 9% per annum over the period 1993 to 1998, to reach $20 billion in 1998.

Where vendors sell a complete package of equipment and standard software, plus customisation if required and support the complete system themselves, such total solutions are defined by INPUT as turnkey systems.

Mid-range equipment vendors such as Siemens Nixdorf and Digital Kienzle have traditionally specialised in selling such "total solutions" to their clients. Similarly, when independent vendors take title to the equipment, sell and support a comparable package of equipment, standard software and related professional services, they are defined as turnkey vendors. However, many independent vendors selling such total solutions on midrange equipment platforms do not take title to the equipment. They work in conjunction with one or more equipment vendors, leaving it to the equipment vendor to contract, deliver and support the equipment. In these cases, INPUT does not define such sales as turnkey systems, but as component sales of software products and related professional services.

Traditionally, turnkey systems were sold on minicomputers. With the development of PCs during the 1980s, many small business turnkey systems have been developed on PC platforms. As the power of workstations and PCs continues to increase, they are becoming the most important equipment platforms for turnkey systems.

In 1992, the most important equipment platform for European turnkey systems was still the minicomputer, accounting for over 55% of market revenues. PCs and workstations accounted for over 40%, and mainframes had less than 5% of the market.

Turnkey systems do not have the same appeal throughout Europe. In the Mediterranean countries, users tend to prefer bespoke systems, rather than standard applications packaged up as turnkey systems. With the cost of turnkey systems significantly less than equivalent bespoke systems, INPUT sees this attitude as gradually changing during the 1990s as these areas of Europe gain exposure to foreign vendors.

Turnkey systems are sold in virtually every industrial market sector, from health care systems to CAD/CAM packages to motor-trader systems. They can be broadly categorised as:

- small- to medium-sized business systems (accounting, marketing, payroll, general manufacturing)

- specialist vertical or niche market systems (health care, banking, engineering, accounting and dental systems)

2. Market Size and Growth, 1993-1998

Exhibit IV-37 summarises INPUT's market forecasts for the turnkey sector. The overall breakdown for the European turnkey market illustrates how INPUT sees that the value of equipment will decline in typical turnkey systems, from 50% in 1993 to 40% in 1998.

EXHIBIT IV-37

Turnkey Systems Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	6,320	6,490	6,730	5	8,190
Application Software Products	2,830	2,900	3,230	14	5,580
System Software Products	335	350	375	7	490
Professional Services	3,140	3,240	3,590	13	6,040
Total (Rounded)	12,600	13,000	13,900	9	20,300

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-38.

EXHIBIT IV-38

Turnkey Systems Market (ECU) Europe

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	4,990	5,120	5,310	5	6,470
Application Software Products	2,230	2,290	2,550	14	4,410
System Software Products	265	280	295	7	385
Professional Services	2,480	2,560	2,840	13	4,770
Total (Rounded)	10,000	10,300	11,000	9	16,000

Exhibit IV-39 provides a comparative country market analysis across the whole of Europe in U.S. dollars. The German market is the largest country market for turnkey systems in Europe, accounting for some 32% of the total in 1992. The three leading country markets - Germany, France and the U.K. - accounted for 66% of the total European turnkey market in 1991.

EXHIBIT IV-39

Turnkey Systems Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	12,500	13,000	14,000	9	20,500
France	2,050	2,050	2,100	6	2,750
Germany	4,100	4,200	4,600	11	7,200
United Kingdom	2,050	2,000	2,100	7	2,800
Italy	770	770	800	8	1,150
Sweden	390	430	470	9	670
Denmark	320	340	370	6	460
Norway	230	250	265	7	350
Finland	180	190	205	4	230
Netherlands	560	620	670	12	1,100
Belgium	280	310	350	9	490
Switzerland	650	690	750	10	1,100
Austria	310	350	400	11	590
Spain	460	500	560	12	900
Portugal	35	42	49	20	100
Greece	56	63	73	16	135
Ireland	125	145	155	8	210
Central and Eastern Europe	18	22	29	27	72

Exhibit IV-40 shows the same breakdown in ECUs.

3. Market Dynamics

The turnkey systems sector is probably the delivery mode in the software and services sector which has been the most affected by the changes taking place in the industry.

Up until the mid-to late-1980s, there were a large number of proprietary minicomputer manufacturers such as Nixdorf and Kienzle, for whom turnkey systems formed the backbone of their business. Similarly, there were a large number of Value Added Resellers selling turnkey solutions based around the offerings of equipment manufacturers such as Digital, HP, Bull, Wang, and Data General.

EXHIBIT IV-40

Turnkey Systems Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	10,000	10,500	11,000	9	16,000
France	1,600	1,600	1,700	6	2,200
Germany	3,300	3,300	3,600	11	5,700
United Kingdom	1,600	1,600	1,650	7	2,250
Italy	610	610	630	8	890
Sweden	310	330	360	9	520
Denmark	250	270	290	6	370
Norway	180	200	210	7	280
Finland	145	155	165	4	185
Netherlands	450	490	530	12	850
Belgium	225	250	275	9	390
Switzerland	510	550	590	10	880
Austria	245	280	310	11	470
Spain	370	400	450	12	710
Portugal	28	33	39	20	81
Greece	44	50	58	16	105
Ireland	100	115	120	8	170
Central and Eastern Europe	14	17	23	27	5

Many of these have been adversely affected by the move to open systems. In the mid-range computer market, there are now only two standards which are generally acceptable to the marketplace, namely, the IBM AS/400 and UNIX. Even Digital's VAX range seems to have lost credibility as an "industry standard".

UNIX-based applications are increasingly being developed to cater for client/server computing and use graphical user interfaces. Both of these concepts are alien to the application software traditionally found in turnkey systems.

Another effect of UNIX and open systems will be to decouple sales of equipment and application software products, as has already happened in the personal computer market. Hence, turnkey systems for small and medium-sized businesses will increasingly be sold through dealers.

Because of these trends, the future for equipment vendors selling turnkey systems looks most promising where there is a strong link between the software and the equipment used. Examples of such markets include point of service financial and retail sector systems and CAD, where the power and graphics capability of the equipment remains important.

4. Competitive Environment

The leading turnkey system vendors in Europe in 1992 are listed in Exhibit IV-41. It is notable that the six leaders are all equipment vendors. Many of these vendors now categorise this business as "systems integration", whereas, INPUT judges that their low level of customisation fits the turnkey description better. Undoubtedly, these vendors are moving as much of this business as possible into their VAR sales channels, where product and vendor differentiation is stronger.

EXHIBIT IV-41

Leading Vendors Turnkey Systems Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	Siemens-Nixdorf	Germany	1,010	8.0
2	Digital	U.S.	320	2.5
3	Intergraph	U.S.	260	2.1
4	IBM	U.S.	250	2.0
5	ICL (Fujitsu)	U.K.	190	1.5
6	Olivetti	Italy	185	1.5
7	Reuters	U.K.	135	1.1
8	McDonnell Douglas	U.S.	120	1.0
9	Sligos	France	100	0.8
10	Cap Gemini Sogeti	France	95	0.8
	Total Listed		2,665	21.2
	Total Market		12,600	100.0

The equipment vendors, who specialised in turnkey systems, now have to battle on two fronts to stay in the market. Firstly, their equipment has to be competitive in both the PC and workstation markets. Secondly, their application software has to be the equal of anything available from application software product vendors in the PC and UNIX marketplaces.

Accordingly, the turnkey systems sector will continue to be a difficult market for equipment vendors. Rather than develop their own application software products, there will be an increasing trend for equipment vendors to licence access to "best of breed" products for sale on their equipment.

I
Equipment Services

1. Market Overview and Structure

The equipment services market was valued at $21.9 billion in 1992. INPUT has tracked this sector for 15 years in Europe, but this is only the second year in which the market data has been integrated into this software and services report.

In the past, equipment service was a clearly defined set of activities, which related to the after-sales support of proprietary hardware configurations - usually performed by a customer service organisation. Because of this after-care orientation, it had little overlap with other computer services sectors, many of which are associated with the development of new business applications.

Nowadays, customer service organisations, such as third-party maintainers and equipment vendors, are diversifying into many of the other markets addressed in this report. Similarly, some professional software service companies are moving into equipment services.

The equipment services market has been segmented by INPUT into two service sectors for 1992:

- *Hardware Maintenance;* the repair or routine preventive maintenance of computer systems or associated hardware, including associated support activities. This sector includes communications processors but excludes PABX equipment. It includes contracts for combined support of hardware and software.

- *Environmental Services;* contains all service revenues associated with changes to the environment of the computer system platform including computer rooms, cabling, networks, and the buildings containing the systems. It also covers environmental planning and audit services.

2. Market Size and Growth, 1993-1998

The overall market for equipment services in Europe will grow from $21.9 billion in 1992 to an anticipated $22.5 billion in 1993, (i.e., with a small growth rate of 3%). This is in contrast to total information services market growth of 8%.

The customer services vendors are growing their non equipment related service revenues at a slightly higher rate than the market as a whole (i.e., they are slowly increasing their market share). Of the $71 billion of 1993 European services expenditure (excluding all software products), customer services vendors will account for $28.5 billion or 40%.

Exhibits IV-42 on summarise the key expected growth rates of the sector.

EXHIBIT IV-42

Equipment Services Market (Dollars) Europe

Subsector	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	14,700	14,900	15,000	-1	14,100
Environmental Services	7,200	7,600	8,050	6	9,950
Total (Rounded)	21,900	22,500	23,100	1	24,000.L.

Converting expenditures into ECUs from the local currency of each country produces Exhibit IV-43.

EXHIBIT IV-43

Equipment Services Market (ECU) Europe

Subsector	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	11,600	11,800	11,900	-1	11,100
Environmental Services	5,700	6,000	6,350	6	7,850
Total (Rounded)	17,300	17,800	18,200	1	19,000.L.

Exhibit IV-44 provides a comparative country/market analysis across the whole of Europe in U.S. dollars. The German market is the largest country market for equipment services in Europe, accounting for some 21% of the total in 1992. The four leading country markets - Germany, France, the U.K. and Italy - accounted for 68% of the total European equipment services market in 1992.

EXHIBIT IV-44

Equipment Services Comparative Country Markets (Dollars) Europe

Country	U.S. $ Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	22,000	22,500	23,000	1	24,000
France	4,000	4,100	4,200	0	4,200
Germany	4,500	4,700	4,800	-1	4,400
United Kingdom	3,800	3,900	3,900	1	4,000
Italy	2,550	2,550	2,650	1	2,700
Sweden	870	930	980	3	1,100
Denmark	490	520	520	2	560
Norway	450	460	470	2	500
Finland	330	330	330	-3	280
Netherlands	1,400	1,450	1,500	4	1,750
Belgium	630	660	680	3	770
Switzerland	940	960	990	2	1,100
Austria	420	440	440	1	470
Spain	980	1,050	1,100	6	1,400
Portugal	115	125	135	9	190
Greece	46	48	51	5	62
Ireland	105	105	110	1	110
Central and Eastern Europe	205	230	260	14	450

Exhibit IV-45 shows the same breakdown in ECUs.

EXHIBIT IV-45

Equipment Services Comparative Country Markets (ECU) Europe

Country	ECU Million (Rounded)				
	1992	1993	1994	93-98 CAGR (%)	1998
Total (rounded)	17,500	18,000	18,000	1	19,000
France	3,200	3,300	3,300	0	3,300
Germany	3,600	3,700	3,800	-1	3,400
United Kingdom	3,000	3,100	3,100	1	3,200
Italy	2,000	2,050	2,050	1	2,150
Sweden	680	730	770	3	850
Denmark	390	410	410	2	440
Norway	350	360	370	2	390
Finland	265	265	265	-3	225
Netherlands	1,100	1,150	1,200	4	1,400
Belgium	500	520	540	3	610
Switzerland	750	770	780	2	860
Austria	330	340	350	1	370
Spain	780	830	880	6	1,100
Portugal	90	98	105	9	150
Greece	36	38	40	5	49
Ireland	82	85	87	1	89
Central and Eastern Europe	160	180	205	14	360

3. Market Dynamics

Active within this equipment services market are three categories of vendor:

- Customer services vendors:
  - Equipment vendors
  - Independent maintenance vendors
  - Dealers and distributors.

- Independent software and services vendors:

  - Customer Services revenues resulting from indirect equipment sales
  - Focused activities, for example, systems platform level training.

- Non industry vendors:

  - Building and Construction companies providing environmental facilities dedicated to computer installation as part of major construction projects.

  - Specialist building services companies, for example, air conditioning suppliers who also provide installation services

IT-industry vendors account for 78% of user expenditure for equipment services in Europe, the remainder of user expenditure being with non-IT-industry vendors.

Equipment suppliers are expected to maintain their strong presence in equipment maintenance and to increase revenues from other services sector, such as: environmental services, network services, systems integration and systems operations.

4. Competitive Environment

The 1992 equipment maintenance revenues of the leading vendors in Europe are listed in Exhibit II-46.

EXHIBIT IV-46

Leading Vendors Equipment Maintenance Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	2,850	19.4
2	Siemens-Nixdorf	Germany	1,300	8.8
3	Digital	U.S.	1,200	8.2
4	Bull	France	870	5.9
5	ICL (Fujitsu)	U.K.	790	5.4
6	Olivetti	Italy	690	4.7
7	Unisys	U.S.	555	3.8
8	HP	U.S.	555	3.8
9	AT&T	U.S.	505	3.4
10	Thomainfor	France	225	1.5
	Total Listed		9,540	64.9
	Total Market		14,700	100.0

Much progress has been made by the customer services divisions of the major equipment vendors in developing non maintenance revenue streams, but their strong dependence on hardware maintenance revenues remains. For example:

- IBM obtains 29% of its European information services revenues in Europe from hardware maintenance.
- Digital has continued to be successful at developing non maintenance revenues, but is still relying on maintenance for 35% of information services revenues.
- Siemens Nixdorf is the most heavily dependent of the three obtaining about 40% of its information services revenues for equipment maintenance .

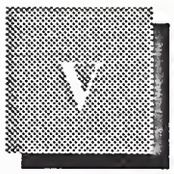
The leading ten equipment vendors between them account for 65% of user expenditure for equipment maintenance in Europe.

The 1992 environmental services revenues of the leading vendors in Europe are listed in Exhibit II-47. Environmental services is a far more fragmented market. These ten leaders had only a 16% market share in 1992. They are typically growing this sector of their business at 20% or 30% per year as they win market share from the smaller traditional vendors and contractors.

EXHIBIT IV-47

Leading Vendors, Environmental Services Europe, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues ($ Millions)	Market Share (Percent)
1	IBM	U.S.	320	4.4
2	Digital	U.S.	225	3.1
3	Unisys	U.S.	130	1.8
4	Bull	France	105	1.5
5	Siemens-Nixdorf	Germany	95	1.3
6	ICL (Fujitsu)	U.K.	75	1.0
7	HP	U.S.	60	0.8
8	Olivetti	Italy	50	0.7
9	Getronics	Netherlands	40	0.6
10	Wang	U.S.	35	0.5
	Total Listed		1,135	15.8
	Total Market		7,200	100.0



Country Market Analysis

A

France - Market Commentary

1. Introduction

France continues to be the largest single market for information services in Europe. In Cap Gemini Sogeti (CGS) France has the only European owned independent professional services company to operate on a world scale.

INPUT forecasts a five year average growth of 6% from FF 127 billion ($24 billion) in 1993 to FF 147 billion ($32 billion) in 1998 for user spending with the information services industry. Growth in 1992 was some 4% below expectations and INPUT's forecast growth has been revised down to reflect the weakening demand, particularly in the areas of professional services, such as contract staff, and turnkey systems.

2. Economic Environment

France's total population in 1992 was 57.37 million, the working population (in 1989) was 24 million (41% female). Its economy ranks only behind that of Germany in terms of size within the EC (European Community). GDP in 1992 at current prices and current exchange rates is estimated by OECD (Organisation for Economic Cooperation and Development) at US$ 1,325 billion, about 17% of OECD European members' total GDP.

Traditional strengths in agriculture and wine making have been augmented by leadership in nuclear power for electricity production and high-speed trains, and by significant positions in defence, aeronautics, space, automobile and telecommunications industries.

A founder member of the EC, 60% of all exports go to other Community countries and this figure has been increasing over the years.

Whilst French postwar regeneration was associated with central planning and direction, the late 1980s saw a less dirigiste philosophy which has encouraged a more dynamic approach. Of recent years, takeovers have tended to increase the French penetration of the upper levels of top 500 companies in Europe as identified by the Financial Times (the FT 500). The aggregate market value of French members of this league table is about the same as that of German members. In 1993, the French government announced plans to sell much of the state's stake in nationalised companies, including Groupe Bull.

GDP growth was slightly higher in 1992 (1.3%) than in 1991 (0.7%) largely because of export activity. There was an increase in the unemployment rate (to 10.2% from 9.5%) and this measure was in line with EC average. Inflation (2.4%) was below average for the OECD (3.5%), and Germany (4.0%). The current account moved into the black for the first time since 1986.

Forecasts of performance indicate growth at a modest level (1.2% in 1994) but not before a further recession in 1993 (-1.0%.) However, the recent good export performance is not expected to continue in a generally poor market and the current account is expected to go into deficit. Inflation is expected to hold steady at around 2.5%.

Economists are guarded in their view of prospects for the French economy in spite of recent improvements, given sluggish home demand and continued dependence on international trade.

3. Information Services Industry

The French market is the largest national market for information services (which now includes equipment services) in Europe and represents some 22% of the total European market. INPUT estimates that in 1992 the French market reached a total of $23 billion (ECU 18 billion) and that it will grow by 5% (including inflation) to exceed $24 billion (ECU 19 billion) in 1993. This rate represents a significant slowdown from the historic perspective over the last decade when an average annual growth of 24% measured in current currency (i.e., including inflation) was achieved.

Exhibit V-1 shows the information services industry analysis for France. Market sectors that can be considered independent of the type industry are identified separately in this table. So, for example, systems software and equipment services are not included in the industry sector market sizes, but are listed under generic markets.

EXHIBIT V-1

Information Services Industry Analysis France, 1993

Market Sector	Market Size (FF Millions)	Percent Of Total
Total Information Services	127,000	100
Industry Sectors Total	76,500	60
Discrete Manufacturing	10,900	9
Process Manufacturing	5,900	5
Transportation	4,800	4
Utilities	3,550	3
Telecommunications	3,650	3
Retail Distribution	2,450	2
Wholesale Distribution	3,300	3
Banking & Finance	14,100	11
Insurance	4,750	4
Healthcare	3,450	3
Education	1,380	1
Local Government	5,800	5
Central Government	6,050	5
Business Services	4,050	3
Other Industries	2,250	2
Cross-Industry Sectors Total	9,500	7
Accounting	1,700	1
Education & Training	145	< 1
Engineering & Scientific	500	< 1
Human Resources	500	< 1
Office Systems	1,850	1
Planning & Analysis	1,650	1
Other Cross-Industry	350	< 1
Cross-Industry Sectors Total	9,500	7
Generic Sectors Total	40,920	32
Equipment Services	21,600	17
System Software Products	16,000	13
Utility and Other Processing	1,150	1
Other Electronic Info Services	2,170	2

As can be seen from Exhibit V-2, INPUT forecasts that market growth over the next five years is expected to average only 6% per annum. Although the overall economic climate is expected to improve over the five-year period, the desire among buyers of software and services for better value for money will limit any return to higher growth rates.

Exhibit V-2 also provides an analysis of the French market divided into the nine separate delivery modes identified by INPUT. Short term growth has been revised down since the 1992 report for all sectors except systems operations. Only systems integration is expected to grow faster in the longer term.

EXHIBIT V-2

Software and Services Market France, 1993-1998

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	36,400	38,300	39,400	2	42,600
Systems Integration	4,750	5,600	6,750	21	14,500
Systems Operations	2,850	3,300	3,750	19	7,900
Processing Services	8,800	9,000	9,100	2	9,950
Network Services	6,700	7,720	8,850	18	17,580
SystemSoftware Products	15,200	16,000	16,700	5	20,300
Application Software Products	14,400	14,700	15,000	6	19,900
Turnkey Systems	10,660	10,740	11,140	6	14,560
Equipment Services	21,100	21,600	21,900	0	21,900
Total (rounded)	121,000	127,000	132,500	6	169,000
Total (excluding Equipment Services)	100,000	105,000	111,000	7	147,000

Exhibits V-3 onward provide market analysis and forecasts for each of the nine separate delivery modes and their respective submodes.

Relative to the overall European information services market, professional services represents some 32% of the total French market as opposed to 23% for the whole of Europe. The French market thus accounts for nearly one third of the total European professional services market. French professional services vendors, notably CGS, are strongly represented in the professional services markets of other countries. However this sector is the one under most threat from changing demands for custom software and has seen growth predictions more than halved in the last two years.

The three main professional services subsectors grew more slowly than expected as spending on consulting, training and contract development staff was restrained by financial cutbacks.

Applications management and maintenance, a small subsector of professional services, has grown rapidly in popularity over the last three years as vendors offer to support users' in-house-developed operational software.

One of the strongest observable general trends in France is towards the delivery by vendors of more complete solutions and away from purpose built customised application building. Consequently, strong growth (though lower than in previous forecasts) is expected in the systems integration market and in the applications software products market.

The most significant fall in forecast growth rates has been in the subsector of PC\workstation application software products. This has been revised down two years running from a very optimistic 1991 forecast of 26% CAGR to a more critical 10% this year. Applications software is experiencing strong price competition, so the market value is not increasing as fast as unit deliveries might suggest.

EXHIBIT V-3

Professional Services Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	4,000	4,350	4,650	7	6,050
Education & Training	3,150	3,350	3,520	5	4,230
Software Development	29,100	30,400	31,000	1	31,400
Application Management	150	200	250	37	950
Total (rounded)	36,400	38,300	39,400	2	42,600

EXHIBIT V-4

Systems Integration Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	1,300	1,450	1,700	17	3,150
Application Software Products	850	1,000	1,400	39	5,200
SystemSoftware Products	380	450	530	17	1,000
Professional Services	2,100	2,600	3,000	13	4,700
Other Services	100	100	135	34	440
Total (rounded)	4,750	5,600	6,750	21	14,500

EXHIBIT V-5

Systems Operations Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	1,530	1,750	1,890	18	4,010
Application Operations	1,170	1,350	1,610	19	3,200
Desktop Services	155	200	255	28	690
Total (rounded)	2,850	3,300	3,750	19	7,900

EXHIBIT V-6

Processing Services Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	7,700	7,850	7,850	1	8,300
Utility Processing	350	355	350	0	355
Other Processing	710	795	890	10	1,305
Total (rounded)	8,800	9,000	9,100	2	9,950

EXHIBIT V-7

Network Services Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	3,900	4,350	4,700	9	6,650
Network Applicaitons	2,225	2,670	3,300	28	9,130
Network Management	575	700	850	21	1,800
Total (rounded)	6,700	7,720	8,850	18	176,580

EXHIBIT V-8

System Software Products Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	6,750	6,800	6,750	-3	5,600
Minicomputer	5,000	5,150	5,250	3	5,900
Workstation and PC	3,450	4,050	4,700	17	8,800
Total (rounded)	15,200	16,000	16,700	5	20,300

EXHIBIT V-9

Application Software Products Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	1,100	1,000	890	-9	600
Minicomputer	4,850	4,300	3,860	-1	3,950
Workstation and PC	8,450	9,400	10,250	10	15,350
Total (rounded)	14,400	14,700	15,000	6	19,900

EXHIBIT V-10

Turnkey Systems Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	5,350	5,500	5,650	4	6,600
Application Software Products	2,500	2,400	2,550	9	3,750
System Software Products	170	180	190	6	240
Professional Services	2,650	2,600	2,750	9	4,000
Total (rounded)	10,660	10,740	11,140	6	14,560

EXHIBIT V-11

Equipment Services Market, France

	FF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	14,500	14,700	14,700	-1	13,100
Environmental Services	6,600	6,900	7,250	5	8,800
Total (rounded)	21,100	21,600	21,900	0	21,900

4. Competitive Environment

Historically the larger French vendors of information services (for example Sligos, GSI, CGI, SG2 and Steria, in addition to CGS) have been highly successful in creating a strong indigenous French industry. This is in stark contrast to the computer systems market where Bull, the state aided computer systems manufacturer continues to face major challenges in its traditional product markets.

Exhibit V-12 lists the leading 30 vendors in the French software and services market in 1992. The high proportion of these vendors in French ownership is clear from the Exhibit. Eight companies listed are of U.S. origin. This is one less than in 1991. France is the only European country to maintain such a strong national presence in its home market.

CGS experienced substantial falling revenues in France during 1992 and posted its first ever (small) loss. Plans for further global expansion attracted Daimler Benz to take a 34% share in CGS holding company Sogeti. With the German industrial giant suffering from the economic recession it is likely that other financial partners will be needed to fund the group's organic and acquisition-based growth strategies.

EXHIBIT V-12

Leading Vendors, Software and Services France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (FF Millions)	Market Share (Percent)
1	IBM	U.S.	6,550	6.5
2	Cap Gemini Sogeti	France	3,500	3.5
3	Axime	France	2,100	2.1
4	Sligos	France	1,950	2.0
5	Groupe Bull	France	1,900	1.9
6	FTLIS [Telecom]	France	1,750	1.8
7	GSI	France	1,750	1.8
8	EDS-GFI	U.S.	1,550	1.6
9	Microsoft	U.S.	1,500	1.5
10	Sema Group	France	1,450	1.5
11	Syseca [Thomson]	France	1,450	1.5
12	Reuters	U.K.	1,400	1.4
13	Digital	U.S.	1,400	1.4
14	CGI	France	1,300	1.3
15	SG2	France	1,000	1.0
16	Steria	France	900	0.9
17	Computer Associates	U.S.	860	0.9
18	Alcatel TiTN	France	800	0.8
19	AT&T	France	785	0.8
20	CISI	France	785	0.8
21	Sopra	France	765	0.8
22	ISE International	France	750	0.8
23	Andersen Consulting	U.S.	740	0.7
24	Unilog	France	660	0.7
25	Oracle	U.S.	580	0.6
26	CCMC-Managix	France	570	0.6
27	Unisys	U.S.	555	0.6
28	IBSI	France	530	0.5
29	Altran	France	485	0.5
30	Siemens-Nixdorf	Germany	480	0.5
	Total Listed		40,945	40.9
	Total Market		100,000	100.0

* Software and services excludes equipment services

One of the most interesting developments in the French industry has been Sogeti's move into management consultancy with the formation, through acquisitions, of Gemini Consulting. CGS and Gemini are managed separately, but the objective is to build business of mutual interest. Synergy between CGS and Gemini Consulting is reported to be growing, with Gemini identifying a wide range of business process re-engineering opportunities.

In 1993, IBM France acquired majority interests in CGI and Axone as it extends its capabilities in the software and services market. CGI is probably best known for its internationally marketed PACbase CASE tools. Axone was previously a joint venture with Sema which has single-mindedly built a strong systems operations business in France.

The remaining exhibits list the leading vendors in each of the separately defined delivery modes including separate vendor analyses within the network services area for electronic information services and network application services.

Equipment services are also shown as two separate lists—equipment maintenance vendors and environmental services vendors. Exhibit V-13 shows the full information services revenue leaders in France, accounting for all software, services and maintenance revenues of these vendors.

EXHIBIT V-13

Leading Vendors, Professional Services France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	2,000	5.5
2	IBM	U.S.	1,280	3.5
3	Sema Group	France	920	2.5
4	Syseca [Thomson]	France	890	2.4
5	Axime	France	835	2.3
6	CGI	France	820	2.3
7	Unilog	France	585	1.6
8	FTLIS [Telecom]	France	565	1.6
9	Andersen Consulting	U.S.	490	1.3
10	Altran	France	470	1.3
	Total Listed		8,855	24.3
	Total Market		36,400	100.0

EXHIBIT V-14

Leading Vendors, Systems Integration France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Cap Gemini Sogeti	France	1,000	21.1
2	IBM	U.S.	745	15.7
3	Andersen Consulting	U.S.	340	7.2
4	Sema Group	France	340	7.2
5	EDS-GFI	U.S.	250	5.3
6	Syseca [Thomson]	France	240	5.1
7	Groupe Bull	France	190	4.0
8	Digital	U.S.	170	3.6
9	Alcatel ISR	France	160	3.4
10	Axime	France	120	2.5
	Total Listed		3,555	74.8
	Total Market		4,750	100.0

EXHIBIT V-15

Leading Vendors, Systems Operations France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	EDS-GFI	U.S.	600	21.1
2	GSI	France	350	12.3
3	FTLIS [Telecom]	France	280	9.8
4	Axone	France	240	8.4
5	SG2	France	185	6.5
6	AT&T	France	165	5.8
7	Sligos	France	150	5.3
8	CISI	France	145	5.1
9	Euriware	France	90	3.2
10	Axime	France	90	3.2
	Total Listed		2,295	80.5
	Total Market		2,850	100.0

EXHIBIT V-16

Leading Vendors, Processing Services France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Sligos	France	805	9.1
2	Axime	France	585	6.6
3	FTLIS [Telecom]	France	370	4.2
4	GSI	France	340	3.9
5	Inforsud	France	200	2.3
6	SG2	France	170	1.9
7	CCMC-Managix	France	170	1.9
8	Cegedim	France	130	1.5
9	ISE International	France	120	1.4
10	IBM	U.S.	120	1.4
	Total Listed		3,010	34.2
	Total Market		8,800	100.0

EXHIBIT V-17

Leading Vendors, Network Application Services France 1992

Rank	Vendor	Country of Origin	Esimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Infonet	Belgium	230	10.3
2	SG2	France	205	9.2
3	GSI	France	195	8.8
4	Sligos	France	195	8.8
5	AT&T	France	180	8.1
6	FTLIS [Telecom]	France	130	5.8
7	Groupe Bull	France	105	4.7
8	GEIS	U.S.	90	4.0
9	IBM	U.S.	80	3.6
10	Axime	France	65	2.9
	Total Listed		1,475	66.3
	Total Market		2,250	100.0

EXHIBIT V-18

Leading Vendors, Electronic Information Services France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Reuters	U.K.	1,090	27.9
2	DAFSA	U.S.	300	7.7
3	Telerate	U.S.	245	6.3
4	Dun & Bradstreet	U.S.	210	5.4
5	FTLIS [Telecom]	France	150	3.8
6	Citicorp	U.S.	110	2.8
7	Mead	U.S.	65	1.7
8	Telekurs	Switzerland	30	0.8
9	Lotus	U.S.	10	0.3
10	Extel	U.K.	5	0.1
	Total Listed		2,215	56.8
	Total Market		3,900	100.0

EXHIBIT V-19

Leading Vendors, System Software Products France 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	3,800	25.0
2	Groupe Bull	France	1,050	6.9
3	Microsoft	U.S.	860	5.7
4	Digital	U.S.	515	3.4
5	Oracle	U.S.	445	2.9
6	Computer Associates	U.S.	405	2.7
7	Novell	U.S.	330	2.2
8	CGI	France	275	1.8
9	Unisys	U.S.	220	1.4
10	ISE International	France	200	1.3
	Total Listed		8,100	53.3
	Total Market		15,200	100.0

EXHIBIT V-20

Leading Vendors, Application Software Products France 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Microsoft	U.S.	590	4.1
2	ISE International	France	420	2.9
3	Lotus	U.S.	385	2.7
4	Sopra	France	350	2.4
5	GSI	France	325	2.3
6	Computer Associates	U.S.	300	2.1
7	Fininfor	France	240	1.7
8	CCMC-Managix	France	230	1.6
9	IBM	U.S.	210	1.5
10	Steria	France	175	1.2
	Total Listed		3,225	22.4
	Total Market		14,400	100.0

EXHIBIT V-21

Leading Vendors, Turnkey Systems France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	Sligos	France	380	3.6
2	Axime	France	295	2.8
3	Siemens-Nixdorf	Germany	270	2.5
4	IBM	U.S.	250	2.3
5	Digital	U.S.	230	2.2
6	Syseca [Thomson]	France	220	2.1
7	Alcatel TiTN	France	190	1.8
8	CISI	France	175	1.6
9	Cap Gemini Sogeti	France	155	1.5
10	Intergraph	U.S.	150	1.4
	Total Listed		2,315	21.7
	Total Market		10,660	100.0

EXHIBIT V-22

Leading Vendors, Equipment Maintenance France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	2,700	18.6
2	Groupe Bull	France	2,250	15.5
3	Thomson	France	970	6.7
4	Digital	U.S.	900	6.2
5	Siemens-Nixdorf	Germany	685	4.7
6	HP	U.S.	475	3.3
7	AT&T	France	425	2.9
8	Unisys	U.S.	420	2.9
9	Olivetti	Italy	395	2.7
10	Wang	U.S.	235	1.6
	Total Listed		9,455	65.2
	Total Market		14,500	100.0

EXHIBIT V-23

Leading Vendors, Environmental Services France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	280	4.2
2	Groupe Bull	France	215	3.3
3	Digital	U.S.	210	3.2
4	Unisys	U.S.	210	3.2
5	TASQ	France	55	0.8
6	HP	U.S.	50	0.8
7	Wang	U.S.	45	0.7
8	Siemens-Nixdorf	Germany	30	0.5
9	Olivetti	Italy	30	0.5
10	Rank Xerox	U.K.	30	0.5
	Total Listed		1,155	17.5
	Total Market		6,600	100.0

EXHIBIT V-24

Leading Vendors, Information Services France, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (FF Millions)	Market Share (Percent)
1	IBM	U.S.	9,600	7.9
2	Groupe Bull	France	4,760	3.9
3	Cap Gemini Sogeti	France	3,460	2.9
4	Digital	U.S.	2,560	2.1
5	Axime	France	2,090	1.7
6	Sligos	France	2,010	1.7
7	EDS-GFI	U.S.	1,740	1.4
8	GSI	France	1,710	1.4
9	Microsoft	U.S.	1,480	1.2
10	Syseca [Thomson]	France	1,460	1.2
11	Reuters	U.K.	1,420	1.2
12	AT&T	France	1,330	1.1
13	CGI	France	1,300	1.1
14	Sema Group	France	1,260	1.0
15	Siemens-Nixdorf	Germany	1,210	1.0
16	Thomson	France	1,200	1.0
17	Unisys	U.S.	1,190	1.0
18	Olivetti	Italy	1,070	0.9
19	SG2	France	1,010	0.8
20	Andersen Consulting	U.S.	920	0.8
21	Computer Associates	U.S.	860	0.7
22	HP	U.S.	830	0.7
23	CISI	France	810	0.7
24	Oracle	U.S.	560	0.5
25	Prime	U.S.	440	0.4
26	ICL	U.K.	420	0.3
27	Lotus	U.S.	400	0.3
28	Wang	U.S.	390	0.3
29	Rank Xerox	U.K.	380	0.3
30	Dun & Bradstreet	U.S.	380	0.3
	Total Listed		48,250	39.9
	Total Market		121,000	100.0

B

Germany - Market Commentary

1. Introduction

Germany now has by far the largest population in Western Europe following the integration of 16 million East Germans in 1990. Germany was a founding member of the European Community (EC).

The information services market (including equipment maintenance) is the second largest in Europe, with a total value of DM30 billion ($20 billion or ECU 15 billion) in 1991.

2. Economic Environment

The population of Germany, including the 11 Länder of the former West and the five of the former DDR, was 80.7 million and the work force approximately 38 million (42% female.)

GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 1,775 billion, about 23% of OECD European members' total GDP.

The accession of the old East was marked by undertakings to raise living standards within a short time and to implement BRD fiscal\commercial laws in the old DDR, with consequent privatisation of many former State enterprises. The East German Mark was given parity with the D.Mark.

Unification created a boom as infrastructure projects sucked in goods from the old West (and from the rest of Europe.) But 1992 saw the end of the boom and the effects of the strains imposed by reunification.

The recession started in Germany in the middle of 1992, and although GDP growth for the year was positive, it was down on 1991. (2.0% compared with 3.7%.) The trend is apparent in the forecast decline in 1993 (-1.5%.)

The principal strength of the economy has been its manufacturing base particularly in sectors such as engineering and chemicals, with companies such as Diamler-Benz, Volkswagen, Siemens, BASF, Bayer and Hoechst. The strength of these sectors is reflected in their spending on information services shown in Exhibit V-25. However the manufacturing sector is clearly one of the hardest hit by recession, resulting generally in reducing spending except in the outsourcing of systems operations and processing services.

EXHIBIT V-25

Information Services Industry Analysis Germany, 1993

Market Sector	Market Size (DM Millions)	Percent Of Total
Total Information Services	32,700	100
Industry Sectors	17,800	54
Discrete Manufacturing	3,555	11
Process Manufacturing	1,580	5
Transportation	765	2
Utilities	415	1
Telecommunications	390	1
Retail Distribution	630	2
Wholesale Distribution	835	3
Banking & Finance	3,830	12
Insurance	1,445	4
Healthcare	895	3
Education	255	1
Local Government	740	2
Central Government	940	3
Business Services	855	3
Other Industries	745	2
Cross-Industry Sectors Total	1,700	5
Accounting	165	1
Education & Training	16	< 1
Engineering & Scientific	40	< 1
Human Resources	50	< 1
Office Systems	190	1
Planning & Analysis	155	< 1
Other Cross-Industry	29	< 1
Cross-Industry Sectors Total	1,700	5
Generic Sectors Total	13,200	40
Equipment Services	7,250	22
System Software Products	5,100	16
Utility and Other Processing	430	1
Other Electronic Info Services	435	1

Inflation at 4.0% exceeded the OECD average as money supply expanded as a result of re-unification commitments. A policy of high interest rates tended to increase pressure on manufacturing companies already affected by falling demand, both internal and external, and by high payroll costs. Germany leads the league of industrial nations for labour rates, partly through its wage rates but also through the 86% additional employers contributions.

Action by the Bundesbank has resulted in the lowering of interest rates, and by the Federal Government to the easing of certain burdens on industry, notably in corporation tax and labour legislation. The outlook is still uncertain, however. Inflation is forecast above the OECD average for 1993 but to decline in 1994, while unemployment is set to remain at around 8%. A current account deficit of around 1% of GDP will continue. Modest GDP growth of 1.0% is expected in 1994.

3. Information Services Industry

The German information services market is the second largest market in Europe, as shown in Exhibit V-26.

EXHIBIT V-26

Software and Services Market, Germany, 1993-1998

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	5,100	5,100	5,250	3	6,000
Systems Integration	955	1,100	1,245	13	2,025
Systems Operations	310	385	460	22	1,030
Processing Services	2,400	2,420	2,580	10	3,820
Network Services	1,410	1,550	1,770	17	3,440
System Software Products	4,900	5,100	5,360	5	6,460
Application Software Products	3,030	3,350	3,850	17	7,260
Turnkey Systems	6,430	6,530	7,070	11	11,130
Equipment Services	7,050	7,250	7,400	0	6,790
Total (rounded)	31,500	33,000	35,000	8	48,000
Total (excluding Equipment Services)	24,500	25,500	27,600	10	41,200

INPUT estimates that in 1993 the market will total DM 33 billion ($21 billion or ECU 17 billion), growing at an average of 8% per annum to DM 48 billion ($31 billion or ECU 24 billion) by 1998. The development of East Germany is not foreeast to significantly increase growth rates for information services in the short-term. However, expenditure will increasingly become more widely distributed throughout the whole of the country.

Professional services adopt a lower profile in Germany compared to the other major European national markets. As elsewhere the use of contract labour (body-shopping) has been severely curtailed, reducing the custom software subsector growth from a forecast 11% to an actual 3% in 1992.

Another delivery mode where Germany lags behind the European average is systems operations. This should not be surprising since Germany has traditionally shown a strong aversion to outsourcing across much of its industry which has preferred to manufacture its own components rather than purchase them from subcontractors. In 1992 this aversion changed and the systems operations market grew rapidly. It is now clear that outsourcing is becoming an accepted business practice in Germany.

INPUT has re-assessed the level of systems integration business claimed by vendors in Germany. As a result, the market size has been revised down overall, and the software product content increased. The long-term forecast growth has also been reduced to 14% as a result of the poor economic outlook and the likely impact on major projects.

Led by vendors such as Siemens Nixdorf Informations systemes, Digital Kienzle, and Taylorix, the German market has always had a strong emphasis on turnkey systems. Competitive pricing and recessionary pressures led to 4% lower growth than INPUT forecast for 1992. The longer term forecast CAGR has been revised down from 13% last year to 9% to reflect this dampening of market demand. There is a large element of professional service in the turnkey sector in Germany.

Detailed local currency forecasts of the components making up each delivery mode are shown in Exhibit V-27 onward for Germany for the period 1992-1997.

EXHIBIT V-27

Professional Services Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	750	825	905	10	1,310
Education & Training	1,000	1,050	1,100	5	1,320
Software Development	3,340	3,200	3,220	1	3,310
Application Management	12	23	28	23	65
Total (rounded)	5,100	5,100	5,250	3	6,000

EXHIBIT V-28

Systems Integration Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	260	300	320	7	425
Application Software Products	170	200	255	30	730
System Software Products	75	90	95	9	140
Professional Services	430	490	550	6	670
Other Services	20	20	25	25	60
Total (rounded)	955	1,100	1,245	13	2,025

EXHIBIT V-29

Systems Operations Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	150	180	215	22	485
Application Operations	100	125	150	22	335
Desktop Services	60	80	95	21	210
Total (rounded)	310	385	460	22	1,030

EXHIBIT V-30

Processing Services Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	2,010	1,990	2,100	9	3,070
Utility Processing	110	110	110	0	110
Other Processing	280	320	365	15	640
Total (rounded)	2,400	2,420	2,580	10	3,820

EXHIBIT V-31

Network Services Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	1,050	1,090	1,130	3	1,260
Network Applications	230	305	450	42	1,780
Network Management	130	155	190	21	400
Total (rounded)	1,410	1,550	1,770	17	3,440

EXHIBIT V-32

System Software Products Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	2,450	2,440	2,430	-6	1,690
Minicomputer	1,450	1,490	1,550	5	1,940
Workstation and PC	1,000	1,170	1,380	19	2,830
Total (rounded)	4,900	5,100	5,360	5	6,460

EXHIBIT V-33

Application Software Products Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	430	410	390	-2	355
Minicomputer	980	1,030	1,210	16	2,145
Workstation and PC	1,620	1,910	2,250	20	4,760
Total (rounded)	3,030	3,350	3,850	17	7,260

EXHIBIT V-34

Turnkey Systems Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	3220	3220	3280	3	3810
Application Software Products	1,515	1,565	1,800	18	3,545
System Software Products	90	90	95	5	115
Professional Services	1,605	1,655	1,895	17	3,660
Total (rounded)	6,430	6,530	7,070	11	11,130

EXHIBIT V-35

Equipment Services Market, Germany

	DM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	4,750	4,800	4,800	-4	3,800
Environmental Services	2,300	2,450	2,600	4	2,990
Total (rounded)	7,050	7,250	7,400	0	6,790

4. Competitive Environment

Exhibit V-36 lists the top thirty vendors in the German software and services market during 1992. It is compiled using only the information services revenues attributable to the domestic market within Germany excluding exports and excluding revenues from within any parent group companies.

As in nearly every European country, IBM leads in software and services revenues. However, in Germany, it is matched by Siemens-Nixdorf Informationsysteme (SNI) which was formally constituted on October lst, 1990 following Siemens' earlier acquisition of a majority stake in Nixdorf Computer AG. Both vendors generated significant revenues from the newly merged eastern regions of Germany, particularly in the public administration sector (regional and local government).

IBM, SNI and Digital have all made recent announcements of major staff reductions and plant closures. Employment practices in Germany mitigate against laying off staff. This seems to have slowed difficult decisions on the downsizing of the equipment vendors operations. All these vendors have been re-deploying staff into services roles, but this has not reduced their cost base fast enough to meet the new market conditions profitably.

Datev, the third largest software and services vendor in Germany, is a co-operative owned by German accountants and tax specialists, which provides software products and processing services to support specialists in these fields. It achieved over 20% growth in 1992.

EXHIBIT V-36

Leading Vendors, Software and Services Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector* Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	2,620	10.7
2	Siemens-Nixdorf	Germany	1,900	7.8
3	Datev	Germany	845	3.4
4	Cap debis	Germany	610	2.5
5	Digital	U.S.	575	2.3
6	Microsoft	U.S.	485	2.0
7	SAP	Germany	475	1.9
8	Reuters	U.K.	440	1.8
9	Computer Associates	U.S.	285	1.2
10	Compunet Computer	Germany	275	1.1
11	Andersen Consulting	U.S.	220	0.9
12	Fiducia	Germany	220	0.9
13	Alldata	Germany	210	0.9
14	Ploenzke-Gruppe	Germany	200	0.8
15	Software AG	Germany	185	0.8
16	ESG-FEG	Germany	170	0.7
17	Taylorix	Germany	165	0.7
18	EDS	U.S.	165	0.7
19	Intergraph	U.S.	160	0.7
20	Bull	France	155	0.6
21	Olivetti	Italy	150	0.6
22	Softlab	Germany	135	0.6
23	HP	U.S.	125	0.5
24	Unisys	U.S.	125	0.5
25	PDV-Gruppe	Germany	125	0.5
26	Novell	U.S.	119	0.5
27	Oracle	U.S.	119	0.5
28	AT&T	U.S.	111	0.5
29	mbp [EDS]	Germany	110	0.4
30	Lotus	U.S.	108	0.4
	Total Listed		11,587	47.3
	Total Market		24,500	100.0

* *Software and services excludes equipment services*

SAP is a uniquely successful European vendor. It established itself during the 1980s as the largest and fastest growing European application software products vendor. It dominates the market for accounting and production management applications based on mainframe architectures in Germany.

However, the company has also recognised the changes taking place in its marketplace, particularly the moves to downsizing and open systems, and has modified its strategy and product development programme accordingly. A new product, R/3, based on UNIX-based equipment and initially aimed at medium-sized organisations, was launched in 1992. A further initiative from SAP is to encourage processing services vendors to offer their software as a service known as "SAP outsourcing". This is expected to give the processing services market new growth.

The conservative German market remains a difficult one for foreign software products companies to penetrate. While this is particularly true for commercial applications software products, vendors of technical products, such as the CAD vendors Intergraph and Computervision, have met with greater success. Germany remains the largest national market for Intergraph across Europe.

Software AG is the only European software product vendor to appear in the top thirty leading vendors in Europe with an established global market presence. Originally best known for its mainframe ADABAS database products, recent product launches have positioned it to carry forward a worldwide user base into the realms of client/server and open systems computing.

Cap Gemini Sogeti has strengthened its position in Germany over the last year with its 49% share in CAP debis. This joint venture with Daimler-Benz took effect in 1992. CAP debis still receives a large proportion of its business from its German parent group, and has been diversifying externally to counter the severe losses being experienced in the car industry.

The leading vendors in Germany for each of INPUT's delivery modes are listed in Exhibits V-37 onwards. Equipment services are shown as two separate lists - equipment maintenance vendors and environmental services vendors. The Exhibit V-47 shows the leaders in terms of full information services revenue in Germany, combining all the revenues in the previous exhibits.

EXHIBIT V-37

Leading Vendors, Professional Services Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	530	10.4
2	Cap debis	Germany	290	5.7
3	SAP	Germany	190	3.7
4	Ploenzke-Gruppe	Germany	170	3.3
5	ESG-FEG	Germany	160	3.1
6	Digital	U.S.	145	2.8
7	Siemens-Nixdorf	Germany	140	2.7
8	Datev	Germany	120	2.4
9	PDV-Gruppe	Germany	90	1.8
10	Integrata	Germany	90	1.8
	Total Listed		1,925	37.7
	Total Market		5,100	100.0

EXHIBIT V-38

Leading Vendors, Systems Integration Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	180	18.8
2	Siemens-Nixdorf	Germany	150	15.7
3	Cap debis	Germany	75	7.9
4	Digital	U.S.	70	7.3
5	Andersen Consulting	U.S.	55	5.8
6	Bull	France	50	5.2
7	EDS	U.S.	45	4.7
8	CGS	France	40	4.2
9	Ploenzke-Gruppe	Germany	30	3.1
10	Rank Xerox	U.K.	20	2.1
	Total Listed		715	74.9
	Total Market		955	100.0

EXHIBIT V-39

Leading Vendors, Systems Operations Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Cap debis	Germany	90	29.0
2	EDS	U.S.	80	25.8
3	Alldata	Germany	25	8.1
4	Digital	U.S.	25	8.1
5	tds	Germany	20	6.5
6	Fiducia	Germany	10	3.2
7	AC Service [Raet]	Netherlands	9.5	3.1
8	Telekom	Germany	9	2.9
9	Datev	Germany	8.5	2.7
10	CSC	U.S.	8	2.6
	Total Listed		285	91.9
	Total Market		310	100.0

EXHIBIT V-40

Leading Vendors, Processing Services Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Datev	Germany	595	24.8
2	Fiducia	Germany	145	6.0
3	IBM	U.S.	110	4.6
4	Alldata	Germany	95	4.0
5	Cap debis	Germany	90	3.8
6	RRZ	Germany	60	2.5
7	Info AG	Germany	45	1.9
8	Telekurs	Switzerland	30	1.3
9	Taylorix	Germany	30	1.3
10	AC Service [Raet]	Netherlands	25	1.0
	Total Listed		1,225	51.0
	Total Market		2,400	100.0

EXHIBIT V-41

Leading Vendors, Network Application Services Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Telekom	Germany	60	26.1
2	IBM	U.S.	40	17.4
3	Cap debis	Germany	30	13.0
4	Digital	U.S.	20	8.7
5	AT&T	U.S.	15	6.5
6	Infonet	Belgium	10	4.3
7	GSI	France	10	4.3
8	GEIS	U.S.	10	4.3
9	Ikoss [Sligos]	Germany	10	4.3
10	Bull	France	5	2.2
	Total Listed		210	91.3
	Total Market		230	100.0

EXHIBIT V-42

Leading Vendors, Electronic Information Services Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Reuters	U.K.	335	31.9
2	Telerate	U.S.	75	7.1
3	Bertelsmann	Germany	60	5.7
4	Genios	Germany	60	5.7
5	VWD	Germany	60	5.7
6	Dun & Bradstreet	U.S.	40	3.8
7	Telekurs	Switzerland	35	3.3
8	Info AG	Germany	15	1.4
9	Mead	U.S.	10	1.0
10	STN	Germany	5	0.5
	Total Listed		695	66.2
	Total Market		1,050	100.0

EXHIBIT V-43

Leading Vendors, System Software Products Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	1,560	31.8
2	Siemens-Nixdorf	Germany	565	11.5
3	Microsoft	U.S.	280	5.7
4	Digital	U.S.	205	4.2
5	Software AG	Germany	150	3.1
6	Computer Associates	U.S.	135	2.8
7	Novell	U.S.	120	2.4
8	Oracle	U.S.	95	1.9
9	Borland	U.S.	90	1.8
10	Softlab	Germany	75	1.5
	Total Listed		3,275	66.8
	Total Market		4,900	100.0

EXHIBIT V-44

Leading Vendors, Application Software Products Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	SAP	Germany	280	9.2
2	Microsoft	U.S.	195	6.4
3	Lotus	U.S.	105	3.5
4	Compunet Computer	Germany	100	3.3
5	Computer Associates	U.S.	100	3.3
6	IBM	U.S.	90	3.0
7	KHK	Germany	70	2.3
8	Datev	Germany	70	2.3
9	Strassle	Germany	60	2.0
10	mbp [EDS]	Germany	35	1.2
	Total Listed		1,105	36.5
	Total Market		3,030	100.0

EXHIBIT V-45

Leading Vendors, Turnkey Systems Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Siemens-Nixdorf	Germany	1,035	16.1
2	Intergraph	U.S.	130	2.0
3	Taylorix	Germany	105	1.6
4	IBM	U.S.	105	1.6
5	Compunet Computer	Germany	100	1.6
6	Digital	U.S.	90	1.4
7	mbp [EDS]	Germany	65	1.0
8	Ikoss [Sligos]	Germany	45	0.7
9	Reuters	U.K.	45	0.7
10	GMO	Germany	25	0.4
	Total Listed		1,745	27.1
	Total Market		6,430	100.0

EXHIBIT V-46

Leading Vendors, Equipment Maintenance Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	Siemens-Nixdorf	Germany	1,100	23.2
2	IBM	U.S.	945	19.9
3	Digital	U.S.	330	6.9
4	HP	U.S.	140	2.9
5	Comparex	U.S.	125	2.6
6	AT&T	U.S.	115	2.4
7	Bull	France	115	2.4
8	Unisys	U.S.	110	2.3
9	Olivetti	Italy	80	1.7
10	Sun	U.S.	60	1.3
	Total Listed		3,120	65.7
	Total Market		4,750	100.0

EXHIBIT V-47

Leading Vendors, Environmental Services Germany, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	120	5.2
2	Digital	U.S.	75	3.3
3	Siemens-Nixdorf	Germany	75	3.3
4	Bull	France	25	1.1
5	Unisys	U.S.	25	1.1
6	HP	U.S.	20	0.9
7	Comparex	U.S.	10	0.4
8	Wang	U.S.	10	0.4
9	AT&T	U.S.	5	0.2
10	Olivetti	Italy	5	0.2
	Total Listed		370	16.1
	Total Market		2,300	100.0

EXHIBIT V-48

Leading Vendors, Information Services Germany 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (DM Millions)	Market Share (Percent)
1	IBM	U.S.	3,810	11.9
2	Siemens-Nixdorf	Germany	3,070	9.6
3	Digital	U.S.	980	3.1
4	Datev	Germany	850	2.7
5	Cap debis	Germany	630	2.0
6	Microsoft	U.S.	480	1.5
7	SAP	Germany	480	1.5
8	Reuters	U.K.	440	1.4
9	HP	U.S.	290	0.9
10	Bull	France	280	0.9
11	Computer Associates	U.S.	280	0.9
12	Unisys	U.S.	260	0.8
13	AT&T	U.S.	240	0.8
14	Olivetti	Italy	200	0.6
15	Intergraph	U.S.	200	0.6
16	Software AG	Germany	180	0.6
17	Comparex	U.S.	160	0.5
18	Prime	U.S.	130	0.4
19	Andersen Consulting	U.S.	130	0.4
20	Novell	U.S.	120	0.4
21	Oracle	U.S.	120	0.4
22	EDS	U.S.	110	0.3
23	Sun	U.S.	110	0.3
24	Lotus	U.S.	110	0.3
25	GSI	France	100	0.3
26	Borland	U.S.	90	0.3
27	AC Service [Raet]	Netherlands	90	0.3
28	Wang	U.S.	80	0.3
29	Telerate	U.S.	80	0.3
30	Sema Group	France	70	0.2
	Total Listed		14,170	44.3
	Total Market		32,000	100.0

C

United Kingdom - Market Commentary

1. Introduction

The United Kingdom has a population of about 57 million, and a work force of about 28 million (46% female). GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 1,041 billion, about 13% of OECD European members' total GDP.

One of the features of its economy is a concentration of large companies, illustrated by fact that the market capitalisation of UK corporations in the Financial Times FT500 for 1992 is $712 billion compared with that of German and French companies at $264 billion and $259 billion. It has been a member of the European Community since 1973.

The U.K.'s information services market is the third largest in Europe, totalling PS 9.8 billion ($16 billion or ECU 12 billion) in 1992. Growth has been severely curtailed by the economic recession and loss of confidence in IT investment generally. Worst hit sectors have been demand for contract IS labour and consulting.

2. Economic Environment

The 1980s saw radical changes in the industrial scene. Labour productivity grew by 50% and industrial relations improved. Tax rates were cut and de-regulation and privatisation were pursued. Labour costs are lower than those of many industrial countries. In a DMark comparison, U.K. costs equate to 54% of German costs and 84% of the French.

Investment by US and Japanese firms in the UK accounts for 40% and 33%, respectively, of those countries' stakes in the EC.

The growth of the 1980s is now well past. The UK gave the worst 1991 GDP performance in the EC at -2.5%, did less badly in 1992 (-0.4%) but was still at the bottom of the EC class. Inflation fell to 3.7%, close to OECD average.

After a financial crisis in September 1992, Britain departed the ERM (Exchange Rate Mechanism) and devalued the Pound Sterling, which was thus one of only three European currencies to weaken over the year, by 4% in relation to the US Dollar, against which the German Mark and French Frank appreciated by more than 10%. So a speculative attack on the Pound resulted in an improved competitive position for the UK. This meant a small trade upturn in late 1992.

The breakdown by sector of the U.K. spend on information services is shown in Exhibit V-49.

EXHIBIT V-49

Information Services Industry Analysis United Kingdom, 1993

Market Sector	Market Size (PS Millions)	Percent Of Total
Total Information Services	10,100	100
Industry Sectors	5,650	56
Discrete Manufacturing	650	6
Process Manufacturing	510	5
Transportation	385	4
Utilities	235	2
Telecommunications	120	1
Retail Distribution	300	3
Wholesale Distribution	190	2
Banking & Finance	1,340	13
Insurance	425	4
Healthcare	305	3
Education	80	1
Local Government	350	3
Central Government	460	5
Business Services	220	2
Other Industries	75	1
Cross-Industry Sectors Total	455	5
Accounting	105	1
Education & Training	25	< 1
Engineering & Scientific	35	< 1
Human Resources	50	< 1
Office Systems	105	1
Planning & Analysis	65	1
Other Cross-Industry	70	1
Cross-Industry Sectors Total	455	5
Generic Sectors Total	4,000	40
Equipment Services	2,450	24
System Software Products	1,150	11
Utility and Other Processing	125	1
Other Electronic Info Services	275	3

In 1993 the UK is the only EC country for which GDP growth rate is forecast as high as 1.9%. And the others will be negative (in recession) or declining. UK inflation is running at about half that of the OECD as a whole. So the country is well placed. But the fact that trading partners like Germany do not offer buoyant markets makes the UK recovery seem vulnerable, until a more general up-swing occurs.

The economic pressures have also led to a reduction of in-house IS spending in the financial services sector and a greater propensity to use external information services vendors. The proportion of total information services spent incurred by the financial services sector in the United Kingdom is significantly higher than the European average.

3. Software and Services Industry

INPUT forecasts that the U.K. market for information services will be PS 10 billion ($16 billion) in 1993, growing at an average of 8% per annum to PS 15 billion ($24 billion) by 1998. This growth is slightly up on last year's forecast for the same period due primarily to an improved economic outlook.

Exhibit V-50 gives the detailed forecast by INPUT delivery mode in local currency. Overall, the U.K. market for information services is forecast to grow slightly faster than the European average reflecting the stronger impact of the continuing recession elsewhere.

EXHIBIT V-50

Software and Services Market, United Kingdom, 1993-1998

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	1,940	1,850	1,800	0	1,780
Systems Integration	645	735	885	22	1,990
Systems Operations	475	585	705	22	1,565
Processing Services	495	530	575	8	785
Network Services	760	850	970	17	1,830
System Software Products	1,100	1,150	1,250	7	1,650
Application Software Products	650	690	760	11	1,150
Turnkey Systems	1,290	1,270	1,330	7	1,780
Equipment Services	2,410	2,450	2,490	1	2,560
Total (rounded)	9,800	10,100	10,800	8	15,100
Total (excluding Equipment Services)	7,350	7,650	8,300	10	12,550

The professional services sector in the U.K. is shrinking. Primarily this is due to continued falling demand for custom software development and contract staff. New development tools are improving programmer productivity, but customers are giving preference to ready-made solutions. These come either in the form of application packages or as systems integration projects based on such packages.

The U.K. still has the largest systems integration market in the whole of Europe, and also the leading network services market.

The systems integration market is forecast to show comparatively low level short-term growth in the U.K., because of the postponement of major projects resulting from the recession. But this is forecast to improve over the next five years.

The U.K. is estimated to account for 35% of the European market for systems operations, and this leadership position is forecast to be even further fuelled by the impact of the recession with users keen to fix their computing costs for a period of years. The culture of the U.K. also shows a greater propensity to outsourcing than is typically found in continental Europe.

The U.K. network services market is two to five years ahead of the rest of Europe, especially in developing services such as EDI and electronic commerce. Part of this is due to the influence of U.S. vendors in the U.K., part is the strength of the City of London after the Big Bang in 1986, which led to a major boom in financial electronic information services and dealing systems.

Detailed local currency forecasts of the components making up each delivery mode in the United Kingdom are shown in Exhibit V-51 onward.

EXHIBIT V-51

Professional Services Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	410	435	470	8	630
Education & Training	190	195	205	4	240
Software Development	1,320	1,190	1,080	-9	720
Application Management	25	35	50	41	195
Total (rounded)	1,940	1,850	1,800	0	1,780

EXHIBIT V-52

Systems Integration Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	175	200	230	15	410
Application Software Products	115	130	185	41	715
System Software Products	50	60	70	18	140
Professional Services	290	330	380	15	665
Other Services	15	15	20	31	58
Total (rounded)	645	735	885	22	1,990

EXHIBIT V-53

Systems Operations Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	270	310	360	18	700
Application Operations	160	210	270	26	680
Desktop Services	50	65	80	24	190
Total (rounded)	475	585	705	22	1,565

EXHIBIT V-54

Processing Services Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	390	405	425	3	475
Utility Processing	15	15	15	0	15
Other Processing	90	110	135	22	295
Total (rounded)	495	530	575	8	785

EXHIBIT V-55

Network Services Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	520	550	580	4	670
Network Applications	180	225	295	32	915
Network Management	60	75	95	27	245
Total (rounded)	760	850	970	17	1,830

EXHIBIT V-56

System Software Products Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	500	485	480	-6	345
Minicomputer	345	360	395	7	510
Workstation and PC	255	305	375	21	795
Total (rounded)	1,100	1,150	1,250	7	1,650

EXHIBIT V-57

Application Software Products Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	65	60	56	-5	45
Minicomputer	170	180	190	7	250
Workstation and PC	415	450	514	14	855
Total (rounded)	650	690	760	11	1,150

EXHIBIT V-58

Turnkey Systems Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	645	660	685	5	845
Application Software Products	310	290	310	9	450
System Software Products	15	16	17	6	21
Professional Services	325	305	325	9	470
Total (rounded)	1,290	1,270	1,330	7	1,780

EXHIBIT V-59

Equipment Services Market, United Kingdom

	PS Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	1,600	1,600	1,600	-1	1,480
Environmental Services	810	850	890	5	1,080
Total (rounded)	2,410	2,450	2,490	1	2,560

4. Competitive Environment

Exhibit V-60 lists the top thirty vendors of software and services in the United Kingdom during 1992.

It is compiled using only the software and services revenues attributable to the domestic market in the U.K., excluding exports and excluding revenues from within any parent group companies.

EXHIBIT V-60

Leading Vendors, Software and Services United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector* Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	570	7.8
2	ICL (Fujitsu)	U.K. (Japan)	450	6.1
3	Digital	U.S.	295	4.0
4	Reuters	U.K.	240	3.3
5	Hoskyns (CGS)	U.K. (F)	185	2.5
6	EDS-Scicon	U.S.	175	2.4
7	AT&T	U.S.	170	2.3
8	Andersen Consulting	U.S.	160	2.2
9	Sema Group	France	150	2.0
10	BT	U.K.	120	1.6
11	Computer Associates	U.S.	110	1.5
12	Microsoft	U.S.	110	1.5
13	Logica	U.K.	110	1.5
14	Data Sciences	U.K.	100	1.4
15	Bull	France	96	1.3
16	Olivetti	Italy	91	1.2
17	Misys	U.K.	90	1.2
18	McDonnell Douglas	U.S.	88	1.2
19	ACT Group	U.K.	74	1.0
20	Oracle	U.S.	68	0.9
21	BIS	U.S.	65	0.9
22	Coopers & Lybrand	U.S.	65	0.9
23	Easams	U.K.	59	0.8
24	Unisys	U.S.	58	0.8
25	HP	U.S.	52	0.7
26	PE-International	U.K.	52	0.7
27	Ferranti	U.K.	50	0.7
28	Price Waterhouse	U.S.	50	0.7
29	Dun & Bradstreet	U.S.	47	0.6
30	Telerate	U.S.	46	0.6
	Total Listed		3,996	54.4
	Total Market		7,350	100.0

* *Software and services excludes equipment services*

As in nearly every European country, IBM leads in software and services revenues. In the UK, IBM is now closely followed by ICL. ICL is one of the most profitable of the equipment vendors operating in Europe and has gained new respect following its acquisition by Fujitsu. ICL is particularly strong in the retail and public sectors in the United Kingdom. Like most other equipment manufacturers, ICL is increasingly active in the systems integration and systems operations delivery modes. It has an acquisition strategy to assist the cultural change to a software and services orientation.

Following the acquisition of SD-Scicon by EDS and the acquisition of Hoskyns by CGS, only 22% of the revenues shown in Exhibit V-61 originate within UK-owned vendors. Overall the U.K. information services market is dominated by U.S.-owned organisations which account for 53% of the revenues shown. ACT's recent acquisition of BIS will restore some U.K. balance in next year's rankings.

Of the four major European economies - Germany, France, the U.K. and Italy - the U.K. has by far the highest penetration by foreign vendors.

U.K.-owned Reuters is Europe's largest electronic information services vendor. It specialises in on-line financial and trading systems.

Hoskyns, part of the Paris-based Cap Gemini Sogeti group, is the market leader in outsourced systems operations. The company pioneered this business during the 1980s, and is now investing in a similar initiative in applications management. Though small, applications management is set to grow rapidly. Hoskyns and other specialist vendors offer to take on full responsibility for on-going software maintenance, even when the software has been developed in-house many years ago. Sometimes this means employing some or all of the customer's staff.

AT&T Istel was formed out of the U.K. car manufacturer Rover Group as BL Systems. The company had an on-going acquisition programme which increased its overall presence in France and Germany, but it had to slim down again in 1992 as revenues fell short of expectations.

EDS-Scicon is now a reputable growing company after a period of uncertainty when it was bought by EDS.

Equipment services are shown as two separate lists - equipment maintenance vendors and environmental services vendors. The Exhibit V-71 shows the leaders in the total information services market in the U.K..

EXHIBIT V-61

Leading Vendors, Professional Services United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Andersen Consulting	U.S.	120	6.2
2	IBM	U.S.	105	5.4
3	Digital	U.S.	70	3.6
4	Coopers & Lybrand	U.S.	65	3.4
5	Misys	U.K.	60	3.1
6	Logica	U.K.	55	2.8
7	Sema Group	France	50	2.6
8	Hoskyns (CGS)	U.K. (F)	50	2.6
9	Price Waterhouse	U.S.	50	2.6
10	ICL (Fujitsu)	U.K. (Japan)	50	2.6
	Total Listed		675	34.8
	Total Market		1,940	100.0

EXHIBIT V-62

Leading Vendors, Systems Integration United Kingdom 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	75	11.6
2	Andersen Consulting	U.S.	70	10.9
3	ICL (Fujitsu)	U.K. (Japan)	65	10.1
4	Bull	France	55	8.5
5	BT	U.K.	50	7.8
6	Digital	U.S.	45	7.0
7	EDS-Scicon	U.S.	40	6.2
8	Hoskyns (CGS)	U.K. (F)	35	5.4
9	Sema Group	France	35	5.4
10	Logica	U.K.	30	4.7
	Total Listed		500	77.5
	Total Market		645	100.0

EXHIBIT V-63

Leading Vendors, Systems Operations United Kingdom 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Hoskyns (CGS)	U.K. (F)	70	14.7
2	AT&T	U.S.	65	13.7
3	EDS-Scicon	U.S.	45	9.5
4	Sema Group	France	40	8.4
5	ICL (Fujitsu)	U.K. (Japan)	40	8.4
6	Digital	U.S.	30	6.3
7	Andersen Consulting	U.S.	25	5.3
8	BIS	U.S.	15	3.2
9	ITnet	U.K.	15	3.2
10	Telecom Capita	U.K.	15	3.2
	Total Listed		360	75.8
	Total Market		475	100.0

EXHIBIT V-64

Leading Vendors, Processing Services United Kingdom 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	EDS-Scicon	U.S.	35	7.1
2	Microgen	U.K.	25	5.1
3	Centre-file	U.K.	25	5.1
4	Data Sciences	U.K.	20	4.0
5	GEIS	U.S.	15	3.0
6	ADP	U.S.	15	3.0
7	IBM	U.S.	10	2.0
8	Granada	U.K.	10	2.0
9	Compower	U.K.	8	1.6
10	AT&T	U.S.	7	1.4
	Total Listed		170	34.3
	Total Market		495	100.0

EXHIBIT V-65

Leading Vendors, Network Application Services United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	AT&T	U.S.	35	19.4
2	BT	U.K.	30	16.7
3	IBM	U.S.	30	16.7
4	GEIS	U.S.	14	7.8
5	ICL (Fujitsu)	U.K. (Japan)	14	7.8
6	Compuserve	U.K.	6	3.3
7	Sprint-Telenet	U.K.	5	2.8
8	Digital	U.S.	4	2.2
9	EDS-Scicon	U.S.	4	2.2
10	Bull	France	2	1.1
	Total Listed		144	80.0
	Total Market		180	100.0

EXHIBIT V-66

Leading Vendors, Electronic Information Services United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Reuters	U.K.	185	35.6
2	Telerate	U.S.	45	8.7
3	Citicorp	U.S.	30	5.8
4	Extel	U.K.	30	5.8
5	Dun & Bradstreet	U.S.	25	4.8
6	ADP	U.S.	20	3.8
7	Quick	U.K.	14	2.7
8	Mead	U.S.	12	2.3
9	Infolink	Belgium	11	2.1
10	Infocheck	U.K.	5	1.0
	Total Listed		377	72.5
	Total Market		520	100.0

EXHIBIT V-67

Leading Vendors, System Software Products United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	310	28.2
2	ICL (Fujitsu)	U.K. (Japan)	175	15.9
3	Digital	U.S.	95	8.6
4	Microsoft	U.S.	65	5.9
5	Oracle	U.S.	60	5.5
6	Computer Associates	U.S.	55	5.0
7	HP	U.S.	30	2.7
8	Ask	U.S.	30	2.7
9	Bull	France	25	2.3
10	Borland	U.S.	25	2.3
	Total Listed		870	79.1
	Total Market		1,100	100.0

EXHIBIT V-68

Leading Vendors, Application Software Products United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	Microsoft	U.S.	45	6.9
2	Computer Associates	U.S.	40	6.2
3	ICL (Fujitsu)	U.K. (Japan)	25	3.8
4	Peterborough	U.K.	25	3.8
5	Lotus	U.S.	20	3.1
6	BIS	U.S.	20	3.1
7	P&P	U.K.	20	3.1
8	IBM	U.S.	20	3.1
9	AT&T	U.S.	15	2.3
10	Kewill	U.K.	15	2.3
	Total Listed		245	37.7
	Total Market		650	100.0

EXHIBIT V-69

Leading Vendors, Turnkey Systems United Kingdom 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	ICL (Fujitsu)	U.K. (Japan)	85	6.6
2	McDonnell Douglas	U.S.	55	4.3
3	Digital	U.S.	45	3.5
4	Kalamazoo	U.K.	30	2.3
5	Intergraph	U.S.	30	2.3
6	Misys	U.K.	25	1.9
7	Reuters	U.K.	25	1.9
8	IBM	U.S.	20	1.6
9	Siemens-Nixdorf	Germany	20	1.6
10	ACT Group	U.K.	15	1.2
	Total Listed		350	27.1
	Total Market		1,290	100.0

EXHIBIT V-70

Leading Vendors, Equipment Maintenance United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	ICL (Fujitsu)	U.K. (Japan)	275	17.2
2	IBM	U.S.	210	13.1
3	Digital	U.S.	165	10.3
4	HP	U.S.	90	5.6
5	Granada	U.K.	80	5.0
6	Bull	France	60	3.8
7	Unisys	U.S.	60	3.8
8	AT&T	U.S.	55	3.4
9	Olivetti	Italy	45	2.8
10	Wang	U.S.	30	1.9
	Total Listed		1,070	66.9
	Total Market		1,600	100.0

EXHIBIT V-71

Leading Vendors, Environmental Services United Kingdom, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	ICL (Fujitsu)	U.K. (Japan)	30	3.7
2	Digital	U.S.	25	3.1
3	IBM	U.S.	20	2.5
4	Unisys	U.S.	20	2.5
5	HP	U.S.	9	1.1
6	Prime	U.S.	8	1.0
7	Wang	U.S.	7	0.9
8	Siemens-Nixdorf	Germany	6	0.7
9	Bull	France	5	0.6
10	ACT Group	U.K.	5	0.6
	Total Listed		135	16.7
	Total Market		810	100.0

EXHIBIT V-72

Leading Vendors, Information Services United Kingdom 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (PS Millions)	Market Share (Percent)
1	IBM	U.S.	780	7.8
2	ICL (Fujitsu)	U.K. (Japan)	740	7.4
3	Digital	U.S.	460	4.6
4	Reuters	U.K.	240	2.4
5	Andersen Consulting	U.S.	220	2.2
6	Hoskyns (CGS)	U.K. (F)	220	2.2
7	AT&T	U.S.	220	2.2
8	EDS-Scicon	U.S.	180	1.8
9	Sema Group	France	170	1.7
10	HP	U.S.	150	1.5
11	Olivetti	Italy	140	1.4
12	Unisys	U.S.	140	1.4
13	Bull	France	120	1.2
14	McDonnell Douglas	U.S.	110	1.1
15	Computer Associates	U.S.	110	1.1
16	Logica	U.K.	110	1.1
17	Microsoft	U.S.	110	1.1
18	ACT Group	U.K.	105	1.1
19	Granada	U.K.	90	0.9
20	Oracle	U.S.	75	0.8
21	Siemens-Nixdorf	Germany	70	0.7
22	Wang	U.S.	55	0.6
23	Prime	U.S.	55	0.6
24	Dun & Bradstreet	U.S.	45	0.5
25	Telerate	U.S.	45	0.5
26	Intergraph	U.S.	45	0.5
27	Amdahl	U.S.	45	0.5
28	Rank Xerox	U.K.	45	0.5
29	GEIS	U.S.	45	0.5
30	Sun Microsystems	U.S.	35	0.4
	Total Listed		4,975	49.8
	Total Market		10,000	100.0

D

Italy - Market Commentary

1. Introduction

Although the Italian economy is considered to be the third largest in Europe its information services market is only the fourth largest after France, Germany and the United Kingdom. Thus, the Italian information services business is still only about 60% as big as that of the United Kingdom and less than half as big as that of France, the largest single country market in Europe.

To date, with perhaps the exception of Olivetti, Italian information services firms have made little impact outside of their home market. Although Finsiel, the largest vendor, ranks in revenue as one of the top five independent information services firms in Europe, it obtains over 95% of its business from within Italy.

2. Economic Environment

Italy's population was 58 million in 1991 and the labour force 21 million (36% female). GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 1,224 billion, about 16% of OECD European members' total GDP.

The 1980's saw a dynamic expansion of the economy based on high levels of investment, and the flexibility and drive of small and medium companies which are a more important constituent of the Italian scene than that of most industrialised countries.

The Italian economy notable for the high involvement of the State. Government outlays accounted for 53% of GDP in 1990, compared with the EC 49% average. State controlled enterprises accounted for 25% of total output. In the late 1980s it was estimated that 40% of industry was publicly owned. The three State holding companies had stakes in almost 1,000 companies and controlled 500 of them. In addition there are public utilities like the railways and electricity.

The industry sector analysis for the Italian information services business is shown in Exhibit V-73.

EXHIBIT V-73

Software and Services Industry Analysis, Italy, 1993

Market Sector	Market Size (Lira Millions)	Percent Of Total
Total Information Services	15,000	100
Industry Sectors	7,950	53
Discrete Manufacturing	1,195	8
Process Manufacturing	650	4
Transportation	455	3
Utilities	335	2
Telecommunications	235	2
Retail Distribution	225	2
Wholesale Distribution	295	2
Banking & Finance	1,280	9
Insurance	475	3
Healthcare	465	3
Education	120	1
Local Government	585	4
Central Government	905	6
Business Services	410	3
Other Industries	320	2
Cross-Industry Sectors Total	875	6
Accounting	205	1
Education & Training	30	< 1
Engineering & Scientific	60	< 1
Human Resources	145	1
Office Systems	185	1
Planning & Analysis	175	1
Other Cross-Industry	75	1
Cross-Industry Sectors Total	875	6
Generic Sectors Total	6,125	41
Equipment Services	3,500	23
System Software Products	2,300	15
Utility and Other Processing	125	1
Other Electronic Info Services	200	1

External trade is less significant than elsewhere in the Community. Italian exports and imports together accounted for 20% of GDP in 1990 as opposed to the EC average of 29%. And the economy of the South is markedly different from that of the industrialised North. Southern GDP per head is only 56% that of the North.

Growth rate was down in 1992 to 0.9% (1.3% in 1991), and so was inflation at 5.4% (6.5% in 1991). The current account deficit worsened again to 2.2% of GDP. The huge fiscal deficit increased although the government addressed the problem with a package of measures.

A devaluation of the Lira took place in the currency crisis of September 1992, which affected the Pound and the Peseta. The Lira weakened over the year, by 3.43% in relation to the U.S. Dollar, against which the German Mark and French Frank appreciated by more than 10%.

Forecasts include stagnation in 1993, but a growth rate of 1.7% in 1994, as the economies of trading partners recover, slightly declining inflation (4.5% in 1993) which will remain above the OECD average, persistent current account deficits and above average unemployment rates.

3. Software and Services Industry

The Italian information services industry, following strong growth (around 30% per annum) throughout the 1980s is expected to only show 3% annual growth between 1992 and 1993. The market size in 1993 is estimated at Lira 15 trillion ($11 billion or ECU 9 billion) growing at 6% to Lira 20.5 trillion ($15 billion or ECU 12 billion) in 1998.

The Italian Government initiated investment programmes in the past to support Olivetti research and development initiatives. But it has not used public sector procurement as an instrument to support the information technology industry. Although the public sector is the largest customer of the computer industry, its expenditure on computers has grown less rapidly than that of the commercial market.

The market forecast is shown in Exhibit V-74 which provides INPUT's market forecast through to 1998 for all nine information services delivery modes. Thus, demand for computer software and services, once largely unaffected by macroeconomic and general investment trends, has now reached a size and level of penetration that subjects it strongly to these influences.

EXHIBIT V-74

Software and Services Market, Italy, 1993-1998

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	3,540	3,460	3,440	3	4,100
Systems Integration	445	515	585	17	1,130
Systems Operations	300	350	410	18	815
Processing Services	1,180	1,185	1,210	4	1,420
Network Services	580	650	740	16	1,370
System Software Products	2,150	2,300	2,450	6	3,050
Application Software Products	1,760	1,940	2,170	13	3,590
Turnkey Systems	1,050	1,050	1,090	8	1,540
Equipment Services	3,440	3,500	3,570	1	3,700
Total (rounded)	14,500	15,000	15,500	6	20,500
Total (excluding Equipment Services)	11,000	11,450	12,100	8	17,000

Exhibit V-75 onward provide the market analysis and forecasts for each individual services delivery mode and their sub-sectors. As is being experienced in the rest of Europe the areas of systems integration, systems operations and network services (specifically network applications services) are offering the highest level growth opportunities.

In comparison with the whole of Europe, the Italian market is particularly strong in both software products sectors, despite a reputation within Italy of software product copying being a widely accepted practice.

Professional services is another delivery mode which represents a larger share of the overall information services market in Italy than in the whole of Europe. Correspondingly, the turnkey systems sector is proportionally lower in Italy, only 9% of the market, compared to a European average of 16%. The Italian users want an individual solution, albeit based upon a standard application package, to meet system needs.

EXHIBIT V-75

Professional Services Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	455	500	525	11	840
Education & Training	240	250	250	6	340
Software Development	2,830	2,680	2,630	1	2,840
Application Management	20	27	32	24	80
Total (rounded)	3,540	3,460	3,440	3	4,100

EXHIBIT V-76

Systems Integration Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	120	140	155	11	235
Application Software Products	80	95	125	33	400
System Software Products	30	40	45	15	80
Professional Services	205	230	245	11	380
Other Services	10	10	13	29	36
Total (rounded)	445	515	585	17	1,130

EXHIBIT V-77

Systems Operations Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	130	150	160	16	320
Application Operations	160	190	230	19	450
Desktop Services	12	15	19	25	46
Total (rounded)	300	350	410	18	815

EXHIBIT V-78

Processing Services Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	1,060	1,060	1,075	3	1,245
Utility Processing	15	15	15	0	15
Other Processing	105	110	120	8	160
Total (rounded)	1,180	1,185	1,210	4	1,420

EXHIBIT V-79

Network Services Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	380	400	420	5	520
Network Applications	162	200	255	28	675
Network Management	38	50	65	28	175
Total (rounded)	580	650	740	16	1,370

EXHIBIT V-80

System Software Products Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	870	905	900	-6	635
Minicomputer	720	755	800	7	1,035
Workstation and PC	560	640	750	17	1,380
Total (rounded)	2,150	2,300	2,450	6	3,050

EXHIBIT V-81

Application Software Products Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	165	155	146	-4	120
Minicomputer	515	535	574	6	730
Workstation and PC	1,080	1,250	1,450	17	2,740
Total (rounded)	1,760	1,940	2,170	13	3,590

EXHIBIT V-82

Turnkey Systems Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	525	535	555	4	665
Application Software Products	255	250	255	11	425
System Software Products	12	12	13	7	17
Professional Services	265	260	270	11	440
Total (rounded)	1,050	1,050	1,090	8	1,540

EXHIBIT V-83

Equipment Services Market, Italy

	Lira Billions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	2,340	2,350	2,360	-1	2,130
Environmental Services	1,100	1,150	1,210	6	1,570
Total (rounded)	3,440	3,500	3,570	1	3,700

4. Competitive Environment

Exhibit V-84 lists the leading thirty organisations active in the Italian software and services market. This exhibit demonstrates the high representation of indigenous vendors with the following exceptions:

- The U.S. owned companies, primarily the computer system vendors, are strongly represented reflecting their dominance of the systems markets.
- Similarly the software and services businesses of two other European owned equipment vendors, Bull and Siemens-Nixdorf, are also represented.

EXHIBIT V-84

Leading Vendors, Software and Services Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	1,170	10.6
2	IBM	U.S.	1,010	9.2
3	Olivetti	Italy	510	4.6
4	Cerved	Italy	280	2.5
5	Digital	U.S.	270	2.5
6	Database Informatica	Italy	200	1.8
7	Microsoft	U.S.	190	1.7
8	Bull	France	170	1.5
9	Reuters	U.K.	165	1.5
10	Siemens-Nixdorf	Germany	150	1.4
11	Cap Gemini Sogeti	France	140	1.3
12	Computer Associates	U.S.	135	1.2
13	Enidata	Italy	130	1.2
14	Andersen Consulting	U.S.	122	1.1
15	Datamat	Italy	110	1.0
16	S & M Group	Italy	110	1.0
17	Engineering	Italy	96	0.9
18	Lombardia Informatica	Italy	73	0.7
19	Syntax [Olivetti]	Italy	72	0.7
20	ITP	Italy	70	0.6
21	Sopin	Italy	60	0.5
22	Unisys	U.S.	59	0.5
23	CDS	Italy	55	0.5
24	Sicit	Italy	55	0.5
25	Datitalia Processing	Italy	50	0.5
26	Logica	U.K.	50	0.5
27	Lotus	U.S.	47	0.4
28	HP	U.S.	46	0.4
29	GEIS	U.S.	43	0.4
30	Novell	U.S.	41	0.4
	Total Listed		5,679	51.6
	Total Market		11,000	100.0

* *Software and services excludes equipment services*

Finsiel was the leading information services vendor with Italian non-captive revenues of well over one billion in 1992. The largest domestic Italian vendor, majority state ownership of the company was changed around in 1993 to put it under the control of the state-owned telphone company STET. Finsiel controlled some 11% of the overall Italian market, and specialises in processing services and customised software development. Over 50% of its total revenues come from government clients, and it is trying to diversify into more commercial sectors.

Olivetti, the Italian equipment vendor specialising in PCs and minicomputers, was the third largest information services vendor in 1992 with revenues of nearly half a billion lira. Despite falling revenues and losses in the parent group, software and services grew, largely through its subsidiary, Olivetti Information Systems (OIS).

Exhibits V-85 onward list the leading vendors in each of the separately defined delivery modes including separate vendor analyses within the network services area for electronic information services and network application services.

EXHIBIT V-85

Leading Vendors, Professional Services Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	655	18.5
2	IBM	U.S.	210	5.9
3	Olivetti	Italy	200	5.6
4	Cerved	Italy	170	4.8
5	Database Informatica	Italy	160	4.5
6	Andersen Consulting	U.S.	115	3.2
7	Cap Gemini Sogeti	France	95	2.7
8	Datamat	Italy	75	2.1
9	Engineering	Italy	75	2.1
10	Digital	U.S.	70	2.0
	Total Listed		1,825	51.6
	Total Market		3,540	100.0

EXHIBIT V-86

Leading Vendors, Systems Integration Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	65	14.6
2	Andersen Consulting	U.S.	60	13.5
3	Finsiel	Italy	60	13.5
4	Olivetti	Italy	45	10.1
5	Digital	U.S.	35	7.9
6	Bull	France	30	6.7
7	Cap Gemini Sogeti	France	25	5.6
8	Logica	U.K.	15	3.4
9	EDS	U.S.	15	3.4
10	Siemens-Nixdorf	Germany	10	2.2
	Total Listed		360	80.9
	Total Market		445	100.0

EXHIBIT V-87

Leading Vendors, Systems Operations Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	140	46.7
2	Olivetti	Italy	25	8.3
3	CDS	Italy	20	6.7
4	Bull	France	15	5.0
5	S & M Group	Italy	10	3.3
6	Sarin	Italy	7	2.3
7	GEIS	U.S.	6	2.0
8	Digital	U.S.	5	1.7
9	IBM	U.S.	5	1.7
10	Datitalia Processing	Italy	5	1.7
	Total Listed		238	79.3
	Total Market		300	100.0

EXHIBIT V-88

Leading Vendors, Processing Services Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Finsiel	Italy	245	20.8
2	Lombardia Informatica	Italy	55	4.7
3	Sopin	Italy	45	3.8
4	Enidata	Italy	30	2.5
5	Olivetti	Italy	25	2.1
6	Sarin	Italy	25	2.1
7	Cedacrinord	Italy	20	1.7
8	IBM	U.S.	20	1.7
9	Cerved	Italy	15	1.3
10	GEIS	U.S.	15	1.3
	Total Listed		495	41.9
	Total Market		1,180	100.0

EXHIBIT V-89

Leading Vendors, Network Application Services Italy 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Database Informatica	Italy	30	18.5
2	GEIS	U.S.	20	12.3
3	IBM	U.S.	15	9.3
4	Infonet	Belgium	12	7.4
5	Finsiel	Italy	12	7.4
6	Olivetti	Italy	10	6.2
7	INTESA	Italy	8	4.9
8	Bull	France	8	4.9
9	Digital	U.S.	6	3.7
10	Engineering	Italy	6	3.7
	Total Listed		127	78.4
	Total Market		162	100.0

EXHIBIT V-90

Leading Vendors, Electronic Information Services Italy 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Reuters	U.K.	125	32.9
2	Cerved	Italy	40	10.5
3	Telerate	U.S.	30	7.9
4	Stet	Italy	25	6.6
5	Dun & Bradstreet	U.S.	15	3.9
6	Citicorp	U.S.	15	3.9
7	INTESA	Italy	10	2.6
8	Datitalia Processing	Italy	5	1.3
9	Mead	U.S.	5	1.3
10	Extel	U.K.	2	0.5
	Total Listed		272	71.6
	Total Market		380	100.0

EXHIBIT V-91

Leading Vendors, System Software Products Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	620	28.8
2	Microsoft	U.S.	110	5.1
3	Digital	U.S.	100	4.7
4	Bull	France	80	3.7
5	Computer Associates	U.S.	65	3.0
6	Olivetti	Italy	50	2.3
7	Siemens-Nixdorf	Germany	45	2.1
8	Novell	U.S.	40	1.9
9	Borland	U.S.	30	1.4
10	HP	U.S.	25	1.2
	Total Listed		1,165	54.2
	Total Market		2,150	100.0

EXHIBIT V-92

Leading Vendors, Application Software Products Italy 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Microsoft	U.S.	75	4.3
2	Olivetti	Italy	65	3.7
3	Computer Associates	U.S.	45	2.6
4	Finsiel	Italy	45	2.6
5	Lotus	U.S.	45	2.6
6	IBM	U.S.	35	2.0
7	Wordperfect	U.S.	35	2.0
8	S & M Group	Italy	25	1.4
9	ITP	Italy	15	0.9
10	Formula Gruppo	Italy	10	0.6
	Total Listed		395	22.4
	Total Market		1,760	100.0

EXHIBIT V-93

Leading Vendors, Turnkey Systems Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	Olivetti	Italy	90	8.6
2	Siemens-Nixdorf	Germany	85	8.1
3	Cerved	Italy	50	4.8
4	Digital	U.S.	45	4.3
5	IBM	U.S.	40	3.8
6	Sicit	Italy	35	3.3
7	Editrice	Italy	25	2.4
8	Enidata	Italy	20	1.9
9	Intergraph	Netherlands	20	1.9
10	Reuters	U.K.	15	1.4
	Total Listed		425	40.5
	Total Market		1,050	100.0

EXHIBIT V-94

Leading Vendors, Equipment Maintenance Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	620	26.5
2	Olivetti	Italy	470	20.1
3	Bull	France	170	7.3
4	Digital	U.S.	155	6.6
5	Siemens-Nixdorf	Germany	80	3.4
6	HP	U.S.	75	3.2
7	Unisys	U.S.	55	2.4
8	AT&T (NCR)	U.S.	40	1.7
9	Memorex	U.S.	20	0.9
10	Prime	U.S.	20	0.9
	Total Listed		1,705	72.9
	Total Market		2,350	100.0

EXHIBIT V-95

Leading Vendors, Environmental Services Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	70	6.4
2	Digital	U.S.	35	3.2
3	Olivetti	Italy	25	2.3
4	Bull	France	20	1.8
5	Unisys	U.S.	10	0.9
6	HP	U.S.	8	0.7
7	Siemens-Nixdorf	Germany	5	0.5
8	Wang	U.S.	3	0.3
9	AT&T (NCR)	U.S.	3	0.3
10	Rank Xerox	U.K.	2	0.2
	Total Listed		181	16.5
	Total Market		1,100	100.0

EXHIBIT V-96

Leading Vendors, Information Services Italy, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Lira Billions)	Market Share (Percent)
1	IBM	U.S.	1,770	11.8
2	Finsiel	Italy	1,180	7.9
3	Olivetti	Italy	1,000	6.7
4	Digital	U.S.	480	3.2
5	Bull	France	360	2.4
6	Siemens-Nixdorf	Germany	240	1.6
7	Andersen Consulting	U.S.	210	1.4
8	Microsoft	U.S.	190	1.3
9	Reuters	U.K.	160	1.1
10	Computer Associates	U.S.	130	0.9
11	HP	U.S.	130	0.9
12	Cap Gemini Sogeti	France	120	0.8
13	Unisys	U.S.	120	0.8
14	AT&T (NCR)	U.S.	60	0.4
15	Logica	U.K.	50	0.3
16	Lotus	U.S.	50	0.3
17	Novell	U.S.	40	0.3
18	ICL	U.K.	40	0.3
19	GEIS	U.S.	40	0.3
20	Prime	U.S.	40	0.3
21	Wang	U.S.	40	0.3
22	EDS	U.S.	30	0.2
23	Wordperfect	U.S.	30	0.2
24	Sun	U.S.	30	0.2
25	Telerate	U.S.	30	0.2
26	Dun & Bradstreet	U.S.	30	0.2
27	Borland	U.S.	30	0.2
28	Rank Xerox	U.K.	30	0.2
29	Sligos	France	20	0.1
30	Memorex	U.S.	20	0.1
	Total Listed		6,700	44.7
	Total Market		15,000	100.0

E

Sweden - Market Commentary

1. Introduction

Sweden's population was 8.64 million in 1991. Its GDP per head at US$ 27,000 is one of the highest in the OECD. GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 246 billion, about 3% of OECD European members' total GDP.

It is a member of the European Free Trade Association (EFTA) and will therefore be part of the EEA (European Economic Area) when this is inaugurated, probably in 1994. Under this, restrictions on trade and the movement of capital between EC and EFTA countries will be largely removed.

Subject to a referendum to be held in 1994, Sweden may become a full EC member in 1995. The move logically follows the increased importance of the EC as a trading partner. The proportion of exports going to Community countries reached 53% of total in 1992, from an average of 44% in the 1980s.

Sweden is the fifth largest software and services market in Europe, estimated at SEK 25.9 billion ($4.2 billion) in 1992.

2. Economic Environment

GDP decline in 1992 was at the same rate (-1.7%) as in 1991. However, the high inflation rate of 1991 (9.3%) was replaced by a figure (2.2%) below the OECD average. The current account deficit worsened to about 4% of GDP. The Swedish Kroner was devalued during the year. Unemployment moved up three percentage points to 8%.

World trading conditions account for some of Sweden's current difficulties. But fundamental internal changes are also important factors, notably the transition from high wages, outstanding welfare benefits and the shift to a big government sector to a leaner, more competitive productive economy.

Forecasts include further recession in 1993, below average growth in 1994, inflation rates first increasing then declining to 3.5% in 1994 (close to OECD average) and unemployment increasing in 1993 and 1994. Even after a decline in 1995, unemployment will remain at levels much greater than those of the 1980s.

3. Software and Services Industry

INPUT forecasts that the Swedish market for software and services will be over SEK 28 billion ($4.6 billion or ECU 3.5 billion) in 1993, growing at an average 7% per annum to over SEK 40 billion ($6.5 billion, ECU 5.1 billion) by 1998.

Exhibit V-97 provides a detailed forecast by INPUT delivery mode in local currency. Professional services forms the largest sector of the Swedish software and services market accounting for over 36% of the total in 1992. This factor indicates the strength of the professional services market in Sweden when compared with the overall European average figure for professional services market share of 23%.

EXHIBIT V-97

Software and Services Market, Sweden, 1993-1998

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	9,400	10,000	10,700	6	13,400
Systems Integration	550	630	770	22	1,700
Systems Operations	370	740	870	16	1,560
Processing Services	2,755	2,850	2,830	0	2,710
Network Services	780	920	1,110	20	2,290
System Software Products	2,270	2,430	2,590	6	3,220
Application Software Products	1,970	2,300	2,620	13	4,330
Turnkey Systems	2,450	2,650	2,900	9	4,150
Equipment Services	5,400	5,800	6,100	3	6,750
Total (rounded)	25,900	28,300	30,500	7	40,100
Total (excluding Equipment Services)	20,500	22,500	24,400	8	33,400

Software development services comprise the largest portion of the Swedish professional services market, accounting for about 82% of total user expenditure for professional services. The primary growth opportunities in the Swedish market lie in the areas of applications solutions, especially systems integration, software products, workstation and PC applications, and network applications.

Detailed local currency forecasts for the components making up each delivery mode are shown in Exhibit V-98 onward for Sweden for the period 1993 to 1998.

EXHIBIT V-98

Professional Services Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	990	1,090	1,200	9	1,700
Education & Training	640	680	730	7	940
Software Development	7,750	8,200	8,700	5	10,650
Application Management	35	45	60	27	150
Total (rounded)	9,400	10,000	10,700	6	13,400

EXHIBIT V-99

Systems Integration Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	150	170	200	16	360
Application Software Products	100	115	165	40	610
System Software Products	45	50	60	20	125
Professional Services	245	280	330	15	560
Other Services	10	15	19	27	49
Total (rounded)	550	630	770	22	1,700

EXHIBIT V-100

Systems Operations Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	240	280	325	15	565
Application Operations	80	400	470	16	840
Desktop Services	50	60	75	21	155
Total (rounded)	370	740	870	16	1,560

EXHIBIT V-101

Processing Services Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	2,500	2,580	2,550	0	2,400
Utility Processing	53	54	53	-1	48
Other Processing	200	215	225	4	260
Total (rounded)	2,755	2,850	2,830	0	2,710

EXHIBIT V-102

Network Services Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	470	510	555	7	705
Network Applications	265	350	470	31	1,360
Network Management	45	60	80	30	220
Total (rounded)	780	920	1,110	20	2,290

EXHIBIT V-103

System Software Products Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	1,200	1,220	1,240	0	1,220
Minicomputer	600	655	705	7	905
Workstation and PC	470	550	640	15	1,090
Total (rounded)	2,270	2,430	2,590	6	3,220

EXHIBIT V-104

Application Software Products Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	180	185	180	-1	165
Minicomputer	540	605	660	8	885
Workstation and PC	1,250	1,510	1,780	17	3,280
Total (rounded)	1,970	2,300	2,620	13	4,330

EXHIBIT V-105

Turnkey Systems Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	1200	1270	1320	4	1580
Application Software Products	460	530	600	13	995
System Software Products	160	170	180	6	225
Professional Services	620	700	800	14	1,350
Total (rounded)	2,450	2,650	2,900	9	4,150

EXHIBIT V-106

Equipment Services Market, Sweden

	SK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	3,550	3,700	3,810	1	3,850
Environmental Services	1,860	2,080	2,290	7	2,880
Total (rounded)	5,400	5,800	6,100	3	6,750

4. Competitive Environment

Exhibit V-107 lists the ten leading software and services vendors in the Swedish market during 1992. This listing is compiled using only the software and services revenues attributable to the domestic market within Sweden, excluding exports and excluding revenues from within any parent group companies or subsidiaries.

IBM has gained the leading place in the Swedish market, pushing Cap Programmator, an indigenous company into second place for the first time in INPUT's rankings.

Of the leading ten software and services vendors in Sweden, six are indigenous companies.

In a move to counter reducing revenue and margins from equipment sales, IBM is vigorously pursuing additional business in software and services. During 1991 and 1992, IBM consolidated operations on the Scandinavian market by reorganising these operations to report into a central office in the region. Further, IBM has been particularly successful in establishing a European-wide systems integration business represented by their 20% share of the Swedish SI market.

EXHIBIT V-107

Leading Vendors, Software and Services Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	IBM	U.S.	1,470	7.2
2	Cap Programmator [CGS]	France	1,190	5.8
3	Sapia	Sweden	1,050	5.1
4	Apiron	Sweden	705	3.4
5	SKD Foretagen	Sweden	705	3.4
6	WM Data Nordic	Sweden	585	2.9
7	Digital	U.S.	460	2.2
8	Enator	Sweden	410	2.0
9	Lantbruksdata	Sweden	320	1.6
10	Reuters	U.K.	250	1.2
	Total Listed		7,145	34.9
	Total Market		20,500	100.0

In 1992 Cap Gemini Sogeti acquired a controlling interest in Programator and merged its own Swedish operations into Cap Programmator. In 1991 Programator had itself acquired share holdings in eight additional companies, three of which were in Sweden. The company has operations in six European country markets including Sweden. The largest IT revenue contribution however (over 85%) is derived from the Swedish market. In 1991 and 1992 the overall revenues of Programator reduced, primarily as a consequence of the company divesting itself of non-strategic units.

The third largest software and services vendor in Sweden is Sapia AB. The key software and services activities of this company are in the areas of data processing services, consultancy and turnkey systems.

The leading ten software and services vendors have between them about a 35% share of the total software and services market.

EXHIBIT V-108

Leading Vendors, Professional Services Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	Cap Programmator [CGS]	France	880	9.4
2	Apiron	Sweden	400	4.3
3	Enator	Sweden	310	3.3
4	IBM	U.S.	295	3.1
5	WM Data Nordic	Sweden	265	2.8
6	Sapia	Sweden	255	2.7
7	Communicator AB	Sweden	170	1.8
8	IBS	Sweden	165	1.8
9	SKD Foretagen	Sweden	135	1.4
10	Digital	U.S.	130	1.4
	Total Listed		3,005	32.0
	Total Market		9,400	100.0

EXHIBIT V-109

Leading Vendors, Systems Integration Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	Cap Programmator [CGS]	France	130	23.6
2	IBM	U.S.	110	20.0
3	Apiron	Sweden	45	8.2
4	Enator	Sweden	40	7.3
5	EDS	U.S.	40	7.3
6	Ericsson	Sweden	35	6.4
7	ICL (Fujitsu)	U.K.	25	4.5
8	Digital	U.S.	20	3.6
9	Bull	France	15	2.7
10	Sapia	Sweden	15	2.7
	Total Listed		475	86.4
	Total Market		550	100.0

EXHIBIT V-110

Leading Vendors, Systems Operations Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	Enator	Sweden	40	10.8
2	Cap Programmator [CGS]	France	40	10.8
3	EDS	U.S.	40	10.8
4	IBM	U.S.	15	4.1
5	Digital	U.S.	14	3.8
6	Sapia	Sweden	10	2.7
7	SKD Foretagen	Sweden	10	2.7
8	Tietotehdas	Finland	7	1.9
9	GEIS	U.S.	7	1.9
10	Conor Information	Sweden	5	1.4
	Total Listed		188	50.8
	Total Market		370	100.0

EXHIBIT V-111

Leading Vendors, Processing Services Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	SKD Foretagen	Sweden	560	20.3
2	Sapia	Sweden	340	12.3
3	Apiron	Sweden	150	5.4
4	WM Data Nordic	Sweden	140	5.1
5	Conor Information	Sweden	135	4.9
6	Lantbruksdata	Sweden	125	4.5
7	CRS Datacraft	Sweden	65	2.4
8	Datema	Sweden	65	2.4
9	Tietotehdas	Finland	50	1.8
10	IBM	U.S.	30	1.1
	Total Listed		1,660	60.3
	Total Market		2,755	100.0

EXHIBIT V-112

Leading Vendors, Network Application Services Sweden 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	Lantbruksdata	Sweden	90	34.0
2	Infonet	Belgium	80	30.2
3	Datema	Sweden	45	17.0
4	IBM	U.S.	35	13.2
5	GEIS	U.S.	20	7.5
6	Apiron	Sweden	20	7.5
7	Digital	U.S.	12	4.5
8	Affarsdata	Sweden	10	3.8
9	WM Data Nordic	Sweden	10	3.8
10	ICL (Fujitsu)	U.K.	8	3.0
	Total Listed		330	124.5
	Total Market		265	100.0

EXHIBIT V-113

Leading Vendors, System Software Products Sweden 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	IBM	U.S.	875	38.5
2	Digital	U.S.	185	8.1
3	Oracle	U.S.	130	5.7
4	Microsoft	U.S.	125	5.5
5	ICL (Fujitsu)	U.K.	95	4.2
6	Ask	U.S.	65	2.9
7	Unisys	U.S.	65	2.9
8	Lantbruksdata	Sweden	60	2.6
9	Cap Programmator [CGS]	France	50	2.2
10	Siemens-Nixdorf	Germany	45	2.0
	Total Listed		1,695	74.7
	Total Market		2,270	100.0

EXHIBIT V-114

Leading Vendors, Application Software Products Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	WM Data Nordic	Sweden	110	5.6
2	Microsoft	U.S.	85	4.3
3	Datema	Sweden	55	2.8
4	IBM	U.S.	50	2.5
5	Lotus	U.S.	45	2.3
6	Wordperfect	U.S.	40	2.0
7	Cap Programmator [CGS]	France	40	2.0
8	IBS	Sweden	35	1.8
9	Maldata	Sweden	35	1.8
10	Apiron	Sweden	30	1.5
	Total Listed		525	26.6
	Total Market		1,970	100.0

EXHIBIT V-115

Leading Vendors, Turnkey Systems Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	Sapia	Sweden	430	17.6
2	Industri-Matematik	Sweden	170	6.9
3	Maldata	Sweden	110	4.5
4	Intergraph	U.S.	100	4.1
5	Digital	U.S.	85	3.5
6	Siemens-Nixdorf	Germany	80	3.3
7	IBM	U.S.	60	2.4
8	Cap Programmator [CGS]	France	50	2.0
9	Apiron	Sweden	50	2.0
10	ICL (Fujitsu)	U.K.	45	1.8
	Total Listed		1,180	48.2
	Total Market		2,450	100.0

EXHIBIT V-116

Leading Vendors, Equipment Maintenance Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	IBM	U.S.	745	21.0
2	ICL (Fujitsu)	U.K.	625	17.6
3	Digital	U.S.	325	9.2
4	Unisys	U.S.	150	4.2
5	Siemens-Nixdorf	Germany	125	3.5
6	ComputerVision	U.S.	85	2.4
7	Bull	France	80	2.3
8	HP	U.S.	75	2.1
9	AT&T	U.S.	65	1.8
10	Wang	U.S.	60	1.7
	Total Listed		2,335	65.8
	Total Market		3,550	100.0

EXHIBIT V-117

Leading Vendors, Environmental Services Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	IBM	U.S.	50	2.7
2	Digital	U.S.	35	1.9
3	ICL (Fujitsu)	U.K.	30	1.6
4	Unisys	U.S.	25	1.3
5	Siemens-Nixdorf	Germany	20	1.1
6	ComputerVision	U.S.	12	0.6
7	Wang	U.S.	9	0.5
8	HP	U.S.	8	0.4
9	AT&T	U.S.	4	0.2
10	Rank Xerox	U.K.	3	0.2
	Total Listed		196	10.5
	Total Market		1,860	100.0

EXHIBIT V-118

Leading Vendors, Information Services Sweden, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (SK Millions)	Market Share (Percent)
1	IBM	U.S.	2,330	9.0
2	Cap Programmator [CGS]	France	1,160	4.5
3	ICL (Fujitsu)	U.K.	890	3.4
4	Digital	U.S.	880	3.4
5	Enator	Sweden	410	1.6
6	Unisys	U.S.	350	1.3
7	Siemens-Nixdorf	Germany	290	1.1
8	Reuters	U.K.	250	1.0
9	Microsoft	U.S.	220	0.8
10	Bull	France	170	0.7
11	Oracle	U.S.	160	0.6
12	EDS	U.S.	160	0.6
13	Intergraph	U.S.	150	0.6
14	Tietotehdas	Finland	140	0.5
15	HP	U.S.	140	0.5
16	ComputerVision	U.S.	120	0.5
17	Wang	U.S.	105	0.4
18	AT&T	U.S.	100	0.4
19	Infonet	Belgium	80	0.3
20	Ask	U.S.	75	0.3
21	Computer Associates	U.S.	70	0.3
22	Telerate	U.S:	45	0.2
23	Lotus	U.S.	45	0.2
24	GEIS	U.S.	45	0.2
25	Novell	U.S.	45	0.2
26	Wordperfect	U.S.	40	0.2
27	Rank Xerox	U.K.	40	0.2
28	Olivetti	Italy	40	0.2
29	Dun & Bradstreet	U.S.	40	0.2
30	Sun Microsystems	U.S.	35	0.1
	Total Listed		8,625	33.2
	Total Market		26,000	100.0

* *Software and services excludes equipment services*

F

Denmark - Market Commentary

1. Introduction

Denmark's population is 5.14 million. GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 142 billion, about 2% of OECD European members' total GDP.

Denmark was one of the second wave of countries to join the European Community (EC), joining with Ireland and the U.K. in 1973. Since that time the country has experienced a number of ups and downs in its highly taxed economy, although on balance it has benefited considerably from being an EC member, in part because of the important role played by agriculture. In 1992 the Danes voted in a referendum against supporting the EC's Maastricht Treaty, giving a verdict which was to be reversed in a further poll in May 1993.

2. Economic Environment

GDP grew in 1992 only slightly less than in 1991, at a rate (1.1%) just above the OECD European average of 1.0%., and at only half the average rate for Denmark in the 1980s. Inflation, already low in 1991, declined to 2.1%. The current account surplus doubled to 3% of GDP, helped by exports of oil from the North Sea.

Unemployment at 11.1% exceeded the OECD European average of 9.9%, and was higher than in 1991. This represents a heavy burden on the economy as welfare benefits are generous. Economists point to these benefits, the relatively small and fragmented manufacturing base (at 16% of GDP, compared with, for example, Austria with 26%), and to possible reductions in EC agricultural subsidies as factors which make for uncertainty in Denmark's future performance.

However, apart from persistent high levels of unemployment other indicators are forecast to be hopeful. Inflation will remain low, GDP growth will decline slightly in 1993, (0.5%) but will recover in 1994 to OECD average rates.

3. Software and Services Industry

The software, services and maintenance industry in Denmark is closely linked to the state of the country's economy. INPUT forecasts that the Danish whole information services market will reach almost $2.7 billion (or ECU 2.1 billion) in 1993, and will grow at an average of 6% per annum to reach $3.5 billion or ECU 2.8 billion) by 1998.

Exhibit V-119 shows the detailed forecast by INPUT delivery mode in the local currency - Danish Kroner.

EXHIBIT V-119

Software and Services Market, Denmark, 1993-1998

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	2,900	3,100	3,250	7	4,250
Systems Integration	340	390	475	20	970
Systems Operations	150	180	220	19	430
Processing Services	3,040	3,010	2,950	-1	2,750
Network Services	530	620	720	17	1,350
System Software Products	1,650	1,750	1,950	7	2,400
Application Software Products	1,350	1,500	1,700	13	2,750
Turnkey Systems	1,910	2,050	2,200	6	2,770
Equipment Services	2,950	3,080	3,110	2	3,340
Total (rounded)	15,000	16,000	17,000	6	21,000
Total (excluding Equipment Services)	11,900	12,600	13,500	7	17,700

The main opportunity markets (all with forecast growth rates of over 10%) are in network services, systems integration, systems operations and applications software products. The professional services sector shows strong interest in CASE tools and the application of object-oriented systems techniques. But professional services spending in 1992 was 9% down on INPUT's previous forecast due to customers cutting back on consulting and training services.

Detailed local currency forecasts of the components making up each service delivery mode in the Danish market are shown in Exhibit V-120 onwards for the period 1992-1997.

Systems Integration in Denmark has half the penetration of Europe as a whole, again due to the small number of large project opportunities. Its growth rate of 17% pa is below the European average of 19%. Nevertheless, opportunities will arise for projects in public sector, utilities and financial services.

Systems operations is less favoured in Denmark than in the larger country markets of Europe, due to the smaller number of reasonably sized opportunities. It is expected to grow at a good growth rate of 20% pa, with public sector and utilities contracts offering the most opportunities.

Processing Services constituted 20% of the 1992 market, which is more than double the European average but is forecast to fall at 1% CAGR. Processing services in Denmark is still important especially in the agricultural and financial services sectors.

Network applications is expected to show the highest growth rate (29% pa) over the five-year period of any of the subsectors. The use of network services is more highly developed in Denmark than in some of the other country markets, both large and small. The public telecommunications authority, Danish Telecom, was reconstituted to include the previously local telephone companies. It is expected to increase its activities in value-added network services (VANS).

EXHIBIT V-120

Professional Services Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	470	520	570	10	850
Education & Training	240	260	270	6	350
Software Development	2,180	2,300	2,400	5	3,000
Application Management	15	20	25	25	60
Total (rounded)	2,900	3,100	3,250	7	4,250

EXHIBIT V-121

Systems Integration Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	90	105	125	14	205
Application Software Products	60	70	100	38	350
System Software Products	30	30	35	17	65
Professional Services	155	175	200	13	320
Other Services	5	10	13	24	29
Total (rounded)	340	390	475	20	970

EXHIBIT V-122

Systems Operations Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	55	65	80	17	145
Application Operations	65	75	90	19	180
Desktop Services	30	40	50	20	100
Total (rounded)	150	180	220	19	430

EXHIBIT V-123

Processing Services Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	2,790	2,750	2,690	-1	2,480
Utility Processing	57	55	53	-3	45
Other Processing	195	200	205	2	220
Total (rounded)	3,040	3,010	2,950	-1	2,750

EXHIBIT V-124

Network Services Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	335	365	395	6	500
Network Applications	180	235	305	27	790
Network Management	15	19	24	26	60
Total (rounded)	530	620	720	17	1,350

EXHIBIT V-125

System Software Products Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	680	710	730	0	710
Minicomputer	570	600	650	5	750
Workstation and PC	380	450	550	16	950
Total (rounded)	1,650	1,750	1,950	7	2,400

EXHIBIT V-126

Application Software Products Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	96	92	90	-2	78
Minicomputer	420	445	480	7	620
Workstation and PC	820	950	1,120	17	2,050
Total (rounded)	1,350	1,500	1,700	13	2,750

EXHIBIT V-127

Turnkey Systems Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	950	980	1015	2	1075
Application Software Products	350	395	440	11	660
System Software Products	120	128	135	5	160
Professional Services	490	550	610	10	870
Total (rounded)	1,910	2,050	2,200	6	2,770

EXHIBIT V-128

Equipment Services Market, Denmark

	DK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	1,850	1,875	1,850	0	1,750
Environmental Services	1,100	1,200	1,260	6	1,590
Total (rounded)	2,950	3,080	3,110	2	3,340

Applications Software in Denmark is forecast to grow with a CAGR of 13%. The attractiveness of the pre-built solution is likely over the five-year forecast period to increase in the midrange and minicomputer sectors, as open systems based on UNIX and networks are already accepted in the Danish market. Downsizing is not a major issue in Denmark since there are few large systems installed.

4. Competitive Environment

Exhibit V-129 lists the top ten vendors in the Danish market as measured on their 1992 (or equivalent 1992) revenues. It has been compiled using only the information services revenues attributable to the domestic market in Denmark, and excludes exports and revenues gained from within any parent group companies. Such captive markets exclude vendors such as Datacentralen from the list.

As in most other countries, IBM heads the list in information services revenues, assisted by its large component of systems software product revenues. IBM's strengths in Denmark also include PC-level product sales, systems integration, processing and network services. IBM has a joint-venture participation with KTAS, the Copenhagen telephone company in the danNet processing and network services company.

EXHIBIT V-129

Leading Vendors, Software and Services Denmark, 1992

Rank	Vendor	Country of Origin	Estimated Country Revenues* (DK Millions)	Market Share (Percent)
1	IBM	U.S.	1,230	10.3
2	PBS	Denmark	830	7.0
3	JDC Data	Denmark	325	2.7
4	Digital	U.S.	195	1.6
5	Olivetti	Italy	185	1.6
6	ICL (Fujitsu)	U.K. (J)	170	1.4
7	Microsoft	U.S.	155	1.3
8	Oracle	U.S.	130	1.1
9	Danet	Denmark	120	1.0
10	Bording Data	Denmark	115	1.0
	Total Listed		3,455	29.0
	Total market		11,900	100.0

* *Software and services excludes equipment services*

G

Norway - Market Commentary

1. Introduction

Norway has a population of 4.27 million. It is the largest non-OPEC exporter of oil. Only 14% of GDP derives from manufacturing.

GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 113 billion, about 1.4 % of OECD European members' total GDP.

Norway is the seventh largest software, services and maintenance market in Europe, estimated at NOK 14 billion ($2.2 billion) in 1992.

2. Economic Environment

In 1992 GDP growth was higher at 3.3% than in 1991 (1.9%). Inflation dropped, for the third year running, to 2.3%. The current account surplus was lower than in 1991 but was still of the order of 3% of GDP.

According to forecasts, a small decline in growth rate will occur in 1993 (to 1.5%) followed by higher growth in 1994 (2.5%). Inflation, little changed in 1993 (2.5%), will remain (at 3.0%) below the OECD average (3.3%) in 1994. And the current account surplus will continue until 1995 at around the current level or marginally less.

Norway is a member of the European Free Trade Association (EFTA) and will therefore be part of the EEA (European Economic Area) when this is inaugurated, probably in 1994. Under this, restrictions on trade and the movement of capital between EC and EFTA countries will be largely removed. It is considered possible that the Norwegians will not ratify the move to join the EC as full members, although negotiations are in train.

The largest Norwegian companies listed in the European Top 100 are the two state owned energy companies, Statoil and Norsk Hydro.

3. Software and Services Industry

INPUT forecasts that the Norwegian market for software and service will be $2.3 billion (ECU 1.8 billion) in 1993, growing at 5% per annum to reach almost $3.0 billion (or ECU 2.4 billion) by 1998.

Exhibit V-130 provides a detailed forecast by INPUT delivery mode in local currency.

EXHIBIT V-130

Software and Services Market, Norway, 1993-1998

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	3,000	3,150	3,350	6	4,150
Systems Integration	260	300	355	17	660
Systems Operations	185	225	265	18	505
Processing Services	3,330	3,450	3,440	0	3,530
Network Services	395	430	475	13	805
System Software Products	1,320	1,380	1,450	6	1,810
Application Software Products	1,160	1,320	1,470	12	2,350
Turnkey Systems	1,470	1,610	1,700	7	2,270
Equipment Services	2,870	2,940	3,030	2	3,190
Total (rounded)	14,000	14,800	15,500	5	19,300
Total (excluding Equipment Services)	11,100	11,900	12,500	6	16,100

In Norway, the largest sector of the software and services market in 1992 is represented by processing services, accounting for about 24% of the total market. However, growth in the processing services sector is forecast at 0% per annum, between 1993 and 1998; in real terms a falling market.

By 1998 professional services will be the largest sector forecast to represent 22% of the total information services market in Norway. User demand for software development services, although hardly growing, represents the largest portion of the professional services market accounting for about 75% of user expenditure in this sector.

The primary growth opportunities in the Norwegian market lie in the areas of applications software products and network applications.

Details of local currency forecasts for each of the components making up each delivery mode is shown in Exhibit V-131 onward, for Norway for the period 1993 to 1998.

EXHIBIT V-131

Professional Services Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	390	425	470	10	670
Education & Training	335	370	410	10	590
Software Development	2,250	2,350	2,450	4	2,850
Application Management	13	15	20	25	45
Total (rounded)	3,000	3,150	3,350	6	4,150

EXHIBIT V-132

Systems Integration Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	70	80	90	12	140
Application Software Products	45	55	75	34	240
System Software Products	20	25	30	10	40
Professional Services	120	135	155	10	220
Other Services	5	5	7	32	20
Total (rounded)	260	300	355	17	660

EXHIBIT V-133

Systems Operations Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	85	100	115	16	210
Application Operations	70	85	100	16	180
Desktop Services	30	40	50	24	115
Total (rounded)	185	225	265	18	505

EXHIBIT V-134

Processing Services Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	3,050	3,160	3,140	0	3,200
Utility Processing	63	63	61	-2	55
Other Processing	215	230	235	3	270
Total (rounded)	3,330	3,450	3,440	0	3,530

EXHIBIT V-135

Network Services Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	260	270	280	6	360
Network Applications	115	135	165	22	360
Network Management	20	25	31	27	83
Total (rounded)	395	430	475	13	805

EXHIBIT V-136

System Software Products Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	615	610	605	0	590
Minicomputer	415	445	475	7	635
Workstation and PC	290	325	365	12	585
Total (rounded)	1,320	1,380	1,450	6	1,810

EXHIBIT V-137

Application Software Products Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	110	110	110	0	105
Minicomputer	350	385	415	8	575
Workstation and PC	700	820	940	15	1,670
Total (rounded)	1,160	1,320	1,470	12	2,350

EXHIBIT V-138

Turnkey Systems Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	750	805	835	5	1035
Application Software Products	275	315	350	12	560
System Software Products	95	100	105	5	130
Professional Services	350	385	405	7	540
Total (rounded)	1,470	1,610	1,700	7	2,270

EXHIBIT V-139

Equipment Services Market, Norway

	NK Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	1,820	1,830	1,850	0	1,750
Environmental Services	1,050	1,110	1,180	5	1,440
Total (rounded)	2,870	2,940	3,030	2	3,190

4. Competitive Environment

Exhibit V-140 lists the leading ten software and services vendors in the Norwegian market during 1992. This listing is compiled using only the software and services revenues attributable to the domestic market in Norway, excluding exports and excluding revenues from within any parent group or subsidiaries.

Unlike many European markets, IBM is not the leading vendor in the software and services market. In Norway IBM is relegated to second place behind NIT an indigenous company. Within the Norwegian software and services market seven of the leading ten vendors are indigenous companies.

The leading software and services vendor in Norway, NIT, commands a 10% share of the market. The company is dedicated to the local and national government in Norway. The primary activities of this company is the provision of processing services which account for about 75% of revenue. The second major activity of the company is in the professional services are a which contributes about 22% of revenue, the remainder being derived from network services. In 1992 the company employed a total of 1000 staff. All 1992 activities of NIT were within the Norwegian market.

EXHIBIT V-140

Leading Vendors, Software and Services Norway, 1992

Rank	Vendor	Country of Origin	Estimated Country Revenues* (NK Millions)	Market Share (Percent)
1	NIT	Norway	1,120	10.1
2	IBM	U.S.	850	7.7
3	Fellesdata	Norway	540	4.9
4	Bankenes Betalingssentral	Norway	525	4.7
5	Novit	Norway	395	3.6
6	EDB	Norway	250	2.3
7	Rogalandsdata	Norway	220	2.0
8	Olivetti	Italy	205	1.8
9	Cap Gemini Sogeti	France	170	1.5
10	Digital	U.S.	165	1.5
	Total Listed		4,440	40.0
	Total market		11,100	100.0

* *Software and services excludes equipment services*

IBM is following a vigorous policy of pursuing additional software and services revenues in a move to counter reducing revenue and margins from equipment sales. IBM has been particularly successful in establishing a European-wide systems integration business and this sector of the software and services market in Norway accounts for almost 7% of the total compared with the overall European average of 4%.

Fellesadata primarily supplies the savings banking sector in Norway. Processing services dominate its activities.

H

Finland - Market Commentary

1. Introduction

The population of Finland was 5.0 million in 1992 in a land area of 338,000 square kilometres (making it one of the least densely populated European countries).

GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 110 billion, about 1.4% of OECD European members' total GDP.

It is a member of the European Free Trade Association (EFTA) and will therefore be part of the EEA (European Economic Area) when this is inaugurated, probably in 1994. Under this, restrictions on trade, and the movement of capital between EC and EFTA countries will be largely removed.

Finland has made individual application for EC membership, and it is likely that full membership will be negotiated and ratified.

2. Economic Environment

The economy, after enviable growth in the 1980s (3.3% on average 1983-90), was badly affected by the general downturn and by political changes in Central and Eastern Europe. The 1991 slump was the worst for many years. Soviet trade all but disappeared, paper and pulp industries were in a cyclical trough. Bank credit losses soared, engineering production and investment slumped and the currency was devalued.

In 1992 the economy shrank again by 3.6% (-6.4% in 1991). Consumer price inflation moved downwards again and, at 2.9%, was below the OECD average. Unemployment again increased dramatically to reach 13.1%, treble the rate in 1991. The current account deficit continued at a high rate (4.6%) in relationship to GDP.

However, there is some guarded optimism in latest economic forecasts. Negative GDP growth is expected in 1993 but at a reduced rate (-1.0%,) to be followed by a modest recovery in 1994 (+1.5%.). Inflation increases slightly to reach 4.5% in 1994, above the OECD average of 3.3%. The current account should be in balance in 1994.

3. Software and Services Industry

The software and services market in Finland is forecast by INPUT to be $1.5 billion or ECU 1.3 billion for 1993. The market is forecast to grow at an average of 3% per annum to reach $1.8 billion or ECU 1.5 billion by 1998. This forecast growth is 3% down on last year's prediction - an indication of the rate at which demand has changed.

Exhibit V-141 shows the detailed forecast by INPUT delivery mode in the local currency.

EXHIBIT V-141

Software and Services Market, Finland, 1993-1998

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	1,510	1,610	1,690	5	2,090
Systems Integration	240	280	330	22	745
Systems Operations	180	210	250	17	460
Processing Services	1,010	990	950	-4	770
Network Services	240	270	300	9	410
System Software Products	850	840	840	1	900
Application Software Products	750	810	880	7	1,150
Turnkey Systems	890	950	1,020	4	1,140
Equipment Services	1,630	1,620	1,610	-2	1,380
Total (rounded)	7,300	7,580	7,870	4	9,050
Total (excluding Equipment Services)	5,670	5,960	6,260	5	7,670

Demand for custom software development projects and contract staff fell in 1992 in Finland as elsewhere in Europe, but some recovery is expected to generate 5% growth in professional services over the next five years.

The size of the systems integration sector has been substantially revised up compared to last year's report. Vendors reported more business than had been assumed previously and a much larger proportion was accounted for by software products. The outlook for growth is also best in this market as more major projects are being contracted out at fixed price.

Outsourced systems operations is expected to continue a healthy growth pattern. This is a market that is generally stimulated by the imposition of tight financial constraints on IT budgets.

Downsizing of hardware investments is expected to lead to further falls in equipment services revenues in Finland.

Detailed local currency forecasts of the components of each delivery mode sector in the Finnish market are shown in Exhibit V-142 onward for the period 1992 to 1997.

EXHIBIT V-142

Professional Services Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	250	270	290	8	395
Education & Training	145	150	155	3	170
Software Development	1,110	1,180	1,240	5	1,510
Application Management	5	5	6	25	15
Total (rounded)	1,510	1,610	1,690	5	2,090

EXHIBIT V-143

Systems Integration Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	65	75	85	16	155
Application Software Products	43	50	70	40	270
System Software Products	20	22	26	20	54.5
Professional Services	107	125	140	14	245
Other Services	5	6	8	30	22
Total (rounded)	240	280	330	22	745

EXHIBIT V-144

Systems Operations Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	100	115	135	16	240
Application Operations	70	80	95	17	175
Desktop Services	12	15	19	25	45
Total (rounded)	180	210	250	17	460

EXHIBIT V-145

Processing Services Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	905	885	850	-4	680
Utility Processing	30	28	26	-6	19
Other Processing	75	76	76	0	72
Total (rounded)	1,010	990	950	-4	770

EXHIBIT V-146

Network Services Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	145	155	160	2	175
Network Applications	80	90	105	11	155
Network Management	18	23	30	27	76
Total (rounded)	240	270	300	9	410

EXHIBIT V-147

System Software Products Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	370	340	310	-7	220
Minicomputer	270	275	280	2	300
Workstation and PC	205	225	250	11	380
Total (rounded)	850	840	840	1	900

EXHIBIT V-148

Application Software Products Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	72	68	65	-6	47
Minicomputer	225	240	255	5	305
Workstation and PC	450	500	560	10	800
Total (rounded)	750	810	880	7	1,150

EXHIBIT V-149

Turnkey Systems Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	435	455	470	0	455
Application Software Products	165	185	205	7	265
System Software Products	55	59	63	3	70
Professional Services	230	255	280	7	350
Total (rounded)	890	950	1,020	4	1,140

EXHIBIT V-150

Equipment Services Market, Finland

	FM Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	1,050	1,030	1,010	-4	800
Environmental Services	575	585	600	0	580
Total (rounded)	1,630	1,620	1,610	-2	1,380

4. Competitive Environment

Exhibit V-151 lists the leading ten information services vendors in the Finnish market as measured on their 1992 revenues. This list has been compiled using only the software and services revenues attributable to the domestic Finnish market, and excludes exports and revenues gained from within any parent group companies. This excludes the City of Helsinki's KT-Tietokeskus, for example, with revenues of FIM 445M in 1992.

Five of the companies are from Finland itself. Last year there were two other Scandinavian-owned vendors, but mergers and changing fortunes have removed them. IBM, Digital and ICL are the non-Nordic companies; all these equipment manufacturers have increased their penetration of information services markets as hardware markets have softened during the past several years. The list excludes the equipment service revenues of these vendors.

The leading two Finnish information services companies Tietotehdas and VTKK are both long established (1960s) companies which have developed from the days as sophisticated service bureaux into vendors with a broad range of capabilities including professional services, equipment supply, processing and network services.

Nokia Data was sold in 1991 to ICL, the U.K. company now itself 80% owned by Fujitsu of Japan. It is strong in turnkey systems with special strength in the banking and finance sector.

The largest vendor specialising in professional services rather than processing services is the Finnish subsidiary of Cap Programmator, now part of the Cap Gemini Sogeti group.

EXHIBIT V-151

Leading Vendors, Software and Services Finland

Rank	Vendor	Country of Origin	Estimated Country Revenues (FM Millions)	Market Share (Percent)
1	Tietotehdas	Finland	600	10.5
2	IBM	U.S.	430	7.5
3	VTKK	Finland	390	6.8
4	Digital	U.S.	255	4.5
5	ICL (Fujitsu)	U.K. (J)	210	3.7
6	Elorg-Data	Finland	160	2.8
7	Paakaupunkiseudom	Finland	140	2.5
8	CMA Data	Denmark	120	2.1
9	Cap Gemini Sogeti	France	120	2.1
10	Kunnallistieto	Finland	110	1.9
	Total Listed		2,535	44.5
	Total market		5,700	100.0

* *Software and services excludes equipment services*

I

Netherlands - Market Commentary

1. Introduction

The Netherlands (Holland), one of the founding members of the European Community (EC), has a population of 15 million. GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 320 billion, about 4.1% of OECD European members' total GDP.

The Information Services market in the Netherlands is the fifth largest in Europe and was Dfl 10.5 billion ($6.1 billion) for 1992.

2. Economic Environment

The population of the Netherlands is over 15 million and its workforce is 6 million (36% female). History, geography, culture and government policy have combined to give the Dutch economic advantages. They are heirs to a long mercantile tradition. Some 50% of all the EC's 320 million consumers live within a 500 km radius of Amsterdam.

The Dutch are good at languages, science and technology. Government incentives have resulted in foreigners contributing 25% of industrial investment in Holland. Perhaps a result of these factors, the Netherlands, with only 4.5% of the population of the EC, accounts for some 13.5% of EC foreign trade and exports (of which energy is 8.5%) equate to about 56% of GDP.

One of the OECD's star performers of recent years, the Dutch economy slowed down in 1991 to a rate of GDP growth of 2.2%, and still further in 1992 to 1.5%, very close to the OECD average. Price inflation was also in line with the OECD average at 3.7%, and the current account balance was the best surplus in the EC.

Forecasts for GDP indicate zero growth in 1993 but a 1.8% recovery in 1994. Inflation will remain under control below OECD averages for 1993 and 1994, and current account balances will remain steady at around 2% of GDP.

3. Software and Services Industry

The Dutch Information Services market is forecast by INPUT to grow from $6.5 billion (ECU 5.1 billion) to $10.0 billion (ECU 7.9 billion) between 1993 and 1998. This is a growth rate averaging 9% per year over the period slightly down on the last forecast.

The Netherlands market represents about 6% of the overall European information services market. Exhibit V-152 gives the breakdown of the market by service mode as defined by INPUT. The professional services sector remains strong, growing faster than the market as a whole, reflecting a continued strong demand for advanced skills and the development of custom software.

EXHIBIT V-152

Software and Services Market, Netherlands, 1993-1998

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	2,980	3,140	3,310	7	4,500
Systems Integration	320	380	455	20	940
Systems Operations	195	240	280	18	540
Processing Services	940	970	1,000	4	1,160
Network Services	385	445	540	23	1,230
System Software Products	1,200	1,250	1,330	6	1,680
Application Software Products	1,080	1,220	1,380	13	2,290
Turnkey Systems	980	1,070	1,170	12	1,870
Equipment Services	2,400	2,490	2,590	4	3,050
Total (rounded)	10,500	11,200	12,100	9	17,300
Total (excluding Equipment Services)	8,100	8,700	9,500	10	14,200

The tables from Exhibit V-153 onward give the forecasts in local currency for the submodes of each service mode for the Netherlands during the period 1993 to 1998.

EXHIBIT V-153

Professional Services Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	390	425	465	11	725
Education & Training	330	350	370	8	520
Software Development	2,230	2,330	2,430	6	3,150
Application Management	25	35	45	25	105
Total (rounded)	2,980	3,140	3,310	7	4,500

EXHIBIT V-154

Systems Integration Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	85	100	115	15	200
Application Software Products	58	68	95	38	340
System Software Products	25	30	35	17	65
Professional Services	145	175	200	12	310
Other Services	7	7	9	29	25
Total (rounded)	320	380	455	20	940

EXHIBIT V-155

Systems Operations Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	100	120	140	16	250
Application Operations	55	65	75	18	150
Desktop Services	40	55	65	21	140
Total (rounded)	195	240	280	18	540

EXHIBIT V-156

Processing Services Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	830	860	880	3	1,000
Utility Processing	27	27	27	1	29
Other Processing	80	87	93	8	128
Total (rounded)	940	970	1,000	4	1,160

EXHIBIT V-157

Network Services Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	235	250	275	9	385
Network Applications	130	170	235	36	780
Network Management	20	25	30	21	65
Total (rounded)	385	445	540	23	1,230

EXHIBIT V-158

System Software Products Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	595	605	625	3	685
Minicomputer	340	350	370	5	440
Workstation and PC	260	290	335	14	555
Total (rounded)	1,200	1,250	1,330	6	1,680

EXHIBIT V-159

Application Software Products Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	105	105	105	0	105
Minicomputer	320	355	390	10	580
Workstation and PC	650	760	880	16	1,600
Total (rounded)	1,080	1,220	1,380	13	2,290

EXHIBIT V-160

Turnkey Systems Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	480	505	535	8	735
Application Software Products	205	235	270	17	510
System Software Products	60	64	68	9	97
Professional Services	235	265	300	15	530
Total (rounded)	980	1,070	1,170	12	1,870

EXHIBIT V-161

Equipment Services Market, Netherlands

	Dfl Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	1,570	1,610	1,660	2	1,750
Environmental Services	825	875	930	8	1,300
Total (rounded)	2,400	2,490	2,590	4	3,050

4. Competitive Environment

Exhibit V-162 lists the top ten vendors in the Dutch market during 1992. It is compiled using only the information services revenues attributable to the domestic market within the Netherlands, excluding exports and excluding revenues from within any parent group companies.

EXHIBIT V-162

Leading Vendors, Software and Services Netherlands 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues* (Dfl Millions)	Market Share (Percent)
1	Cap Volmac	France	730	9.0
2	IBM	U.S.	610	7.5
3	Raet	Netherlands	535	6.6
4	BSO Origin	Netherlands	440	5.4
5	RCC	Netherlands	400	4.9
6	Getronics	Netherlands	350	4.3
7	Digital	U.S.	185	2.3
8	CMG	U.K.	160	2.0
9	Multihouse	Netherlands	125	1.5
10	Microsoft	U.S.	125	1.5
	Total Listed		3,660	45.2
	Total Market		8,100	100.0

* *Software and services excludes equipment services*

Cap Volmac (Volmac merged with the Dutch subsidiary of Cap Gemini Sogeti group in 1992) is the information services market leader in the Netherlands. Last year IBM was number one. Some 90% of Cap Volmac's revenues come from within the Netherlands, most of the rest came from neighbouring Belgium. Active in most industry sectors, some 28% of Volmac business is done in Banking and Insurance, and 15% in the public sector. In 1991 it was a group of 24 operating companies with a wide variety of primarily professional services specialisations. During 1992 the company has been busy re-structuring to gain more synergy between subsidiaries and with the rest of Cap Gemini Sogeti.

Second largest Dutch vendor Raet N.V. also saw revenues rise with acquisitions. It absorbed AC Service into the Group. Just over 20% of business is now international, with subsidiaries in Switzerland, Germany, Austria, Belgium and Cyprus, and the company offers a wide range of products and services to practically all industry sectors.

BSO/Origin has reorganised its four companies (including Origin/Technology in Business) operating in different market sectors, to provide a clearer management structure. Origin was previously a 50-50 joint ownership between BSO and Philips, who now owns only 20%. Origin was formed from the international systems operations of both companies.

CMG operates primarily in the Netherlands and the U.K. with a strong specialisation in financial services. It was one of the few independent leaders who increased revenues in 1992.

The leading companies are ranked for each service delivery mode, according to their attributable 1992 revenues in the Netherlands.

EXHIBIT V-163

Leading Vendors, Professional Services Netherlands 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Cap Volmac	France	565	19.0
2	Getronics	Netherlands	215	7.2
3	Raet	Netherlands	210	7.0
4	RCC	Netherlands	200	6.7
5	BSO Origin	Netherlands	195	6.5
6	IBM	U.S.	120	4.0
7	CMG	U.K.	100	3.4
8	Bouwfonds Informatica	Netherlands	85	2.9
9	Ordina	Netherlands	70	2.3
10	Multihouse	Netherlands	50	1.7
	Total Listed		1,810	60.7
	Total Market		2,980	100.0

EXHIBIT V-164

Leading Vendors, Systems Integration Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	70	21.9
2	BSO Origin	Netherlands	60	18.8
3	Cap Volmac	France	60	18.8
4	Raet	Netherlands	25	7.8
5	Bull	France	20	6.3
6	Digital	U.S.	20	6.3
7	Logica	U.K.	20	6.3
8	Andersen Consulting	U.S.	15	4.7
9	EDS	U.S.	10	3.1
10	Rank Xerox	U.K.	5	1.6
	Total Listed		305	95.3
	Total Market		320	100.0

EXHIBIT V-165

Leading Vendors, Systems Operations Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Raet	Netherlands	30	15.4
2	EDS	U.S.	25	12.8
3	Cap Volmac	France	20	10.3
4	CMG	U.K.	20	10.3
5	BSO Origin	Netherlands	13	6.7
6	CSC	U.S.	8	4.1
7	IBM	U.S.	6	3.1
8	Computer Centrum N'land	Netherlands	5	2.6
9	Digital	U.S.	5	2.6
10	Multihouse	Netherlands	4	2.1
	Total Listed		136	69.7
	Total Market		195	100.0

EXHIBIT V-166

Leading Vendors, Processing Services Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	RCC	Netherlands	200	21.3
2	Raet	Netherlands	160	17.0
3	BSO Origin	Netherlands	80	8.5
4	Computer Centrum N'land	Netherlands	40	4.3
5	ADP	U.S.	35	3.7
6	CMG	U.K.	25	2.7
7	Getronics	Netherlands	14	1.5
8	Telekurs	Switzerland	12	1.3
9	IBM	U.S.	11	1.2
10	Medsys	Netherlands	10	1.1
	Total Listed		587	62.4
	Total Market		940	100.0

EXHIBIT V-167

Leading Vendors, Network Application Services Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Raet	Netherlands	25	19.2
2	IBM	U.S.	14	10.8
3	Infonet	Belgium	13	10.0
4	CMG	U.K.	8	6.2
5	BSO Origin	Netherlands	4	3.1
6	Digital	U.S.	4	3.1
7	Bull	France	2	1.5
8	Multihouse	Netherlands	2	1.5
9	GEIS	U.S.	2	1.5
10	GSI	France	2	1.5
	Total Listed		76	58.5
	Total Market		130	100.0

EXHIBIT V-168

Leading Vendors, System Software Products Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	350	29.2
2	Microsoft	U.S.	70	5.8
3	Getronics	Netherlands	70	5.8
4	Digital	U.S.	70	5.8
5	Oracle	U.S.	45	3.8
6	Unisys	U.S.	30	2.5
7	Cap Volmac	France	30	2.5
8	Novell	U.S.	30	2.5
9	Raet	Netherlands	25	2.1
10	Bull	France	25	2.1
	Total Listed		745	62.1
	Total Market		1,200	100.0

EXHIBIT V-169

Leading Vendors, Application Software Products Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Raet	Netherlands	55	5.1
2	Microsoft	U.S.	50	4.6
3	Lotus	U.S.	30	2.8
4	Cap Volmac	France	25	2.3
5	Wordperfect	U.S.	25	2.3
6	IBM	U.S.	20	1.9
7	SAP	Germany	16	1.5
8	Bouwfonds Informatica	Netherlands	15	1.4
9	BSO Origin	Netherlands	13	1.2
10	Multihouse	Netherlands	10	0.9
	Total Listed		259	24.0
	Total Market		1,080	100.0

EXHIBIT V-170

Leading Vendors, Turnkey Systems Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	BSO Origin	Netherlands	65	6.6
2	Getronics	Netherlands	55	5.6
3	Multihouse	Netherlands	50	5.1
4	Siemens-Nixdorf	Germany	35	3.6
5	Cap Volmac	France	35	3.6
6	Intergraph	U.S.	30	3.1
7	Digital	U.S.	30	3.1
8	IBM	U.S.	25	2.6
9	Ordina	Netherlands	13	1.3
10	Olivetti	Italy	10	1.0
	Total Listed		348	35.5
	Total Market		980	100.0

EXHIBIT V-171

Leading Vendors, Equipment Maintenance Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	290	18.5
2	Getronics	Netherlands	180	11.5
3	Digital	U.S.	120	7.6
4	Unisys	U.S.	75	4.8
5	Siemens-Nixdorf	Germany	55	3.5
6	HP	U.S.	50	3.2
7	AT&T	U.S.	45	2.9
8	Bull	France	45	2.9
9	ICL (Fujitsu)	U.K.	35	2.2
10	Olivetti	Italy	35	2.2
	Total Listed		930	59.2
	Total Market		1,570	100.0

EXHIBIT V-172

Leading Vendors, Environmental Services Netherlands 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	Getronics	Netherlands	60	7.3
2	IBM	U.S.	35	4.2
3	Unisys	U.S.	14	1.7
4	Digital	U.S.	10	1.2
5	Raet	Netherlands	6	0.7
6	HP	U.S.	5	0.6
7	Bull	France	5	0.6
8	ICL (Fujitsu)	U.K.	3	0.4
9	Siemens-Nixdorf	Germany	3	0.4
10	AT&T	U.S.	3	0.4
	Total Listed		144	17.5
	Total Market		825	100.0

EXHIBIT V-173

Leading Vendors, Information Services Netherlands, 1992

Rank	Vendor	Country of Origin	Estimated Sector Revenues (Dfl Millions)	Market Share (Percent)
1	IBM	U.S.	940	8.5
2	Cap Volmac	France	740	6.7
3	Getronics	Netherlands	590	5.4
4	Raet	Netherlands	560	5.1
5	BSO Origin	Netherlands	450	4.1
6	Digital	U.S.	330	3.0
7	Unisys	U.S.	170	1.5
8	CMG	U.K.	150	1.4
9	Siemens-Nixdorf	Germany	125	1.1
10	Microsoft	U.S.	120	1.1
11	Bull	France	100	0.9
12	Olivetti	Italy	95	0.9
13	HP	U.S.	90	0.8
14	AT&T	U.S.	75	0.7
15	ICL (Fujitsu)	U.K.	75	0.7
16	Reuters	U.K.	70	0.6
17	Oracle	U.S.	60	0.5
18	Andersen Consulting	U.S.	55	0.5
19	EDS	U.S.	50	0.5
20	Intergraph	U.S.	50	0.5
21	Logica	U.K.	40	0.4
22	Wang	U.S.	35	0.3
23	Dun & Bradstreet	U.S.	30	0.3
24	Lotus	U.S.	30	0.3
25	Novell	U.S.	30	0.3
26	SAP	Germany	25	0.2
27	Telekurs	Switzerland	25	0.2
28	Ask	U.S.	25	0.2
29	ComputerVision	U.S.	25	0.2
30	Sun Microsystems	U.S.	25	0.2
	Total Listed		5,185	47.1
	Total Market		11,000	100.0

J

Belgium - Market Commentary

1. Introduction

The population of Belgium is 9.8 million, and the labour force numbers approximately 4.2 million (35% female,) with a major presence in metallurgy industries. The population is divided into two groups: the Walloons (33%) speaking French and the Dutch speakers, the Flemish (67%). Problems in living together are not now a factor.

Wealth in the country centres on Brussels - main seat of the European Community administration - and on the northern, Flemish, part of the country. The rapid decline of the steel, coal, textiles and ship-building industries have left the country's government with heavy debts which are gradually being passed to the regional governments to service directly.

GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 219 billion, about 3% of OECD European members' total GDP.

A founder member of the EC, Belgium has long established links with Netherlands and Luxembourg, in the customs union Benelux which dates from the 1920s.

The information Services market is estimated to be the ninth largest in Europe at BF101 billion ($3.2 billion) in 1992.

2. Economic Environment

In Belgium and Luxembourg, GDP growth rate dropped in 1992 to 0.9% from 2.0% as a result of general economic circumstances in international trade and in particular as the recession bit in Germany; a major export market for Belgium. Inflation declined from 3.2% to 2.5%. The current account remained in surplus to the tune of 2.3% of GDP. Unemployment increased by a percentage point to 10.3%, which is almost precisely the average for the EC.

Forecasts now include zero GDP growth rate in 1993 and 1.2% in 1994, small increases in inflation in 1993 (2.7%) and 1993 (3.0%). The current account will continue in surplus, whilst unemployment will decrease slightly over the longer term.

Wealth in the country centres on Brussels - main seat of the European Community administration - and on the northern, Flemish, part of the country. The rapid decline of the steel, coal, textiles and ship-building industries have left the country's government with heavy debts which are gradually being passed to the regional governments to service directly.

Luxembourg, once a beneficiary of the steel industry, is prospering as a kind of fiscal paradise, with low tax, banking secrecy, duty-free shopping, etc. Some of the new banking laws on disclosure in Switzerland seem to have caused substantial funds to be diverted alternatively to Luxembourg. This increase in Luxembourg's competitive advantage is only threatened by the possibility that other EC members may push for new banking legislation across the community.

3. Information Services Industry

INPUT forecasts that the Belgian market for Information Services will be $3.4 billion (ECU 2.7 billion) in 1993, growing at an average of 8% per annum to $5.1 billion (ECU 4.0 billion) by 1998.

Exhibit V-174 gives the detailed forecast by INPUT service delivery mode in local currency. The Belgian market is strong in custom software development - an element of the professional services delivery mode. Professional services represented 28% of the whole Belgian market in 1992, compared to 23% for Europe overall.

The primary high growth opportunities lie in the area of application solutions, especially application software products, network services, systems operations and systems integration.

EXHIBIT V-174

Software and Services Market, Belgium, 1993-1998

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	27,800	29,900	32,100	7	42,600
Systems Integration	4,250	5,000	5,750	15	10,000
Systems Operations	2,340	2,690	3,110	17	5,900
Processing Services	7,830	7,860	7,900	1	8,310
Network Services	4,250	4,800	5,450	13	9,000
System Software Products	13,100	14,000	14,900	6	19,100
Application Software Products	11,900	13,700	15,600	14	26,700
Turnkey Systems	9,010	10,000	11,040	9	15,700
Equipment Services	20,200	21,000	21,800	3	24,500
Total (rounded)	101,000	109,000	118,000	8	162,000
Total (excluding Equipment Services)	80,000	88,000	96,000	9	137,000

EXHIBIT V-175

Professional Services Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	4,050	4,540	5,090	12	7,880
Education & Training	2,250	2,390	2,430	4	2,870
Software Development	21,400	22,900	24,500	7	31,600
Application Management	50	80	100	26	250
Total (rounded)	27,800	29,900	32,100	7	42,600

EXHIBIT V-176

Systems Integration Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	1,150	1,350	1,500	9	2,100
Application Software Products	760	900	1,200	32	3,600
System Software Products	340	400	450	12	700
Professional Services	1,920	2,250	2,450	8	3,300
Other Services	80	100	130	25	310
Total (rounded)	4,250	5,000	5,750	15	10,000

EXHIBIT V-177

Systems Operations Market, Belgium

BF Millions					
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	1,500	1,700	1,950	16	3,600
Application Operations	810	950	1,110	18	2,150
Desktop Services	30	40	50	30	150
Total (rounded)	2,340	2,690	3,110	17	5,900

EXHIBIT V-178

Processing Services Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	6,990	6,990	7,000	1	7,230
Utility Processing	210	208	206	0	205
Other Processing	630	660	695	6	870
Total (rounded)	7,830	7,860	7,900	1	8,310

EXHIBIT V-179

Network Services Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	2,650	2,860	3,090	7	4,100
Network Applications	1,480	1,790	2,170	21	4,550
Network Management	110	135	165	21	355
Total (rounded)	4,250	4,800	5,450	13	9,000

EXHIBIT V-180

System Software Products Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	6,460	6,590	6,660	1	6,810
Minicomputer	4,010	4,410	4,810	9	6,690
Workstation and PC	2,580	2,970	3,390	14	5,640
Total (rounded)	13,100	14,000	14,900	6	19,100

EXHIBIT V-181

Application Software Products Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	1,060	1,060	1,050	0	990
Minicomputer	3,550	3,940	4,340	10	6,250
Workstation and PC	7,250	8,650	10,200	18	19,500
Total (rounded)	11,900	13,700	15,600	14	26,700

EXHIBIT V-182

Turnkey Systems Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	4490	4800	5100	5	6100
Application Software Products	2,010	2,330	2,680	14	4,460
System Software Products	250	270	290	6	365
Professional Services	2,260	2,600	2,970	13	4,770
Total (rounded)	9,010	10,000	11,040	9	15,700

EXHIBIT V-183

Equipment Services Market, Belgium

	BF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	14,200	14,650	15,100	2	16,500
Environmental Services	5,980	6,340	6,660	5	7,980
Total (rounded)	20,200	21,000	21,800	3	24,500

4. Competitive Environment

Exhibit V-184 lists the top ten vendors in the Belgian market during 1992. It is compiled using only the software and service revenues attributable to the domestic market within Belgium, excluding exports and excluding revenues from within any parent group companies.

As in nearly every European country, IBM leads in information services revenues. It has vigourously pursued additional business in both software and services in order to counter falling income and margins from its equipment supply and maintenance businesses. It has been particularly successful in establishing a European-wide systems integration business.

EXHIBIT V-184

Leading Vendors, Software and Services Belgium, 1992

Rank	Vendor	Country of Origin	Estimated Country Revenues* (BF Millions)	Market Share (Percent)
1	IBM	U.S.	5,510	6.9
2	Digital	U.S.	2,360	3.0
3	Computer Sciences Corp	U.S.	2,100	2.6
4	Dolmen	Belgium	2,100	2.6
5	Siemens-Nixdorf	Germany	1,940	2.4
6	Cap Gemini Sogeti	France	1,720	2.2
7	TIS Group	Belgium	1,450	1.8
8	Andersen Consulting	U.S.	1,280	1.6
9	Microsoft	U.S.	1,230	1.5
10	Administra Computing	Belgium	1,150	1.4
	Total Listed		20,840	26.1
	Total market		80,000	100.0

* *Software and services excludes equipment services*

Digital's software and service revenues have risen this year, unlike the hardware business. The company organises its services business under a single management structure and is rapidly diversifying into all types of service with the general exception of application software development.

CSC, the largest independent software and services vendor in the U.S., established a strong position in Belgium with its acquisition of CIG Intersys in 1989. This acquisition doubled CSC's revenues in Europe. The Belgian subsidiary offers a full range of services specialising in the transport, manufacturing and banking and finance sectors. CSC's more recent acquisitions aim to establish a European management consulting group led by its subsidiary Index. The U.S. company has declared its intention to invest heavily in building its European business, but its Belgian operations did not perform to expectation in 1992.

The first wholly Belgian vendor on the list is Dolmen, followed by the diverse TIS Group. TIS (Telinfo Integrated Systems) is a public company operating primarily in Belgium with subsidiaries specialising in banking, government, retail and engineering and scientific market sectors.

K

Switzerland - Market Commentary

1. Introduction

The Swiss population was 6.79 million in 1991, small in comparison with many European countries. But Switzerland ranks fourth in terms of the capitalisation of its FT500 companies, ahead of bigger countries like Spain and Netherlands, ranking behind France but with a figure about half the French one.

GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 241 billion, about 3.1% of OECD European members' total GDP.

The information services market is the eighth largest in Europe with a total size of SF 5.2 billion ($3.7 billion) in 1992.

2. Economic Environment

GDP decline continued in 1992 at -0.6%. Inflation at 5.8% in 1991 gave way to a rate of 4.5%, marginally above the OECD average, but the current account surplus increased from 4% to 6.5% of GDP. Unemployment increased to 2.5%. The Zürich Stock Exchange was one of the minority of European exchanges to register growth, ending 10.5% up on the year.

The future should include a modest return to growth in 1994 (2.0%) after a flat year in 1993. Inflation should decline to fall below the OECD average in 1994 at 2.5%. Current account surpluses will continue.

However, there is concern for the longer term future of the Swiss economy after the referendum rejecting integration with the European Economic Area. The dangers of isolation from the European mainstream are considerable.

Economists are warning that investment in innovative new products and re-skilling the labour force must take priority if Switzerland is to retain its high competitive ranking in industrial Europe.

3. Information Services Industry

Exhibit V-185 illustrates the breakdown of the market into INPUT's nine information service delivery modes.

EXHIBIT V-185

Software and Services Market, Switzerland, 1993-1998

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	910	950	1,000	8	1,390
Systems Integration	220	255	290	15	510
Systems Operations	54	63	71	14	121
Processing Services	425	455	480	7	630
Network Services	210	240	280	20	590
System Software Products	725	750	765	5	975
Application Software Products	430	480	540	14	910
Turnkey Systems	900	960	1,040	10	1,540
Equipment Services	1,310	1,340	1,370	2	1,510
Total (rounded)	5,200	5,500	5,850	8	8,200
Total (excluding Equipment Services)	3,850	4,150	4,450	10	6,650

The Swiss Information Services market is forecast by INPUT to grow from $4.0 billion (ECU 3.1 billion) in 1993 to $5.9 billion (ECU 4.7 billion) in 1998. This is an average annual growth rate of 8%, similar to that of the European market as a whole. As one would expect of a dominantly German speaking nation, the pattern of business is very similar to Germany's, with turnkey systems and application products larger than usual.

Exhibits V-186 onward give details of the forecasts for all the subsegments of each delivery mode in the Swiss market for the period 1993-1998. Professional consulting services and network services growth in 1992 was below last year's expectations.

EXHIBIT V-186

Professional Services Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	100	110	120	12	195
Education & Training	160	160	165	5	205
Software Development	650	675	715	8	980
Application Management	3	3	4	25	9
Total (rounded)	910	950	1,000	8	1,390

EXHIBIT V-187

Systems Integration Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	60	68	76	10	110
Application Software Products	40	45	60	32	180
System Software Products	20	20	23	12	35
Professional Services	95	115	125	8	170
Other Services	5	5	6	25	15
Total (rounded)	220	255	290	15	510

EXHIBIT V-188

Systems Operations Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	30	35	39	11	60
Application Operations	20	23	26	14	45
Desktop Services	4	5	6	26	16
Total (rounded)	54	63	71	14	121

EXHIBIT V-189

Processing Services Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	370	395	415	6	540
Utility Processing	17	17	17	2	19
Other Processing	40	44	49	11	73
Total (rounded)	425	455	480	7	630

EXHIBIT V-190

Network Services Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	165	175	195	11	290
Network Applications	40	55	75	37	265
Network Management	7	9	11.5	30	33
Total (rounded)	210	240	280	20	590

EXHIBIT V-191

System Software Products Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	365	355	340	-1	320
Minicomputer	220	235	245	7	330
Workstation and PC	140	160	180	15	325
Total (rounded)	725	750	765	5	975

EXHIBIT V-192

Application Software Products Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	64	63	62	-1	58
Minicomputer	125	135	150	10	220
Workstation and PC	240	280	330	18	635
Total (rounded)	430	480	540	14	910

EXHIBIT V-193

Turnkey Systems Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	465	485	515	7	695
Application Software Products	160	180	200	14	340
System Software Products	55	60	60	7	85
Professional Services	215	235	260	12	420
Total (rounded)	900	960	1,040	10	1,540

EXHIBIT V-194

Equipment Services Market, Switzerland

	SF Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	780	785	790	1	820
Environmental Services	525	550	575	5	690
Total (rounded)	1,310	1,340	1,370	2	1,510

4. Competitive Environment

The top ten vendors in the Swiss market for 1992 are listed in Exhibit V-195. This listing is compiled using only the software and services revenues attributable to the domestic market in Switzerland, excluding exports and excluding revenues from within any parent group or subsidiaries.

EXHIBIT V-195

Leading Vendors, Software and Services Switzerland, 1992

Rank	Vendor	Country of Origin	Estimated Country Revenues* (SF Millions)	Market Share (Percent)
1	IBM	U.S.	390	10.0
2	Telekurs	Switzerland	215	5.5
3	Digital	U.S.	190	4.9
4	Fides	Switzerland	100	2.6
5	Reuters	U.K.	95	2.4
6	Siemens-Nixdorf	Germany	80	2.1
7	Microsoft	U.S.	80	2.1
8	Unisys	U.S.	75	1.9
9	Andersen Consulting	U.S.	55	1.4
10	AT&T	U.S.	45	1.2
	Total Listed		1,325	34.0
	Total market		3,900	100.0

* *Software and services excludes equipment services*

Two Swiss vendors feature in the list. Telekurs is a major European electronic information services vendor to the banking and finance sector. They sell on-line financial information, trading systems, processing services and related professional services.

An association of largely Swiss banks own Telekurs which is also responsible for the Swiss computer centre where all payment transfers between Swiss banks are executed.

Fides Informatics is part of the Fides Group which also includes a Trust Division and a Management Consultancy. The company specialises in banking, insurance, health care, communications and industrial automation.

L

Austria - Market Commentary

1. Introduction

Austria's population is 7.8 million, with a skilled labour force and a strong industrial base at odds with its image of mountains and gemütlichkeit. Manufacturing accounts for 26% of GDP, which, in 1992 at current prices and current exchange rates, is estimated by OECD at US$ 185 billion, about 2.4% of OECD European members' total GDP.

It is a member of the European Free Trade Association (EFTA) and will therefore be part of the EEA (European Economic Area) when this is inaugurated, probably in 1994. Under this, restrictions on trade and the movement of capital between EC and EFTA countries will be largely removed.

Meantime Austria has made individual application for EC membership, which will probably be negotiated in time for it to join in 1995.

2. Economic Environment

GDP growth, among other things, has led to Austria being dubbed "one of OECD's stars in recent years." In 1991 it bucked the European trend with 3% expansion. 1992 saw growth at a lower level (1.5%,) a very slight increase in inflation to 3.7%, around the average for the OECD. There was a small current account deficit (0.2% of GDP.)

For the future, 1993 is expected to be a year of zero growth, with 1994 showing a small growth at 1.5%. Inflation should fall below the OECD average by 1994 at 2.8%.

3. Information Services Industry

Exhibit V-196 shows the Austrian market for information services in local currency broken down by delivery mode.

EXHIBIT V-196

Software and Services Market, Austria, 1993-1998

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	3,390	3,610	3,880	6	4,900
Systems Integration	400	460	515	14	885
Systems Operations	155	175	205	16	360
Processing Services	1,890	1,930	1,950	2	2,080
Network Services	705	785	890	14	1,530
System Software Products	2,820	2,980	3,160	6	3,940
Application Software Products	1,760	2,000	2,280	13	3,750
Turnkey Systems	3,420	3,850	4,330	11	6,440
Equipment Services	4,600	4,740	4,840	1	5,090
Total (rounded)	19,100	20,500	22,100	7	29,000
Total (excluding Equipment Services)	14,500	15,800	17,200	9	23,900

The market is forecast by INPUT to grow from $1.9 billion (ECU 1.5 billion) in 1993 to $2.7 billion (ECU 2.1 billion) by 1998, a CAGR of 7% - just below last year's forecast of 8%.

In comparison to the overall European market, Austria exhibits similar characteristics to Germany with packaged application solutions - applications software products and turnkey systems - more dominant in the business mix than is usual.

Exhibits from Exhibit V-197 onward give details of the forecasts for all the subsegments of each delivery mode in the Austrian market for the period 1991-1998. Growth forecasts for professional services and environmental services have both been heavily revised down since last year's report reflecting greater caution in the economic outlook and the continued rise in packaged solutions.

EXHIBIT V-197

Professional Services Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	430	470	520	10	750
Education & Training	405	420	440	4	520
Software Development	2,540	2,700	2,900	6	3,600
Application Management	10	15	17	16	31
Total (rounded)	3,390	3,610	3,880	6	4,900

EXHIBIT V-198

Systems Integration Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	110	125	135	8	185
Application Software Products	70	85	110	30	320
System Software Products	30	34	38	12	59
Professional Services	180	205	220	8	295
Other Services	10	10	12	20	25
Total (rounded)	400	460	515	14	885

EXHIBIT V-199

Systems Operations Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	65	75	85	13	140
Application Operations	60	65	75	13	120
Desktop Services	30	35	45	23	100
Total (rounded)	155	175	205	16	360

EXHIBIT V-200

Processing Services Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	1,670	1,700	1,730	2	1,860
Utility Processing	72	70	68	-2	59
Other Processing	150	155	155	1	165
Total (rounded)	1,890	1,930	1,950	2	2,080

EXHIBIT V-201

Network Services Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	570	610	665	8	900
Network Applications	105	135	175	29	480
Network Management	30	40	50	30	150
Total (rounded)	705	785	890	14	1,530

EXHIBIT V-202

System Software Products Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	1,300	1,300	1,300	0	1,230
Minicomputer	910	970	1,040	6	1,300
Workstation and PC	610	710	820	15	1,410
Total (rounded)	2,820	2,980	3,160	6	3,940

EXHIBIT V-203

Application Software Products Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	175	175	175	0	165
Minicomputer	530	580	640	9	880
Workstation and PC	1,050	1,240	1,460	17	2,700
Total (rounded)	1,760	2,000	2,280	13	3,750

EXHIBIT V-204

Turnkey Systems Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	1730	1905	2090	8	2805
Application Software Products	630	735	860	15	1,480
System Software Products	200	220	240	8	320
Professional Services	860	990	1,140	13	1,830
Total (rounded)	3,420	3,850	4,330	11	6,440

EXHIBIT V-205

Equipment Services Market, Austria

	Sch Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	3,050	3,110	3,140	1	3,260
Environmental Services	1,550	1,630	1,700	2	1,830
Total (rounded)	4,600	4,740	4,840	1	5,090

4. Competitive Environment

Exhibit V-206 lists the top vendors in the Austrian market for 1992.

IBM is the largest information services vendor in Austria with the merged Siemens-Nixdorf (SNI) still generating attributable revenues of less than half those of the market leader. Neither company has grown as significantly as its major Austrian competitors in the past three years. In fact, SNI probably suffered some loss of client base to competitors during the uncertain period after the takeover.

Digital Equipment moved rapidly up the rankings when it acquired the Mannesmann Kienzle business. The initiative to sell to small and medium enterprises has not been as successful as was hoped.

Management Data is a twenty-one year old company operating out of Vienna, Innsbruck, Salzburg, Germany, Hungary, U.K. and Singapore. It has a network of agents across the rest of Europe, Japan and South Africa. Its main specialisation is International Banking software primarily selling this as turnkey systems.

Dataservice is a wholly-owned subsidiary of an Austrian Bank. It has a strong PC orientation as well as a wide range of processing services, and specialises in banking, insurance and manufacturing systems. Beko has an engineering bias across a wide range of platforms and specialises in manufacturing, laboratory and general business administration systems.

EXHIBIT V-206

Leading Vendors, Software and Services Austria, 1992

Rank	Vendor	Country of Origin	Estimated Country Revenues* (Sch Millions)	Market Share (Percent)
1	IBM	U.S.	1,520	10.5
2	Siemens-Nixdorf	Germany	700	4.8
3	Digital	U.S.	455	3.1
4	Management Data	Austria	400	2.8
5	EDV	Austria	370	2.6
6	Beko	Austria	350	2.4
7	Data-Service	Austria	350	2.4
8	Unisys	U.S.	270	1.9
9	GRZ Linz	Austria	250	1.7
10	Microsoft	U.S.	235	1.6
	Total Listed		4,900	33.8
	Total market		14,500	100.0

* *Software and services excludes equipment services*

M

Spain - Market Commentary

1. Introduction

Spain's population is 39 million and its work force 14.6 million (32% female). It joined the EC in 1986, and enjoyed considerable (5% plus per year) growth in the late 1980s. A land area of over 500,000 km makes it the second largest country in Europe (after France). Traditional agriculture, a rapidly expanding industrial sector, and continuing foreign exchange earnings from tourism contributed to growth.

Spain joined the European Community (EC) in 1986. Since then the country has exhibited the fastest growth of the larger nations of the Community, catching up from a less developed position.

GDP in 1992 at current prices and current exchange rates is estimated by OECD at US$ 574 billion, about 7% of OECD European members' total GDP.

With a software and services market of Ptas 390 billion (US$ 3.6 billion) in 1992, Spain is the seventh largest market in Europe.

2. Economic Environment

Growth rate has slowed in recent years, but at 2.4% it still exceeded the EC average, keeping Spain among the leaders in growth in 1991. But in 1992 growth slowed to 1.0%. The current account deficit remained constant at 6.2% of GDP, compared with the EC average of 1.0%. Inflation rates remained above the OECD average at 5.9%. Unemployment increased by two points to 18.4%. The peseta was devalued, whilst remaining in the ERM.

Whilst some of the downturn is seen as the result of the general situation in Europe (70% of Spanish exports are to other EC countries), the other factor is the deflationary policy pursued by government. In 1993 recession is forecast (0.5% GDP drop). Inflation will decline and by 1994 will be (at 3.8%) in sight of the OECD average of 3.3%. Unemployment will persist at high levels for the foreseeable future, one forecast for 1997 is for 18%. The current account deficit should improve to around 4% of GDP in 1994, but no surplus is yet on the horizon.

3. Information Services Industry

The Information Services industry in Spain is sharing in the general difficulties of the economy. INPUT forecasts the Spanish market will reach 435 billion pesetas (Ptas) ($3.9 billion or ECU 3.1 billion) in 1993, and will grow at an average of 11% per annum to reach over 710 billion Ptas ($6.5 billion or ECU 5.1 billion) by 1998.

Exhibit V-207 shows the detailed forecast by INPUT delivery mode in the local currency. The Spanish market is strong in professional services with IS consulting, systems integration, applications software and turnkey systems exhibiting good market growth.

EXHIBIT V-207

Software and Services Market, Spain, 1993-1998

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	84,000	91,000	99,000	9	141,000
Systems Integration	20,000	24,000	29,100	22	65,100
Systems Operations	4,500	5,300	6,200	18	12,100
Processing Services	31,600	33,400	35,000	6	44,100
Network Services	17,100	19,400	22,500	16	40,800
System Software Products	47,900	50,900	55,200	9	79,800
Application Software Products	33,500	38,500	44,500	16	82,000
Turnkey Systems	51,200	55,700	62,500	12	99,300
Equipment Services	109,000	116,500	124,000	6	153,000
Total (rounded)	399,000	435,000	478,000	11	717,000
Total (excluding Equipment Services)	290,000	318,000	354,000	12	564,000

Detailed local currency forecasts of the components making up each delivery mode in the Spanish market are shown in Exhibit V-208 onwards for the period 1992-1997.

In the professional services sector, IS consulting was down in 1992 some 4% below last year's prediction due to the uncertainty in the business climate. However, long-term expectations remain relatively unchanged. The propensity of Spanish companies to opt for a custom developed solution is giving way to greater use of pre-built application products. But custom software project demand is still expected to grow much more rapidly than elsewhere in Europe.

The systems integration growth rate has been revised up from 18% to 21%. INPUT has also revised upward the size of the systems integration market in Spain as a result of new revenue data from vendors. The extensive use of standard software products within systems integration projects had previously been underestimated.

Processing services is forecast to grow faster (at 6%) than the average for the European market (4%). Processing services in Spain are still important especially in the financial services sectors of banking, securities and insurance.

Network applications services are expected to show a high growth rate (24% pa) over the five-year period. The use of the services is less highly developed in Spain than in the larger country markets, but Spain is intent on catching up in this as in many other areas. The public telecommunications operator (PTO), Telefonica SA, is making considerable investments in the country's infrastructure and has also a strong presence in the information services industry.

Applications software in Spain is a strong market at the lower end of the system price range where multi-user or networked microcomputers are being installed with proprietary software products from multi-national vendors. The attractiveness of the pre-built solution is likely over our forecast period to increase in the mainframe and minicomputer sectors, as open systems based on UNIX and networks are installed to replace older and larger systems (downsizing).

Turnkey systems has always been a strong sector in Spain due to the number of small systems platforms being sold into the country's large number of relatively small companies. It is expected to continue with good growth as many small enterprises install their first company systems. Average prices for new installations are expected to continue falling.

EXHIBIT V-208

Professional Services Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	11,800	13,600	15,800	17	29,500
Education & Training	8,500	8,800	9,150	5	11,100
Software Development	63,400	68,000	73,000	8	99,000
Application Management	330	550	680	24	1,590
Total (rounded)	84,000	91,000	99,000	9	141,000

EXHIBIT V-209

Systems Integration Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	5,400	6,500	7,600	16	13,700
Application Software Products	3,600	4,300	6,100	40	23,400
System Software Products	1,400	1,900	2,300	19	4,550
Professional Services	9,200	10,800	12,500	15	21,400
Other Services	400	480	600	33	2,000
Total (rounded)	20,000	24,000	29,100	22	65,100

EXHIBIT V-210

Systems Operations Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	2,200	2,600	3,000	17	5,700
Application Operations	2,000	2,350	2,750	17	5,250
Desktop Services	300	375	465	25	1,150
Total (rounded)	4,500	5,300	6,200	18	12,100

EXHIBIT V-211

Processing Services Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	26,900	28,500	29,900	6	37,800
Utility Processing	2,050	2,100	2,150	3	2,400
Other Processing	2,600	2,800	2,950	7	3,850
Total (rounded)	31,600	33,400	35,000	6	44,100

EXHIBIT V-212

Network Services Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	11,500	12,500	13,900	10	20,400
Network Applications	4,000	4,900	6,100	24	14,200
Network Management	1,600	2,000	2,500	25	6,200
Total (rounded)	17,100	19,400	22,500	16	40,800

EXHIBIT V-213

System Software Products Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	21,000	20,800	21,000	1	21,800
Minicomputer	16,500	18,000	20,000	11	30,400
Workstation and PC	10,400	12,100	14,200	18	27,600
Total (rounded)	47,900	50,900	55,200	9	79,800

EXHIBIT V-214

Application Software Products Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	3,100	3,050	3,100	1	3,250
Minicomputer	10,100	11,000	12,200	11	18,400
Workstation and PC	20,500	24,200	29,000	20	60,100
Total (rounded)	33,500	38,500	44,500	16	82,000

EXHIBIT V-215

Turnkey Systems Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	25500	27000	29500	9	41700
Application Software Products	10,100	11,400	13,200	16	23,900
System Software Products	3,100	3,300	3,650	10	5,400
Professional Services	12,500	14,000	16,100	15	28,300
Total (rounded)	51,200	55,700	62,500	12	99,300

EXHIBIT V-216

Equipment Services Market, Spain

	Ptas Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	75,100	78,900	82,800	4	95,000
Environmental Services	34,000	37,400	41,100	9	58,100
Total (rounded)	109,000	116,500	124,000	6	153,000

4. Competitive Environment

Exhibit V-217 lists the top ten vendors in the Spanish market as measured on their 1992 (or equivalent 1992) revenues. It has been compiled using only the software and services revenues attributable to the domestic market in Spain, and excludes exports and revenues gained from within any parent group companies.

EXHIBIT V-217

Leading Vendors, Software and Services Spain, 1992

Rank	Vendor	Country of Origin	Estimated Country Revenues (Ptas Millions)	Market Share (Percent)
1	IBM	U.S.	26,500	9.1
2	Eritel	Spain	14,400	5.0
3	Digital	U.S.	10,300	3.6
4	Andersen Consulting	U.S.	9,500	3.3
5	Logic Control	Spain	9,200	3.2
6	CISI	France	7,300	2.5
7	Iberimatica	Spain	6,500	2.2
8	Siemens-Nixdorf	Germany	6,300	2.2
9	Olivetti	Italy	6,000	2.1
10	Microsoft	U.S.	6,000	2.1
	Total Listed		102,000	35.2
	Total market		290,000	100.0

As in most other countries IBM heads the list in software and services revenues, strongly assisted by its large component of systems software product revenues. IBM's strengths in Spain include also PC-level product sales, systems integration and network services.

Eritel is now the largest of the indigenous computer services vendors, having been formed as a merger between two companies, Entel and Eria, the latter having previously acquired a third company, Ceninsa, of comparable size. Eritel is owned by the INI state holding company and Telefonica, the Spanish PTO. Its strategic thrusts are in the areas of systems integration, consultancy and other professional services.

Logic Control is a market leader in the standard microcomputer hardware and software markets. Ibermatica is part-owned by Eritel and specialises in financial services applications. The high proportion of foreign vendors illustrates the eagerness of the large players in Europe to participate in the Spanish market.

N

Central and Eastern Europe - Market Commentary

1. Introduction

The opening up of trade between Eastern and Western Europe promises new opportunities in software and services. Rather than developing overnight it is likely to take a decade before new trading patterns have been established. INPUT estimates that the Eastern European market for software, services and maintenance was nearly $670 billion in 1992.

For the purposes of INPUT's forecasts, Central and Eastern Europe is defined as Albania, Bulgaria, Czechoslovakia, Poland, Romania, the Baltic States (Estonia, Latvia and Lithuania), the independent states emerging from the break-up of Yugoslavia, and the new Commonwealth, which was established in January 1992 after the dissolution of the Soviet Union (Byelorussia, the Russian Federation, Ukraine and the other republics in Europe).

2. Economic Environment

Country	Population (Millions)	GDP (US$ B)	GDP per Capita (US$ K)
Albania	3.3	2.0	0.6
Bulgaria	9.0	9.9	1.1
Czech Rep	10.3	25.7	2.5
Hungary	10.5	31.4	3.0
Poland	38.4	153.5	4.0
Romania	23.2	15.0	0.7
Russia	148.8	230.6	1.6
Slovak Rep	5.3	10.1	1.9
Slovenia	2.0	12.0	6.0

The pace of change in Central and Eastern Europe has continued unabated during 1992 and 1993.

Inflation has risen dramatically in all these countries as prices are freed of restrictions. The economic recession worsens as workers are laid off from all uneconomic, until lately state-owned enterprises. High external debts and lack of hard currency make it difficult for these countries to attract external investment or to 'prime the pump' of new industries by making external purchases.

Most of the hordes of Western advisers and consultants that flocked into the newly freed countries in 1989 and 1990 left again in 1991 and 1992. Their over-optimistic initial reactions were replaced by equally excessive predictions of catastrophe. Certainly they learned that a command economy cannot be converted overnight into a market economy. Nevertheless, a significant pent-up requirement for information systems, products and services remains.

3. Information Services Industry

The total market size for information services (including software, software services and equipment services) for 1992 was revised up 70% to reflect the unexpected level of systems integration contracts placed. Growth of 22% in 1992 will give a forecast market of $815 million. By 1998 the market is expected to reach $2 billion with an average annual growth rate of 21%. This assumes reasonable economic progress in the most important country markets, namely:

- Czech Republic
- Poland
- Hungary
- Ukraine
- Russian Federation

Exhibits V-218 onward give the breakdown of the market by service mode as defined by INPUT. In comparison to the rest of Europe the market for software and services is embryonic in Central and Eastern Europe. As a result INPUT anticipates a relative rapid rise in nearly all sectors.

The systems integration sector is booming in Central and Eastern Europe. Major contracts are being placed to establish financial trading, processing and communications infrastructures. This has been especially true in the Czech Republic.

Equipment services is the second largest delivery mode and the forecast growth reflects the opportunity to sell large volumes of current technology hardware products into the region. Applications and systems software products are expected to benefit similarly with very positive growth. Systems integration projects will follow the natural adoption of open systems and PCs and the demand for relatively complex systems based on these leading-edge technologies.

Processing and network services will remain fairly small sectors. Systems operations will be an important way to support existing public sector data centres that may have no captive market after privatisation.

4. Competitive Environment

Telecommunications infrastructures are woefully inadequate in all Eastern European countries. New systems and improvements are being obtained by installing cellular-based mobile networks either before or alongside fixed network projects. Banking systems are also being installed to help establish western standards of financial trading services. Logistics is the third key area of infrastructure investment, but is likely to be the last to be funded. German vendors are particularly well placed to develop business in Central and Eastern Europe.

EXHIBIT V-218

Software and Services Market, Central and Eastern Europe, 1993-1998

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	52	62	72	18	139
Systems Integration	250	325	375	22	880
Systems Operations	9	14	19	47	95
Processing Services	14	17	21	36	79
Network Services	3	5	6	46	33
System Software Products	48	58	73	29	208
Application Software Products	69	80	94	16	165
Turnkey Systems	18	22	29	27	72
Equipment Services	205	230	260	14	450
Total (rounded)	670	815	950	21	2,120
Total (excluding Equipment Services)	465	585	690	23	1,670

Electronic mail already has over 15,000 subscribers in Russia from among what were parts of the previous state apparatus. Privatisation will bring many similar state-funded systems to the open market.

Local distributors stress the need to reinvest profits locally in order to counter the vicious circle that follows when technology imports are transferred into inflating economies. Nantucket and Lotus are two software companies that set up local offices and distributor/dealer networks in the former U.S.S.R. Andersen Consulting's activities include implementing distribution systems. AT&T NCR has interests in government and banking sectors. ICL has been long established in Russia and Poland. IBM and Unisys have announced contract awards. In early 1992 Digital opened its Moscow office.

INPUT believes many opportunities will be created by working closely with partners in local industry and local government in Eastern European countries. At the strategic level, these countries have the chance to leap-frog technology generations and establish electronic commerce-based businesses in what are effectively 'green-field site' economies. Innovative thinking based on partnerships between Western service-orientated companies and local post-communist, neo-capitalist entrepreneurs is the way forward for economies that do not have time to tread the long path beaten by advanced Western industrial nations.

EXHIBIT V-219

Professional Services Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	2	2	2	0	2
Education & Training	30	36	42	17	80
Software Development	20	24	28	19	57
Application Management	0.1	0.1	0.1	0	0.1
Total (rounded)	52	62	72	18	139

EXHIBIT V-220

Systems Integration Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	70	90	100	16	185
Application Software Products	45	60	80	39	315
System Software Products	20	25	30	19	60
Professional Services	110	145	160	15	295
Other Services	5	5	7	38	25
Total (rounded)	250	325	375	22	880

EXHIBIT V-221

Systems Operations Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	5	7	9	38	35
Application Operations	3	5	7.5	58	50
Desktop Services	1	2	2.5	38	10
Total (rounded)	9	14	19	47	95

EXHIBIT V-222

Processing Services Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	8	9	11	18	21
Utility Processing	4.5	5	5	10	8
Other Processing	1.5	2.5	5	82	50
Total (rounded)	14	17	21	36	79

EXHIBIT V-223

Network Services Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	0.5	0.5	1	48	3.5
Network Applications	1.5	2.5	3.5	50	19
Network Management	1	2	1	38	10
Total (rounded)	3	5	6	46	33

EXHIBIT V-224

System Software Products Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	15	15	16	6	20
Minicomputer	15	18	23	25	56
Workstation and PC	18	25	34	39	132
Total (rounded)	48	58	73	29	208

EXHIBIT V-225

Application Software Products Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	10	10	11	2	11
Minicomputer	23	26	30	13	48
Workstation and PC	36	44	53	19	106
Total (rounded)	69	80	94	16	165

EXHIBIT V-226

Turnkey Systems Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	9	11	14	25	33
Application Software Products	3	4	5	27	13
System Software Products	1	1	2	32	4
Professional Services	5	6	8	30	22
Total (rounded)	18	22	29	27	72

EXHIBIT V-227

Equipment Services Market, Central and Eastern Europe

	USD Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	160	180	205	13	330
Environmental Services	45	48	53	20	120
Total (rounded)	205	230	260	14	450

O

Rest of Europe - Market Commentary

1. Introduction

The market designated as the Rest of Europe was valued at $1.3 billion in 1992. It primarily consists of three member countries of the EEC: Portugal, Greece, and Ireland. Portugal and Greece each have populations of around 10 million whereas Ireland has only 3.5 million.

GDP in 1992 at current prices and current exchange rates is estimated by OECD as follows:

- Portugal US$ 84 billion
- Greece US$ 79 billion
- Ireland US$ 46 billion

In total this represents about 2.7% of OECD European members' total GDP.

2. Economic Environment

Portugal's growth rate (2.2%) in 1991 again exceeded EC and OECD averages, but so did inflation rate at 11.3%. Continued steady growth rates are forecast, along with a small improvement in inflation.

Greece's 1991 growth rate (1.8%) was clearly positive after the 1990 figure at around zero. Consumer price inflation improved marginally, but at 18.8% was almost four times the EC average. Current forecasts are for continued modest real growth combined with stubbornly persisting current account deficits and inflation declining to around 10% in 1994.

Of the three, Ireland had the highest growth rate (1.7%). But inflation was much lower at 3.2%, better than the OECD and EC averages. It also had high unemployment at around 15%. Forecasts indicate growth rates not far from 2% in 1992 and 1993, with inflation just above 3%. A small continuing surplus on the current account is predicted.

3. Information Services Industry

The software and services market is relatively healthy in all three countries. The following Exhibits give forecasts in local currencies and are based on available economic data for each country.

Portugal is expected to grow overall from $320 million (ECU 260 million) in 1993 to $660 million (ECU 530) million by 1998, a CAGR of 15% including inflation.

In the same period Greece will also increase at 15% CAGR from $370 million (ECU 290 million) to $740 million (ECU 580 million).

Ireland is forecast to grow from $710 million (ECU 560 million) to $1,040 million (ECU 830 million), a CAGR of 8%.

EXHIBIT V-228

Software and Services Market, Portugal, 1993-1998

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	6,000	7,200	8,400	16	14,800
Systems Integration	1,500	1,830	2,160	20	4,560
Systems Operations	275	330	390	19	780
Processing Services	2,900	3,400	3,950	16	7,100
Network Services	1,150	1,500	2,000	33	6,300
System Software Products	4,150	4,800	5,650	17	10,650
Application Software Products	2,250	2,750	3,350	22	7,300
Turnkey Systems	4,900	5,750	6,800	20	14,150
Equipment Services	15,700	17,000	18,700	9	26,000
Total (rounded)	38,800	44,600	51,400	15	91,600
Total (excluding Equipment Services)	23,100	27,600	32,700	19	65,600

EXHIBIT V-229

Professional Services Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	805	990	1,190	20	2,450
Education & Training	680	800	920	14	1,540
Software Development	4,550	5,400	6,250	15	10,800
Application Management	0.1	0.1	0.1	0	0.1
Total (rounded)	6,000	7,200	8,400	16	14,800

EXHIBIT V-230

Systems Integration Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	410	500	570	14	960
Application Software Products	270	330	450	38	1,640
System Software Products	120	150	175	16	320
Professional Services	670	810	920	13	1,510
Other Services	30	35	45	29	125
Total (rounded)	1,500	1,830	2,160	20	4,560

EXHIBIT V-231

Systems Operations Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	120	140	165	18	315
Application Operations	95	115	135	19	275
Desktop Services	60	73	90	21	190
Total (rounded)	275	330	390	19	780

EXHIBIT V-232

Processing Services Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	2,550	2,950	3,450	16	6,100
Utility Processing	120	140	150	10	230
Other Processing	240	290	360	22	770
Total (rounded)	2,900	3,400	3,950	16	7,100

EXHIBIT V-233

Network Services Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	760	960	1,250	29	3,390
Network Applications	280	400	580	44	2,510
Network Management	100	125	160	27	410
Total (rounded)	1,150	1,500	2,000	33	6,300

EXHIBIT V-234

System Software Products Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	1,900	2,050	2,250	9	3,100
Minicomputer	1,400	1,650	2,000	20	4,050
Workstation and PC	860	1,080	1,380	27	3,520
Total (rounded)	4,150	4,800	5,650	17	10,650

EXHIBIT V-235

Application Software Products Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	190	210	240	11	360
Minicomputer	650	800	950	19	1,900
Workstation and PC	1,400	1,750	2,150	24	5,050
Total (rounded)	2,250	2,750	3,350	22	7,300

EXHIBIT V-236

Turnkey Systems Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	2450	2800	3200	15	5650
Application Software Products	920	1,140	1,410	25	3,480
System Software Products	260	300	360	19	710
Professional Services	1,250	1,500	1,850	23	4,300
Total (rounded)	4,900	5,750	6,800	20	14,150

EXHIBIT V-237

Equipment Services Market, Portugal

	Esc Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	11,400	12,500	13,800	10	19,700
Environmental Services	4,250	4,500	4,900	7	6,300
Total (rounded)	15,700	17,000	18,700	9	26,000

EXHIBIT V-238

Software and Services Market, Greece

Dra Millions					
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	15,900	18,100	20,800	16	37,600
Systems Integration	1,400	1,650	1,950	18	3,800
Systems Operations	650	700	850	16	1,450
Processing Services	8,550	9,500	10,400	10	15,650
Network Services	2,750	3,250	3,950	22	8,800
System Software Products	9,900	11,100	12,600	15	22,200
Application Software Products	5,700	6,900	8,400	23	19,100
Turnkey Systems	11,300	12,800	14,700	16	27,400
Equipment Services	9,300	9,800	10,300	5	12,500
Total (rounded)	65,000	74,000	84,000	15	149,000
Total (excluding Equipment Services)	56,000	64,000	74,000	16	136,000

EXHIBIT V-239

Professional Services Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	1,750	2,000	2,300	15	3,950
Education & Training	1,600	1,700	1,820	8	2,460
Software Development	12,500	14,400	16,700	17	31,200
Application Management	0.1	0.1	0.1	0	0.1
Total (rounded)	15,900	18,100	20,800	16	37,600

EXHIBIT V-240

Systems Integration Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	380	445	500	12	800
Application Software Products	250	300	410	35	1,350
System Software Products	110	130	150	16	270
Professional Services	630	740	850	11	1,250
Other Services	30	35	45	26	110
Total (rounded)	1,400	1,650	1,950	18	3,800

EXHIBIT V-241

Systems Operations Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	350	400	460	15	800
Application Operations	230	260	300	14	500
Desktop Services	50	60	75	23	170
Total (rounded)	650	700	850	16	1,450

EXHIBIT V-242

Processing Services Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	7,500	8,350	9,150	11	13,900
Utility Processing	380	410	430	6	560
Other Processing	670	740	800	10	1,180
Total (rounded)	8,550	9,500	10,400	10	15,650

EXHIBIT V-243

Network Services Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	1,850	2,070	2,360	13	3,890
Network Applications	800	1,060	1,420	33	4,470
Network Management	100	130	165	28	455
Total (rounded)	2,750	3,250	3,950	22	8,800

EXHIBIT V-244

System Software Products Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	4,500	4,700	4,950	6	6,250
Minicomputer	3,200	3,650	4,250	16	7,700
Workstation and PC	2,200	2,710	3,380	25	8,260
Total (rounded)	9,900	11,100	12,600	15	22,200

EXHIBIT V-245

Application Software Products Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	580	610	640	5	780
Minicomputer	1,550	1,800	2,100	17	3,900
Workstation and PC	3,600	4,500	5,700	26	14,400
Total (rounded)	5,700	6,900	8,400	23	19,100

EXHIBIT V-246

Turnkey Systems Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	5550	6100	6800	13	11100
Application Software Products	2,150	2,550	3,000	20	6,400
System Software Products	610	670	740	13	1,210
Professional Services	3,000	3,500	4,150	20	8,650
Total (rounded)	11,300	12,800	14,700	16	27,400

EXHIBIT V-247

Equipment Services Market, Greece

	Dra Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	8,600	9,030	9,480	5	11,520
Environmental Services	720	760	800	5	970
Total (rounded)	9,300	9,800	10,300	5	12,500

EXHIBIT V-248

Software and Services Market, Ireland, 1993-1998

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Professional Services	90	95	101	8	142
Systems Integration	6	6.5	7.5	20	16
Systems Operations	4	5	7	28	17
Processing Services	39	39	38	0	37
Network Services	10	12	14	19	29
System Software Products	59	61.5	64.5	6	83
Application Software Products	45	51	58	14	98
Turnkey Systems	75	85	90	8	125
Equipment Services	61	63	65	1	66
Total (rounded)	390	420	445	8	615
Total (excluding Equipment Services)	330	355	380	9	545

EXHIBIT V-249

Professional Services Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
IS Consulting	11	11	11.5	6	14.5
Education & Training	9	9	9.5	7	12.5
Software Development	70	75	80	9	115
Application Management	0.1	0.1	0.1	0	0.1
Total (rounded)	90	95	101	8	142

EXHIBIT V-250

Systems Integration Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	1.7	1.85	2	8	2.75
Application Software Products	0.7	1	1.4	43	6
System Software Products	0.4	0.45	0.5	11	0.75
Professional Services	3	3	3.5	16	6.3
Other Services	0.01	0.01	0.01	0	0.01
Total (rounded)	6	6.5	7.5	20	16

EXHIBIT V-251

Systems Operations Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Platform Operations	3	3.5	4.5	23	10
Application Operations	1.1	1.5	2	25	4.5
Desktop Services	0.2	0.4	0.6	48	2.8
Total (rounded)	4	5	7	28	17

EXHIBIT V-252

Processing Services Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Transaction Processing	30	29	28	-2	25
Utility Processing	1	1	1	0	1
Other Processing	8	8.5	9	5	11
Total (rounded)	39	39	38	0	37

EXHIBIT V-253

Network Services Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Electronic Information Services	6	6.5	7.5	12	11.5
Network Applications	3	4	5	29	14.5
Network Management	1	1	1.5	27	3.3
Total (rounded)	10	12	14	19	29

EXHIBIT V-254

System Software Products Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	30	29	28	-2	25
Minicomputer	17	18.5	20	8	27.5
Workstation and PC	12	14	16.5	17	30.5
Total (rounded)	59	61.5	64.5	6	83

EXHIBIT V-255

Application Software Products Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Mainframe	5	5	5	0	5
Minicomputer	12	13	14	8	19
Workstation and PC	28	33	39	18	74
Total (rounded)	45	51	58	14	98

EXHIBIT V-256

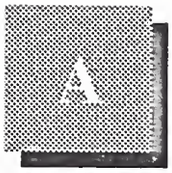
Turnkey Systems Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment	41	43.5	45.5	4	53.5
Application Software Products	14	16	18.5	14	30.5
System Software Products	3	3	3	0	3
Professional Services	18	20.5	23	12	36.5
Total (rounded)	75	85	90	8	125

EXHIBIT V-257

Equipment Services Market, Ireland

	IP Millions				
Subsector	1992	1993	1994	93-98 CAGR(%)	1998
Equipment Maintenance	41	42	42.5	0	42
Environmental Services	20	21	22	3	24
Total (rounded)	61	63	65	1	66



Definition of Terms

A
Introduction

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

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

B
Overall Definitions and Analytical Framework

1. Information Services

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

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)

- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

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

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

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

2. Market Forecasts/User Expenditures

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

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

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

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

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

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

3. Delivery Modes

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

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

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

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

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

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

4. Market Sectors

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

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

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

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

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

5. Trading Communities

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

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

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

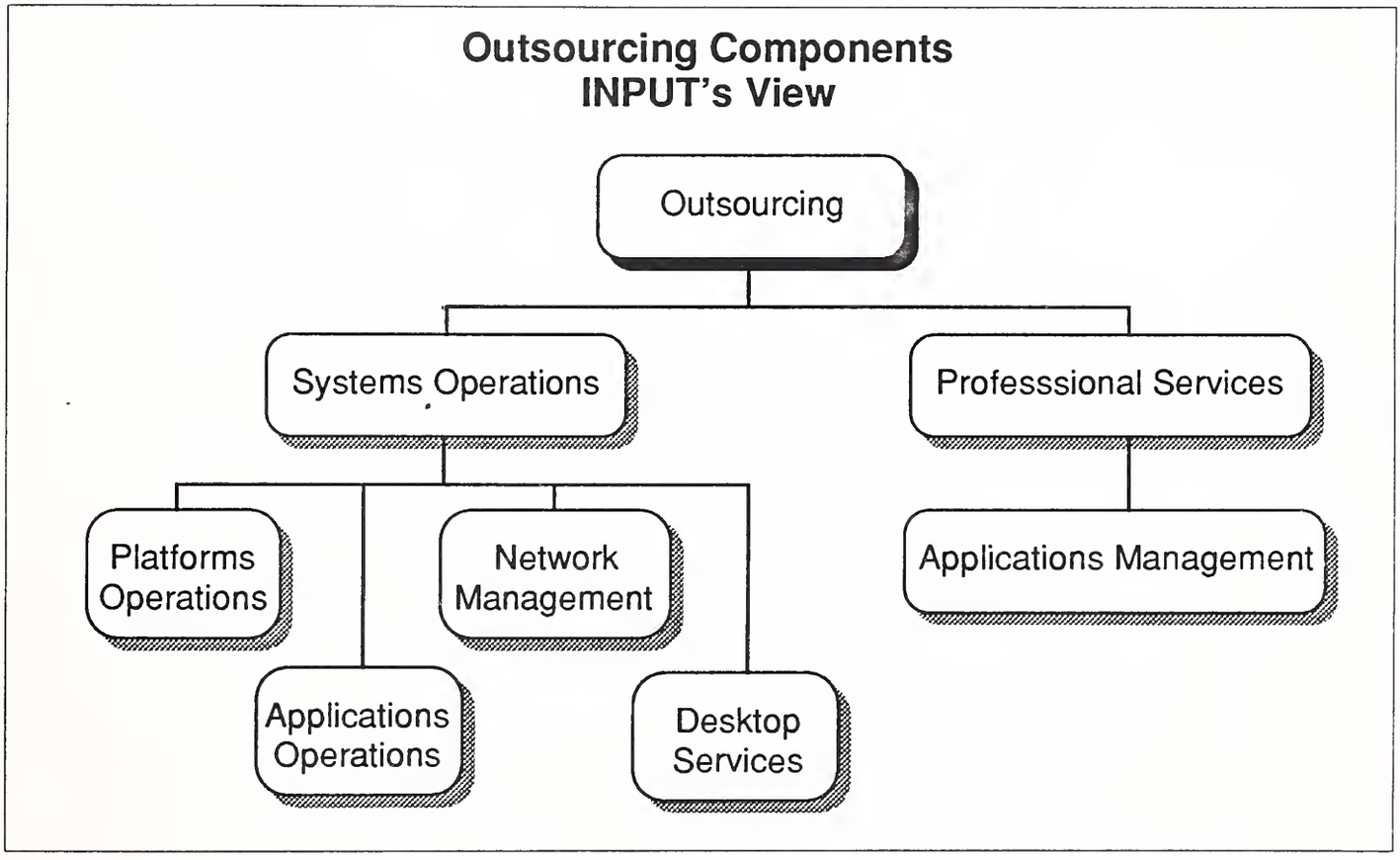
6. Outsourcing

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

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

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

EXHIBIT A-1



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

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

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

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

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

C
Delivery Modes and Submodes

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

1. Software Products

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

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

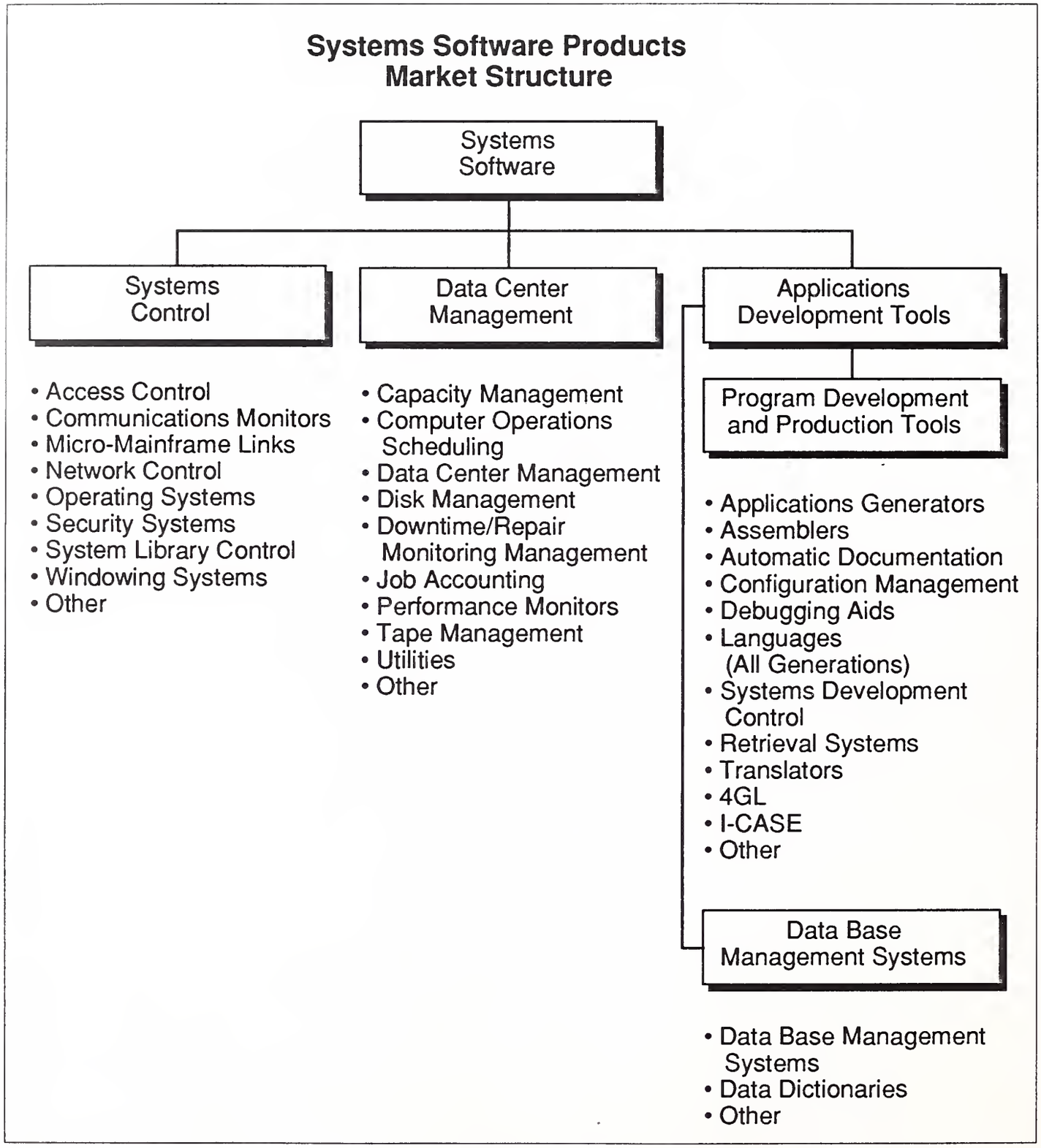
Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged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

EXHIBIT A-2

a. Systems Software Products

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

EXHIBIT A-3



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

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

- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

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

b. Applications Software Products

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

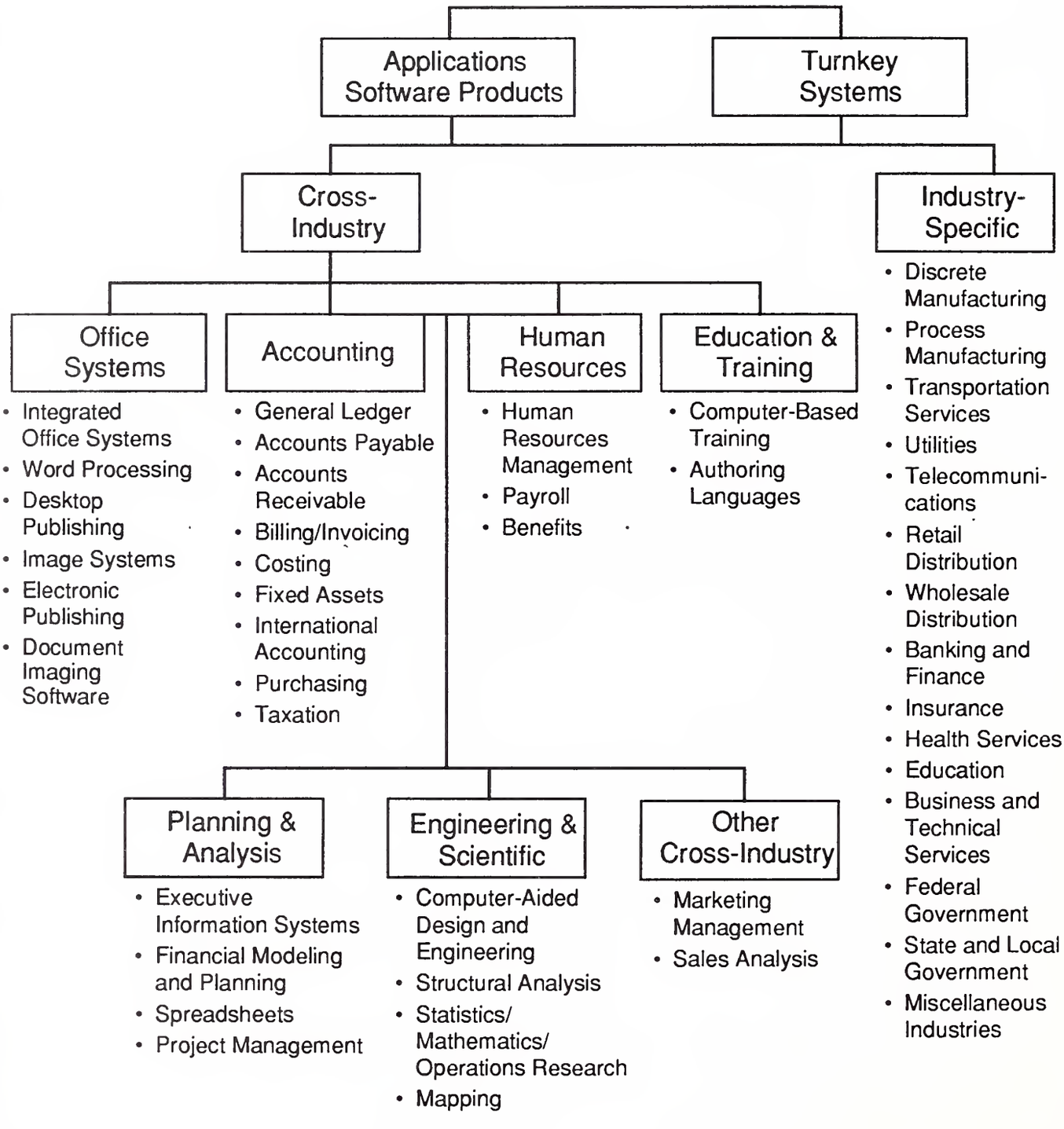
- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile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

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

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

EXHIBIT A-4

Application Products and Turnkey Systems



2. Turnkey Systems

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

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilize standard computers and do not include specialized hardware such as word processors, cash registers, process control systems, or embedded computer systems for military applications.

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

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

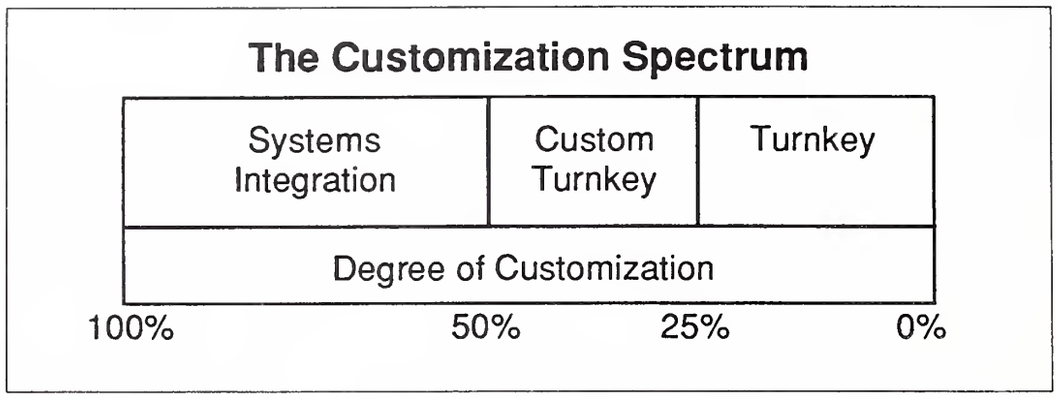
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such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

Turnkey systems have three components:

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

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

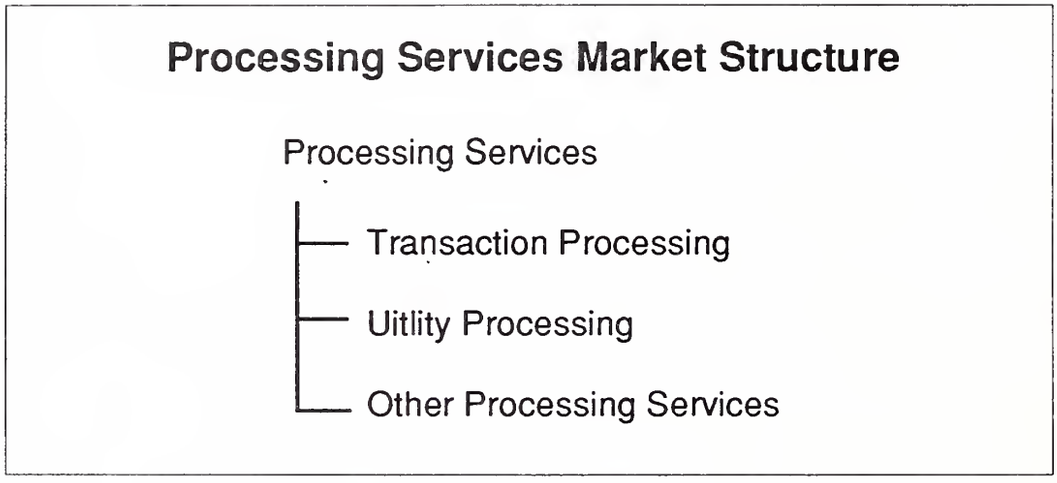
EXHIBIT A-5



3. Processing Services

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

EXHIBIT A-6



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

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

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

4. Systems Operations

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

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

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

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

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

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

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

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

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

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-7.)

The components of a systems integration project are the following:

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

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

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

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

EXHIBIT A-7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

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

Other Miscellaneous Products/Services

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

6. Professional Services

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

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

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

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

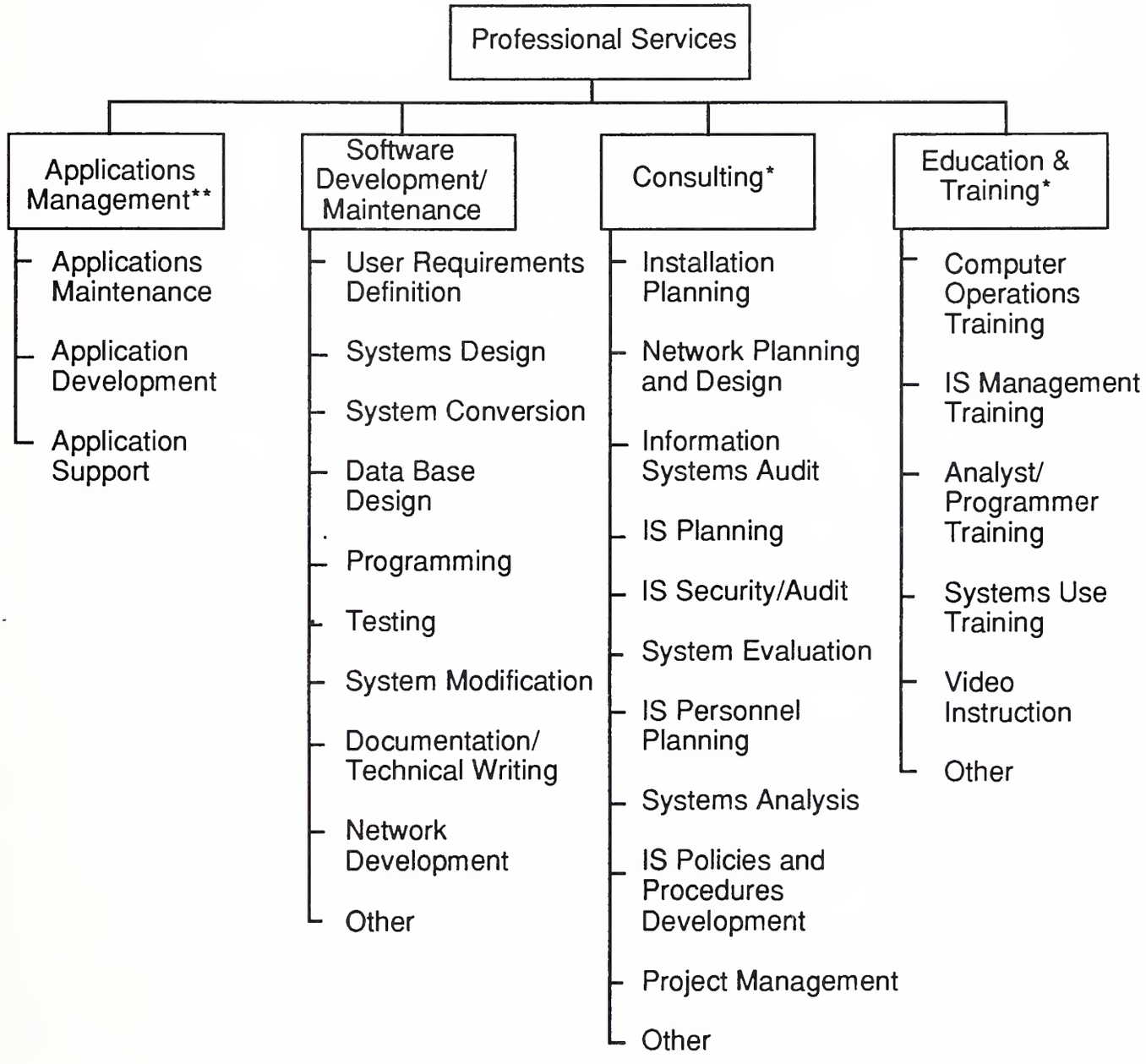
- *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

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

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

EXHIBIT A-8

Professional Services Market Structure



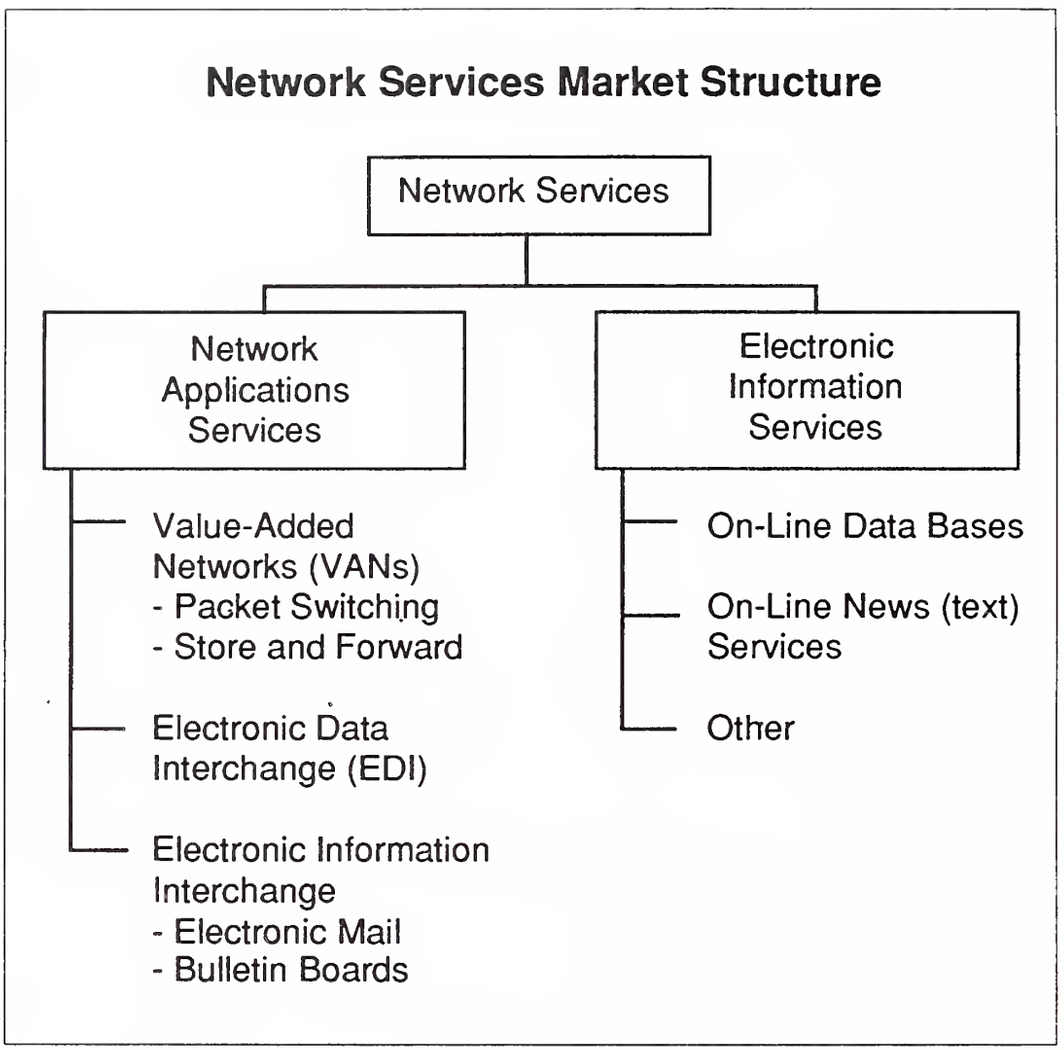
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

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

EXHIBIT A-9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

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

The two kinds of electronic information services are:

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

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

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

b. Network Applications

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

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

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

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

8. Equipment Services

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

- *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for

computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.

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

D
Computer Equipment

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

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

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

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

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

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

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

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

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

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

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

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

- *Client/server computing* - Client/server is an architecture that assembles applications software and data bases, systems software, and computer and networking equipment into a usable form for the purpose of leveraging information technology investments.

  Broadly defined, it can include any kind of server, such as file servers and network servers, that are accessed by any kind of client, including a nonintelligent terminal. INPUT has elected to use the narrower and newer definition, by which application and data processing is shared between a client and a server. It is through the act of sharing that the greatest benefit is derived in terms of leveraging information technology investments. It is also the cause of the greatest change for vendors and users.

E
Sector Definitions

1. Industry Sector Definitions

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

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

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

EXHIBIT A-10

Industry Sector Definitions

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

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

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

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

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

2. Cross-Industry Sector Definitions

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

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

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

The seven cross-industry markets are:

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

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

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

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

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

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

Office Systems consists of the following six categories:

Integrated Office Systems (IOSs) - IOSs integrate the applications that perform common office tasks. Typically these tasks include the following core applications, all of which are accessed from the same terminal, microcomputer or workstation:

- Electronic mail
- Decision support systems
- Time management
- Filing systems

IOSs enable office workers to utilize applications that are resident on a number of hosts or servers, thus creating a corporate communication environment through integrating line-of-business software with personal software productivity tools. IOSs capitalize on the cross-platform architectures of major vendors. Major hardware vendors such as IBM, Data General, Digital, Hewlett-Packard and NCR all offer IOSs.

Work flow and groupware products are also included within the IOS definition.

Word Processing - Word processing is the most common microcomputer application and is a basic application within the office systems sector. Word processing addresses several levels of functionality, from the production of simple correspondence to large document generation where many people within different departments have input.

Desktop Publishing (DTP) - Desktop publishing refers to the page-design software programs that allow small and mid-sized organizations to publish printed documents (brochures, catalogs, newsletters, reports, etc.) from the desktop. The primary functions of DPT software include the manipulation of the following functions:

- Layout and design of columns.
- Text manipulation (font type).
- Graphic manipulation.
- Print Control (color type, paper type)

Electronic Publishing - Electronic publishing includes composition, printing, and editing software for documents containing multiple typefaces and graphics including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing encompasses a method of document management and control from a single point regardless of how many authors/locations work on a document. Desktop publishing (DTP) on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer.

Graphics - Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. Thus, the graphics component of office systems sector includes the following elements:

Presentation graphics represent the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data.

Paint and line art drawing programs are used for illustrations while page layout programs are used to integrate text and graphics.

Electronic form programs allow users to create and print forms in-house. Some applications work with OCR scanners allowing users to scan pictures and logos directly on the forms.

Document Imaging Software - The software that allows users to manipulate (store, retrieve, print) images that have been scanned from paper documents. The applications that imaging software generates include: full text retrieval, document management, and database management. Document imaging software is a component of an imaging system. Hardware components of imaging systems include: scanners, image servers, workstations, optical drives, printers, and storage devices.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS
- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

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

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

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:
  - Sales analysis
  - Marketing management
  - Demographic market planning models

3. Delivery Mode Reporting by Sector

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

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.
- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

EXHIBIT A-11

Delivery Mode versus Market Sector Forecast Content

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

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

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

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

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

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

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

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

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

F

Vendor Revenue and User Expenditure Conversion

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

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

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

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

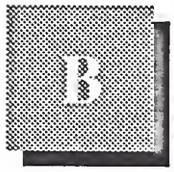
Exhibit A-12 summarizes the net effect of the various ratios used by INPUT to convert vendor revenues to user expenditure (market size) figures for each delivery mode.

EXHIBIT A-12

Vendor Revenue to User Expenditure Conversion

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

(Blank)



Information Services Industry Publications

The following publications on the European market for software, services and maintenance are available from INPUT. Please contact your nearest office for details on price and availablility of reports and research programme subscriptions.

Parallel research is carried out by INPUT from the U.S.A. and Japan to provide both global and local analysis of these fast moving markets.

Systems Integration Programme

SI Market Analysis & Forecast 1993-1998 (IEU-SMF)
Competitive Vendor Profiles (IEU-SVN)

Systems Integration Quarterly Perspectives

Leading Applications Driving SI Projects (IEU-SLQ)
Client/Server Integration Services (IEU-STQ)
Procurement Approaches to SI (IEU-SFQ)
Opportunities in Re-engineering (SEIC2)
Methods for Successful SI Projects (SEIV2)
Opportunities in Downsizing (SEIN2)

Outsourcing Programme

Outsourcing Market Analysis & Forecasts (IEU-OMF)
Competitive Vendor Profiles (OEVP2)

Outsourcing Quarterly Perspectives

Business Operations Outsourcing (IEU-OLQ)
Outsourcing - Client Satisfaction (IEU-OTQ)
Outsourcing Opportunities in Government (IEU-OFQ)
Outsourcing Systems Operations (OESO2)
Outsourcing Network Management & Operations (OECS2)
Outsourcing Applications Management (OEAM2)
Outsourcing Desktop Services (OEDT2)

Information Services Industry Research Programme

Market Forecast Database 1993-1998 (IEU-MMF)
Industry Sector Forecast Database 1993-1998 (IEU-MME)
Software & Services Vendor Profiles (IEU-MVN)

Quarterly Perspectives

Client/Server - Service Opportunities (IEU-MLQ)
IS Consulting - Competitive Perspective (IEU-MTQ)
Professional Services - Refocus for the '90s (IEU-MSQ)
Database Migration - The Skills Barrier (IEU-MFQ)

Industry Sector Software & Services Market Reports (1992-1997)

Banking & Finance (IEIB2)
Insurance (IEII2)
Discrete Manufacuturing (IEID2)
Process Manufacturing (IEIP2)
Distribution (IEIR2)
Utilities (IEIU2)
Transportation (IEIT2)
National Government (IEIG2)

Customer Services Programme

Market Sector Analysis & Forecasts 1993-1998 (IEU-CMF)
Multivendor Maintenance Market 1992-1997 (CEIM2)

Quarterly Perspectives

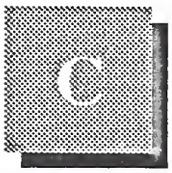
Environmental Services(IEU-CTQ)
Outsourcing Repair Services (IEU-CSQ)
Vendor Structures for Professional Services (IEU-CFQ)
Open Systems Services - Challenges & Strategies (CERS2)
Vendor Service Strategies (CEVS2)
User Trends & Issues (CETS2)
Impact of Downsizing on CS Markets (CEDT2)

Large System User Satisfaction (CEUS2)
Medium System User Satisfaction (CEUM2)
Small System User Satisfaction (CEUP2)

Network Management Programme

Network Services Market Analysis 1992-1997 (NENS2)
Corporate Network Management Requirements (NECN2)
EDI Services User Satisfaction (NECS2)
End User Network Services (NEEU2)

(Blank)



Forecast Reconciliation

Amendments highlighted by the reconciliation table, shown in Exhibit C-1, between last year's forecasts and this year's are as follows:

- The Network Management subsector has been moved back from Systems Operations delivery mode to Network Services.

- Equipment Services are included in the analysis. At the top of each table is a total for software and services which excludes Equipment Services to give a comparison with previous INPUT tables.

- The European forecast, when expressed in U.S. dollars, fell by 6% due to exchange rate changes between the 1992 and 1993 publications.

- The software product component of Systems Integration delivery mode has been revised upward for many countries. This has resulted in some downward adjustment to the separate delivery modes of Applications Software and Systems Software Products.

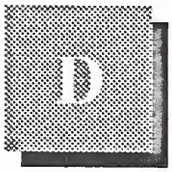
- The definition of applications management has been clarified to those outsourcing contracts which include management responsibility for application development and maintenance. This has reduced the size of this market within the Professional Services delivery mode.

- The most significant negative effect on the forecasts has been in the custom software subsector of Professional Services. Independent vendors in this sector have suffered cutbacks in contract-labour (body-shopping), reduced spending on custom software development projects, strong competition from the equipment vendors as they build up their services market share, and budget cuts, particularly in the defence and discrete manufacturing industries in Europe.

EXHIBIT C-1

Information Services Market, Europe
1992 Forecast Database Reconciliation

Delivery Modes	1992 Market				1997 Market				1992	1993
	1992 Report (U.S.$M)	1993 Report (U.S.$M)	Variance (U.S. $M)	Variance (%)	1992 Report (U.S.$M)	1993 Report (U.S.$M)	Variance (U.S. $M)	Variance (%)	Report CAGR Forecast	
Software and Services Total (excl. Equipment Services)	86,000	78,000	-8,000	-9	142,500	115,500	-27,000	-19	11	9
Professional Services	26,400	23,300	-3,100	-12	40,800	27,800	-13,000	-32	9	4
- IS Consulting	3,670	3,180	-490	-13	6,430	4,910	-1,520	-24	12	9
- Education & Training	2,650	2,490	-160	-6	3,470	3,230	-240	-7	6	6
- Custom Software	19,300	17,500	-1,800	-9	28,300	19,100	-9,200	-33	8	2
- Application Management	810	125	-685	-85	2,670	540	-2,130	-80	27	34
Systems Integration	4,100	4,050	-50	-1	9,250	9,650	400	4	18	19
- Equipment	1,550	1,110	-440	-28	3,030	2,140	-890	-29	14	14
- Application Software	165	725	560	339	485	3,040	2,555	527	24	37
- System Software	115	320	205	178	300	695	395	132	21	16
- Professional Services	2,160	1,820	-340	-16	5,250	3,490	-1,760	-34	19	12
- Other	90	90	0	0	180	260	80	44	15	30
Systems Operations	2,390	2,150	-240	-10	6,320	5,350	-970	-15	22	20
- Platform Operations	1,260	1,160	-100	-8	3,020	2,460	-560	-19	19	18
- Application Operations	880	810	-70	-8	2,280	2,270	-10	0	21	22
- Desktop Services	260	210	-50	-19	1,050	645	-405	-39	32	24
Processing Services	8,900	8,250	-650	-7	10,700	9,950	-750	-7	4	4
- Transaction Processing	7,800	7,150	-650	-8	8,900	8,200	-700	-8	3	3
- Utility Processing	300	275	-25	-8	340	280	-60	-18	3	0
- Other Processing	840	800	-40	-5	1,400	1,460	60	4	11	13
Network Services	5,360	4,900	-460	-9	12,030	10,400	-1,630	-14	17	17
- Electronic Info Svcs	3,550	3,240	-310	-9	5,730	4,470	-1,260	-22	10	6
- Network Applications	1,410	1,290	-120	-9	5,100	4,780	-320	-6	29	31
- Network Management	410	375	-35	-9	1,180	1,105	-75	-6	24	24
System Software	14,000	12,900	-1,100	-8	19,600	17,100	-2,500	-13	7	6
- Mainframe	6,610	5,990	-620	-9	6,990	5,300	-1,690	-24	1	-4
- Minicomputer	4,420	4,050	-370	-8	6,380	5,300	-1,080	-17	8	6
- Workstation/PC	3,010	2,880	-130	-4	6,260	6,460	200	3	16	18
Application Software	10,900	9,800	-1,100	-10	20,800	16,800	-4,000	-19	14	12
- Mainframe	1,150	990	-160	-14	1,300	790	-510	-39	2	-4
- Minicomputer	3,400	3,040	-360	-11	5,500	4,240	-1,260	-23	10	8
- Workstation/PC	6,300	5,800	-500	-8	14,000	11,800	-2,200	-16	17	16
Turnkey Systems	13,900	12,600	-1,300	-9	23,000	18,400	-4,600	-20	11	9
- Equipment	6,870	6,320	-550	-8	9,460	7,820	-1,640	-17	7	5
- Application Software	3,040	2,830	-210	-7	6,050	4,850	-1,200	-20	15	14
- System Software	360	335	-25	-7	550	460	-90	-16	9	7
- Professional Services	3,600	3,140	-460	-13	6,930	5,280	-1,650	-24	14	13
Equipment Services	23,800	21,900	-1,900	-8	27,600	24,000	-3,600	-13	3	1
- Equipment Maintenance	15,900	14,700	-1,200	-8	17,400	14,600	-2,800	-16	2	-1
- Environmental Services	7,870	7,200	-670	-9	10,220	9,450	-770	-8	5	6
Grand Total	110,000	100,000	-10,000	-9	170,000	140,000	-30,000	-18	9	8



Analysis of Vendor Research Sample

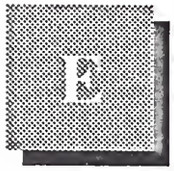
Interviews are conducted annually with a wide cross-section of computer software and service vendors, with the specific objective to obtain quantitative data on their financial performance and the sources of their revenues. Exhibit D-1 shows an analysis of the research sample by country.

EXHIBIT D-1

Vendor Research Sample

Country Market	Number of Active Vendors Analysed
France	100
Germany	100
United Kingdom	100
Italy	75
Sweden	50
Norway	40
Denmark	40
Finland	35
Netherlands	55
Belgium	60
Austria	40
Switzerland	45
Spain	50
Rest of Europe	20

(Blank)



Economic Assumptions

There follow some notes on the methodology INPUT uses in making forecasts and judging how reasonable they are.

INPUT reports are based principally on three strands of research activity conducted throughout the year:

- A vendor research programme with more than 300 interviews with prominent software and services vendors across Europe. This research assesses their attributable revenues in each country by delivery made and, where possible by industry sector. INPUT consultants use their own judgement in many cases to categorise revenues into subsectors. In particular, INPUT excludes revenues considered captive, such as those from a vendor's parent company.

- Several hundred vendor and user interviews across all European market sectors to determine trends and opinions. These interviews are part of the research that INPUT carries out in specific sectors of the software and services market. In 1990, for example, INPUT produced reports on more than 20 different software and services market sectors.

- Additionally, INPUT maintains an extensive library and database of information relating to the software and services industry. This covers, for example, INPUT's customer services programme data: results of INPUT's research into the hardware maintenance market, which includes its diversification into the software and services market.

All the forecasts from these activities are produced in local currency for each country, then consolidated with common economic and exchange rate data to produce a top-level forecast. This is done for software and services in each country and in Europe as a whole. At each stage it is examined for reasonableness and consistency and, if necessary, revisited. For example, we satisfactorily tested the question: Will predicted user budgets for information systems support the predicted growth rates in software and services?

The forecasts also benefit from assignments for and feedback from INPUT clients, who include more than 100 of the leading vendors of software and services around the world. For example: INPUT supplied an economic model to a market leading client on the potential effect of rising oil prices on forecast software and services growth rates. In summary, this showed that falling real growth was largely counterbalanced by increases in inflation, resulting in continued high dollar growth forecasts for the market.

In order to consolidate INPUT's forecasts and vendor data into a consistent set of European analyses each year, it is essential to use a standard set of economic factors. The following pages show the inflation and exchange rates in use for 1992 studies.

A

European Exchange Rates

The following table, Exhibit E-1, shows the standard exchange rates used throughout the 1993 programme to consolidate country market data for overall Western European forecasts and vendor market shares.

EXHIBIT E-1

U.S. Dollar and ECU Exchange Rates—1992

Country	Currency	US Dollar	ECU
France	FF	5.26	6.64
Germany	DM	1.55	1.97
United Kingdom	PS	0.634	0.800
Italy	Lira (K)	1.36	1.73
Sweden	Sek	6.24	7.96
Denmark	DK	5.98	7.58
Norway	NK	6.41	8.15
Finland	FM	4.96	6.10
Netherlands	Dfl	1.74	2.20
Belgium	BF	31.91	40.34
Switzerland	SF	1.39	1.75
Austria	Sch	10.89	13.82
Spain	Ptas	110.82	140.30
Portugal	Esc	138.26	174.00
Greece	Dra	202.32	255.00
Ireland	IP	0.589	0.745
Eastern Europe	$	1	1.266

Source: Financial Times 30 December 1992

B

European Inflation Rates

Exhibit E-2 shows the average five-year inflation assumptions for each reported country and the changes from those used in reports produced in the previous year. All INPUT forecasts include the effects of inflation as well as natural market growth rates. For consistency, the same inflation rates are used throughout all the different market sector research and analysis during a calendar year, unless specified otherwise.

EXHIBIT E-2

Inflation Assumptions—1991 and 1992

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

Source: OECD Forecasts Q4 1992

The latest economic growth measurements and predictions from the OECD, referred to in the text for each country, are listed in Exhibit E-3.

EXHIBIT E-3

GDP Growth Rate Assumptions

Country	1991 (%)	1992 (%)	1993 (%) Forecast	1994 (%) Forecast
Austria	3.0	1.5	0.0	1.5
Belgium	2.0	0.9	0.0	1.2
Denmark	1.2	1.1	0.5	2.5
Finland	-6.4	-3.6	-1.0	1.5
France	0.7	1.3	-1.0	1.2
Germany (West Germany)	3.7	1.1	-1.5 1.2	1.0
Greece	1.8	1.5	1.0	1.5
Ireland	2.2	2.4	1.1	2.0
Italy	1.3	0.9	0.0	1.7
Netherlands	2.2	1.5	0.0	1.8
Norway	1.9	3.3	1.5	2.5
Portugal	2.2	1.1	0.5	2.0
Spain	2.3	1.0	-0.5	1.5
Sweden	-1.7	-1.7	-2.0	1.0
Switzerland	-0.1	-0.6	0.0	2.0
United Kingdom	-2.2	-0.4	1.9	2.9
EC	1.4	1.1	0.75	1.75

Sources: OECD and Barclays Bank Economic Review

The commentary on each country provides details of the latest published consumer price inflation rates for each country. They are listed in Exhibit E-4. These are not necessarily the figures used to help create the INPUT forecasts (refer to Exhibit E-2).

EXHIBIT E-4

Consumer Prices Growth Rates

Country	1991 (%)	1992 (%)	1993 (%) Forecast	1994 (%) Forecast
Austria	3.3	3.7	3.4	2.8
Belgium	3.2	2.5	2.7	3.0
Denmark	2.4	2.1	1.0	1.5
Finland	4.3	2.6	3.0	4.5
France	3.2	2.4	2.5	2.5
Germany (West Germany)	3.5	4.0	4.0	2.8
Greece	19.5	15.9	14.5	10.0
Ireland	3.2	3.1	2.0	3.0
Italy	6.5	5.4	4.5	3.8
Netherlands	3.9	3.7	2.5	3.0
Norway	3.4	2.3	2.5	3.0
Portugal	11.4	8.9	6.3	4.5
Spain	5.9	5.9	4.7	3.8
Sweden	9.3	2.2	4.5	3.5
Switzerland	5.8	4.0	3.3	2.5
UK	5.9	3.7	1.7	3.8
EC	5.3	4.6	4.5	3.5

Source: OECD

(Blank)