THE SYSTEMS INTEGRATION MARKET

WESTERN EUROPE 1991 - 1996

INPUT

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Systems Management Programme - Europe

The Systems Integration Market,
Western Europe, 1991-1996

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Abstract

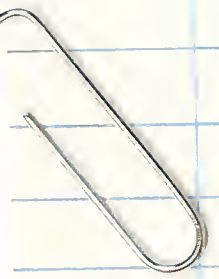
This report analyses the Systems Integration market in Western Europe, providing market size and forecast data and rankings for leading competitors. Individual assessments for each country market are included except for Greece, Ireland and Portugal which are treated as a group.

Systems Integration is defined by **INPUT** as the management of a large information systems project that provides a complete solution to a complex application requirement through custom selection and implementation of a variety of information system, networking or automation 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 client for delivery of the specified system function, on schedule and at the contracted price.

To be included in the information services market, systems integration projects must involve some application processing component. In addition, the majority of the cost must be associated with information systems products and/or services. **INPUT** analyses the Systems Inteygration sector into four sub-modes:

- Systems Equipment
- Professional Services
- Software Products
- Other Services

This report also contains profiles of some of the leading systems integration vendors in Europe.



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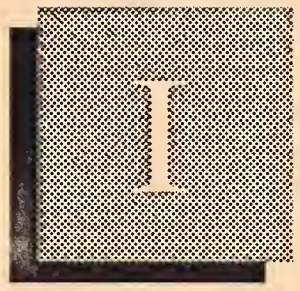


Introduction

I Introduction

A Objectives

The objectives of this report are:

- to provide current market size estimates and five year forecasts for the systems integration market both for Western Europe overall and for the major country markets
- to identify the leading vendors in the systems integration market in Western Europe
- to provide profiles of a number of the leading vendors.

B Scope

Systems integration is a business offering that provides a complete solution to a complex information system, networking or automation requirement through 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.

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

- Program management, including subcontractor management.
- Needs analysis.
- Specification development.
- Conceptual and detailed systems design and architecture.
- Systems component selection, modification, integration and customisation.
- Custom software design and development.
- Custom hardware design and development.
- Systems implementation including testing, conversion and post-implementation evaluation and tuning.

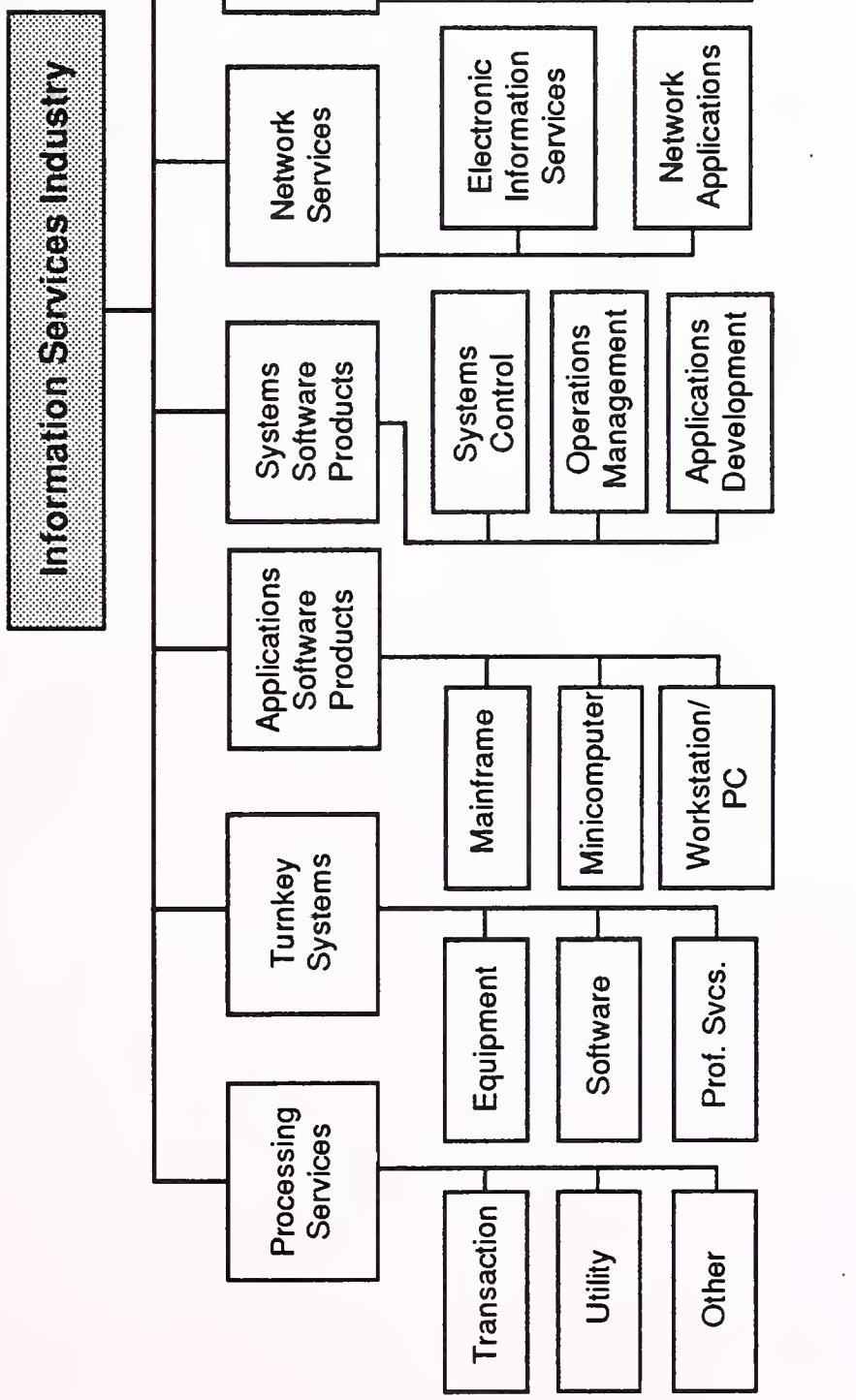
- Life-cycle support, including:
  - Systems documentation and user training
  - Systems integration during development
  - Systems maintenance

Exhibit I-1 positions systems integration within the overall information services market. It can be seen that the systems integration market is divided into four submodes. This sector thus includes products, both equipment products and software products in addition to the professional services for software development and project management that represent the most important value added aspects of the systems integration sector. The fourth submode would include activities such as processing services provided within the overall context of a systems integration contract.

The market analysis provided in this report covers the whole of Western Europe and provides individual country market forecasts except for Greece, Ireland and Portugal which are treated as a group.

Exhibit I-1

Information Services Industry Structure—1991



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C
Report Structure

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

- Chapter II is an executive overview providing a concise summary of the salient points of the report.

- Chapter III provides an overview of the Western European systems integration market including the overall European forecast and competitive analysis.

- Chapter IV contains the market analysis and forecast for each individual country market.

- Chapter V contains profiles of some of the leading systems integration vendors in Western Europe.

- The appendices to the report contain a detailed data-base of each country market forecast in local currency and in ECU's and a reconciliation of the differences between this forecast and previous **INPUT** forecasts for the systems integration market.

II

Executive Overview

II Executive Overview

A
Recession leads to Slowdown in Systems Integration Market

Although INPUT estimates that the Western European systems integration market will be worth $7.9 billion by 1996, as shown in Exhibit II-1, there is a significant slowdown in overall market growth compared to previous years. A major cause of this slowdown is the recession, or threat of recession, being experienced in the major European countries which is leading to the postponement of major projects. The region expected to show the highest growth over the next few years is Southern Europe, particularly Spain and Italy.

The systems integration market is still being driven by the market and financial pressures impacting on organisations. As companies feel the need to change their business practices fundamentally to increase their competitiveness, so there is a corresponding need to re-align their information systems rapidly and effectively. Systems Integration is often seen as a means of rapidly bringing about the required changes while transferring the risk to a third party. However it is a practice which is frequently opposed by in-house IS management as they seek to retain control of all development activities.

Another strong driving force is the need within organisations to make information - often from existing applications - more widely available, either across departmental barriers or even on a pan European basis. Hence a major segment of the systems integration market consists of providing interoperability to users via network integration projects. In 1991, this segment is estimated to be worth $750 million in Western Europe.

Systems integration services provide a complete solution to an information systems development need that exhibits three key characteristics that differentiate it from other service solution approaches. These three key characteristics are:

- It is a custom application with the contractor taking responsibility for the implementation of the complete system into the user's working environment.

- It is a development that is characterised by its technical complexity, often involving more than one technology and the involvement of more than one vendor to supply the critical technologies and appropriate integration skills.

- One vendor will take overall management responsibility for the delivery of a complete working system usually at an agreed price and schedule with penalties for project overruns.

Exhibit II-1

Systems Integration Market, Western Europe

	User Expenditure Western Europe - $ Billions		
Subsector	1991	1991-1996 CAGR (Percent)	1996
Systems Integration	3.3	19	7.9

B
Western Europe Market Development

The components of the systems integration sector can be analysed into the major sectors shown in Exhibit II-2. This Exhibit shows the market analysis and forecast for each of these sub-sectors in Western Europe.

Systems integration contracting generally implies the provision of the necessary computer and communications equipment within the contract and thus this is included within the overall market assessment. Professional services represents the critical skill needs for the planning, design, development and project management of a systems integration project. To provide a systems integration solution it is also often necessary or desirable to utilise both systems and applications software products as well as to utilise processing and network services.

Indeed, the availability of suitable software kernels or application software products is becoming a critical success factor for vendors operating in the systems integration market. While such software products may still require customising to meet the needs of individual clients, their presence both demonstrates the vendor's experience in providing business solutions of the required nature and significantly reduces the cost and timescales of the project. Accordingly software products is forecast to be the fastest growing element within systems integration contracts over the forecast period.

Decreasing unit equipment costs and the related trend towards downsizing contribute to the lower growth expected for the equipment sector.

Exhibit II-2

Systems Integration Development

	User Expenditure Western Europe - $ Billions		
Subsector	1991	1991-1996 CAGR (Percent)	1996
Equipment	1.3	15	2.6
Professional Services	1.8	21	4.6
Software Products and Other	0.3	22	0.8

The systems integration market can also be broken down into those projects which are primarily applications/business solutions driven and those which are primarily concerned with network integration/technical infrastructure development. The breakdown of the market between these two segments is shown in Exhibit II-3.

Exhibit II-3

Western Europe Systems Integration Market Segmentation, 1991

Market Segment	Share of Market (percent)	Value ($ millions)
Networking/ Infrastructure Development	22	750
Applications/Business solutions	78	2,600

Examples of projects which are primarily application/business solution led include:

- the hospital information pilots being undertaken in the U.K.
- the U.K. Post Office counters automation project
- the Nauheim Concept for air traffic control in Germany
- the Portugese fishery control and protection project
- the control centre contract for Electricité de France.

Examples of projects which primarily involve network integration/infrastructure development include:

- the Redacs project for the Royal Navy
- the UK Department of Social Security Strategy Terminal System
- the communications network for the Spanish post office.

Network integration projects are frequently comparatively "technical" sales made through the IS department of the client, whereas "business solution" projects increasingly involve senior end user managers as the principal purchasing influence. A breakdown of the systems integration market by major purchasing influence is shown in Exhibit II-4.

Exhibit II-4

Western Europe, Systems Integration Major Purchasing Influence, 1991

Major Influence	Share of Market (percent)	Value ($ Millions)
CEO or end user Director	60	2,000
IS Director or Manager	38	1,250
Consultants	2	100

This illustrates the importance of vendors achieving access to senior end user management, who are now the major influence in vendor selection in the majority of systems integration contracts. While still regarded by vendors as a comparatively minor factor in the overall systems integration marketplace, the role of consultants in vendor selection is seen to be steadily increasing. Accordingly many vendors are either developing their own in-house business consultancy capabilities and/or entering into alliances with the recognised management consultancies.

C
Systems Integration Country Markets

Nearly three quarters of the entire Western European market for systems integration services is accounted for by the three major country economies of France, Germany and the United Kingdom. Exhibit II-5 shows clearly this market position. Germany is forecast to overtake the United Kingdom as the largest national systems integration market in Western Europe during the forecast period. Growth in Germany will continue to be strong over the next few years fuelled by the redevelopment of the infrastructure and facilities in the eastern part of the country. On the other hand, growth in the U.K. is forecast to be relatively depressed - the economic recession is still leading to the postponement of a significant proportion of major projects.

Some of the faster growing markets over the forecast period are forecast to be in Southern Europe, particularly Italy and Spain. Italy has been a major market for Bull for a number of years and ICL has had considerable success in Spain recently with projects for the Secretaria General de Communicaciones and the Department of Social Security.

The Scandinavian market, like the UK market, is slightly depressed at the present time.

Exhibit II-5

Systems Integration Country Markets

Country	Market Share (Percent)	Estimated 1991 Revenues $ Millions
United Kingdom	26	880
Germany	23	790
France	22	735
Italy	9	290
Benelux	8	265
Others	12	390
TOTAL	**100**	**3,350**

D
Industry Market Opportunities

Exhibit II-6 indicates the industry market analysis of the Western European systems integration business. It can clearly be seen that the Government sector remains a very important source of systems integration contacts. It is from this sector, notably the Defence sector, that the concept of systems integration originated. However this now represents the lowest growth area of the entire market whereas the civil government and commercial sectors represent much higher growth opportunities. An important factor in the civil government sector will be the opening up of public procurement under EEC "1992" legislation. Office automation projects continue to be important in both the defence and civil government sectors with Bull recently winning the Nato secure message handling project and with secure office automation contacts for the UK MOD and Foreign Office still to be awarded.

Systems integration in the manufacturing sector will be driven by the need for companies to integrate their design, material resource planning and production activities. These types of system are still a long way from being achieved at this juncture but there is no question that users are moving in this direction. The opportunities in both the discrete and process sector will initially be aimed at linking together existing components of manufacturing systems rather than the development of large-scale systems integration projects. There is also a need to make design information much more widely available across companies to speed up new product development.

The utilities sector represents a much larger proportion of the systems integration market than it does of the whole software and services business. This is due to the sheer size of the operating units within this industry and the high investment required in efficient use of resources, for example in energy management systems for power generation. Denationalisation has been a major driving force in this sector in the UK in recent years.

The banking and finance sector is undergoing considerable transformation in the period up to 1992. This is creating opportunities for systems integration but generally in areas which are considered non-core activities or where outstanding cost savings can be made. Financial institutions still place considerable emphasis on in-house development for those areas which they consider to be of critical importance to their operations.

In the distribution sector the development of pan-European alliances amongst retail and wholesaling organisations is generating a growing demand for more complex network based national and cross-border operational systems.

Exhibit II-6

Industry Market Opportunities, 1991
Western Europe Systems Integration

Industry Sector	Market Share (Percent)	Expenditure $ Millions
Manufacturing	21	700
National Government	18	600
Banking & Finance	16	540
Utilities	15	500
Distribution	12	400
Others	18	610
TOTAL	**100**	**3,350**

E
Systems Integration Competitive Environment

Exhibit II-7 highlights the five leading vendors in the European systems integration market. This group reflects the sharing of the market between two key groups of vendors, equipment vendors and independent software and services vendors.

Equipment vendors are focusing on systems integration as a route to improving account control in the face of increasing systems complexity and the erosion of equipment margins. Equipment vendors have generally tried to adopt a service as opposed to a product orientation as a key part of their strategy. With the advent of open systems, equipment vendors such as ICL and Bull recognise the importance of systems integration in adding value and differentiating their offerings from those of their competitors. Without systems integration there is a danger of being trapped in a commodity market for equipment, putting considerable pressure on their account control and profit margins.

The independent vendors, of which Cap Gemini Sogeti and Andersen Consulting are the most significant, would claim that systems integration is the logical expression of their role in supporting their clients' system development needs. Cap Gemini Sogeti's acquisition of SCS strengthens their overall European market share in Western Europe. Now that they have at last achieved a significant presence in the United Kingdom with their acquisition of Hoskyns, they are capable of making further significant inroads into this market. Similarly their involvement with Debis in Germany further strengthens their capabilities in this important marketplace.

Andersen Consulting is aiming to gain and maintain market position by becoming the pre-eminent provider of solutions to "top" organisations worldwide through a policy of providing both consultancy and provision of strategic information systems. It is interesting to note that Andersen Consulting have achieved very high growth in both systems integration services and in the adjacent professional services sector almost purely through organic growth.

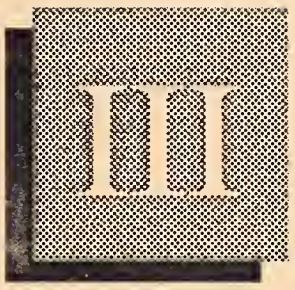
Clearly some sectors of the systems integration market will favour the equipment vendor group, others the independent vendor group. For example Siemens has a considerable advantage in the factory automation sector as it is also a manufacturer of PLCs. It is evident however that the inherent complexities of systems integration make it extremely difficult for any vendor to tackle all the opportunities on their own. There thus exists a considerable need for collaboration in order to acquire access to specific software products, specific technology and the accompanying skill base. Many joint ventures and partnering arrangements are thus being formed and this activity will intensify in order to meet the critical user needs in this sector.

Many vendors are following Andersen Consulting's lead and recognising the importance of management consultancy in gaining credibility with senior end user management and access to prior knowledge of impending systems integration contracts. As a result vendors are both developing in-house consultancy groups and developing partnerships with the leading management consultancies.

Exhibit II-7

Western Europe Systems Integration Leading Vendors 1989

COMPANY	MARKET SHARE (PERCENT)	ESTIMATED REVENUES ($MILLIONS)
Cap Gemini Sogeti	12	330
IBM	11	320
Andersen Consulting	11	300
Siemens	4	110
Logica	3	90



European Overview

III European Overview

A Introduction

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

- Professional Services

- Software Products

- Other Services

This service delivery mode thus includes equipment wherever it is included as part of the overall systems integration contract. 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. 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. 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.

Exhibit III-1 enumerates the component products and services that may be a part of a systems integration project and from which the vendor can expect to receive revenue. Each project's unique requirements dictate which of these components are applicable to the project and the proportion of the total project expenditures to be made for each component involved.

Exhibit III-1

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 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

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.

Traditionally systems development has been managed in-house, with the outside supplier providing only specific services and products. However, many in-house information systems departments are unable to keep pace with fast-changing technology, or to respond swiftly to the need for major systems changes. The appropriateness of systems integration as a response to user needs is driven therefore by a greater willingness on the part of clients to contract out management responsibility to third party vendors.

A continuing feature of the systems integration market is the significant number of very large pan-European contracts. This project characteristic is determined either by virtue of the client being a European institution or several European institutions that need to integrate their operations, or by the need of a large multinational organisation to improve its pan-European capabilities. Examples include the large imaging contract won by Rank Xerox from the European Patent Office, the European fighter project, the secure office system from Nato, and the plan by the European Commission to link the major Government departments of each member state to its counterparts across the community.

However INPUT forecasts that the major growth in the systems integration market will increasingly come from the medium-sized project sector rather than growth in the number of very large projects.

B
Market Size and Growth

1. Forecast Assumptions

The market assessments and forecasts provided in this report cover the period 1990 through to 1996 and assess user expenditure for systems integration contracts. Market sizes and forecasts are assessed in local currency and converted into US dollars for aggregation and comparative purposes. The forecasts for each country in US dollars are listed in Appendix A, while Appendix B provides the country forecasts in ECUS.

Forecasts have been expressed in actual monetary terms and therefore include estimates for inflation.

2. Market Forecast

The forecast growth of the systems integration market in Western Europe is shown in Exhibit III-2. Exhibit III-3 provides more detailed numerical data for the four sub-modes of the sector.

The market growth forecast for the systems integration delivery mode has been revised downwards significantly this year. There are two factors contributing to this. Firstly the inflation forecast for the period 1991 to 1996 is typically 2% lower in each country than was forecast for the period 1990 to 1995. Secondly the current economic climate is leading to the postponement of a number of large projects, decreasing the rate of market growth.

Exhibit III-2

Western European Systems Integration Market 1991-1996

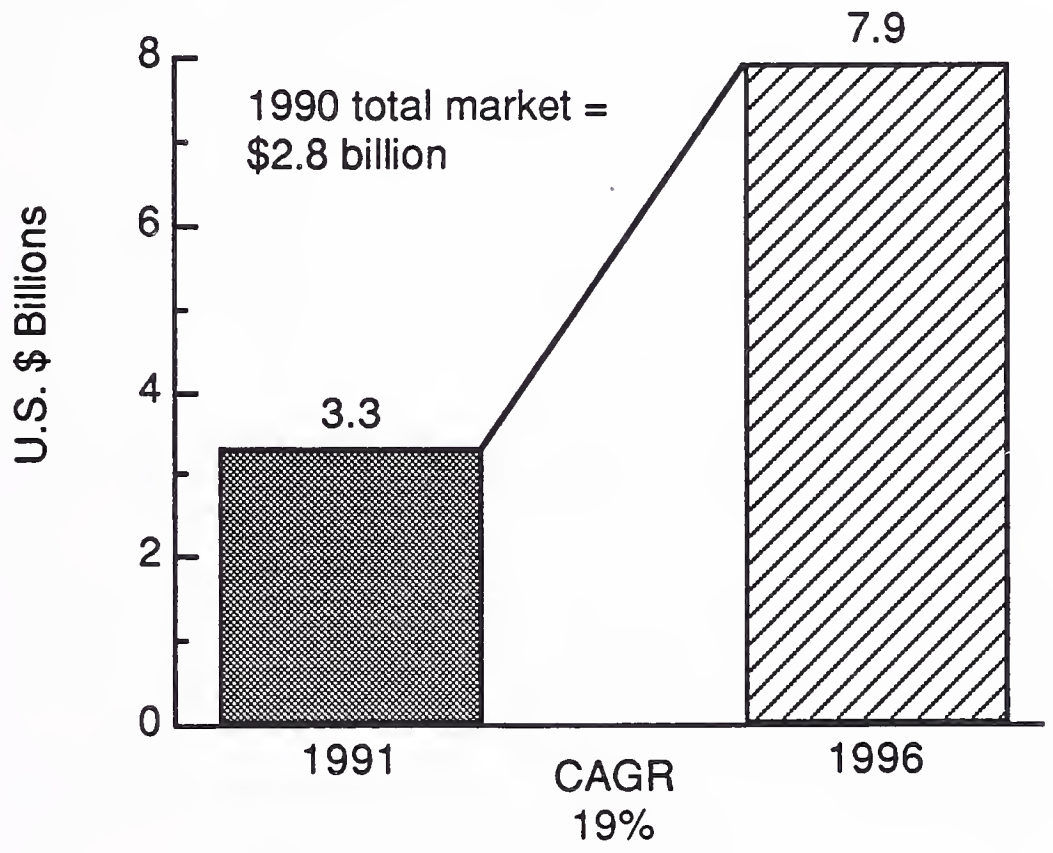


Exhibit III-3

System Integration Forecast
Western Europe, 1991

	USER EXPENDITURE $ MILLIONS			
SUB-SECTOR	1990	1991	1991-96 CAGR %	1996
Equipment	1,130	1,300	15	2,600
Professional Services	1,430	1,760	21	4,550
Software Products	185	220	24	640
Other Services	75	75	17	160
Total	**2,800**	**3,350**	**19**	**7,900**

One of the key driving forces in the systems integration market is the need for the client base to change systems in line with changing organisations. Currently, European business is undergoing unprecedented structural change. One of the most significant manifestations of that change is the level of merger and acquisition activity recorded in Europe. In the first quarter of 1990, 269 French companies with an approximate value of $10 billion (U.S. dollars), and 370 companies in the U.K. with an approximate value of $9.7 billion (U.S. dollars) were taken over. French companies spent nearly $5 billion (U.S. dollars) to acquire 116 foreign concerns. France has now surpassed the U.K. in merger and acquisition activity, whose significance to software and services vendors is that all over Europe, users are facing a major restructuring, reorganisation, and re-evaluation of their systems.

The other major driving forces in the systems integration market are:

- The necessity of adopting IS systems to radically changing business processes
- IS infrastructure development to facilitate greater sharing of data across systems and departments.

The relative proportions of the four sub-sectors of the systems integration market are analysed in Exhibit III-4. The most significant sub-sectors are clearly those of professional services and systems equipment. Over the forecast period the relative proportions of these two sectors are expected to change with equipment declining proportionally. Reasons for this change include decreasing unit equipment costs and downsizing balanced against increasing project complexity leading to a higher professional services component. The software development content of professional services may reduce slightly as a result of the development of software kernels or modules of common re-usable systems that can form a basis for the development of systems integration contracts. However the additional requirements for management, technical expertise and training in order to perform the integration will increase.

The proportion of software products used within systems integration projects is also expected to increase. The ability to utilise either a standard software product or a kernel as the basis of a project is important in reducing project costs and improving vendor credibility.

Exhibit III-5 shows the sub-sector growth expectations in graphic form which emphasises the differing growth patterns for these elements. The software products' component is expected to show the highest rates of growth in line with its growing importance as a basis for the development of major systems.

Exhibit III-4

Systems Integration Project Component Trends 1991-1996
Western Europe

	PROPORTION OF TOTAL MARKET (PERCENT)	
COMPANY	1991	1996
Equipment	39	33
Professional Services	52	57
Software Products	7	8
Other Services	2	2

Exhibit III-5

Systems Integration Market by Project Component Group 1991-1996

	User Expenditure Western Europe - $ Billions		
Subsector	1991	1991-1996 CAGR (Percent)	1996
Equipment	1.3	15	2.6
Professional Services	1.8	21	4.6
Software Products	0.2	24	0.6
Other Services	0.1	17	0.2

Exhibit III-6 shows the relative sizes of the regional markets within Western Europe. Nearly three quarters of the total market for systems integration is contributed by the three major economies of France, Germany and the United Kingdom. Exhibit III-7 provides a more detailed level of forecast data for each individual country market. The UK market, from a relatively more developed position in 1991, is expected to grow at below the European average rate, in contrast to France and Germany which are expected to grow at a faster rate than the European average. However two of the highest growth rates over the forecast period are expected in Southern Europe, in Italy and Spain. Scandinavia, on the other hand, is forecast to exhibit comparatively low growth rates. The same comparative country market data shown in Exhibit III-7 in US dollars is provided in ECUs in Exhibit III-8. For completeness Exhibit III-9 provides the base data for these market size estimates and forecasts in local currencies.

Exhibit III-6

Comparative Regional Market Sizes
Systems Integration, 1991

REGION	1991 $ MILLIONS	MARKET SHARE %
Germany	790	23
United Kingdom	880	26
France	735	22
Italy	290	9
Benelux	265	8
Scandinavia	160	5
Switzerland & Austria	110	3
Spain	100	3
Others	20	1
Total (rounded)	**3,350**	**100**

Exhibit III-7

Systems Integration
Comparative Country Markets
Western Europe, 1991-1996

	User Expenditure $ millions				
Country	1990	1991	1996	Growth 1990-1991 Percent	1991-1996 CAGR (Percent)
France	605	735	1,820	22	20
Germany	655	790	2,050	21	21
United Kingdom	770	880	1,780	15	15
Italy	240	290	790	22	22
Sweden	50	62	135	25	17
Denmark	33	40	85	20	17
Norway	32	40	85	22	17
Finland	15	18	38	21	15
Netherlands	125	155	355	22	18
Belgium	92	110	215	20	18
Switzerland	63	80	185	22	19
Austria	27	33	85	19	20
Spain	85	100	265	21	21
Rest of Europe	15	20	45	20	18
Total (rounded)	**2,800**	**3,350**	**7,900**	**20**	**19**

Exhibit III-8

Systems Integration Forecast Western Europe
ECU's

	User Expenditure ECU's millions			
Country	1990	1991	1991-96 CAGR (Percent)	1996
France	440	535	20	1330
Germany	480	580	21	1500
United Kingdom	560	645	15	1300
Italy	180	210	22	575
Sweden	35	45	17	100
Denmark	23	30	17	63
Norway	25	30	17	63
Finland	10	13	15	28
Netherlands	90	110	18	260
Belgium	68	80	18	185
Switzerland	45	57	19	135
Austria	20	25	20	62
Spain	60	75	21	190
Rest of Europe	12	15	18	33
Total (rounded)	**2,050**	**2,450**	**19**	**5,820**

Exhibit III-9

Systems Integration Forecast Western Europe
Local Currency

Country	Currency	1990	1991	1991-96 CAGR%	1996
Austria	Sch M.	320	400	20	1,000
Belgium	BF M.	3,200	3,840	18	8,800
Denmark	DK M.	210	250	17	550
Finland	FM M.	60	75	15	150
France	FF M.	3,400	4,140	20	10,300
Germany	DM M.	1,100	1,330	21	3,450
Italy	Lira B.	300	360	22	975
Netherlands	DFl M.	210	260	18	600
Norway	NK M.	210	260	17	560
Spain	Ptas M.	8,000	9,620	21	25,000
Sweden	SEK M.	280	350	17	770
Switzerland	SF M.	80	100	19	235
UK	M.	395	455	15	915
Rest of Europe	US $ M.	15	20	18	45
Europe	US $ M.	2,800	3,350	19	7,900

C
Industry Market Analysis

One of the major factors that has created so much interest in the systems integration market over the last five years has been the rapidly growing opportunity in the commercial sector. Systems integration originated as a concept in the Defence sector now forecast to grow at a significantly lower rate than the rest of the market. The comparative position between the commercial, civil government and defence sectors for systems integration is shown in Exhibit III-10, East-West detente has led to a significant cut in anticipated defence expenditure with a consequent impact on the forecast growth rate for systems integration projects in this sector.

Exhibit III-11 provides a more detailed industry sector analysis of the Western European systems integration market for the year 1990. National governments remain an important market segment for systems integration vendors. Although defence spending may be on the decline, projects such as the expected award of the CHOTS contract to ICL will remain of major importance. Civil government projects are likely to offer considerable levels of opportunity over the next few years fuelled by the continuing need to develop major infrastructure and the EEC's liberalisation of public procurement. Examples of projects include the UK Inland revenue's 50m IRON project, and the EC's proposal to link major government departments across member states.

The liberalisation of public procurement is a major issue which has yet to be fully developed. This process is unlikely to happen quickly as national governments will continue to find ways of favouring local suppliers. However, the complex technological and managerial requirements of systems integration will mitigate against this process and as a result major vendors operating on a multinational basis are likely to increase their overall position in the market.

The manufacturing sector is another very important sector for systems integration vendors, as companies attempt to develop links between their various " islands of automation". In both the process and discrete manufacturing sectors, there is considerable emphasis in capturing real-time information from the shopfloor and using this up-to-date information to drive the production management process.

The Banking and Finance sector will experience significant growth in the securities sub-sector as local, regional and national markets link together. This is already happening in many European countries and will continue throughout the 1990s. Although the fusion of banks in all countries is creating opportunities to re-organise systems, the major European banks still tend to prefer to use in-house development of customer database systems. However, there will be significant opportunities for new front-office systems in the new banking conglomerates, and a corresponding threat to the closed user group processing centres.

The rationalisation and homogenisation of insurance practises throughout Europe is creating many pressures on in-house I.S. departments to keep up with the changes in legislation. There has been relatively little contracting out of major systems in insurance, which only accounts for around 5% of the total market. There could be opportunities for vendors as the insurance market becomes more pan-European.

The transportation and utilities sectors account for a much larger proportion of the systems integration market than they do for software and services as a whole. Over the last few years, there have been major projects started that are still in progress that have been targeted at the transport opportunities in a de-regulated Europe. Examples are the two airline reservation systems Galileo and Amadeus, the Channel Tunnel project, and a major investment in systems for railways. There have been large projects for electricity generating companies in many countries in Europe, as well as for nuclear power in France, the coal industry in Belgium, and water companies in the United Kingdom.

The need to develop large and complex network based applications is an important driver for systems integration contracts. In the distribution sector the development of pan-European alliances amongst retail and wholesaling organisations is generating a growing demand for more complex network based national and cross-border operational systems.

Exhibit III-10

Systems Integration Market Analysis
Western Europe, 1991-1996

	User Expenditure Western Europe - $ Millions		
Subsector	1991	1991-1996 CAGR (Percent)	1996
Commercial	2,630	20	6,500
Civil Government	220	18	510
Defence	500	12	870
Total	**3,350**	**19**	**7,900**

Exhibit III-11

Industry Sector Breakdown, 1991
Systems Integration, Western Europe

Industry Sector	Market Size $ millions	Percentage of Total
Government		
- national	600	18
- local	100	3
Manufacturing		
- discrete	400	12
- process	300	9
Banking & Finance	540	16
Utilities	500	15
Distribution	400	12
Insurance	170	5
Others	335	10
Total	**3,350**	**100**

D
Market Segmentation

Besides industry and country breakdowns, there are a number of ways in which the systems integration market can be usefully segmented.

One additional segmentation - by type of project - is shown in Exhibit III-12, which shows that while networking/infrastructure development projects form a significant proportion of the systems integration market, the majority of projects are business solution led.

In networking/infrastructure development projects, the major purchasing influence is typically from within the cient's IS department. However the major purchasing influence on systems integration projects concerned with implementing business solutions is increasingly coming from outside the client's IS department as senior directors increase their involvement in these decisions. Third party advisers, particularly consultants, are also becoming more important in influencing vendor selection. The current breakdown of the systems integration market by major purchasing influence is shown in Exhibit III-13.

Exhibit III-12

Market Segmentation, 1991
Systems Integration, Western Europe

Market Segment	Share of Total Market (%)	Value $m
Networking/Infrastructure Development	22	750
Applications/Business Solutions	78	2,600

Exhibit III-13

Major Purchasing Influence, 1990
Systems Integration, Western Europe

Major Purchasing Influence	Share of Total Market (%)	Value $m
IS Director or Managers	38	1,250
CEO or end user Director	60	2,000
Consultants	2	100

E
Competitive Environment

The leading vendors in the Western European systems integration market are listed in Exhibit III-14. Of these ten vendors, five are independent professional services companies, the other five are equipment vendors.

The largest independent systems integration vendor in Western Europe is Cap Gemini Sogeti. Cap Gemini Sogeti has been expanding very aggressively in recent years, greatly improving its geographic coverage of Western Europe via its acquisition of Hoskyns in the UK and SCS in Germany. The recent relationship with Debis promises dramatically to strengthen CGS's position in Germany and to give a major boost to its capability in the manufacturing sector. Cap Gemini Sogeti also recognises the importance of business/IS consulting in targeting the systems integration market and in 1990 acquired two consultancies: United Research and Gamma SA.

The largest equipment vendor in the market is IBM who promotes systems integration as the solution to large applications requirements for its largest customers. Equipment vendors are focusing on systems integration as a route to improving account control in the face of increasing systems complexity and the erosion of margins on equipment. Equipment vendors have generally tried to adopt a service orientation (systems integration) market positioning to move away from their historic product orientation (equipment manufacturer).

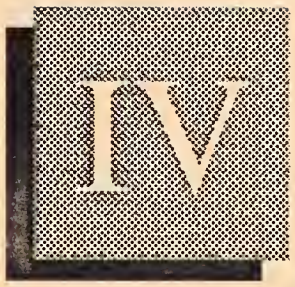
The second largest independent systems integration vendor in Western Europe is Andersen Consulting. Andersen Consulting wants to gain and maintain position by becoming the pre-eminent provider of solutions to "top" organisations worldwide by establishing a profile as the "respected consultant/provider of strategic information systems". Andersen Consulting has a full in-house capability at the high end of the development life cycle, and also makes use of alliances in the areas of systems software, equipment, custom and communications equipment and equipment maintenance.

The second tier equipment manufacturers such as Unisys, ICL, and Bull view systems integration as a vital mechanism for differentiating their capabilities, as computer equipment moves towards open systems and becomes a commodity product. Accordingly each of these companies has established a systems integration business unit as a focus for its activities in this area. Because of their focus on open systems networking, the networking/infrastructure development segment of the market is an important target market for these vendors.

Exhibit III-14

Vendor Revenues, 1990
Systems Integration, Western Europe

RANK	COMPANY NAME	REVENUE $ MILLIONS
1	CAP GEMINI SOGETI	330
2	IBM	320
3	ANDERSEN CONSULTING	300
4	SIEMENS NIXDORF	110
5=	LOGICA	90
5=	SD SCICON	90
7	SEMA	85
8	UNISYS	80
9	ICL	65
10	BULL	50



Country Market Analysis

IV Country Market Analysis

A
France

Despite being the largest country market in Western Europe for software and services as a whole, France is the third largest country market in systems integration. However, France has the largest professional services market in Europe, more than twice the size of Germany and 60% larger than the United Kingdom, and systems integration has a high professional services content. It is expected therefore, that the systems integration sub-sector will experience high growth rates in France. The French market is projected to overtake the United Kingdom market in systems integration by 1996. Exhibit IV-1 shows the projected growth of the French market by systems integration sub-sectors.

The systems integration revenues for the leading vendors are shown in Exhibit IV-2. Cap Gemini Sogeti are leaders of the French market, as a result of their acquisition of Cap Sesa, whose total signed orders reached 3.5 billion French Francs in 1989. Sesa was a company with considerable experience of the management of large projects, for example the FF400 million control centre contract for Electricite de France. Cap Gemini Sogeti's operations in France have subsequently used the designation Cap Sesa.

Another significant contract was the FF220 million contract for the Paris Bourse, that was won by Andersen Informatique. This contract could lead to other significant business wins for Andersen in Europe, in view of the projections for linking up European stock exchanges.

There still exists a significant body of French independent vendors who remain as professional services vendors, and who are not "prime contractors" in the systems integration sense. It is expected that many of these will be forming alliances with equipment vendors.

Exhibit IV-1

Systems Integration Market Forecast, 1991-1996 France

	FF Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	1350	1620	15	3300
Professional Services	1750	2200	22	5960
Software Products	200	250	27	830
Other Services	100	70	25	210
Total	**3400**	**4140**	**20**	**10300**

Exhibit IV-2

Leading Vendors, 1990 Systems Integration France

Rank	Company Name	Estimated Revenues (FF Millions)
1	Cap Gemini Sogeti	850
2	IBM	370
3	Andersen Consulting	275
4	Thomson	240
5	Sema	170
6	Alcatel	140
7	Steria	120
8	Axime	110
9	Sinorg	100
10	GFI	65

B
Germany

Germany is forecast to overtake the United Kingdom as the largest country market in Western Europe for systems integration in 1991, and this lead will be maintained, since the growth of the French market is expected to slacken. Exhibit IV-3 provides the market analysis and forecast for the German market. A major source of systems integration projects over the next few years will be the redevelopment of the infrastructure and the establishment of new facilities within East Germany.

The leading vendors in systems integration are listed in Exhibit IV-4. SD-Scicon is no longer a significant player in the German systems integration market following the sale of SCS to Cap Gemini Sogeti, whereas Cap Gemini Sogeti has significantly enhanced its potential in Germany with the SCS acquisition and its partnership with Debis Systemhaus. Debis Systemhaus has considerable expertise in industrial systems and projects and in GEI Systemhaus has a group already experienced in handling large projects for manufacturing automation, telecommunications, airports and government.

One of the more significant systems integration contracts in Germany is the Grossversandhaus warehousing project by Siemens with an estimated value of 230 million Deutschmarks ($130 million). Other large contracts in Germany include a DM 125 million point of sale system by Nixdorf for Ko-operativa, and an DM 80 million project for air traffic control with Unisys.

Exhibit IV-3

Systems Integration
Market Forecast, 1991-1996
Germany

	DM Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	480	560	16	1200
Professional Services	515	650	24	1900
Software Products	75	90	25	280
Other Services	30	30	18	70
Total	**1100**	**1330**	**21**	**3450**

Exhibit IV-4

Leading Vendors, 1990
Systems Integration
Germany

Rank	Company Name	Estimated Revenues (DM Millions)
1	Siemens Nixdorf	130
2	IBM	120
3	Andersen Consulting	65
4	Cap Gemini Sogeti	40
5	Unisys	30
6	Ploenzke	30
7	Ferranti	25
8	Mannesmann Kienzle	25
9	Logica	15
10	IKOSS	15

C
United Kingdom

Although still the largest country systems integration market, at the exchange rates in use, the United Kingdom market is being influenced by two factors which are slowing growth. These two factors are cuts in government spending on defence, and economic recession. Major capital expenditure projects are being postponed due to uncertainties in the economy, and the relatively high interest rates which still prevail. In recent years, two major sources of systems integration projects in the United Kingdom have been the privatisation of the major utilities - electricity and water authorities - and projects initiated by national government. A breakdown of the market by sub-sectors is shown in Exhibit IV-5.

A number of United Kingdom companies have been in difficulties with their commitments on fixed price projects. SD-Scicon and Logica are the two most widely publicised examples. It is not clear whether this will inhibit the market by leading to an unwillingness on the part of vendors to share the risk with the client. The acquisition of ICL by Fujitsu has enhanced ICL's image as a financially stable supplier of sytems integation services, and is likely to improve ICL's position in the market. The leading ten systems integrators in the UK are listed in Exhibit IV-6.

Some examples of large systems integration projects within the U.K. include:

- DSS - Andersen Consulting/British Telecom
- National Power - Andersen Consulting
- Customs and Excise - British Telecom/ICL.
- The British Gas internal network - Nixdorf.
- The Channel Tunnel communications system - Racal-Milgo led consortium.
- The United Kingdom Home Office passport issuing project - Thorn EMI and Tandem.

The CHOTS project for the MOD has recently been awarded to ICL and the Foreign Office's secure office automation project is likely to be restarted soon.

Exhibit IV-5

Systems Integration
Market Forecast, 1991-1996
United Kingdom

	£ Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	145	155	13	280
Professional Services	215	255	16	540
Software Products	25	30	20	75
Other Services	10	12	8	18
Total	**395**	**450**	**15**	**915**

Exhibit IV-6

Leading Vendors, 1990
Systems Integration
United Kingdom

Rank	Company Name	Estimated Revenues (£ Millions)
1	Andersen Consulting	65
2 =	SD-Scicon	40
2 =	Cap Gemini Sogeti	40
4 =	IBM	30
4 =	Logica	30
4 =	ICL	30
7	Sema	20
7 =	ACT	20
9	Data Sciences	15
10 EDS	10	

D
Italy

The Italian systems integration market is forecast to grow significantly as shown in Exhibit IV-7, with the professional services sub-sector achieving a 26% per annum compound growth rate over the next five years.

The leading systems integrators are shown in Exhibit IV-8. It is interesting to note the predominance of foreign companies. The willingness of the large Italian state apparatus to liberalise its public procurement has been identified as one of the most significant influences in this market. The 7 billion Lire City of Rome Urban Information System (SIU) contract won by Cap Gemini Sogeti, the Metro Milanese contract and the Societa Autostrada contract won by Logica, are all indications that liberalisation of public procurement is possible in Italy as well as in the rest of Western Europe.

A great many vendor alliances have been developed in Italy, as vendors look for complementary skills sets in order to go after systems integration business. These include joint ventures between:

- IBM and Fiat.
- Digital Equipment and Fiat.
- IBM and Stet.
- IBM and Pirelli.
- Enidata and Sligos.
- Italtel, Telematica, and Cap Sesa.

Bull has achieved considerable success in systems integration in Italy, where the company has its most most highly developed, and longest established, systems integration project centre, and where a range of established partnerships already exist.

Exhibit IV-7

Systems Integration
Market Forecast, 1991-1996
Italy

	Lira Billions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	120	135	17	290
Professional Services	150	190	26	600
Software Products	20	25	21	65
Other Services	10	10	15	20
Total	**300**	**360**	**22**	**975**

Exhibit IV-8

Leading Vendors, 1990
Systems Integration
Italy

Rank	Company Name	Estimated Revenues (Lira Millions)
1	Andersen Consulting	50
2 =	Olivetti	45
2 =	IBM	45
4 =	Bull	30
4 =	Cap Gemini Sogeti	30
6	Logica	12
7	Datitalia	10
8	Unisys	8
9 =	EDS	6
9 =	Datamont	6

E
Sweden

The considerable amount of company re-structuring including mergers and acquisitions activity in Sweden will help to drive the systems integration market. Exhibit IV-9 shows a breakdown of the systems integration revenues streams. The de-regulation of markets in Europe and the debate about relationships with the EEC, allied with a poor economic performance has put considerable pressure on Swedish companies and their traditional preference for processing services solutions. From the point of view of cost, efficiency and lack of flexibility the processing solution is coming under increasing pressure.

Another development has been the high level of minority stake investments by IBM in Sweden. These include:

- IBS, a software development company with an English subsidiary Lychgate.
- Agridata, a specialist software developer.
- Enator, a venture capitalist, which sells computers, data processing services, and IS consultancy.
- Modulfretagen, a software developer and IS consultancy with a majority of revenues derived from Finland.

Exhibit IV-10 lists the leading five vendors of systems integration in Sweden. Domestic vendors have tended to concentrate on processing services and turnkey systems but a definite shift into systems integration is detectable, as the processing centres with poor growth and cost pressures look for new revenue growth opportunities. However, overall, market growth remains comparatively low in line with the state of the economy and the impact of this on the software and services market.

Exhibit IV-9

Systems Integration
Market Forecast, 1991-1996
Sweden

	Sek Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	110	130	12	230
Professional Services	145	190	19	460
Software Products	20	25	23	70
Other Services	5	5	15	10
Total	**280**	**350**	**17**	**770**

Exhibit IV-10

Leading Vendors, 1990
Systems Integration
Sweden

Rank	Estimated Company Name (Sek Millions)	Revenues
1 =	Cap Gemini Sogeti	60
1 =	IBM	60
3	Ericsson	35
4	Logica	17
5	Sapia	15

F
Denmark

As the only Scandinavian country within the EEC, Denmark has experienced a significant amount of investment from the Scandinavian EFTA countries (Finland, Norway and Sweden) who are concerned at being marginalised by the "1992" initiative. This has to some extent offset the problems experienced by the Danish economy with its heavy dependence on agriculture. Exhibit IV-11 shows the forecast for Denmark in the four systems integration sub-sectors.

Denmark is set to take advantage of its position as doorway of the EEC to the rest of Scandinavia, and has converted the Copenhagen stock exchange to a de-centralised electronic system as part of a strategy to win part of the European financial business after 1992.

The domination until now of Danish software and services user expenditure by domestic companies that are closed user groups is clearly threatened by de-regulation in Europe. Systems integration is offering an opportunity for foreign companies to assert leadership as the large domestic companies undergo re-structuring. Exhibit IV-12 shows Kommunedata as the leading Scandinavian supplier in the Danish systems integration market.

One large contract of note is the Danish Post Office System worth 125 million Danish Kroner, won by Logica.

Exhibit IV-11

Systems Integration
Market Forecast, 1991-1996
Denmark

	DK Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	85	100	11	170
Professional Services	110	130	20	325
Software Products	10	15	25	45
Other Services	5	5	15	10
Total	**210**	**250**	**17**	**550**

Exhibit IV-12

Leading Vendors, 1990
Systems Integration
Denmark

Rank	Company Name	Estimated Revenues (DK Millions)
1	IBM	45
2	Kommunedata	38
3	Cap Gemini Sogeti	18
4	Unisys	15
5	Logica	8

G
Norway

The Norwegian software and services industry has experienced a slow-down relative to other Western European countries, and Norway is one of the few countries in Europe with a high rate of unemployment amongst people with information systems skills. Exhibit IV-13 shows the breakdown of systems integration revenues forecast for Norway.

Norwegian software and services companies are undergoing a major re-structuring. Kommunedata has divested and five parts of the company are merging with Vest-Viken EDB to form the NIT Group, which had around 1,000 employees and a revenue of around $140 million in 1990. NIT plan to develop and enhance their systems integration capabilities, and are moving their emphasis away from government into the commercial sector. There are some other mergers in the process of being negotiated and put together. However, as Exhibit IV-14 shows, the Norwegian systems integration market is dominated by foreign companies, principally the leading pan-European systems integrators.

Scanvest, who were acquired by Olivetti in 1990, have been awarded a contract from the Norwegian Post Office worth around 50 Million Norwegian Kroner ($7 Million).

Exhibit IV-13

Systems Integration
Market Forecast, 1991-1996
Norway

	NK Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	90	100	14	190
Professional Services	100	140	17	310
Software Products	15	15	27	50
Other Services	5	5	15	10
Total	**210**	**260**	**17**	**560**

Exhibit IV-14

Leading Vendors, 1990
Systems Integration
Norway

Rank	Company Name	Estimated Revenues (NK Millions)
1	Andersen Consulting	65
2	IBM	40
3	Unisys	15
4	Bull	12
5	Cap Gemini Sogeti	12

H
Finland

Finnish companies are facing a number of uncertainties in the economic environment which in addition to possible worldwide recession include their isolation from the developing integration of the EEC and the future of trade with the USSR. Exhibit IV-15 provides the market analysis and forecast for systems integration in Finland.

Finnish domestic companies have been able to maintain their markets against foreign competitors, three of the top five systems integrators listed in Exhibit IV-6 being Finnish companies. However, as a gateway between the West and Russia and the Baltic States, it is possible that an increase in investment by multinational software and services companies will take place. Companies such as IBM are already moving into the Finnish software and services businesses via companies in Sweden, since there are close links between the two countries.

In 1991, ICL, which already has considerable experience of major projects in Eastern Europe acquired Nokia Data, to enhanced significantly its systems integration capability in both Scandinavia and Eastern Europe. Nokia Data has substantial expertise in the integration of major corporate personal computer networks.

Exhibit IV-15

Systems Integration Market Forecast, 1991-1996 Finland

	FM Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	25	30	11	50
Professional Services	30	40	16	85
Software Products	5	5	19	12
Other Services	-	-	-	3
Total	**60**	**75**	**15**	**150**

Exhibit IV-16

Leading Vendors, 1990 Systems Integration Finland

Rank	Company Name	Estimated Revenues (FM Millions)
1	KT-Tietokesku	35
2	Tietotehdas	30
3	Unisys	20
4	Nokia Data	20
5	Cap Gemini Sogeti	10

I
Netherlands

There has been a considerable level of merger activity in the Netherlands, for example that of the Algemene Bank Nederland (ABN) and Amsterdam-Rotterdam Bank (AMRO) to create Holland's largest bank, the seventh largest bank in Europe. A general re-structuring of industry markets in the Netherlands should provide major systems integration opportunities. Exhibit IV-17 provides the market analysis and forecast for the systems integration market in the Netherlands.

The leading ten systems integrators in the Netherlands are listed in Exhibit IV-18. Cap Gemini Sogeti have consolidated their market presence by merging their Cap Gemini Sogeti subsidiary with Pandata. Logica have won some significant projects in Holland recently, including the Gas Uni project, the Schipol control tower project, and the Schelderader project for the Dutch Government with Philips. Thorn EMI, now Data Sciences, also won a significant project for the Government with the radar training project for the Dutch navy.

Philips, ranked at number three in the list of leading systems integration vendors in the Netherlands, has a joint venture with BSO a Dutch professional services company, BSO/PASS. This places them in a potentially strong position to compete with domestic rivals like Volmac and Raet.

Exhibit IV-17

Systems Integration
Market Forecast, 1991-1996
Netherlands

	Dfl Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	90	100	15	200
Professional Services	100	135	20	330
Software Products	15	20	25	60
Other Services	5	5	15	10
Total	**210**	**260**	**18**	**600**

Exhibit IV-18

Leading Vendors, 1990
Systems Integration
Netherlands

Rank	Company Name	Estimated Revenues (Dfl Millions)
1	Cap Gemini Sogeti	40
2	IBM	40
3	Philips	18
4 =	Unisys	15
4 =	BSO	15
6 =	Logica	13
6 =	Andersen Consulting	13
6 =	Siemens	10
6 =	Volmac	10
10	Bull	8

J

Belgium

Exhibit IV-19 shows the systems integration market analyses and forecast for Belgium. The Belgium market will benefit from EEC systems information funded projects such as the contract for the European parliament OVIDE, won by an SD-Scicon/Bull consortium. Recently, Bull has beaten ICL to win the $10m Minvera secure office system contract with Nato. In the UK, ICL remains in sole contention for the MOD's corporate headquarters office technology system (CHOTS), a project of a similar nature to Minerva.

The European Commission is also proposing a major project to link the major government departments - such as Customs & Excise, and taxation authorities - across each of the member states.

The Belgian market is generally too small to support the growth of large indigenous software and services vendors and consequently multinational companies will continue to predominate in the Belgian market as shown in Exhibit IV-20.

Exhibit IV-19

Systems Integration
Market Forecast, 1991-1996
Belgium

	BF Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	1300	1500	16	3150
Professional Services	1600	1970	19	4750
Software Products	200	250	23	700
Other Services	100	120	11	200
Total	**3200**	**3840**	**18**	**8800**

Exhibit IV-20

Leading Vendors, 1990
Systems Integration
Belgium

Rank	Company Name	Estimated Revenues (BF Millions)
1	Cap Gemini Sogeti	340
2	Unisys	280
3	Sema	260
4	Andersen Consulting	210
5	Logica	200

K
Switzerland

The systems integration market in Switzerland is expected to experience significant growth over the next five years influenced by a real shortage of information systems expertise and the demand from strong manufacturing and financial organisations. The market analysis and forecast for Switzerland is shown in Exhibit IV-21.

Andersen Consulting are the leading vendor in this market in Switzerland as is shown in the vendor listing included as Exhibit IV-22. Andersen Consulting have developed systems for the Zurich stock exchange and have been awarded a contract worth 35 million SF ($22 million) to link all the Swiss stock exchanges.

Exhibit IV-21

Systems Integration
Market Forecast, 1991-1996
Switzerland

	SF Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	35	42	16	90
Professional Services	40	50	19	120
Software Products	5	6	27	20
Other Services	-	2	20	5
Total	**80**	**100**	**19**	**235**

Exhibit IV-22

Leading Vendors, 1990
Systems Integration
Switzerland

Rank	Company Name	Estimated Revenues (SF Millions)
1	Andersen Consulting	15
2	Unisys	12
3	Cap Gemini Sogeti	10
4	Digital	5
5	Bull	2

L
Austria

Exhibit IV-23 shows the market assessment for the Austrian systems integration sector. Despite being outside the EEC at the present time the Austrian economy is expected to benefit from the expansion of trade with the countries of Eastern Europe.

Exhibit IV-24 indicates the leading vendors in the Austrian market, emphasising the role of multinational companies in the systems integration business. It is anticipated that Siemens Nixdorf will become stronger in this market in the future. In 1990, they gained a significant UNIX based contract with the Creditanstalt Bank.

Exhibit IV-23

Systems Integration Market Forecast, 1991-1996 Austria

	Sch Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	150	180	17	390
Professional Services	145	190	22	520
Software Products	20	25	26	80
Other Services	5	5	15	10
Total	**320**	**400**	**20**	**1000**

Exhibit IV-24

Leading Vendors, 1990 Systems Integration Austria

Rank	Company Name	Estimated Revenues (SF Millions)
1	IBM	60
2	Cap Gemini Sogeti	40
3	Unisys	25
4	Digital	23
5	Bull	17

M
Spain

The Spanish market has been one of the fastest growing in Western Europe, and it has attracted very high levels of foreign investment as well as a high level of investment by the Spanish Government to modernise antiquated state run systems. The market analysis and forecast for Spain is shown in Exhibit IV-25.

Andersen Consulting are one of the fastest growing software development and systems services organisations in Spain, although a upheaval resulting in the departure of a number of partners has presented some challenges. Andersen Consulting have a number of joint ventures in Spain, for example with British Aerospace for CIM systems. In the first quarter of 1990, two Spanish companies Eria and Entel agreed to merge their software development activities in order to create a domestic contender for this market.

Recent contracts in Spain that are not with central government are the Barcelona Olympics project with the Sema Group, an inventory management project by the national airline Iberia with Unisys, the Basque government network project with McDonnell Douglas and an air landing system for the Spanish civil aviation authority with Thomson CSF. Siemens have continued to build on their past relationship with the Spanish Railways RENFE. Following the development of a ticketing system, they are now involved with a very large signalling project.

Exhibit IV-25

Systems Integration
Market Forecast, 1991-1996
Spain

	Ptas Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	3500	3900	15	8000
Professional Services	3800	4900	24	14500
Software Products	500	600	27	2000
Other Services	200	220	18	500
Total	**8000**	**9620**	**21**	**25000**

Exhibit IV-26

Leading Vendors, 1990
Systems Integration
Spain

Rank	Company Name	Estimated Revenues (Ptas Millions)
1	Page Iberica	2700
2	IBM	1500
3	Andersen Consulting	1200
4	Sema Group	860
5	Cap Gemini Sogeti	400

N
Rest of Europe

The systems integration market forecast for the rest of Europe is shown in Exhibit IV-27. The "Rest of Europe" is defined as comprising Greece, Portugal and Ireland.

Portugal is attracting a high level of foreign investment, (approximately $US 650 million in 1988) and the government is undertaking a major privatisation of state industries. However much of this investment tends to be motivated by access to low labour costs and the best strike record in Western Europe. However systems integration projects are contracted for example that which the Portuguese State Fishery Agency awarded to Unisys.

In Ireland the Industrial Development Authority (IDA) has had some success in attracting high technology companies to invest, Digital and Apple being notable examples. As a result eleven percent of all data processing equipment imported into the UK is sourced from Ireland. One of the resources claimed by the Irish authorities is the availability of a well educated, skilled workforce. The opportunity thus exists in Ireland to develop off-shore capabilities that could contribute to the execution of systems integration contracts. The overall size of the Irish market does however indicate a very small potential for systems integration projects.

Exhibit IV-27

Systems Integration
Market Forecast, 1991-1996
Rest of Europe

	$ Millions			
Subsector	1990	1991	1991-1996 CAGR (%)	1996
Systems Equipment	7	10	15	20
Professional Services	7	9	20	22
Software Products	1	1	25	3
Other Services	-	-	-	-
Total	**15**	**20**	**18**	**45**

Profiles of Leading Vendors

V Profiles of Leading Vendors

A
Unisys' Complex Systems Organisation

1. Background

Unisys' Complex Systems Organisation (CSO) was established in 1988 in response to the growing needs of Unisys' major customers for total solutions. CSO's revenues in Western Europe are estimated to be $50 million.

The group is essentially a project-driven organisation, deployed in large accounts where it can address customers' complex solution requirements. It specialises in project management and systems integration, chiefly within a multi-vendor environment. Unisys' view of the Systems Integration process is shown in Exhibit V-1.

The Complex Systems Organisation is positioned across Europe: in some countries it exists as a joint venture, in some as a separate legal entity and in others it forms part of the local Unisys subsidiary. The group is 220 people strong, supplemented by outside resources as required. In addition, the CSO network is able to call upon the Unisys European Skills Group, based at Uxbridge in the UK, who are part of the Software & Services organisation - as well as the many Unisys specialist Skills Centres located around Europe. Similar organisations to CSO also exist in Australia and the United States.

The formation of the European CSOs has been a gradual and individual process. In some countries such as Portugal, the creation of a local CSO was fairly rapid as the business had already been developed there.

From 1st September 1990, CSO has been the responsibility of Kevin Devaney, Vice President of Software and Services.

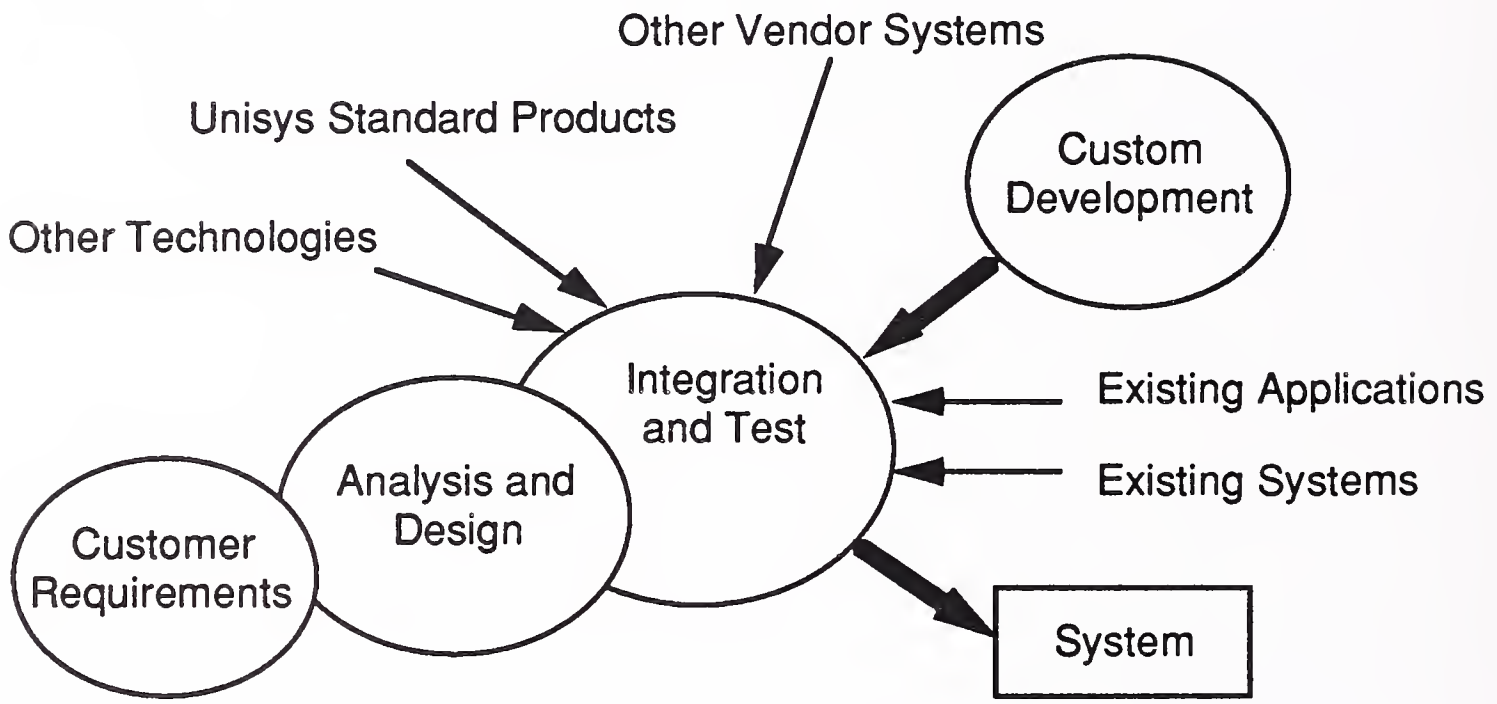
"The importance of being able to provide a total solution to the customer is paramount to Unisys", he explains, "I believe the Complex Systems Organisation is a key ingredient as we accelerate the move from being a hardware and software vendor towards being a total solutions company".

"With the CSOs in place", Devaney comments, "Unisys feels confident that it can provide the complex integration services vital to the success of our customers during the 1990s. The CSOs are positioned as a pan European network so that we now have the skills and the expertise to be the total solution provider in all major markets."

While CSO is Unisys' main vehicle for systems integration projects, Unisys' Professional Services organisation also implements some systems integration projects without involving CSO.

Exhibit V-1

The Systems Integration Process



CSO—Total Programme Management

Source: CSO UK

2. Driving Forces

Unisys believes that the systems integration market is characterised by the attributes listed in Exhibit V-2.

Firstly, systems integration is driven by business pressures. For example, some organisations are driven to systems integration by financial pressures, other organisations face intense competition in their markets, and organisational issues can also be a driving force. The refocusing, reorganisation, and greater geographical coverage being induced in European organisations in the run up to 1992 are major factors leading to systems integration projects.

Unisys also believes that users are no longer looking for vendors to build them single application solutions. Customers' requirements are becoming more complex and frequently involve a considerable communications element. This is because interoperability is becoming one of the key driving forces. Users frequently have a range of applications running on heterogeneous equipment and need either to integrate these applications or at least provide more widespread access to them. While one solution to this problem would be to standardise on a single vendor's equipment, Unisys believes that a better approach is to implement an intelligent open systems network linking both new systems and existing applications.

Exhibit V-2

Characteristics of S.I. Projects

- Driven by Business Pressures
- Desired solution is complex multi-disciplinary
- Extensive communications infrastructure required
- Programme Management an essential element

The benefits of this approach are:

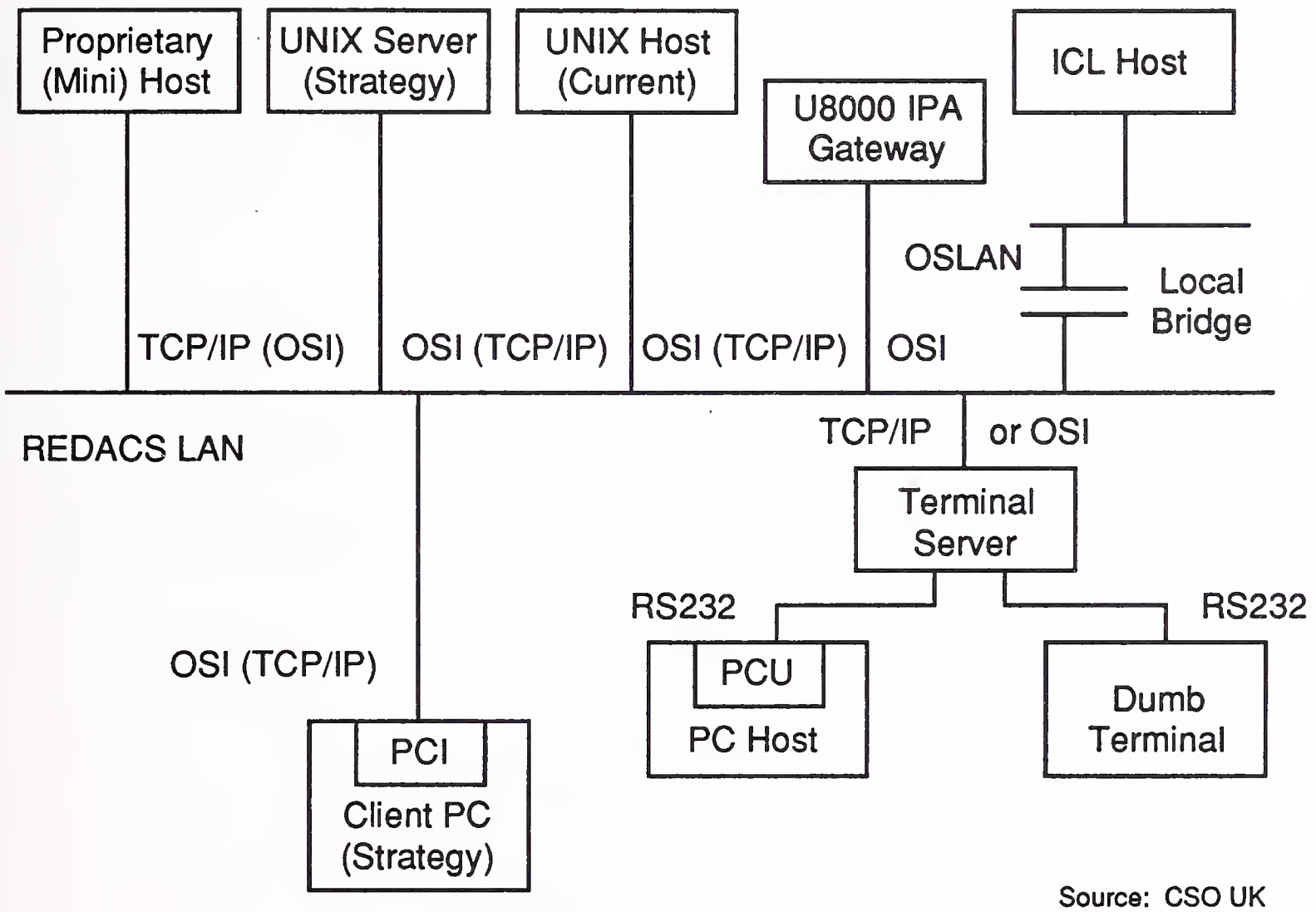
- Protection of current investment in systems and information
- An open infrastructure is established onto which new applications can be added or "old" systems replaced
- Future IS investment is protected.

In Unisys' experience, the existing applications already implemented within a company are likely to be based on a wide range of heterogeneous equipment covering a number of suppliers. The heterogeneity introduced by linking existing systems far outweighs that introduced by the introduction of new systems. However, another advantage of Unisys' approach is that it enables users to continue to use proprietary architectures, where appropriate, within an open framework, since many true open systems still lack the power and sophistication of proprietary systems. So the user's move to open systems can take place more gradually and in a controlled manner.

An example of such a project providing users with access to applications spread across a range of proprietary and Unix systems is the Redacs (Regenerated Data Communications) project shown in Exhibit V-3. This project required the supply, implementation and maintenance of a data communications network for the Royal Navy Supply and Transport Service. Initially this involved linking 40 sites and 2,000 devices, expanding to 5,500 devices by 1995.

Exhibit V-3

REDACS LAN Connectivity



Source: CSO UK

3. Target Markets

Unisys believes that the initial role of CSO is primarily to target large companies in sectors where Unisys has an established client base rather than to target new market sectors. Accordingly, the principal target markets of CSO, shown in Exhibit V-4, tend to reflect the profile of Unisys' overall large account user base.

Exhibit V-4

Unisys CSO
Target Markets

- Major financial institutions
- Central government/defence
- Utilities
- Airlines/transportation/construction

However, each national CSO organisation has its own unique pattern of business and some indications of the areas of expertise exhibited by CSO in a number of European markets are shown in Exhibit V-5.

Exhibit V-5

Unisys CSO
Specific Country Specialisations

UK	- Police force systems - Regional electricity companies - Financial institutions
Germany	- Airlines
France	- Public sector
Switzerland	- Banking
Spain	- Airlines - Public sector
Portugal	- Fishing industry

Some examples of projects carried out in Western Europe are shown in Exhibit V-6.

Exhibit V-6

Typical Projects

Crown Prosecution Service (UK)	- Tracking case progress
Frankfurt International Airport (Germany)	- Air traffic control
RTC Group (Switzerland)	- Major networking projects
Royal Navy (UK)	- Data Communications network for supply and transport services
Post Office (France)	- Distributed network with OSI capability
Ministry of Agriculture, Fishery & Food (Portugal)	- Fishing control & protection
Banque Nationale de Paris (France)	- Branch networking
Cerved (Italy)	- Integrated network

Unlike many major systems integration vendors, CSO is not currently endeavouring to establish either its own internal business consultancy or links with the major management consultancies, though this may change in the future. At present, CSO seems to be mainly concentrating on technical design and management rather than business skills - though CSO works closely with Unisys' "line of business" consultants where required. The rationale for this approach may be that Unisys is concentrating on accounts it knows well and so has little need for added intelligence of impending projects. CSO recognises the danger of becoming too closely linked to consultancies and risking losing the right to tender for the supply of projects.

4. Project Organisation

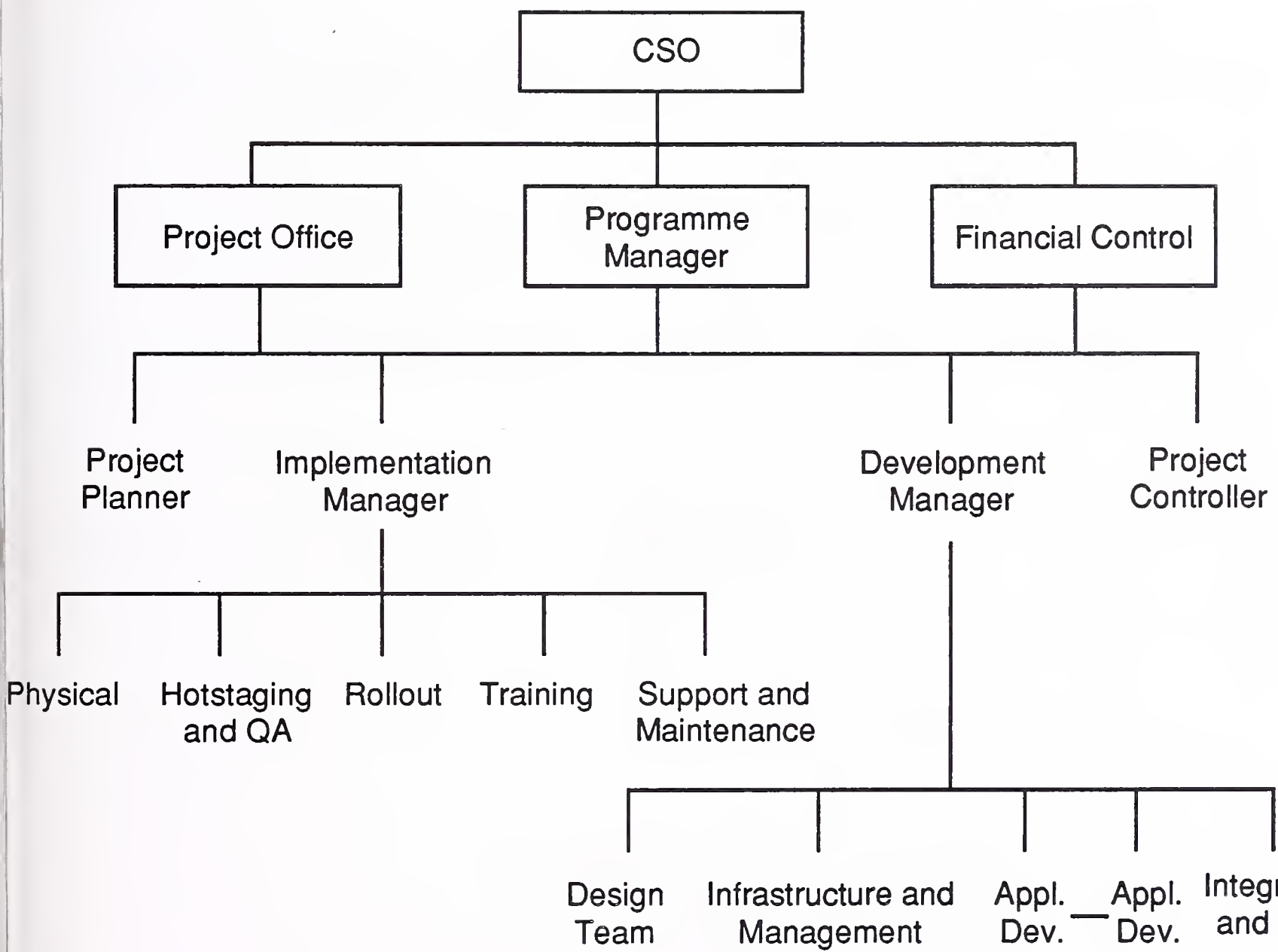
CSO has its own professional business development managers who work closely with Unisys' Line of Business sales force in the identification of systems integration projects. CSO regularly presents its capabilities to the sales forces to assist them in recognising systems integration opportunities. Once the salesman has "opened the door", CSO takes responsibility for the sale. CSO relies predominantly on consultative selling, that is establishing the credibility of its technical architects and programme managers. The organisations' credibility in accepting, containing, and managing risk is felt to be paramount.

The project organisation adopted by CSO for each major project is shown in Exhibit V-7. CSO itself concentrates its resources into project design and management capabilities. Much of the development resource on any project will be subcontracted to Unisys' Professional Services Organisation or to third parties.

A typical project is split into two teams: one undertaking development and the other implementation. This ensures that only stable releases, rather than the latest development version, are implemented in the user environment. To ensure that the project stays on target, each project is independently reviewed by the project office (checking progress) and by financial control (checking expenditure).

Exhibit V-7

Project Organisation



Project Plans
Standards and Quality
Status and Escalation Reporting

Financial Control
Contracts

Source: CSO UK

5. Major Strengths

The key strengths of CSO are listed in Exhibit V-8.

Like many of the equipment vendors, CSO sees its commitment to open systems as critical to its future development, and the organisation has undoubtedly built up considerable expertise in open systems network integration.

Two strengths which assist CSO in differentiating itself from the major professional services vendors are its wide European coverage and the organisation's access to those equipment and systems software customisation skills, normally associated with an equipment vendor.

While CSO might be seen by potential customers to lack independence in equipment choice, CSO will use other vendors' equipment where it believes this is better suited to the task in hand. To assist CSO in maintaining its independence, its revenues are not included in the target set for each national Unisys subsidiary. However, the "line of business" salesman is paid a bonus for assisting in the development of a systems integration sale.

Exhibit V-8

Unisys CSO

Key Strengths

- Commitment to open systems
- European coverage
- Technical & R&D Support
- Experience in OSI network integration
  - overall network design
  - component selection and implementation

B
ICL Secure Systems

1. Background

In mid 1990 ICL brought together the various parts of the company working on systems integration into one division, ICL Secure Systems.

The nucleus of Secure Systems was the ICL MOD business unit, with its experience in handling large and complex defence contracts.

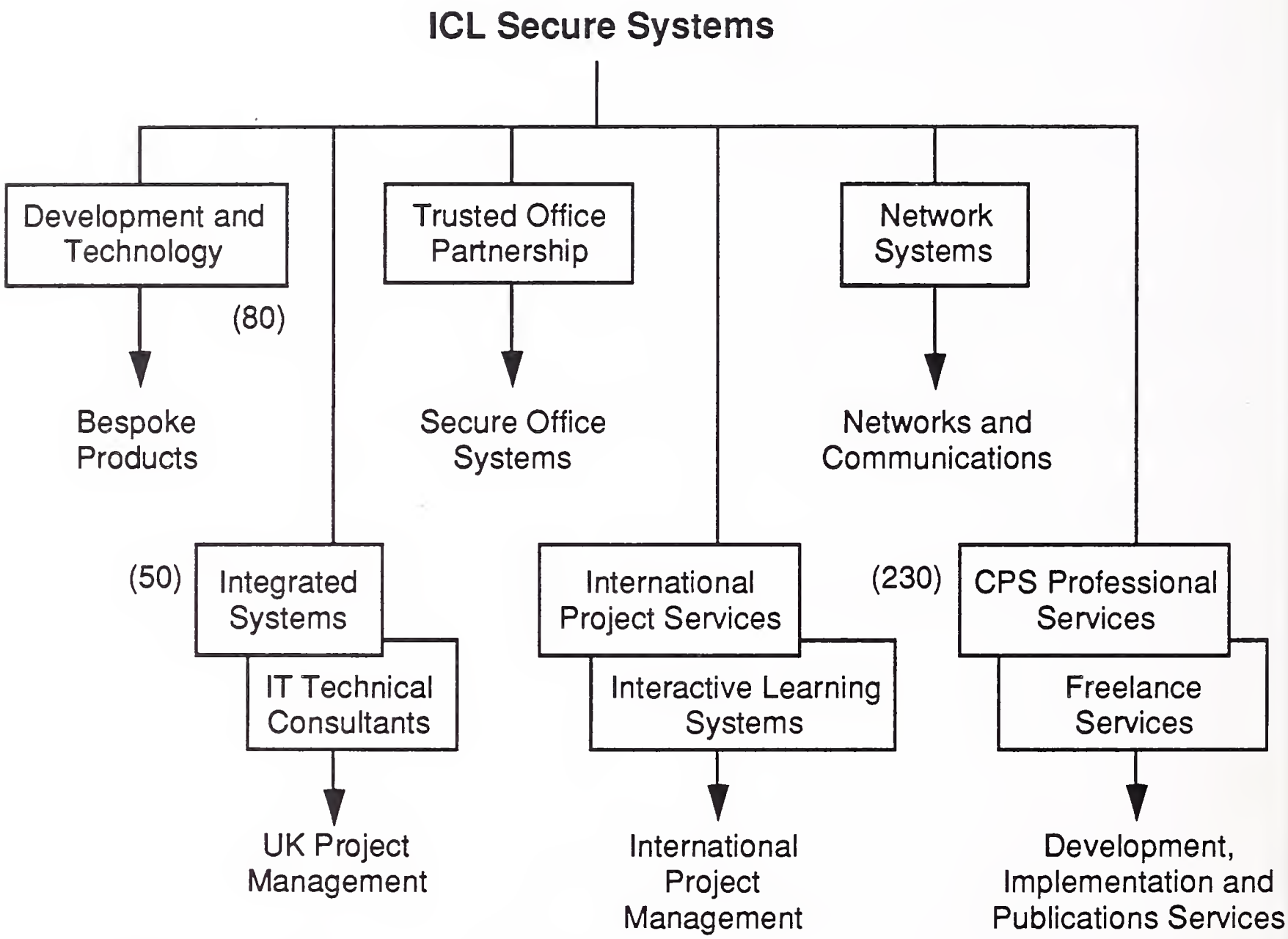
ICL recognised that with the advent of open systems and a steady increase in the number of tenders calling for a total business solution to be installed and made operational in the client's organisation, the company had to be active in systems integration or risk being relegated to a "box" or software supplier.

ICL currently claims systems integration revenues of $240 million, and is looking to increase these revenues at 30% per annum.

2. Organisation

The current organisation of ICL Secure Systems is shown in Exhibit V-9. In total, the division employs over 800 personnel.

Exhibit V-9



( ) Number of staff

International Project Services manages large scale international projects. Interactive Multimedia Systems supplies technology based interactive training solutions.

The Trusted Office Partnership (TOP) is a consortium bidding for Secure Electronic Office systems. Its largest project, CHOTS for MOD HQ runs into hundreds of millions of pounds.

CPS also joined Secure Systems and provides software and applications development and implementation, consultancy, packaged services and authorship.

Network Systems provides a wide range of networking capability, particularly network consultancy and multivendor network integration skills.

ICL recognises that the systems integration market is often best targeted through industry-specific account teams, and so sales of systems integration contracts are conducted not by dedicated sales staff within ICL Secure Systems but through the ICL account teams or third parties already working with the prospect. Where appropriate ICL Secure Systems has access to the resources and skills of ICL's industry-specific business units.

3. Target Markets

Overall, ICL is organised into five industry-specific business units, covering the following sectors in the UK:

- National Accounts
- covering primarily the major utilities
- Local Government and Healthcare
- Manufacturing and Commercial
- Retail
- Financial Services.

On a worldwide basis, ICL targets the Retail and Financial Services sectors. ICL Secure Systems also addresses these two sectors world-wide and in addition focuses on:

- IT in telecommunications

- airlines and ports

- the security/enforcement market.

Its security/enforcement capability is a particular specialism of ICL stemming from the company's work for the UK MOD. This area is now thought to be growing in excess of 30% per annum and is applicable to the sectors shown in Exhibit V-10.

Exhibit V-10

Security/Enforcement Market

- Banks and stockbrokers
- Local government and healthcare
- Legal Profession

Detecting financial fraud is obviously a critical application for this technology. The key is not in restricting access to particular transaction types by user but in having the capability to audit each user's pattern of work and identify any deviations from the norm.

Within local government and the health sector, data held on individuals is also highly sensitive as are briefing details within the legal profession.

The Local Government sector is a major niche market for ICL while the company claims it is the third most successful vendor of information systems to the retail sector world-wide.

4. Geographic Coverage

ICL Secure Systems has a worldwide remit, and has carried out a number of major projects in Hong Kong including scheduling systems for Cathay Pacific and Hong Kong International Terminals. However within Western Europe, the bulk of ICL's system integration revenues still originate in the United Kingdom.

Extending ICL's coverage of Western Europe is seen as the key to meeting the company's systems integration growth objective, and a major collaboration in continental Europe is perceived as the means by which ICL's coverage can be rapidly extended.

ICL groups Western Europe (excluding the United Kingdom) into three sectors:

- Southern Europe (Spain, Italy, Switzerland and Austria)
- Central Europe (Germany, France, Benelux)
- Northern Europe (Scandinavia and Eastern Europe).

ICL is forming in 1991 a European Network Integration Centre in Spain to address large projects in Southern Europe. The main emphasis is on networking led (particularly x.25) projects in Spain together with X.400 projects in Portugal.

ICL is also establishing its own systems integration capability to cover central Europe.

Exhibit V-11

Nokia Data

- Majors on big projects
- Concentrates on faster moving markets
- Strong in financial services
- Opportunities in Eastern Europe

In Scandinavia, ICL owns RCI, and now Nokia Data. The opportunities ICL anticipates from its ownership of Nokia Data, which gives the company much improved coverage of Scandinavia, are shown in Exhibit V-11.

Nokia Data concentrates on large projects often selling, installing, and networking thousands of personal computers and their applications within a single project. This means that the organisation is complementary to ICL whose traditional expertise lies in networking mainframes and minicomputers, giving ICL greater access to the more rapidly growing terminal, personal computer, and Unix-based markets. Nokia Data is particularly strong in financial services, and this range of capability is perceived to be especially applicable to the emerging markets of Eastern Europe.

ICL has also purchased five software and services vendors in Europe over the last year including:

- Databolim (Sweden)
- Comdec (Netherlands)
- SIAC (Netherlands)

The role of these acquisitions is to extend ICL's expertise in vertical markets and to add systems integration capability.

5. "Risk" and "Reputation" Businesses

ICL characterises systems integration as the "risk" business, and views a lengthy relationship with potential clients as essential to success. A costed PERT analysis is required as a key element in the business approval process for systems integration projects, and this is used to ensure that the project team has sufficient understanding of the client and his requirements. The rule within ICL Secure Systems is that unless the company has been working with the potential client for a lengthy period, a bid should not be put forward.

ICL believes that price is seldom a differentiator on large projects, the main attribute sought by the potential client is certainty that the vendor can deliver. The acquisition of ICL by Fujitsu has served to reduce the perceived level of risk in using ICL as a systems integrator.

ICL has also moved into the "reputation" business with the formation of IT Partners. IT Partners employs 50 personnel, and although wholly owned by ICL, offers "arms length" management consultancy making use of ICL's expertise in fields such as:

- Quality Management
- Human resource management
- Marketing.

ICL finds that the spin-offs from this operation in terms of advance warning of major projects are considerable.

6. Key Products and Partnerships

ICL is strongly committed to open systems, particularly open systems networking. In May 1991, ICL announced it OPENframework architecture and launched its Open Systems Management Centre. OPENframework is a blueprint for distributed computing while the Open Systems Management Centre specialises in the control of open systems multi-vendor distributed networks. In the retail sector, for example, ICL has established an open systems platform and buys equipment such as bar code scanners from the most appropriate source.

Two of ICL's major strengths in systems integration are its networking capability and its expertise in system security.

ICL, like many other systems integrators, finds that collaborators on one project can be competitors on the next. In the UK, ICL has worked closely in the past with:

- Coopers & Lybrand Deloitte
- Touche Ross
- Sema Group
- P-E
- PA
- CSC.

For the Ministry of Defence CHOTS project, ICL is leading a consortium including: Hewlett Packard, Data Logic, BISS, and Coopers & Lybrand Deloitte.

Some examples of projects carried out by ICL are listed in Exhibit V-12.

These reflect ICL's capabilities in network integration as well as the company's expertise in delivering innovative business solutions. ICL believes in establishing partnerships with its customers on systems integration projects and working closely with them. This approach often leads to the development of products which can be more widely marketed by ICL and the client afterwards. For example, the airline scheduling system developed for Cathay Pacific will be offered to other airlines.

Exhibit V-12

Typical Projects

· UK MOD	- Secure Office Communications
· Deutsche Presse-Agentur	- News transmission systems (Germany)
· Racal (UK)	- Revenue management system
· Post Office (Spain)	- Communications network
· Cathay Pacific (HK)	- Airline scheduling system

The major strengths of ICL Secure Systems are listed in Exhibit V-13.

Exhibit V-13

Major Strengths

- Stability conferred by Fujitsu ownership
- Commitment to open systems
- System security expertise
- Network integration capabilities

C
Andersen Consulting

The Company

Andersen Consulting was formed, as a distinct worldwide business unit within the Arthur Andersen worldwide organisation, in 1989. The original firm was founded in the U.S.A in 1913 and entered the information services business in 1952.

The coordinating entity of the Arthur Andersen Worldwide Organisation is Arthur Andersen & Co. S.C. based in Geneva, Switzerland. It includes all member firms and their related entities. This worldwide organisation serves clients through two business units: Arthur Andersen for audit and business advisory, tax and corporate speciality services; and Andersen Consulting for strategic services, integration services (systems integration and systems management), information technology consulting and change management services.

Andersen Consulting's European operations also co-ordinate markets in the Middle East, India and Africa.

Each member firm is privately owned and controlled by the partners in the country in which it operates. Member firms provide uniform professional training, they share practice methodologies and technology, and coordinate their operations to eliminate barriers to serving clients.

The European business has expanded rapidly in recent years almost entirely through organic growth. Several small acquisitions have been completed in the last two years to add specialist skills and products. These include Computer Management (Norway), CMC (Spain), Rossmore Warwick (U.K.) and RPS (France).

The firm is active in central and eastern Europe with German and Austrian offices handling activity in Hungary and Czechoslovakia, and the U.K. office handling Poland and the U.S.S.R..

Andersen Consulting focus their attention on the critical understanding of their client's industry, seeing each sector as subject to a unique combination of forces affecting business decisions. The Market Sectors they identify with are:

Financial Services:

- Banking
- Capital Markets
- Insurance
- Asset Finance

Industrial and Consumer Products

- Automotive
- Aerospace and Defence Contractors
- Pharmaceuticals and Food Processing
- Oil and Gas
- Chemicals
- Electronics
- Retail and Wholesale Distribution

Government and Services

- European, National, Regional and Local Government
- Defence and Security Agencies
- Healthcare and Social Services
- Telecommunications
- Electric, Gas and Water Utilities
- Transportation and Hotels
- Leisure and the Media

Across these markets there are a set of common management needs, recognised by Andersens as:

Financial Management

- Planning and Reporting
- Financial Control and Cost Management
- Treasury Management

Materials Management and Logistics

- End-to-end Pipeline Management

Sales and Marketing

- Sales and Market Analysis
- Customer Service Systems
- Database Marketing

Executive Information Systems

- World Class Management

Organisation

European Managing Partner	Vernon Ellis
France	Gerard Van Kemmel
United Kingdom & Ireland	Keith Burgess
Italy	Mike McGrath
Spain & Portugal	Pedro Navarro
Germany, Austria, Hungary & Czechoslovakia	Thad Perry
Scandinavia, Benelux, Switzerland & Africa	Martin Vandersteen

Key Products and Services

Andersen Consulting is a leading supplier of software and services in Europe. It's main skills are in providing "front end" management consultancy to clients and then following through with other IS professional services and complex systems integration projects to fully implement new information systems. Its management consultancy capability centres on business integration - the inter-relationship of these four fundamental aspects of business:

- Devising both business and IT strategies in fast changing markets.
- Planning, developing and implementing computer systems and networks with appropriate IS technology.
- Managing and controlling large computer centres and telecommunications networks.
- Managing the resulting changes and their impact on people within the business organisation.

The range of services Andersen Consulting offers includes:

Strategic Services:

- Strategic Planning and Studies
- Marketing and Sales Planning
- Competitive Studies
- Organisation studies
- Total Competitiveness
- Information Planning

Change Management Services:

- Organisation Change
- Human Resource Management
- Knowledge Transfer
- Technology Assimilation

Integration Services:

- Strategy Integration
- Systems Integration
- Systems Management

Andersen Consulting is the largest independent commercial systems integration vendor in Western Europe.

The company's consultancy services are based around five advanced systems centres. These are large IBM computer facilities. Project teams use workstations connected to these centres for the automation of bespoke applications development for each client. A worldwide voice and data network, AANET, has been implemented which connects staff in offices around the world with these advanced systems centres.

Software Products and Services:

The company targets the CASE tool, operations management, manufacturing and distribution sectors with its software products. These are sold independently from its consulting business.

Andersen Consulting has developed a range of CASE tools. They were initially used internally by their IS consultants, then launched on the open market under the name FOUNDATION. This range operates in a wide range of IBM, Digital and Bull environments and consists of:

- Method/1
- Design/1
- Install/1
- Plan/1

FOUNDATION is an integrated, automated software development environment designed to support the entire life-cycle of application software development.

CO-OPERATE is an integrated methodology and software tool set for computer operations designed for the IBM MVS operating system.

Andersen's integrated manufacturing solutions are the MAC-PAC range of products. Arthur Andersen is an IBM agent and works with IBM in delivering a complete package to end users.

The MAC-PAC product range consists of:

- MAC-PAC AS/400 is an integrated manufacturing, distribution and financial system for IBM AS/400.
- MAC-PAC JIT for IBM mainframes and supports real-time communication with a CIM network.
- MAC-PAC D is a range of IBM mainframe and Digital-based products for the aerospace and defence industry.

DCS/Logistics is an integrated distribution system for a range of IBM mainframe and Digital environments.

Other industry specific software products have been developed for use in wholesale and retail banking, leasing, utilities and various Government departments.

Andersen Consulting delivers its own application software, plus customization where needed, and associated professional services, such as training and consultancy. IBM delivers and supports the equipment, retaining it under the IBM title.

Financial Information

This relatively unique combination of skills is providing Andersen Consulting with a strong growth record, averaging well above 30% per year for the last five years in Europe.

Exhibit V-14

TWO-YEAR FINANCIAL SUMMARY (FYE 31/8/1990) ($ MILLIONS)
BY MAJOR MARKET SECTOR

SECTOR	1989 $M	1990 $M	1989-90 GROWTH (PERCENT)	PERCENT OF 1990 TOTAL
Industrial & Consumer Products	183.2	246.0	34.3	38
Financial Services	170.3	238.2	39.9	36
Government & Healthcare	62.3	92.1	47.8	14
Telecommunications & Utilities	23.8	39.7	66.8	6
Other	19.3	36.9	91.2	6
EUROPE TOTAL	**458.9**	**652.9**	**42.3**	**100**

Exhibit V-15

TWO-YEAR PROFESSIONAL HEADCOUNT (FYE 31/8/1990)

	1989	1990	GROWTH (PERCENT)
EUROPE TOTAL	**5400**	**6700**	**24.1**

Andersen Consulting has maintained this growth almost exclusively through organic growth, with a firm policy of graduate recruitment and staff development. However they still have to recruit in first class experienced consultants for each market sector, and there are signs that this could become increasingly difficult. As the firm takes a larger and larger market share in its chosen sectors, so it is seeking an ever higher proportion of the available skill pool.

Market Analysis

Exhibit V-16

FINANCIAL ANALYSIS BY COUNTRY, 1990

COUNTRY	$M	PERCENT
United Kingdom/Ireland	183	28
Spain	130	20
France	120	18
Italy	80	12
Germany/Austria	55	8
Scandinavia	35	5
Benelux	25	4
Switzerland	15	2
Portugal	10	2
EUROPE TOTAL	**653**	**100**

Exhibit V-17

MARKET ANALYSIS BY DELIVERY MODE

DELIVERY MODE	$M	PERCENT
Non-IT Consulting	60	9
Professional Services	270	41
Software Products	30	5
Systems Integration	270	41
Systems Operations	25	4
EUROPE TOTAL	**653**	**100**

Andersen Consulting in Systems Integration

Andersen Consulting is one of the market leaders in systems integration, particularly in the "business solution" segment of the market.

Target Markets

Andersen Consulting views systems integration as a main board-led market where the potential clients are primarily concerned with "business transformation". Quoting a recent Andersen Consulting press release: "The senior management of large European companies must not just look for a quick fix to help them over the business downturn - they must take the long view and focus on "re-engineering" their organisation."

Accordingly Andersen Consulting emphasises the strategic rather than the tactical use of IS and tries to avoid being seen as a technology provider like the major professional services vendors and equipment vendors. Andersen Consulting focuses on the business objective to which technology may be a part of the solution.

Andersen Consulting targets its sales efforts primarily on main board directors, though the company admits that systems integration projects are sometimes channelled through the in-house IS department. The company focuses on industries which are perceived to be undergoing radical change. For example the recent privatisation of the water and electricity utilities in the UK generated growth rates for Andersen Consulting in excess of 65% in the utilities sector in 1990. Other sectors with high growth rates were the healthcare and telecommunications sectors.

Strengths and Weaknesses

Andersen Consulting's major strength is that the organisation is perceived as combining the business expertise of a management consultancy with the IS expertise of a professional services vendor. Accordingly Andersens, unlike typical professional services vendors, has a comparatively high degree of board-level credibility.

In addition to its integration services, Andersens emphasise their

- Strategic Services
  - strategic planning
  - competitive studies
  - organisation studies

- Change Management Services
  - organisation change
  - human resource management
  - knowledge transfer.

The organisation also has a wide range of industry specialists and consultants with the traditional management consultancy's functional expertise in:

- Financial management
- Materials management and logistics
- Sales and marketing.

So Andersen Consulting tends to be perceived by company directors as a consultancy with IS expertise, rather than a professional services vendor who has "bolted on" consultancy.
Because of its influence with senior directors, Andersens is often feared by IS management who prefer to deal with the more easily manageable traditional professional services vendor.

Technology

Despite this image, Andersen Consulting does in practice have a strong commitment to pushing technology. For example, in the U.S., Andersens has nine technology exhibits running in five "Business Integration Centres". These include:

- Logistics 2000 - simulating the logistics pipeline of a distribution company

- Hospital of the Future

- Smart Store 2000 - the supermarket and food processing industry example.

The purpose of these centres is to demonstrate to senior executives the potential of IS. Andersen Consulting, like many other software and services vendors, has found that senior executives have a poor understanding of IS and do not have a clear vision of how it might be used to improve their organisation's business processes.

Andersen Consulting is also a leading vendor and user of CASE tools.

The company recently stepped up its investment in computer-aided systems engineering (Case) to the tune of £35.3m for its Foundation strategy, pledging to spend a further £20.5m this year.

This year, the company announced its latest Foundation products for co-operative processing and the DEC Vax environment.

It claims the Install/1 version 2.0 is the first commercially available Case product to support DEC's version of IBM's Case AD/Cycle program, Cohesion, and generate DEC's ACMS transaction processing applications.

Andersen Consulting is also offering a client-server software engineering tool for the OS/2 environment following the release a few months ago of a co-operative processing version of Foundation of VAX/VMS. Andersen says it is working to integrate the two products so that OS/2 and Windows clients can access OS/2, VAX or IBM mainframe servers. Prices for the product range from $50,000 for a starter kit to $1m for a large-scale project. Later this year Andersen's Method/1 methodology will offer rules for splitting applications among processors.

Role of Andersen Consulting

Although Andersen Consulting likes to be seen as primarily a prime contractor, the majority of its projects do not involve the management of subcontractors. In fact the organisation is often used in a "consulting engineer" role, assisting user management in the specification of projects and the selection of subcontractors, and subsequently indirectly assisting in the management of projects.

In these instances, the project often consists of a series of contracts between the user and his selected subcontractors, with Andersen Consulting being paid as an adviser on a time and materials basis.

An example is the recent DSS project in the UK, where Andersen Consulting:

- developed the operational requirement
- assisted in vendor selection
- provided consultants to work with the users in steering the development and in testing the systems releases as they became available.

In cases where Andersen Consulting acts as prime contractor, clients are usually charged on a time and materials basis for consulting and change management activities, on a fixed price basis for clearly defined systems development activities.

Andersen Consulting manages the client by committing a partner to projects to liaise with senior management and manage their expectations, freeing the development team to concentrate on the project rather than the politics.

D
EDS/SD-SCICON

The Company

SD-Scicon was formed in 1988 by a takeover by SD (Systems Designers) of the far larger Scicon Group, previously owned by BP. SD was originally founded in 1969 and obtained flotation on the stock market in 1982. Scicon started operations in 1960 as part of CEIR (Corporation for Economic and Industrial Research)- U.S.

Prior to its recent acquisition by EDS, the main SD-Scicon shareholders were:

NAME	PERCENT OWNED
British Aerospace	24.8
British Aerospace Pension Fund	1.1
Morgan Grenfell Investment Management (discretionary fund manager)	18.9
Prudential Corporation Plc (partly beneficial owner, partly as discretionary fund manager)	6.2
Management (approximately)	10.0

Both British Aerospace and Morgan Grenfell have now agreed to sell their shareholdings to EDS, and these shares together with around 7% acquired on the open market were sufficient to give EDS overall control of SD-Scicon in August '91. Morgan Grenfell accepted a price of 60 pence per share - which would value SD-Scicon at £ 161 million. However, British Aerospace had earlier agreed to a price of 45 pence per share.

Exhibit V-18

SUBSIDIARIES

SUBSIDIARY	PROPORTION OF SHARES HELD %	COUNTRY
SD-Scicon Europe Limited	100	UK
SD-Scicon UK Limited	100	UK
Groupe Francais d'Informatique SA (GFI) 100		France
GFI Techniques Bull SA	100	France
Charbonnages de France Informatique (CdFI)	51	France
SD-Scicon Inc 100		US
Systems Control Inc	100	US
Systems Designers Software, Inc	100	US
Secure Information Systems Ltd	49	UK
PS Groep BV 35		NL
Vehicle Test Technology, Inc	50	US
Systems Control Technology, Inc	49	US

Takeovers, Mergers/Sales

August 1991: Acquired by EDS.

October 1990: Acquired 51% of ordinary shares of Charbonnage de France Informatique SA (CdFI).

July 1990: Sale of German subsidiary, loss-making systems integrator SCS, to CAP Gemini Sogeti for $40 million, including a debt write-off.

January 1990: Sale of main U.S. operation, Warrington Financial Systems, to U.S. disaster recovery company Sungard for $65 million.

April 1989: Sale of artificial intelligence division to a management buy-out team.

November 1988: Sale of System Control including Energy Systems Division to Combustion Engineering Inc. for $11.7 million.

CdFI was the computing services operation of the French national coal industry. The company is particularly strong in processing services and is looking to develop its systems operations activities from this base.

Key Products and Services

SD-Scicon offers the following services to an international client base:

Systems Integration, where the company has brought together one of the largest skill bases in Europe able to develop and support Information Technology systems. Expertise covers systems consultancy, bespoke and packaged software, and computer and communications hardware. The company acts as prime contractor in turnkey systems supply. Six market sectors cover transport, utilities, government, defence, energy and industry;

Facilities Management, where the company operates computer centres and communications networks for clients, and provides associated services such as computer hardware, software and communications equipment maintenance:

Consultancy, where the group contains a blend of technological and analytical skills to carry out technical studies in operations research, modelling and simulation, the application of advanced technologies such as neural network, signal processing, requirements analysis and method studies, and multi-disciplinary strategic studies;

Application Products, where the company supplies and supports specific application and software package products, together with associated training.

In North America, SD-Scicon also has a specialist company in the **Vehicle Inspection** business, operating road vehicle emission inspection and safety testing facilities for State authorities.

Geographic coverage

In the UK, the seriousness of the problems in Systems Integration became clearer as the year progressed and the extent of the problems were identified by the new commercial management procedures. Urgent attention was paid to quantifying the extent of the problems, taking measures to ensure timely completion of the contracts, and putting in place procedures to reduce the risks on all such future business.

The cause of many of the problems was a rapid movement towards large complex fixed-price contracts from 1987 onwards, led by public sector procurement policies. One example was the Foreign Office London Integrated Office System (FOLIOS) where a substantial refund was paid. The commitments were entered into as the software industry adjusted to these changes and competed to obtain business of a size and complexity not previously contracted on a fixed-price basis.

An improved management infrastructure to address the problems has now been put in place and new commercial, financial reporting and management systems are being installed by executives recruited from the contracting and engineering industries.

In the remaining UK businesses, the Consultancy and Facilities Management divisions were profitable, but the Products business was hard hit by the UK recession, particularly in the last quarter of the year. Steps have been taken to reduce costs in this area, but this part of the UK business is unlikely to make normal margins until conditions in manufacturing and retail industry improve.

During 1990, very substantial annual costs have been removed from the UK businesses. This is due to a combination of normal cost reduction measures as business levels declined during the year and, to a significant extent, the fundamental restructuring, involving the elimination of superfluous management levels, appointment of new divisional directors in a simpler business structure, and a rigorous policy of decentralisation. New decentralised financial systems are being installed in 1991 and there is increased emphasis on training and modern professional management of human resources.

Exhibit V-19

MARKET ANALYSIS BY GEOGRAPHIC AREA (£ MILLIONS)
CONTINUING SOFTWARE & SERVICES BUSINESS, 1990

COUNTRY	REVENUE	PERCENT
UK	112.7	51
France	74.2	33
Rest of Europe	21.6	10
US	11.5	5
Other	1.8	1
TOTAL	**221.8**	**100**

Exhibit V-20

MARKET ANALYSIS BY DELIVERY MODE (MILLIONS)
CONTINUING EUROPEAN SOFTWARE & SERVICES BUSINESS, 1990

DELIVERY MODE	REVENUE	PERCENT
Processing Services	12	6
Systems Operations	30	14
Network Services	5	2
Software Products	19	9
Turnkey Systems	32.5	16
Professional Services	60	29
Systems Integration	50	24
TOTAL	**208.5**	**100**

Recent Projects as Prime Contractor

CLIENT	PROJECT	VALUE ($ MILLIONS)
EEC Belgium	OVIDE project for MEPS	7
Euro fighter	ADA software	8
Exxon Chemical	Integrate process control	
Gasversorgung (Germany)	Gas pipelines	4
MOD	Battlefield system	21
MOD	R.A.F. supply	

Recent Projects as Subcontractor

CLIENT CONTRACTOR	PROJECT	VALUE ($ MILLIONS)	PRIME
U.K. Space Centre	Earth Observation Data Centre (EODC)	18	British Aerospace
Deutsche Life Ass.	NA	NA	GFM

Co-operative Agreements

- For U.K. Defence with GEC-Marconi and STC
- For Space with British Aerospace.

Exhibit V-21

MARKET ANALYSIS BY INDUSTRY SECTOR (MILLIONS)
CONTINUING EUROPEAN SOFTWARE & SERVICES BUSINESS, 1990

SECTOR	REVENUES	PERCENT
Government	60	30
Process Manufacturing	50	25
Discrete Manufacturing	20	10
Utilities	30	15
Finance & Insurance	20	10
Other	28.5	10
TOTAL	**208.5**	**100**

Exhibit V-22

FIVE-YEAR FINANCIAL SUMMARY FOR SD-SCICON (MILLIONS) (FYE 31-12)

YEAR	1986	1987	1988	1989	1990
Total Revenue	61.5	83.7	224.3	285.9	256.5
Annual Growth Rate (percent)		36	168	27	(10)
Revenue from continuing business	43.5	58.6	160.9	215.8	239.2
Annual Growth Rate (percent)		35	175	34	11
Profit before taxation	4.5	7.4	13.4	3.6	(19.8)
Annual Growth Rate (percent)		64	81	(73)	(550)
Profit after tax				(0.6)	(23.0)
Annual Growth Rate (percent)					(3700)
EPS (pence)	2.3	3.8	4.0	(1.2)	(12.4)

SD-Scicon in Systems Integration

In the UK, SD-Scicon's organisation reflects the importance the company attaches to the systems integration market. The company is organised into the following divisions:

- Systems Integration North
  - which includes the business units targeting the Energy and Industry sectors

- Systems Integration South
  - which provides business units targeting:
    - Transportation and Government
    - Utilities
    - Defence.

- Consultancy

- Products
  - handles those software products which are applicable to a range of market sectors

- Facilities Management
  - including processing and network services and catering for a number of applications in banking and finance.

Target Markets

In order of priority, SD-Scicon's principal market in systems integration are:

- Government
- Process Manufacturing
- Utilities/Energy
- Financial Services
- Discrete Manufacturing

However following the failure during 1990 of a number of government-sponsored systems integration projects, such as the FOLIOS project for the UK Foreign Office, SD-Scicon has addressed the sources of these problems and is re-establishing itself as a prime contractor for large systems integration projects, particularly in the public sector.

E
Groupe Bull

Overall Strategy

For practically all suppliers of information systems, 1990 was a difficult year. Bull finished the year with an operating loss of FF 3.2 billion. In response, the Groupe developed a Transformation Plan for 1991 and 1992, and began implementing it in November 1990. Its main objective is to reestablish the Groupe's profitability, and it involves a vast restructuring programme and product development acceleration. To implement the restructuring called for in the plan, Groupe Bull made a provision in 1990 of FF 4 billion.

This Transformation Plan is intended to improve the company's operating margin over the course of the next two years by more than FF 4 billion, particularly through the following means:

- Manufacturing will be consolidated in six key, specialised and sophisticated factories, instead of the 13 that were operated at the beginning of 1990.

- Operational and administrative costs will be reduced by 10% per year in relative terms, particularly through the reduction of staff not directly involved in production, development, sales, or services.

- Groupe Bull will concentrate its efforts on key markets where it has a reasonable chance of being competitive - which implies forming partnerships in activities where the company has not reached critical size, as it did in 1990 for the CP8 "smart card" with F.-C. Oberthur, or as it plans to do in 1991, for distribution in Scandinavia with Nokia.

- Staff reductions totalling more than 5,000 will be made in 1991 which, added to the staff reductions implemented in 1990, will account for nearly 20% of Bull personnel. In addition to these steps, and in order to increase the Groupe's economic efficiency, its speed of response and its integration, the company has defined new worldwide organisations that will be established in 1991.

- A single organisational body will be responsible, at a worldwide level, for product policy and research and development.

- The European subsidiaries (Italian and British) of the American subsidiary Bull HN, and those of Bull S.A., will come under a single operational authority for the whole of Europe (excluding France but including the Eastern European countries). The purposes of this organisation will be to establish appropriate operating structures for the single European market.

- The operations of Bull S.A. and Bull HN in the Far East will be combined under the operational authority of Bull HN.

The intention behind the restructuring is to make it possible for Bull to improve its efficiency in an increasingly difficult market.

Groupe Bull believes that its customers want information systems that guarantee the flexibility of their organisations, freedom to choose (or change) their suppliers at a moment's notice, and access to standardised applications developed by leading-edge companies. Since 1984, Bull has been concentrating the greatest part of its efforts on open and distributed data systems that respond directly to these requests. Ultimately, this evolution in information technology will lead to genuine smart networks providing easy access to a multitude of hardware platforms, databases, applications and services - all from an individual workstation.

To meet these changing needs, Bull announced in March 1991 its Distributed Computing Model, which defines the future architecture of the Groupe's product offer and provides integration and complementarity between GCOS and UNIX and MS-DOS systems. Strengthened by its links with France Tlcom, Bull considers itself well placed to become one of the leading suppliers of such systems.

To put this architecture into practice, Groupe Bull launched in 1990 a special FF 11 billion ($2 billion) development program over four years that serves as the heart of its research and development work - an investment which in 1990 totalled FF 3,747 billion ($688 million).

It can therefore be seen that the Transformation Plan deals not only with organisational changes and cost-cutting, but also with building the future, and that it comprises a substantial programme for investment in research and development, training, enhancements in productivity and sales development. In response to the sudden acceleration in market changes, it aims at radically altering the pace at which Bull implements the strategic guidelines it established in 1983: the development of distributed and open information systems; the development of solutions combining hardware, software, and services; and the establishment of cooperation agreements with other companies in order to offer customers the world's best technology.

Ownership and Major Subsidiaries

The French Government has a majority stake in Compagnie des Machines Bull as shown in Exhibit V-23.

Exhibit V-23

SHAREHOLDERS

SHAREHOLDER	PERCENT OWNED
French State	76%
France Telecom	17%
NEC	5%
Other	2%

The direct subsidiaries of Compagnie des Machines Bull at year-end 1990 are shown in Exhibit V-24. Most of these organisations have an extensive number of further subsidiaries. Notable among these is the personal computer manufacturer Zenith Data Systems.

Exhibit V-24

SUBSIDIARIES

NAME	COUNTRY	PERCENT OWNED
Bull Data Systems NV	Netherlands	100
Bull HN Information Systems Inc	United States	72.2
Bull International NV	Netherlands	100
Bull S.A.	France	99.9
European Computer Industry Research Centre GmbH	Germany	33.3
OGIC	France	99.9
SOFOM	France	99.9

Worldwide Revenues

Groupe Bull's worldwide revenues including breakdowns by geographic region and industry sector are shown in Exhibits V-25 to V-28.

Exhibit V-25

GEOGRAPHIC BREAKDOWN OF REVENUES, 1990 (FF MILLIONS)

REGION	REVENUES	PERCENT
Western Europe	24,108	70
North America	7,841	23
Other	2,631	7
TOTAL	**34,580**	**100**

Exhibit V-26

WORLDWIDE REVENUE BY SEGMENT, 1990
GROUPE BULL CLASSIFICATION (FF MILLIONS)

SEGMENT	REVENUES	PERCENT
Hardware Sales	21,400	62
Software	3,500	10
Services	1,700	5
Maintenance	7,300	21
Other	680	2
TOTAL	**34,580**	**100**

Exhibit V-27

REVENUES BY INDUSTRY SECTOR, 1990
WORLDWIDE (FF MILLIONS)

INDUSTRY SECTOR	REVENUES	PERCENT
Transport/energy	2,800	8
Administration, health, education	10,400	30
Distribution	2,100	6
Banking/insurance	6,200	18
Manufacturing	3,500	10
Service/other	2,680	8
Indirect Sales	6,900	20
TOTAL	**34,580**	**100**

Exhibit V-28

FIVE YEAR FINANCIAL SUMMARY, (FF MILLIONS)

YEAR	1986	1987	1988	1989	1990
Revenue	17,796	18,071	31,547	32,721	34,580
Annual Growth Rate (%)	-	2	75	4	6
Profit before taxes	271	225	303	(267)	(6,790)
Annual Growth Rate (%)	-	(17)	35	(188)	(2,443)

European Software and Services Revenues

INPUT's estimates of Groupe Bull's software and services revenues in Western Europe, including breakdowns by delivery mode, industry sector, and country are shown in Exhibits V-29 to V-31.

Exhibit V-29

1990 MARKET ANALYSIS BY INPUT DELIVERY MODE ($ MILLIONS)
WESTERN EUROPE, SOFTWARE AND SERVICES

DELIVERY MODE	REVENUE	PERCENT
Turnkey Systems	100	13
Processing Services	15	2
Network Services	45	6
Software Products	375	47
Professional Services	210	26
Systems Integration	50	6
Systems Operations	-	-
TOTAL	**795**	**100**

Exhibit V-30

ESTIMATED REVENUES BY INDUSTRY SECTOR, 1990
WESTERN EUROPE, SOFTWARE AND SERVICES ($ MILLION)

INDUSTRY SECTOR	REVENUES	PERCENT
Manufacturing	120	15
Banking/Finance	200	25
Distribution	65	8
Transportation	55	7
Utilities	40	5
Government	240	30
Other	75	10
TOTAL	**795**	**100**

Exhibit V-31

ESTIMATED REVENUES BY COUNTRY, 1990
WESTERN EUROPE, SOFTWARE AND SERVICES ($ MILLIONS)

COUNTRY	REVENUES	PERCENT
France	390	50
Germany	65	8
United Kingdom	65	8
Italy	140	18
Belgium	35	4
Netherlands	24	3
Spain	15	2
Switzerland	15	2
Sweden	15	2
Austria	10	1
Denmark	10	1
Norway	8	1
Finland	3	-
TOTAL	**795**	**100**

Target Markets

Bull is placing increasing emphasis on vertical markets and considers its key markets to be:

- manufacturing
- finance
- retail and distribution
- public sector.

Groupe Bull is keen to develop its partnerships in software and services to serve these sectors. In January 1991, Bull established the Market and Application Development Group for the development and management of vertical solutions in the Groupe's key markets.

In manufacturing, Bull is focusing on the shop floor, MRP and computer-integrated manufacturing, with a new UNIX-based MRP II system, including integrated financials, released in early 1991. New alliances have also been established within the finance sector. For example, in June the Groupe created a new joint venture, Sopra-Bull, with Spanish software house Sopra Informatica, to develop banking solutions, especially for the Spanish market. More globally, Bull continued to strengthen its partnership with Andersen Consulting, launching in March the jointly-developed BRAHMS (BRANCH Management System) banking solution under GCOS 8.

The retail and distribution sector was similarly reinforced over the last year, with the opening in Amsterdam in October of the BIRD (Bull International Retail & Distribution) Center. The demonstration and training facility is equipped with in-store and point-of-sale systems and is designed to promote and provide the latest in retail and distribution solutions.

Fourthly, the public sector remains the Groupe's largest source of business on a worldwide basis. Traditional areas, such as social security, police, defence and taxation enjoy continued success, but new, emerging areas are likewise receiving significant attention.

Partnerships

Notable alliances formed by Groupe Bull in 1990 include:

- Major agreement signed with Videoton group of Hungary to establish a joint company (49% Bull-owned) to manufacture Bull systems.
- Worldwide agreement signed with SAS Institute for porting and sale of SAS System Decision-Support Software on Bull DPX/2 platforms.
- German Institute of Social Sciences INFAS and Bull form partnership to supply computerised results on East German parliamentary elections. Partnership later expanded to track elections in Romania, Czechoslovakia and Poland.
- Bull Italia joins with Italian government to support development in southern Italy through creation of Bull R&D centers.
- Bull establishes joint software company, Sopra-Bull, with Sopra Informatica in Spain to develop banking solutions.
- Swiss telecommunications group Ascom and Bull agree to develop products combining fingerprint-recognition technologies and microprocessor cards.
- Agreement with Modcomp provides Bull Open Software with Modcomp's REAL/IX real-time UNIX operating system.

- Bull acquires 51% of BOD Datensysteme GmbH in Germany to expand its offer of horizontal and vertical solutions based on UNIX.

- Bull acquires 60% of French software house Mthodes et Informatique to improve software and service offer on GCOS 7 systems.

- Worldwide agreement signed with IBSI Software Technology and Delta Software Technology to market Conceptor and Delta CASE products on Bull's MS-DOS, UNIX and CGOS platforms.

- Affinity Line introduced, a range of products allowing applications on Bull servers to be integrated into Microsoft Windows environments, and an initial building block of Bull's Distributed Computing Model.

- Worldwide agreement signed with SAP AG to develop and market all SAP commercial application software on DPX/2 platforms.

In the Netherlands, the Groupe purchased an 85% share of the Dutch firm Prodetis, which provides store-management and wholesale applications. The acquisition thereby helped strengthen Bull's position in Holland's retail and wholesale food market industry.

Architecture

Continuing to expand its range of standard products for customers, the Groupe finalised in April 1990 its acquisition of Zenith Data Systems.

Likewise in April, the Groupe confirmed its commitment to the Open Software Foundation (OSF), stating that it would base its future open products on the OSF/1 operating system, integrating OSF's Distributed Computing Environment (DCE) into its system architecture. This commitment was reiterated in October at the worldwide introduction of OSF/1.

Additional strategic support for open systems was reaffirmed earlier in the year when the Groupe verified its intention to support and promote in Europe the Portable Common Tool Environment standard, which defines the interface specifications for accessing a distributed database under UNIX. This was followed by demonstration of the Open Document Architecture and the Open Document Interchange Format on Bull systems, at the CeBIT fair in Hanover, Germany.

Strategic partnerships were also established in order to expand as widely as possible the range of UNIX technologies available to customers through Bull. For example, the Groupe reached agreement with the U.S. firm Modcomp for Real/IX, a real-time implementation of the UNIX operating system.

In the medium-term, Groupe Bull is looking to accelerate the introduction of its Distributed Computing Model. In October 1990, Groupe Bull introduced Affinity Line which allows end users to integrate applications running on Bull GCOS servers into a Microsoft Windows environment, and provides a cornerstone of Bull's comprehensive Distributed Computing Model.

Systems Integration

Groupe Bull has strong systems integration credentials in Europe and is expanding its U.S. participation. It is committed to providing successful solutions for systems integration clients even if the majority of the product is non-Bull. Groupe Bull has a strategic focus on developing and maintaining quality partnerships with other SI vendors that offer opportunities in Europe and in the U.S.

Groupe Bull's renewed emphasis on systems integration is a result of recognition of its clients' needs for services and solutions. Its large customers have expressed a growing need for systems integration services as they see equipment architectures evolving in two related but distinctly different directions.

First, Groupe Bull's clients believe that open systems architecture is being reaffirmed as vendors cooperate to find a common operating environment strategy. Users are planning new systems applications that are transportable across platforms and that will reduce their corporate investment in software development and maintenance costs.

Second, corporations are implementing distributed architecture strategies to capitalise on the cost-effectiveness of minicomputers or microcomputers for departmental applications while still retaining the information depository capabilities of large mainframes.

Market Evolution

The pattern that Groupe Bull's clients believe is emerging is that no one vendor can provide the entire solution - hence the need for a system integrator. Groupe Bull is positioning itself to participate in that market as it evolves. Exhibit V-32 presents Groupe Bull's view of systems integration market drivers.

The need for integration services increases as the need for interoperability increases. The systems integrator must know how to combine different platforms with multiple operating systems to deliver a seamless solution to the user. Such a solution must adapt to a customer environment that becomes more complex as businesses become more interdependent and operate around the world and around the clock.

Exhibit V-32

SYSTEMS INTEGRATION MARKET DRIVERS

- Need for interoperability
- Complex customer environments
- Complex procurement decisions
- Sharing of project risks
- Focus on mission-critical systems

The procurement process will become increasingly complex in this environment. Along with this complexity will be a higher degree of risk. The client's MIS staff needs to focus more and more on mission-critical systems, systems whose successful implementation will, at the least, improve firms' competitiveness. Often, these systems will even alter the way the company does business. In such an environment, clients are seeking the systems integrator to share in the project risk.

Groupe Bull's Integration Strengths

The strengths that Groupe Bull brings to the systems integration marketplace are summarised in Exhibit V-33. Groupe Bull is an organisation of more than 2,500 systems integration professionals. The technological skills they bring to bear on client problems include expertise in such "hot" new technologies as image processing and secure networks.

Exhibit V-33

GROUPE BULL INTEGRATION STRENGTHS

- 2,500 SI professionals
- New technology focus
  - Secure networks
  - Image processing
- Worldwide development network
- Base of European SI projects

Groupe Bull recognises the importance of focussing on vertical markets in order to develop a presence in systems integration and has already penetrated selective niches in specific market sectors in Europe. Groupe Bull plans to build on its expertise to expand penetration even further. At the present time, Groupe Bull claims 25% of the police command-and-control systems in the U.K, Italy, Spain and France. It also claims 30% of the market in the retail and distribution industry in the Netherlands. As Exhibit L illustrates, the company also claims a dominant position with European taxation and customs authorities.

Overall the company's principal successes have been in the government and banking sectors. For example in the U.K., Groupe Bull's emphasis has been on UNIX-based government projects.

The market penetration illustrated in Exhibit V-34 is particularly significant when one notes that the European Economic Community is developing proposals to link the information systems of many of the major national government departments to their equivalents throughout the EEC. Groupe Bull is well positioned as an integrator of choice for this opportunity if it does indeed come to pass.

Exhibit V-34

GROUPE BULL'S MARKET PENETRATION

MARKET NICHE	COUNTRIES
Palloo command/control	UK., France, Italy, Spain, U.S.
Taxation systems	U.K., Poland, France, Ireland, U.S.
Custom systems	U.K., Belgium, Denmark, Italy, France
Retail distribution	The Netherlands, U.S., Canada
Health & human services	U.S., Canada

Groupe Bull is well positioned to be a worldwide systems integrator serving the needs of its global clients. The recent acquisition of Honeywell Federal Systems Inc. enhances that capability. The emphasis on systems integration is in line with the overall company strategy of expanding its role from that of an equipment vendor to that of a full-service provider in the information technology industry.

The systems integration orientation will strengthen Groupe Bull's image as a problem solver and business partner among clients and prospects. The move into systems integration is viewed as a positive move internally, because the systems integration market is a clearly defined, maturing market that has been profitable for the vendor community. Open systems are seen as critical for the development of systems integration opportunities by Groupe Bull.

Organising for Systems Integration

The organisational structure that has been implemented to pursue the systems integration market is a matrix management concept designed to use Groupe Bull's technical strengths efficiently.

Systems Integration Business Units (SIUs), designated as profit centres, are being established in the U.K., Italy, France, Benelux, Germany, Scandinavia, and the U.S. They do not have engineering (systems development) resources assigned to them, but actually subcontract with the Groupe Bull Project Management/Engineering Centres (PME) for the needed resources to accomplish the systems integration task. The PME Centres are located in the U.K., Italy, France, Germany, and the U.S. Italy has possibly the most highly developed systems integration unit within the company; the German operation is concentrating largely on new business opportunities. Once a systems integration opportunity is won, a contract director is named to assume full responsibility for the execution of the contract.

Exhibit V-35 summarises the role of the Systems Integration Group within the larger Groupe Bull organisation.

Exhibit V-35

ROLE OF THE SYSTEMS INTEGRATION GROUP

- Provide strategic direction to SIUS
- Develop operating policies
- Support affiliates
- Develop internal skills
- Coordinate and build teams
- Establish worldwide partnerships
- Manage large multinational contracts

The SI Group's staff will be responsible for providing strategic direction and developing operating policies for all the SIUs. The group must formulate policies, identify the tools needed to resolve the clients' problems, and solidify the management processes necessary to delivery systems solutions in a timely manner. Internal policies relating to risk management, progress reporting, quality assurance, and financial management are among those to be implemented at the group level.

The coordinating functions established by the SI Group will be dictated by the company's international scope and the individual profit centre structure of the SI organisation. The group will provide overall support to the affiliates, will be responsible for skills development across the many individual units, and will build the worldwide partnerships that must be in place to supplement Groupe Bull's internal resources. Finally, whenever multinational contracts are required, the group will be responsible for executing and administering them.

Partnership Management

Groupe Bull has evolved a more permanent concept for developing partnerships. The company will focus on developing partnerships with a small number of key players with which it can establish long-term, durable partnerships over an extended time. The relationship will not be opportunistic - that is, designed for a specific situation - but rather will be designed to let the partners work together jointly in R&D projects as well as in joint marketing and sales activities.

Groupe Bull expects the relationships to vary considerably in geographic scope - ranging from partnerships for specific countries to partnerships that span entire continents and even become worldwide. The commitment of the partners will also vary across opportunities. For example, a vendor may be a subcontractor to Groupe Bull on one opportunity, and the same vendor may be the prime contractor on another opportunity, with Groupe Bull as a subcontractor. Both vendors are perfectly comfortable with either relationship if a truly durable partnership has been established. Exhibit V-36 illustrates the types of firms with which Groupe Bull has established partnerships in national markets. For example, in France it is not uncommon for Groupe Bull to act as a subcontractor to CGS and Andersen Consulting.

Overall Groupe Bull sees the ability to build consortia as the key to success. In particular, the company recognises that it is not viewed as expert in business consultancy and needs to develop partnerships to fill this gap in its perceived capabilities.

Exhibit V-36

TYPICAL GROUPE BULL PARTNERSHIPS

Country	Partner Firm
U.K.	Logica British Telecom SD-Scicon Nucleus Technology
France	Andersen Consulting CAP Gemini Sogeti SEMA
U.S.	Deloitte Touche Nordata

Typical SI Projects

Groupe Bull has extensive systems integration experience in Europe. Typical of its broad experience are the projects listed in Exhibit V-37. They represent the range of technologies that Groupe Bull - as a full-service systems integrator - provides, and the range of clients and applications it is capable of addressing.

Exhibit V-37

TYPICAL GROUP BULL SI PROJECTS

Ansaldo (Italy)	Complete plant automation	UNIX TCP/IP MRPII X.25 Multivendor equipment
Dept. Social Services (U.K.)	Largest operational European OSI network	DSA/OSI X.25 ICL GCOS6
Post Office (France)	Workstation network for Financial Services Department	UNIX LAN X.25

Business Objectives

Groupe Bull has very clearly defined the broad business objectives for the Systems Integration Group. The target is to win one out of every four bids at the start, and then to improve that ratio to one out of every two as the SIU's experience increases. Current (1990) revenue for Groupe Bull's systems integration activities, exclusive of the Honeywell Federal Systems Inc. revenue, is claimed to be $150 million. This represents less than 2% of the overall Groupe Bull revenues. The company has targeted its systems integration business to grow between 30% and 40% annually, and projects its SI revenues to be $800 million to $900 million by 1995.

F
EDS

The Company

EDS was founded in 1962 and became an independent subsidiary of General Motors in 1984. It is a world leader in the supply of information technology services providing consultancy, systems development, systems integration and systems management to almost every market sector.

Worldwide EDS employs over 62,000 professionals.

EDS currently has more than 7,200 clients in 28 countries worldwide.

EDS' largest client is General Motors Corporation (GM) and its subsidiaries, which contributed approximately 53% ($3.2 billion) to EDS' 1990 revenue.

EDS and its subsidiaries were acquired by GM in October 1984 for approximately $2.5 billion.

Approximately 82% of EDS' total 1990 revenues were derived from North American operations. The remaining 18% were derived from international activities.

Through its work for GM, EDS has gained expertise in factory automation, strengthened its international presence and enhanced its communications expertise.

"EDS is on an equity investment binge" according to Computer Systems News. EDS's investment style is equity-for-business transactions, in which it typically injects money into a company in return for a facilities management contract. The company has practiced a growth by acquisition strategy throughout its 28-year life, and is currently more active than ever along those lines. The company is currently completing the acquisition of SD-Scicon in the UK, a move which will treble the company's European software and services revenues.

Robotron-Projekt Dresden and EDS are planning to offer a computer bureau service in former Eastern Germany. Robotron will offer consultancy and market software, while EDS will build and run the computer centre operations.

EDS is currently organised into strategic business units, which include:

- International and global industries (international means all countries outside North America)
- Manufacturing and distribution
- Government systems
- Financial services
- Insurance services
- Energy and petrochemicals.

Key Products and Services

The activities of the company are classified as:

- Consulting
- Systems Development
- Systems Integration
- Systems Management.

Consulting

EDS defines this service unit as products and services derived from consultative work such as organizational consulting, strategic consulting, information technology assessments or short-term project work that is primarily analytical.

Systems Development

Developmental products and services are defined as project work where the results will be turned over to the customers. (Software licence revenue is included here.)

Systems Integration

Systems integration products and services consist of custom systems integration projects.

Systems Management

Products and services in this business unit include: operating systems on behalf of customers, service bureau offerings, remote computing services, facilities management, network management and programming management.

Some examples of recent international contracts awarded include the following:

- At the end of 1990, EDS signed a major seven-year systems management contract with Midland Bank Plc, U.K.. Under the agreement, EDS will collect, process and distribute credit and debit card transactions from the bank's merchant customers.

- EDS expanded its relationship with National Westminster Bank by signing two new contracts in 1990. One agreement provides operational support for existing financial and management systems developed by EDS. The other is for the design and implementation of a new administration system that will provide the bank's stationary and printing department with enhanced management and financial reporting.

- In 1990 EDS announced the launch of a new international banking system; EDS*IBS. The system was developed jointly by Kredietbank and EDS in Brussels.

- A five year agreement was signed with Credit Lyonnais, France in 1990. EDS will connect a new data centre into the Credit Lyonnais network and 2,200 banking branches in France.

- During 1990, a significant systems management agreement was signed with Chausson, a French industrial firm that manufactures automobiles for its parent corporations, Peugeot and Renault of which it is a joint venture. Under this agreement EDS will assume total responsibility for Chausson's information systems including the implementation and operation of new integrated manufacturing management and plant automation systems.

- Towards the end of 1990, EDS achieved a major system management agreement with SAAB Automobile AB in Sweden. EDS will manage SAAB's current systems and begin developing future information management strategies to support SAAB's operations worldwide.

- EDS is to manage the data centre of Telefonica de Espana SA a supplier of EDI (Electronic Document Interchange) services.

- During the first quarter of 1989, EDS signed a three-and-one-half-year agreement with BASF (a West German chemical company) to provide an information technology infrastructure for the chemical company's storage and packaging department.

- In Spain, EDS will develop and implement an automatic warehouse system for Danone, a large producer of dairy products. It is also developing a stock management system for Spain's fifth-largest savings and loan bank, Caixa de Catalunya.

- Under contract with DANZAS-SATEM (France), EDS will operate and maintain the company's distribution systems.

- EDS' seven-year contract extension with French manufacturer Gallay provides for administrative systems and manufacturing applications services.

- Also during the quarter, EDS negotiated a 10-year contract with the International Bank of Asia (Hong Kong) to assume responsibility for its information technology systems.

- EDS signed a five-year contract with Sociaal Fonds Bouwijverheid, the social security administration for the Dutch construction industry, to install and operate a pension fund system.

- EDS finalised an eight-year contract with Netherlands shipbuilder Verolme Scheepswarf Heusden BV to develop and manage new financial reporting, personnel, time registration and production systems.

EDS currently has more than 250 international contracts with clients in various industries.

Market Analysis

A five-year summary of source of worldwide revenue by operating group is estimated by EDS as follows:

Exhibit V-38

EDS WORLDWIDE ESTIMATED SOURCE OF REVENUE SUMMARY (PERCENT)

YEAR	1986	1987	1988	1989	1990
Financial and insurance	15	18	22	21	19
Commercial/ communications/ international services	13	16	17	13	17
Government systems	12	14	14	11	11
Subtotal*	40	48	53	45	47
GM	60	52	47	55	53
TOTAL	100	100	100	100	100

* *These estimates include certain revenue from GM that has been reported in the Commercial, Communications, and International Services and Financial and Insurance Groups.*

A further breakdown of 1989, 1988, 1987 and 1986 revenue follows ($ millions):

Exhibit V-39

WORLDWIDE MARKET ANALYSIS BY CLIENT BASE ($ MILLIONS)

YEAR	1986	1987	1988	1989	1990
Systems and operating contracts					
· Outside customers	1,127.7	1,444.8	1,907.6	2,384.6	2,787.5
· GM + subsidiaries	3,195.1	2,883.3	2,837.0	2,988.9	3,234.2
	4,322.8	4,328.1	4,744.6	5,373.5	6,021.7
Interest and other	43.2	99.6	99.5	93.3	87.1
TOTAL	**4,366.0**	**4,427.7**	**4,844.1**	**5,466.8**	**6,108.8**

Approximately 53% ($3.2 billion) of EDS' total 1990 revenue was derived from its parent company, GM, and 1.4% was derived from interest and other. The remaining 45.6% ($2.8 billion) of total revenue was derived from clients in various industries, including banking and finance, insurance, manufacturing, retail, distribution, transportation and energy. INPUT estimates that approximately $222 million of this was generated from within Western Europe.

Exhibit V-40

1990 MARKET ANALYSIS BY EUROPEAN GEOGRAPHIC MARKET ($ MILLIONS

GEOGRAPHIC MARKET	REVENUE	PERCENT
France	75.0	34
Germany	23.6	11
U.K.	73.4	33
Spain	14.7	7
Sweden	5.3	2
Benelux	29.9	13
TOTAL	**222**	**100**

The following table shows the 1990 breakdown by delivery mode for the international operations.

Exhibit V-41

1990 MARKET ANALYSIS BY DELIVERY MODE FOR EDS (USING EDS CLASSIFICATION) ($ MILLIONS

DELIVERY MODE	REVENUE	PERCENT
Consultancy	7	3
Systems Development	27	12
Systems Management	157	71
Systems Integration	31	14
TOTAL	**222**	**100**

Exhibit V-42

1990 MARKET ANALYSIS BY DELIVERY MODE FOR EDS (USING INPUT CLASSIFICATION) ($ MILLIONS

DELIVERY MODE	REVENUE	PERCENT
Processing Services	52	23
Network Services	8	4
Applications Software Products	14	6
Professional Services	35	16
Systems Operations	88	40
Systems Integration	25	11
TOTAL	**222**	**100**

Financial Information

On a worldwide basis, EDS' total 1990 revenue reached $6.1 billion, a 12% increase over 1989 revenue of $5.5 billion. Net income rose 14%, from $435 million in 1989 to $497 million in 1990.

Exhibit V-43

EDS FIVE-YEAR FINANCIAL SUMMARY ($ MILLIONS) (FYE 31-12)

YEAR	1986	1987	1988	1989	1990
Revenue	4,366.0	4,427.7	4,844.1	5,466.8	6,108.8
Annual Growth Rate	27%	1%	9%	13%	12%
Profit before Taxes	464.0	524.3	589.4	680.3	788.7
Annual Growth Rate	28%	13%	12%	15%	16%
Profit after Taxes	260.9	323.1	384.1	435.3	496.9
Annual Growth Rate	37%	24%	19%	13%	14%
EPS (Earnings/share)	$1.07	$1.33	$1.57	$1.81	$2.08
Annual Growth Rate	36%	24%	19%	15%	15%

EDS in Systems Integration

Target Markets

EDS believes that systems integration projects are purchased at board-level, and that most of their systems integration business is "business created" rather than "Requests for Proposals" responded to. Accordingly, the company concentrates on developing board-level relationships with identified target prospects. For example, in the UK, EDS restricts itself to targeting approximately 100 user organisations.

These products will typically be organisations who are considered ripe for outsourcing due to the financial/market pressures they currently face. In recent years, it is apparent that organisations in the financial services sector have been one of EDS' prime targets. EDS recognises that its chances of success are significantly improved if the target company already appreciates that it has to change considerably if it is to succeed in its marketplace.

EDS believes that its prospects consider outsourcing because of the attractions of:

- increased real control : the proposition that it is easier in practice to manage an external vendor than an in-house department

- currency of technology : the technology of systems integration projects is changing rapidly with considerable emphasis on areas such as CASE and open systems network integration. EDS have experienced staff with possibly more up-to-date skills than their in-house rivals

- genuine risk transfer : via predetermined prices and schedules.

The company's prospects are also seeking vendors who have substantial experience in managing change, training end users, and thoroughly integrating systems into the end-user environment.

EDS also offers independence from equipment manufacturers and experience in integrating a range of technologies.

At the end of a systems integration project, EDS may be required to assist in transferring the technology in-house or the user may elect to continue to outsource the maintenance and/or operation of the system to EDS.

Some of the projects carried out by EDS are listed earlier.

Acquisition of SD-Scicon

The acquisition of SD-Scicon will effectively treble EDS' European software and services business. In 1990 EDS' revenues were $200 million while the combined revenues of the group including CdFI were approximately $670 million.

In 1990 this would have had a dramatic impact on EDS' software and services league placings in Western Europe, making the new combined group:

- 9th in software and services overall
- 4th in systems integration behind CGS, IBM, and Andersen Consulting
- 2nd to CGS in systems operations.

The SD-Scicon Group is a good match for EDS in that like EDS its recent emphasis has been on developing its systems operations and systems integration businesses. However while SD-Scicon undoubtedly has the technical skills necessary for undertaking large projects, its commercial management had not been of the same high standard resulting in substantial losses being incurred in 1990.

Exhibit V-44

COMBINED EDS AND SD-SCICON REVENUES

EUROPEAN DELIVERY MODE ANALYSIS 1990

DELIVERY	REVENUES ($ MILLIONS) EDS	SD-SCICON	COMBINED	PERCENT
Processing Services	50	25	75	12
Network Services	10	10	20	3
Systems Operations	85	60	145	23
Software Products	15	40	55	9
Professional Services	35	110	145	23
Turnkey Systems	-	60	60	10
Systems Integration	25	95	120	20
TOTAL	**220**	**400**	**620**	**100**

* Note: In a full year, CdFI will contribute a further $50 million revenues, much of it in the processing services and systems operations delivery modes.

EDS will no doubt impose its own commercial standards and procedures on SD-Scicon to prevent similar losses occurring in the future. However users may still be reluctant to use SD-Scicon as prime contractor for large projects in the immediate future. British Aerospace has already chosen the Sema Group as its partner to bid for large defence software contracts - particularly computer systems for warships - in preference to SD-Scicon.

In terms of industry sectors served, SD-Scicon and its subsidiaries are in many ways complementary to EDS. EDS' strengths lie in discrete manufacturing and the financial sector, while the SD-Scicon group has considerable experience in serving the processing manufacturing sector and the energy sector.

Exhibit V-45

SD-SCICON GROUP REVENUES, 1990 BREAKDOWN BY INDUSTRY

SECTOR	REVENUES	PERCENT
Government	125	31
Process Manufacturing	105	26
Discrete Manufacturing	40	10
Utilities	70	17
Finance and Insurance	30	7
Other	35	9
TOTAL	**400**	**100**

The new EDS will be particularly strong in the United Kingdom and France with

- 10th place in software and services in France
- 6th place in software and services in the UK.

However EDS still needs to strengthen its position in the rest of Europe and particularly in Germany where it faces considerable competition in its chosen markets of the manufacturing sector, systems integration, and systems operations from the new combination of Cap Gemini Sogeti and Debis.

Exhibit V-46

COMBINED EDS & SD-SCICON REVENUES EUROPEAN COUNTRY ANALYSIS 1990

COUNTRY	REVENUES ($ MILLIONS) COMBINED EDS	SD-SCICON	COMBINED	PERCENT
UK	75	220	295	48
France	75	140	215*	35
Rest of Western Europe	70	40	110	17
TOTAL	**220**	**400**	**620**	**100**

* Note:

Taking into account a full year's revenues for CdFI increases this figure to approximately $265 million.

Appendices

A Systems Integration Market Forecasts in Local Currencies

Exhibit A-1

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 France

	FF Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	1620	1850	2150	2500	2850	3300	15
Professional Services	2200	2670	3270	4000	4880	5960	22
Software Products	250	300	380	510	650	830	27
Other	70	80	100	130	170	210	25
TOTAL	**4140**	**4900**	**5900**	**7140**	**8550**	**10300**	**20**

Exhibit A-2

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Germany

	DM Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	560	650	760	890	1030	1200	16
Professional Services	650	790	1000	1240	1530	1900	24
Software Products	90	110	140	180	225	280	25
Other	30	35	40	50	60	70	18
TOTAL	**1330**	**1585**	**1940**	**2360**	**2845**	**3450**	**21**

Exhibit A-3

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 United Kingdom

	£ Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	155	175	195	220	250	280	13
Professional Services	255	295	345	400	465	540	16
Software Products	30	35	43	52	62	75	20
Other	12	13	15	15	17	18	8
TOTAL	**455**	**520**	**600**	**685**	**790**	**910**	**15**

Exhibit A-4

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Italy

	Lira Billions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	135	160	185	210	250	290	17
Professional Services	190	240	300	380	480	600	26
Software Products	25	30	35	45	55	65	21
Other	10	10	13	15	17	20	15
TOTAL	**360**	**440**	**533**	**650**	**800**	**975**	**22**

Exhibit A-5

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Sweden

	SEK Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	130	145	165	185	205	230	12
Professional Services	190	225	270	325	385	460	19
Software Products	25	30	35	45	55	70	23
Other	5	5	7	8	10	10	15
TOTAL	**350**	**405**	**477**	**563**	**655**	**770**	**17**

Exhibit A-6

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Denmark

	DK Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	100	110	125	135	155	170	11
Professional Services	130	150	185	225	270	325	20
Software Products	15	20	23	30	35	45	25
Other	5	5	7	8	10	10	15
TOTAL	**250**	**285**	**340**	**400**	**470**	**550**	**17**

Exhibit A-7

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Norway

	NOK Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	100	110	125	145	165	190	14
Professional Services	140	155	185	225	265	310	17
Software Products	15	20	23	30	40	50	27
Other	5	5	7	8	10	10	15
TOTAL	**260**	**290**	**340**	**410**	**480**	**560**	**17**

Exhibit A-8

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Finland

	FM Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	30	33	37	40	45	50	11
Professional Services	40	47	55	63	73	85	16
Software Products	5	7	7	8	10	12	19
Other	-	-	-	2	2	3	
TOTAL	**75**	**87**	**100**	**113**	**130**	**150**	**15**

Exhibit A-9

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Netherlands

	Dfl Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	100	110	130	150	175	200	15
Professional Services	135	155	185	230	275	330	20
Software Products	20	25	30	40	50	60	25
Other	5	7	7	8	10	10	15
TOTAL	**260**	**297**	**352**	**428**	**510**	**600**	**18**

Exhibit A-10

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Belgium

	BF Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	1500	1700	1950	2300	2700	3150	16
Professional Services	1970	2300	2750	3350	4000	4750	19
Software Products	250	300	375	465	570	700	23
Other	120	130	145	165	180	200	11
TOTAL	**3840**	**4430**	**5220**	**6280**	**7450**	**8800**	**18**

Exhibit A-11

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Switzerland

	SF Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	42	48	57	65	77	90	16
Professional Services	50	60	70	85	100	120	19
Software Products	6	8	10	12	15	20	27
Other	2	2	3	3	5	5	20
TOTAL	**100**	**118**	**140**	**165**	**197**	**235**	**19**

Exhibit A-12

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Austria

	Sch Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	180	200	240	285	335	390	17
Professional Services	190	225	280	350	425	520	22
Software Products	25	32	40	50	63	80	26
Other	5	7	7	8	10	10	15
TOTAL	**400**	**465**	**567**	**693**	**833**	**1000**	**20**

Exhibit A-13

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Spain

	Ptas Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	3900	4500	5200	6000	6950	8000	15
Professional Services	4900	6100	7600	9400	11500	14500	24
Software Products	600	765	970	1250	1550	2000	27
Other	220	260	300	360	425	500	18
TOTAL	**9620**	**11600**	**14100**	**17000**	**20400**	**25000**	**21**

Exhibit A-14

Systems Integration Market Forecast in Local Currency by subsector, 1991-1996 Rest of Western Europe

	$ Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	10	12	13	15	17	20	15
Professional Services	9	10	13	15	18	22	20
Software Products	1	1	2	2	2	3	25
Other	-	-	-	-	-	-	-
TOTAL	**20**	**23**	**28**	**32**	**37**	**45**	**18**

B Systems Integration Market Forecasts in ECU's

Exhibit B-1

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 France

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	210	240	280	320	370	425	15
Professional Services	285	345	420	520	630	770	22
Software Products	32	40	50	65	85	105	27
Other	10	10	13	17	22	27	25
TOTAL	**535**	**635**	**760**	**920**	**1100**	**1330**	**20**

Exhibit B-2

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Germany

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	245	285	330	390	450	520	16
Professional Services	285	345	435	540	665	825	24
Software Products	40	48	60	80	100	120	25
Other	13	15	17	22	25	30	18
TOTAL	**580**	**690**	**840**	**1030**	**1240**	**1500**	**21**

Exhibit B-3

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 United Kingdom

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	220	260	275	310	350	400	13
Professional Services	360	420	490	570	660	770	16
Software Products	43	50	60	75	88	110	20
Other	17	18	20	20	25	25	8
TOTAL	**640**	**740**	**845**	**975**	**1,120**	**1,300**	**15**

Exhibit B-4

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Italy

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	80	95	110	125	150	170	17
Professional Services	110	140	180	225	285	355	26
Software Products	15	18	20	27	33	38	21
Other	5	5	8	10	10	12	15
TOTAL	**210**	**260**	**315**	**385**	**475**	**575**	**22**

Exhibit B-5

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Sweden

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	17	20	20	25	27	30	12
Professional Services	25	30	35	42	50	60	19
Software Products	3	5	5	5	7	10	23
Other	-	-	-	-	-	-	15
TOTAL	**35**	**45**	**53**	**62**	**73**	**100**	**17**

Exhibit B-6

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Denmark

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	12	13	15	15	18	20	11
Professional Services	15	17	20	25	30	37	20
Software Products	2	2	3	3	3	5	25
Other	-	-	-	-	-	-	15
TOTAL	**30**	**33**	**40**	**45**	**55**	**63**	**17**

Exhibit B-7

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Norway

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	12	13	15	15	18	20	14
Professional Services	15	17	20	25	30	35	17
Software Products	2	2	3	3	5	5	27
Other	-	-	-	-	-	-	15
TOTAL	**30**	**33**	**38**	**45**	**55**	**63**	**17**

Exhibit B-8

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Finland

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	5	5	7	7	8	10	11
Professional Services	7	10	10	12	13	15	16
Software Products	-	-	-	-	2	2	19
Other	-	-	-	-	-	2	-
TOTAL	**13**	**15**	**18**	**20**	**25**	**28**	**15**

Exhibit B-9

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Netherlands

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	43	47	55	65	75	85	15
Professional Services	58	67	80	100	120	140	20
Software Products	10	10	13	17	22	25	25
Other	2	3	3	3	5	5	15
TOTAL	**110**	**130**	**150**	**185**	**220**	**260**	**18**

Exhibit B-10

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Belgium

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	32	35	40	50	57	65	16
Professional Services	42	50	58	70	85	100	19
Software Products	5	7	8	10	12	15	23
Other	3	3	3	3	5	5	11
TOTAL	**80**	**93**	**110**	**132**	**157**	**185**	**18**

Exhibit B-11

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Switzerland

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	25	28	33	37	45	52	16
Professional Services	30	35	40	50	57	70	19
Software Products	3	5	5	7	8	10	27
Other	-	-	2	2	3	3	20
TOTAL	**57**	**68**	**80**	**95**	**113**	**135**	**19**

Exhibit B-12

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Austria

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	10	12	15	18	20	25	17
Professional Services	12	15	17	22	25	32	22
Software Products	2	2	2	3	5	5	26
Other	-	-	-	-	2	2	15
TOTAL	**25**	**29**	**35**	**43**	**52**	**62**	**20**

Exhibit B-13

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Spain

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	30	35	40	45	53	60	15
Professional Services	38	47	58	72	88	110	24
Software Products	5	5	7	10	12	15	27
Other	2	2	2	3	3	5	18
TOTAL	**75**	**90**	**110**	**130**	**155**	**190**	**21**

Exhibit B-14

Systems Integration Market Forecast in ECU's by subsector, 1991-1996 Rest of Europe

	ECU Millions						
Subsector	1991	1992	1993	1994	1995	1996	1991-1996 CAGR (%)
Equipment	7	8	10	10	12	15	15
Professional Services	7	7	8	10	13	15	20
Software Products	1	1	1	1	1	2	25
Other	-	-	-	-	-	-	-
TOTAL	**15**	**17**	**20**	**23**	**27**	**33**	**18**

C Reconciliation

The reconciliation of the market forecasts between 1990 and 1991 is shown in Exhibit C-1. The bulk of the variation between the 1990 market estimates made in 1990 and 1991 arises from the differing exchange rates used (+12%).

The growth forecasts over the period from 1991 to 1996 have also been revised sharply downwards. Two percent of this reduction is accounted for by the differing inflation assumptions used, but real growth has also been revised downwards reflecting the more difficult economic trading conditions across much of Europe.

The relative growth of the sub-sectors within systems integration has also been modified to reflect the growing importance of standard software products rather than custom software development.

	1990 Market			1995 Market				
Sub Sector	1990 Report $M	1991 Report $M	Variance %	1990 Report $M	1991 Report $M	Variance %	1990-1995 CAGR Forecast in 1990	1991-1996 CAGR Forecast in 1991
Systems Equipment	1,000	1,130	+13	2,625	2,260	-14	21	15
Professional Equipment	1,265	1,430	+13	4,375	3,770	-14	28	21
Software Products	155	185	+19	490	515	+5	26	24
Other Services	70	75	+7	160	145	-9	18	17
TOTAL	**2,490**	**2,800**	**+12**	**7,650**	**6,700**	**-12**	**25**	**19**