

SYSTEMS INTEGRATION VENDOR ANALYSIS

EUROPE 1992

INPUT

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Abstract

The Systems integration market has become the background for control of the information services market. The principal participants in this struggle for the positions of business adviser and prime contractor of information systems to the user community are the professional services vendors and the equipment vendors, though the PTTs also show ambitions in this area.

This report identifies the objectives and analyses the strategies of fifteen key vendors to the European systems integration market. The vendors analysed include leading systems vendors, professional services vendors, subsidiaries of PTTs, and management consultancies.



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Table of Contents

I	Introduction	I-1
	A. Purpose	I-1
	B. Scope and Methodology	I-1
	C. Report Structure	I-2
	D. Related Reports	I-2
II	Executive Overview	II-1
	A. Competition Between Professional Services Vendors and Systems Vendors Intensifies	II-1
	1. Building Management Consulting Capabilities	II-1
	2. Establishing Pan-European Capability	II-2
	3. Increased Industry Focus	II-3
	4. Developing Skills of Account Managers	II-3
	B. IBM and Cap Gemini Sogeti—Well Positioned for Future	II-3
III	Vendor Profiles	III-1
	A. Andersen Consulting—Combining Processes, People and Technology	III-1
	B. BT Customer Systems—Becoming a Global Leader in Systems Integration	III-4
	1. Targeting Communications Intensive Activities	III-5
	2. Development of Its Corporate Image	III-7
	3. Forming Partnerships	III-7
	C. Cap Gemini Sogeti—Targeting Transnational Projects	III-7
	1. Organization into Strategic Business Areas	III-8
	2. Each SBA Assigned Global Responsibilities	III-9
	3. Introduction of International Accounts Programme	III-9
	D. Coopers & Lybrand—Anticipating Growth in Business Process Re-engineering	III-10
	1. Targeting Times 500	III-10
	2. Offering BreakPoint BPR	III-11
	3. Retaining Their Independence	III-13

Table of Contents (Continued)

III

E.	CSC—Major Emphasis on Business Re-engineering	III-14
	1. Concentrating on the Desired Future	III-14
	2. Aggressive Exploitation of Technology	III-16
	3. An Interactive Approach to System Design	III-17
F.	Data Sciences Aims to Become a European Leader in Systems Integration	III-19
	1. Expanding its Activities in Civil Government and Finance	III-20
	2. Major Systems Integration Projects, Data Sciences	III-22
	3. Expansion of Geographic Coverage	III-23
	4. Strengthened Partnerships with Equipment Vendors	III-24
G.	Digital—In-depth Industry Targeting	III-24
	1. Systems Integration Becomes the Key to Large Accounts	III-24
	2. Digital is now Targeting 25 Industry Sectors	III-26
	3. Clients Must View Digital as a Key Service Provider	III-29
H.	EDS Aims to Close the “Impact Gap”	III-31
	1. Increased Emphasis on Front-End Activities	III-31
	2. Offering Co-Investment with Clients	III-35
	3. Adopting Transnational Positioning	III-35
I.	Gemini Consulting—Seamless Delivery of Business Transformation	III-36
	1. The Vision of Business Transformation	III-37
	2. Formation as a Separate Entity	III-38
	3. Developing Close Relationships with Cap Gemini Sogeti	III-38
J.	Groupe Bull—A Co-existing Services and Technology Company	III-39
	1. Market Evolution	III-40
	2. Groupe Bull’s Integration Strengths	III-40
	3. Organising for Systems Integration	III-42
	4. Partnership Management	III-43
	5. Typical SI Projects	III-44
	6. Business Objectives	III-45
K.	Hewlett-Packard Develops its Systems Integration Activities to Support its Computer Systems Business	III-45
	1. World-Class Open Systems Professional Services Provider	III-46
	2. Providing Solutions for the Manufacturing and Telecommunications Sectors	III-47
	3. Focusing on Technology Integration	III-49

Table of Contents (Continued)

III

L.	ICL—New Organisation Structure for Increased Emphasis on Services	III-49
1.	Formation of Associated Services Division and Subsequently ICL Enterprises	III-50
2.	Aggressive Partnering and Acquisitions Programme	III-53
3.	Setting Service Revenue Targets	III-54
M.	KPMG Norton Nolan—Formed Strategic Business Management Unit to Address Business Process Re-engineering	III-54
N.	Logica—Concentrating on Long-Term Partnership	III-57
1.	Strong Presence in the Finance Sector	III-57
2.	Highly Developed Technical Skills	III-58
3.	Space	III-58
4.	Telecommunications	III-59
5.	Energy & Utilities	III-59
6.	Defence	III-60
7.	High R&D Commitment	III-60
8.	Emphasis on Long-term Partnerships	III-62
O.	Unisys—Aiming to Become Services Company with Strong Technological Skills	III-63
1.	Repositioning its Service Offerings	III-63
2.	Partnerships for Strategic Consultancy Services	III-64
3.	Changing Skill Mix	III-65

Exhibits

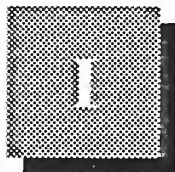
I	-1 Products/Services in Systems Integration Projects	I-3
II	-1 Vendor Positioning (1)	II-4
	-2 Vendor Positioning (2)	II-4
	-3 Vendor Positioning (3)	II-5
	-4 Vendor Positioning (4)	II-5
III	A-1 Andersen Consulting—U.K.	III-2
	B-1 Typical Projects BT Customer Systems	III-5
	C-1 Strategic Business Areas (SBAs)	III-8
	D-1 Coopers & Lybrand Consulting Division	III-11
	D-2 Examples of Business Process Re-engineering Projects	III-13
	E-1 CSC European Structure/Value Chain—“Making IT Happen”	III-15
	E-2 CSC’s Service Offerings	III-16
	E-3 Vision and Strategy Stage	III-17
	E-4 Business and Systems Design, Development and Integration	III-18
	F-1 Divisional Organization Chart—Data Sciences	III-20
	F-2 Data Sciences’ Key Markets—Systems Integration, Europe	III-21
	F-3 Major Systems Integration Projects—Data Sciences	III-22
	F-4 Principal Applications Software Products—Data Sciences, Banking and Finance	III-23
	G-1 Digital’s View of the Marketplace Degree of Customisation	III-25
	G-2 Digital: Business Strategy	III-26
	G-3 Digital Enterprise Integration Services Organisation	III-27
	G-4 European Integration Centres	III-28
	G-5 Systems Integration Centres—United Kingdom	III-28
	H-1 Business Integration Continuum	III-32
	H-2 EDS Scicon, Revenue by Service Type	III-33
	H-3 EDS: Business Information Planning	III-34
	I-1 Constituents of Gemini Consulting	III-37
	J-1 Systems Integration Market Drivers	III-40
	J-2 Groupe Bull Integration Strengths	III-41
	J-3 Groupe Bull’s Market Penetration	III-41

Exhibits (Continued)

III

J-4	Role of the Systems Integration Group	III-43
J-5	Typical Groupe Bull Partnerships	III-44
J-6	Typical Groupe Bull SI Projects	III-45
K-1	Organisation Chart—Hewlett-Packard, Customer Support Division	III-47
K-2	Current Partnerships—Hewlett-Packard	III-48
K-3	Example of Projects—Hewlett-Packard, Systems Integration	III-48
L-1	ICL Group—Organisation Structure	III-50
L-2	ICL (U.K.)—Organisation Structure	III-51
L-3	Examples of Projects	III-52
L-4	Recent Acquisitions	III-53
N-1	Logica (U.K.)—Organisation Structure	III-57

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Introduction

A

Purpose

The purpose of this report is to analyse the strategies of 15 vendors operating in the European systems integration market—in the light of current industry trends.

B

Scope and Methodology

This report concentrates specifically on vendors' systems integration activities. In particular, it identifies each vendor's objectives and strategies in the SI market.

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility for the delivery of the specified system function.

As listed in Exhibit I-1, the components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.
- *Software products* - prepackaged applications and systems software products.
- *Professional services* - the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all the professional services activities required to develop, implement, and operate an information system—including consulting, programme/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance.
- *Other Services* - most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

This report is based on interviews with fifteen systems integration vendors.

C

Report Structure

Chapter II is the Executive Overview. It outlines the major trends in the systems integration market and positions some of the leading vendors against the critical success factors in this market.

Chapter III contains the vendor profiles, indicating the approaches of these 15 vendors to the European systems integration market.

D

Related Reports

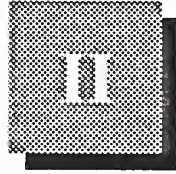
- *Systems Integration Markets, Europe, 1992-1997*
- *Systems Integration Opportunities in Re-engineering, Europe, 1992*
- *Impact of Downsizing on Systems Integration, Europe, 1992-1997*
- *Methods for Successful Systems Integration Projects, Europe, 1992*

EXHIBIT I-1

Product/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
 - Programme/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

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Executive Overview

A

Competition Between Professional Services Vendors and Systems Vendors Intensifies

Over the past year, the battle between the systems vendors and the professional services vendors for leadership of the systems integration market has intensified. The systems vendors have gained market share by separating their organisations into product and service delivery units.

Both groups of vendors want to become the principal prime contractors for the major IS projects carried out within their clients. To achieve this role, vendors are:

- Building up their management consultancy capabilities
- Establishing themselves widely across Europe
- Offering a greater industry-specific emphasis
- Developing the skills of their account managers

1. Building Management Consulting Capabilities

Senior executives are taking high levels of control over the identification and approval of major systems development projects. Accordingly, they are becoming the key decision makers in the selection of systems integration vendors. As a result, decision criteria are becoming more business-oriented and less technically-oriented. This has worked to the advantage of vendors such as Andersen Consulting, who has successfully combined management consultancy and IS development capability to achieve above average growth over the past five years.

This approach is emphasised by senior executives' disillusionment with the former contribution of information systems to their business. Senior executives expect IS to demonstrate its contribution to the organisation's competitive positioning. Hence, there is a need for vendors:

- To demonstrate business understanding
- To contribute to the redesign of business processes
- To assist in change management
- To develop information systems that can facilitate these redesigned processes

In response, many of the leading vendors are either developing in-house management consultancy capability or seeking alliances with suitable partners.

Some examples include:

- Cap Gemini Sogeti's formation of Gemini Consulting with approximately 600 European management consultants
- CSC's acquisition of Index
- Digital's development of an in-house capability of 100 European consultants
- EDS' development of a Strategic Business Consulting Group with 30 European consultants

2. Establishing Pan-European Capability

One of the major strengths of the leading systems vendors is their strong coverage across Europe. Typically, the professional services vendors have had a lesser pan-European influence, as have the indigenous systems vendors.

However, with the advent of the single market in 1993, many European organisations are building their market share across Europe. In addition, the major targets for business process re-engineering services are the major multinational companies. Although the majority of systems integration projects are confined to a single country, there are many projects that cross national boundaries.

Many of the leading systems integration vendors in Europe are coordinating their offerings between countries. For example, Digital is establishing European systems integration centres specialising in particular industries. Cap Gemini Sogeti has organised the group into seven strategic business areas, each of which has been allocated global responsibility for one or more sectors.

3. Increased Industry Focus

The most important factor in targeting the systems integration market is in-depth industry expertise. This covers business knowledge of the sector and application software products to facilitate systems development.

Vendors need to target clients at a detailed industry sector level. Though many vendors still target five or six industry sectors, Digital is focusing its account managers at a detailed level by re-organising the company into more than 20 industry facing units. Whereas the company does not have an in-depth capability across each of these sectors, Digital will continue to strengthen its industry expertise, setting a challenge that other vendors will be forced to follow.

4. Developing Skills of Account Managers

The other major challenge for vendors operating in the European systems integration market is the need to modify the role of their account managers. In the past, account managers have frequently adopted a strong “product pushing” role and have operated at a technical level.

For vendors to succeed in the European systems integration market in the future their account managers must:

- Work closely with the client’s senior executives
- Become business advisers not product salespersons
- Strengthen their consultative selling skills
- Take on a role of account coordinator rather than sole sales point

Cap Gemini Sogeti’s response to this challenge has been to introduce an international accounts programme. This requires 12 senior members of the group to develop board-level contacts with approximately 30 key multinational companies.

B

IBM and Cap Gemini Sogeti—Well Positioned for Future

Ten critical success factors in the system integration market are:

- Pan-European capability
- Account management skills
- Industry knowledge and coverage
- Access to industry-specific application “building blocks”
- Project management and systems development capability
- Access to advanced technology
- Business process re-engineering capability
- Outsourcing capability

The level of capability of each of a number of systems integrator vendors against these criteria are assessed in Exhibits II-1 to II-4.

EXHIBIT II-1

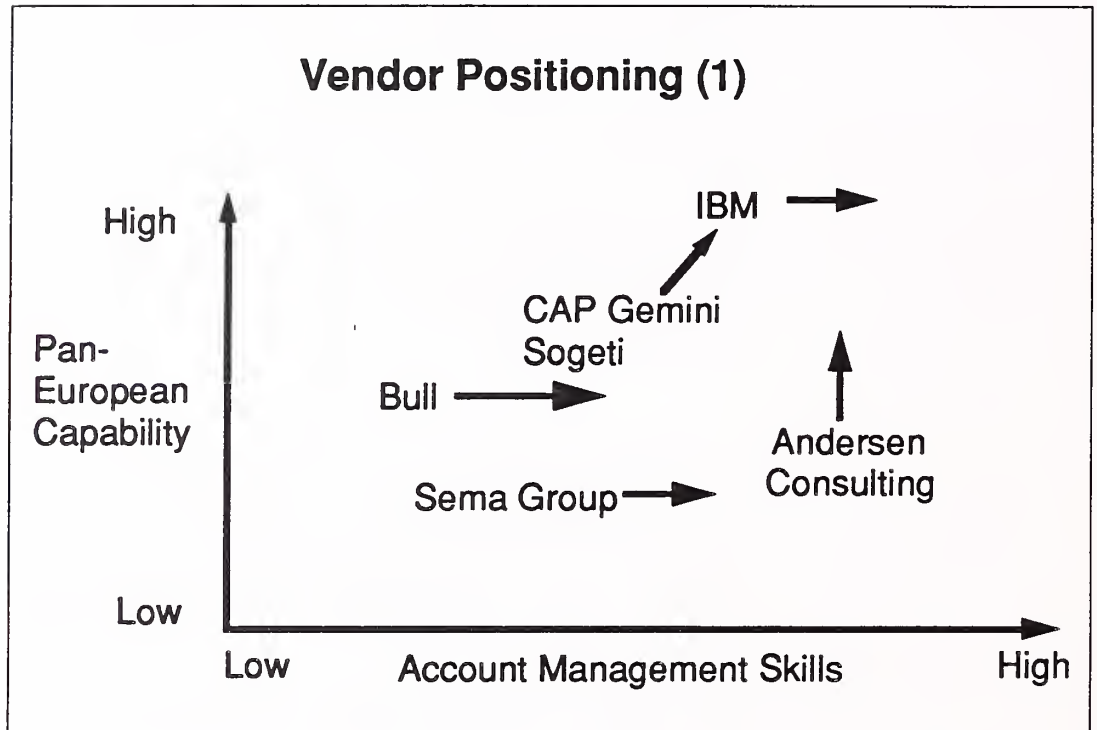


EXHIBIT II-2

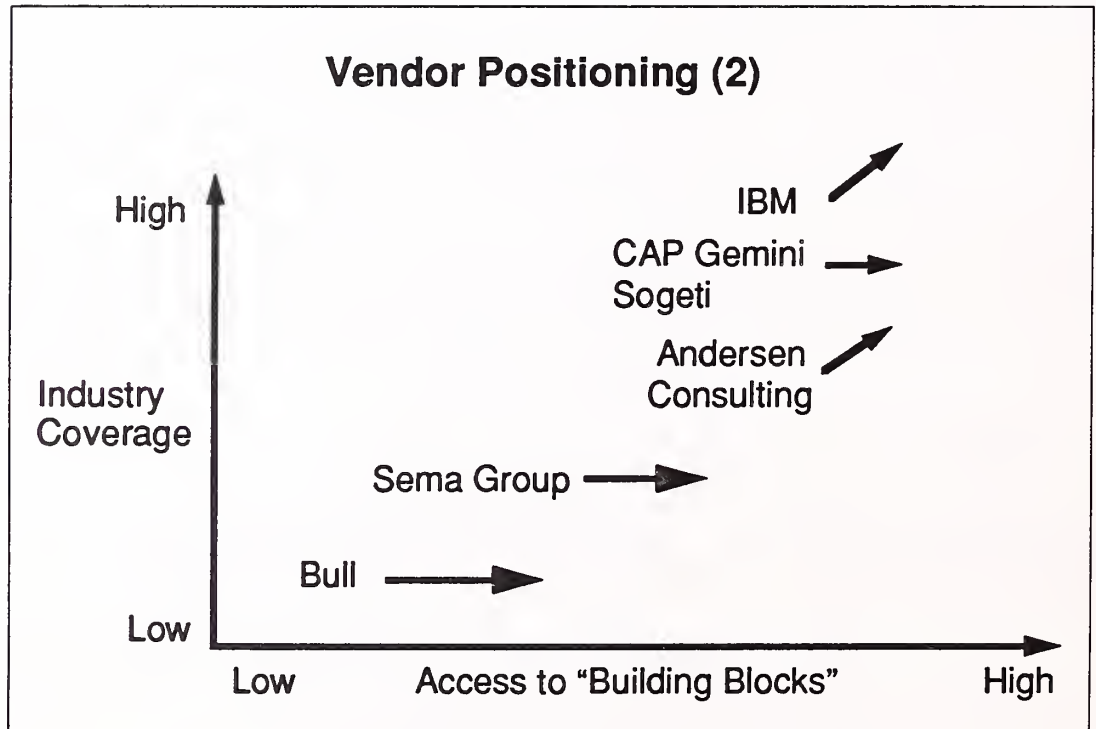


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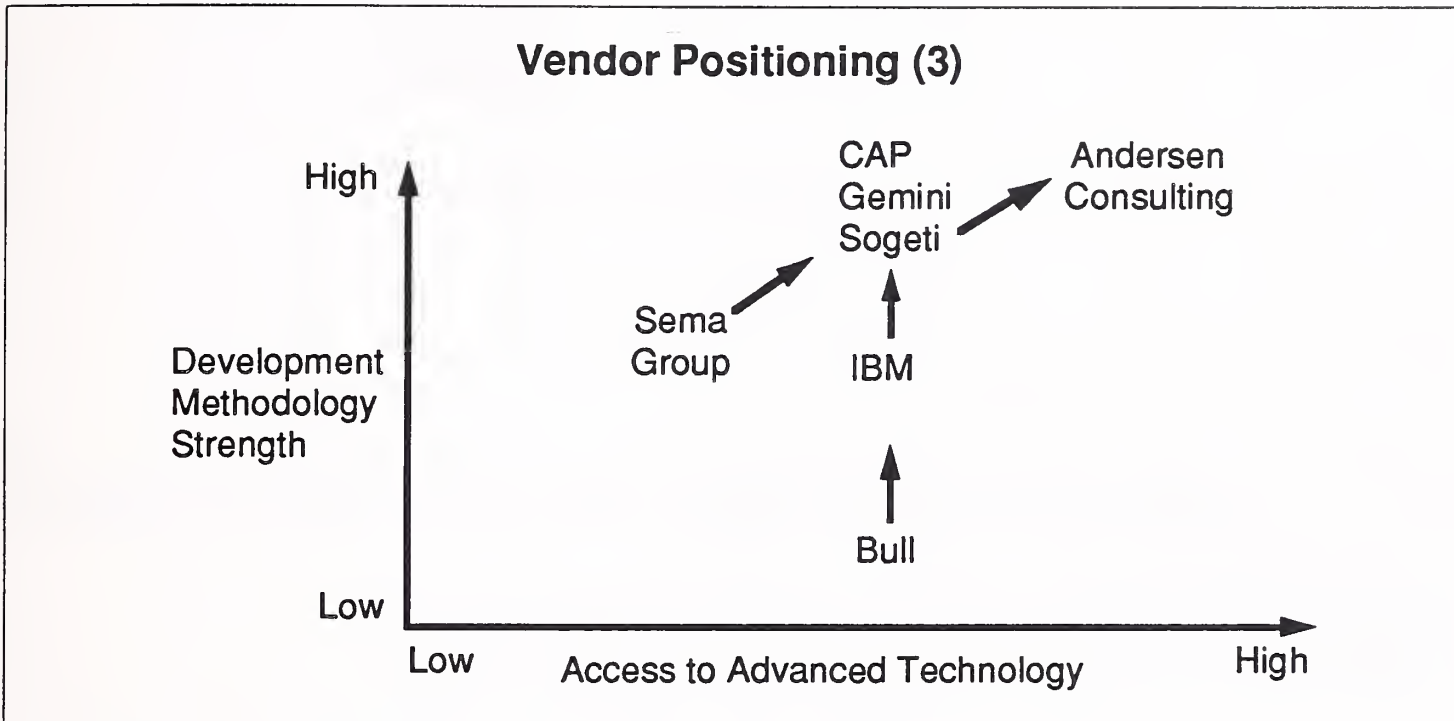
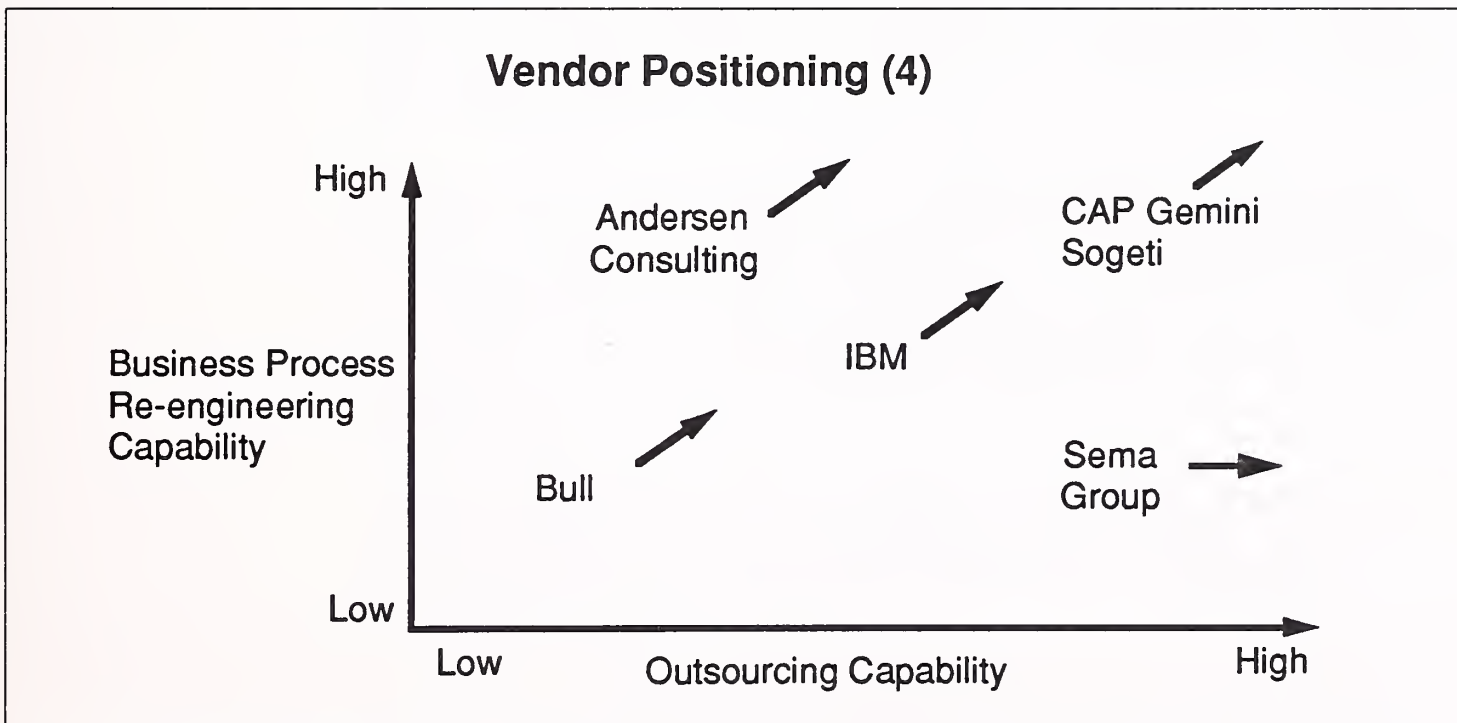
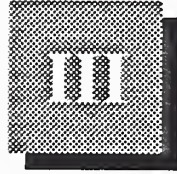


EXHIBIT II-4



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Vendor Profiles

A

Andersen Consulting—Combining Processes, People and Technology

Andersen Consulting has achieved growth rates in Europe in excess of 30% for a number of years and is one of the market leaders in the systems integration market. This success has been achieved by a tight integration of business consulting and IS expertise.

Whereas business process re-engineering is a comparatively recent concept in Europe, Andersen Consulting has for the last five years held the objective of being “the pre-eminent provider to top organisations of end-to-end business process solutions and the leading information technology that supports them”.

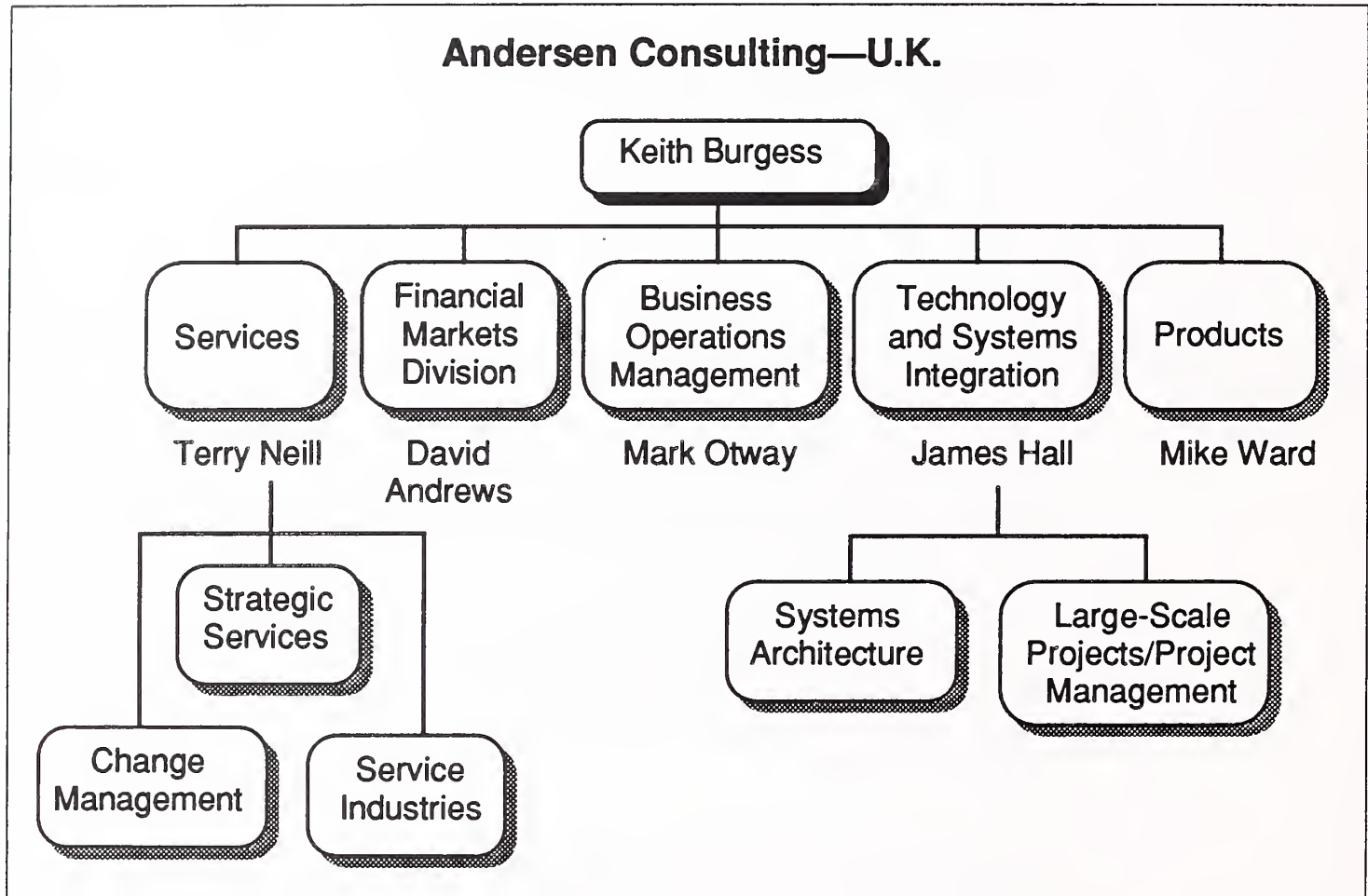
Over the past five years or more, Andersen Consulting has successfully differentiated itself from the leading systems vendors and professional services companies by offering a business-oriented, rather than a technical approach, to senior executives. Senior executives, outside the internal IS department, tend to be the key decision makers for large projects, particularly when these involve a substantial element of business process re-engineering.

The challenge for Andersen Consulting over the next few years is to maintain this differentiation as the leading systems vendors and professional services vendors endeavour to develop their own management consulting capabilities.

However, Andersen Consulting remains comparatively unique in that it has developed an organisational structure that highly integrates its management consulting and systems development activities, yet retains an aura of independence. The leading systems vendors face the issue of persuading clients about the independence of their management consulting teams. On the other hand, for example, Gemini Consulting has been established as an “independent” subsidiary and faces the challenge of re-integrating its activities with those of Cap Gemini Sogeti.

Andersen Consulting's organisation structure in the United Kingdom is shown in Exhibit A-1.

EXHIBIT A-1



Andersen Consulting utilises resources from each of these units as required to support business process re-engineering projects. All partners sell for the company. A team approach is often adopted in which a small number of partners work together on one client, usually a 'client partner' or an 'Account Executive'. For example, in the case of National Power there are three partners involved: the systems integrator, the industry partner and a strategy partner.

Within business process re-engineering projects, there is typically a high level of interaction between the Services division and the Technology and Systems Integration division. Business process re-engineering projects usually involve:

- Strategic business planning
- Change management that includes organisation planning, design and development, and training

- Systems building, integration and management
- Operational consultancy work to deliver a one-off or continuing service

Andersen Consulting prefers the term business integration to business process engineering. The organisation defines business integration as the process of aligning the organisation, people, systems and technology with the business strategy.

Andersen believe that IS is not necessarily the driving force behind business integration, but it is often a catalyst. The 1990s was the decade of the customer, which caused an increased focus on the customers of Andersen's clients. Due to the recession, there has been greater emphasis on saving costs and seeking radical change to achieve major improvements in the operating performance of an organisation. Furthermore, the drive from government for privatisation has had a significant impact.

Work station-based client/server systems enable integration technologies as are document image processing for the improvement of office systems.

Andersen Consulting believes that business integration impacts the typical in-house IS department significantly. Organisations seek a 'lean and mean' approach to IS and wish to rundown the IS activity by building running operational systems and hand over the maintenance to third parties. Often, IS departments are not geared up for this because two sets of skills are required:

- The psychology of seeking continuous improvement and service
- Projects that will lead to a step change in the effectiveness of the organisation

These, coupled with the need to be in close contact with the chief executive, have left many IS departments isolated and unable to respond. All too often the IS department is a group of expensive technical staff who are not relating well to the business needs of the organisation.

Andersen targets *The Times* Top 200 in the following sectors:

- Public sector
- Asset finance
- Oil, insurance and banking
- Aerospace and defence
- Consumer products

Sales efforts are directed toward the chief executive officer of the organisation.

In the U.K., Andersen Consulting estimates that it has between 15 and 20 business integration clients. Example contracts include the following:

- Thames Water - where Andersen has been involved from the top level planning, through systems building, organisation design and training (including CBT) and the systems management of the previous system. The aim of the exercise was to provide Thames Water's 11 million customers with a single point of contact at its new customer services centre at Swindon. At the heart of this system is the CUSTOMER/1 system, but prior to that a whole change management programme was devised. The whole project generated in excess of \$20 million in fees for Andersen Consulting.
- National Power - where, following privatisation, a multidisciplinary team has designed a leading technical infrastructure into the basic fabric of the organisation and culture. In two years an IS strategy has been put in place, a common computing and communications infrastructure has been installed throughout the company, and the delivery of critical operational and business applications has begun. These include such systems as:
 - Procurement
 - Financial general ledger
 - Accounts payable
 - Property services
 - Energy trading
 - Operational information system
 - Work management
 - Executive information system

The ultimate aim is to provide a competitive edge in the newly structured power industry. The fee value of this business integration project is approximately \$20 million over two to three years.

B

BT Customer Systems—Becoming a Global Leader in Systems Integration

BT Customer Systems with total revenues of approximately £200 million in 1991 has been described as the largest U.K.-owned supplier of computing services. The company, formed from a large number of individual BT profit centres in 1990, is particularly active in the systems integration market. Throughout its existence, BT Customer Systems has emphasised its desire to be the prime contractor for large, complex projects.

BT Customer Systems now intends to develop into an international business and become one of the leading five vendors in its chosen markets within five years.

Despite its apparent size, BT Customer Systems has considerable scope to develop its presence in the systems integration market. Roughly one-third of the company's revenues is derived from captive business and over half of the remainder comes from the company's strong position in the public sector. The company's activities are also strongly concentrated in the United Kingdom.

BT Customer Systems' objectives are being addressed by:

- Adopting a strong market focus
- Changing its image
- Forming appropriate partnerships

1. Targeting Communications Intensive Activities

Exhibit B-1 provides a number of examples of projects undertaken by BT Customer Systems.

These projects reflect BT Customer System's advanced network integration capabilities. Historically, the majority of the company's projects have been network integration projects.

EXHIBIT B-1

Typical Projects BT Customer Systems

Client	Nature of Project
ICI	Global Communications infrastructure
BP	Emergency control centre
Mercantile Credit	Network integration between credit reference agency, mainframe, and dealer workstations
Department of Social Security	Strategy Terminal Systems programme
HM Customs & Excise	Customs handling of import and export freight
Digital	Telemarketing system

The company's current market foci also reflect its targeting of communications intensive applications. These foci are:

- Solutions related to the interfaces between enterprises, their customers, and their partners, for example:
 - Voice response systems
 - EDI
 - Telemarketing
- Systems that support new organisational structures or cultures, for example:
 - Teleworking systems
 - Corporate messaging/office automation systems
 - Change management consultancy
- Systems that assist enterprises in delivering service to their customers, for example:
 - Document image processing
 - Home banking systems
 - Retailing systems

The principal industries being targeted by BT Customer Systems are:

- Banking and finance
- Government—civil and defence
- Transportation
- Manufacturing

The company has its own products for the banking sector. These are packaged under the identities Integrated Trading Systems (ITS) and Open Trading Systems (OTS). ITS encompasses switches and dealer boards, whereas OTS provides distribution of data in video or digital form. BT Customer Systems has also developed an advanced cargo processing system for use by airlines, freight forwarders, and customs authorities.

BT Customer Systems views coordination between elements of the "extended enterprise" as a major opportunity within the manufacturing sector. Overall, BT Customer Systems should be favoured by the adoption of client/server architectures, necessitating a greater communications emphasis.

2. Development of Its Corporate Image

So far, BT Customer Systems has adopted a comparatively low profile in the systems integration market. However, this is going to change. One of the first steps will be a change in company name to reflect the company's market positioning more accurately.

BT Customer Systems will also expand its business skills by building on its depth of technical expertise to offer business process re-engineering and change management capability. The company perceives that these skills are vital to ensure that its clients realise the benefits from new information systems. As the skill mix changes, so BT Customer Systems may begin to subcontract skills of low-perceived value to the customer, allowing the company to concentrate on delivering improved business processes to its clients.

3. Forming Partnerships

Though BT Customer Systems intends to develop its own skills in business process re-engineering and change management, it may need to use partners to supplement its own skills in these areas in the short term. Other areas where the company will need partners are in developing its global market coverage and in obtaining access to advanced technology.

BT already has office locations worldwide and BT Customer Systems will deploy its own personnel within this infrastructure. However, the company will also speed up this process by means of acquisitions should suitable companies become available.

BT Customer Systems has expertise in telemarketing and image processing. In these areas, the company has developed relationships with a number of suppliers to gain access to a range of products, ensuring that BT Customer Systems does not become tied to a specific platform.

C

Cap Gemini Sogeti—Targeting Transnational Projects

Cap Gemini Sogeti claims to have left its body-shopping image far behind and states that 40% of the company's revenues—FF 4 billion—are now derived from its systems integration activity. Certainly, the company has now reached a critical mass in each of the major European software and services markets that include:

- France
- Germany
- United Kingdom

- Italy
- the Netherlands
- Sweden

However, although Cap Gemini Sogeti believes it can satisfy 80% of market demand by operating on a national basis, the remaining 20% of the market requires a transnational approach.

Cap Gemini Sogeti's response to this opportunity has been a major group restructuring that:

- Organizes the company into seven strategic business areas (SBAs)
- Allocates each SBA an area of global responsibility
- Introduces an international accounts programme

1. Organization into Strategic Business Areas

Though Cap Gemini Sogeti's SBAs appear to be organized along strictly geographic lines, each SBA also has a global responsibility. These global responsibilities are for either a specific industry sector or for a particular service line. Some examples of the specialisms assigned to individual SBAs are listed in Exhibit C-1.

EXHIBIT C-1

Strategic Business Areas (SBAs)	
Location of SBA	Specialism
Paris	Telecommunications
London	Financial services
Germany	Manufacturing
Benelux	Distribution
U.S.	Oil and chemicals

For example, the Paris SBA is responsible for developing Cap Gemini Sogeti's market share with telecommunications companies whereas the German SBA is responsible for developing Cap Gemini Sogeti's global presence in the manufacturing sector.

2. Each SBA Assigned Global Responsibilities

Each SBA has responsibility within its own target sector for:

- Replicating expertise across countries
- Taking advantage of high growth opportunities
- Targeting multinational organizations

In addition to their focus on a particular industry, SBAs may have a service line responsibility. For example, Hoskyns has responsibility for developing the group's outsourcing expertise, and debis Systemhaus is a specialist in the provision of low-cost platform operations.

Each SBA will typically be organized into five to seven divisions. In addition to these divisions, each SBA will have a number of Market Development Units (MDUs) and Skill Centres. These MDUs will specialize by industry subsector and will be staffed by senior sales personnel and high-calibre consultants who will take responsibility for the SBA's major clients. These personnel are expected to have a good understanding of their subsector and will form alliances with other vendors, particularly application software product vendors.

Skill Centres will house the organizations specialist technical skills such as artificial intelligence and imaging. Within Cap Gemini Sogeti's new organization, responsibility for the application of new technologies will be devolved from Cap Gemini Innovation into the SBAs.

3. Introduction of International Accounts Programme

Having put in place a strategy and organization to deliver transnational services, Cap Gemini Sogeti has commenced an international accounts programme to sell its transnational capabilities.

Currently, Cap Gemini Sogeti is targeting approximately 30 multinational organizations. Senior members of Cap Gemini Sogeti are each assigned two named accounts on a worldwide basis and are expected to develop a board-level, transnational approach for the development of each account.

It is likely that these accounts will also be independently targeted by Gemini Consulting. Overall, Cap Gemini Sogeti is endeavouring to develop a business-oriented, rather than a technically-oriented, approach to each of these accounts at a senior level.

D**Coopers & Lybrand—Anticipating Growth in Business Process Re-engineering**

At present, many senior executives in Europe are disillusioned with the contribution that information systems have made to their business. Companies are frequently presented with soaring IS budgets, but little evidence that use of information systems has contributed to improve their competitive positioning. This has led to demands for improvement in IS effectiveness combined with lower IS spending.

It also increases the influence of management consulting organisations. Users frequently have little faith in the business knowledge and understanding of their in-house IS departments and are turning to external vendors that possess these skills.

Management Consultancies such as Coopers & Lybrand (C&L) are taking advantage of this trend, and the resulting demand for business process re-engineering by:

- Targeting the equivalent of Times 500 companies
- Offering a branded service—Breakpoint BPR
- Retaining their independence from other vendors

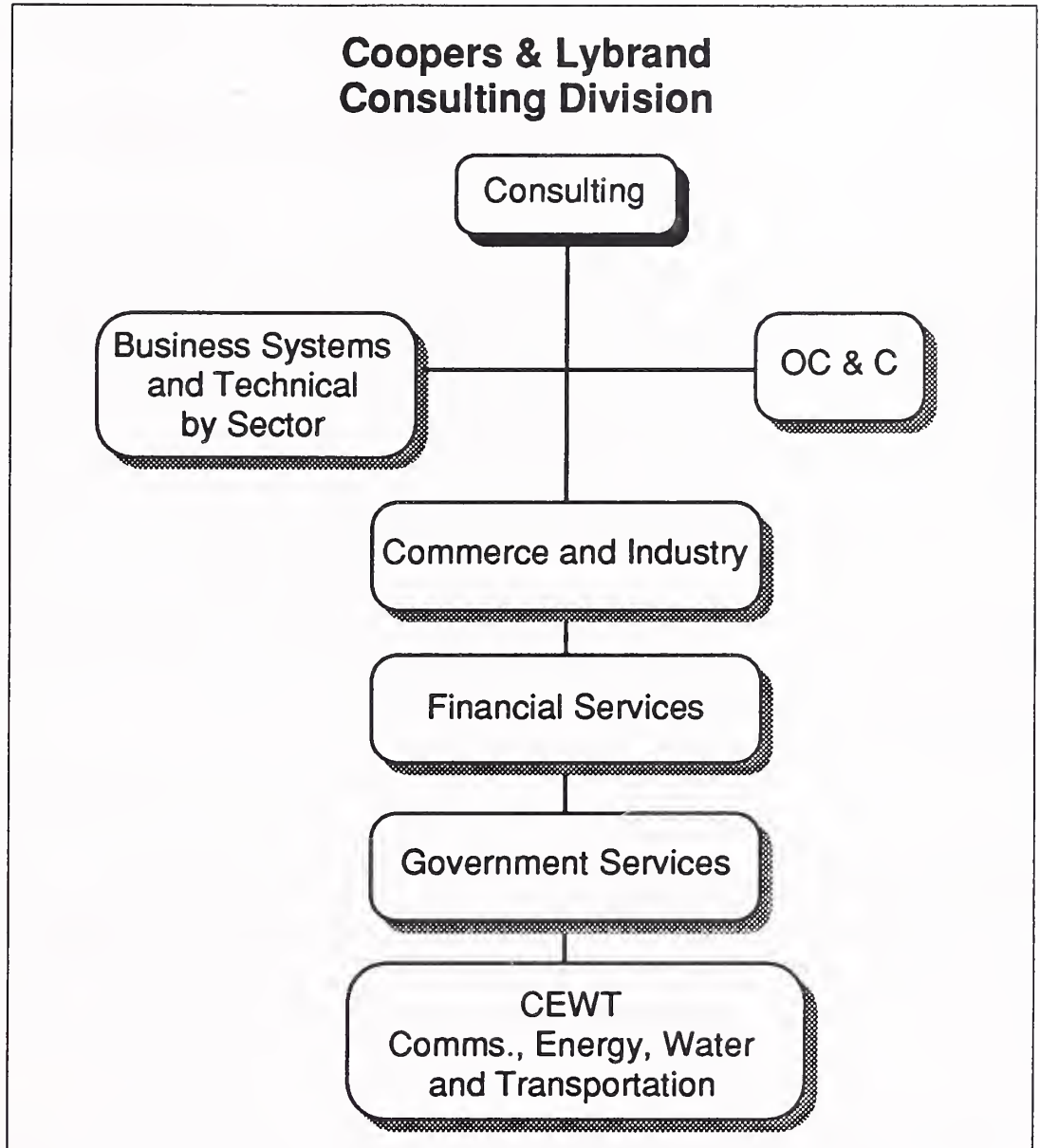
1. Targeting Times 500

C&L is structured into five main areas of Consulting, Accounts and Audit, Tax, Corporate Finance and Insolvency. Consulting is structured as shown in Exhibit D-1.

Within each of the 4 main areas of consulting there are multidisciplinary teams from human resources, accounts, information systems, engineering, logistics and marketing. In the U.K., these comprise 450 staff in total of whom 70-100 are sufficiently senior enough to discuss such topics as business process re-engineering (BPR). Though BPR activities started within the commercial and industrial sector, it has expanded its sphere of activity to the other 3 areas.

C&L directs its activities towards the Times 500 organisations in the U.K. and while it does not see limits as far as the business application of technology is concerned, it does tend to be more active within commerce and industry and the CEWT division. Sales activities are almost always directed to the chief executive, although sometimes to a budget holding departmental senior manager, but the contact initially is never the in-house IS management.

EXHIBIT D-1



2. Offering BreakPoint BPR

C&L defines business process re-engineering as a means of achieving radical improvement in performance and business competitiveness through identifying core business processes. It is essential to be selective, that is, to select only one or two processes that will give the greatest return, as perceived by the customer, otherwise the changes may be too great for an organisation to absorb. C&L stresses that BPR is not simply about gaining better performance from an organisation's IS systems.

C&L's prime offering is BreakPoint BPR, which has 4 main components:

- Core process definition
- BreakPoint identification
- Process re-design
- Change management

Other related services that may lead to the use of BPR services include:

- Total quality management
- Activity based management (including activity based costing)
- Time based management

C&L believes that one of the key driving forces is the increased complexity and sophistication of the buying public. Customers are becoming increasingly demanding in what they are seeking from their suppliers, including cost, quality, levels of service and responsiveness, time between order and delivery. Furthermore, companies are attempting to meet these demands while keeping up with technological advances, meeting the demands of the work force (for example, the wish to have a more balanced lifestyle rather than be disrupted by company postings, long hours etc.), adapting to social and legislative change and providing shareholders with acceptable demands on their investment. These, together with the recession, mean that more companies wish to re-evaluate what the customer really wants and values; they wish to check themselves against industry or service benchmarks and are open to consider a major change in how they conduct their business.

A functional view of a business may well be useful for the incumbent management to maintain control, but this can lead to functional 'silos' causing barriers to meet key customer requirements. C&L believes that improvements to those things, which customers perceive as high in value, can only be achieved by looking *across* the company from the customers' point of view (rather than the business function's point of view). This enables the core business processes to be identified, enabling re-engineering to deliver lower cost, faster response, better service and improved quality.

Technologies are important, but must always be considered as enabling factors rather than key drivers to make BPR happen. There is no specific technology for BPR—the latest technology must be viewed as one possibility and should only be used as part of the packaged solution of process re-design.

In the U.K., C&L has had 12-15 clients for their BPR services and 4-5 of these are still active. An annual fee revenue of £2-3 million is being derived and they are expecting a fairly rapid continuing growth of about 20% in the business from their existing clients. Examples of typical business process re-engineering projects are listed in Exhibit D-2.

EXHIBIT D-2

Examples of Business Process Re-engineering Projects

Client Industry Sector	Nature of Project
Commodity chemicals	Review of value chain processes from order generation to fulfillment.
Banking	Re-engineering of back office functions.
Brewing	Business process re-engineering including introduction of total quality management and activity based costing.

Business process re-engineering projects typically involve redesigning the supply chain of the client to deliver improved customer service—reduced lead times or greater flexibility—and reduced process costs.

For example, one client of Coopers & Lybrand claims to have undertaken a business process re-engineering project, which saved an immediate 15% in administrative costs, identified a further 15% reduction for the near future, provided a more flexible response to customer requirements and increased their market share.

3. Retaining Their Independence

Business process re-engineering projects typically lead to a need to redesign and re-implement the IS support for those processes affected. Accordingly, identification of such projects at an early stage is a key objective for many systems integration vendors, and vendors are either setting up their own management consultancy organisations or seeking partnerships to address this issue.

However, C&L does not have any strategic alliances for the provision of solutions resulting from its BPR services and is not seeking them. The retention of independence and integrity is seen as a key factor in their services and must not be compromised. C&L has been courted by a number of vendors for such alliances, but will only respond on a one-off basis rather than develop a formal on-going relationship with another vendor.

E**CSC—Major Emphasis on Business Re-engineering**

At present, Computer Sciences Corporation's activities remain concentrated within the U.S. market. For the year ending 31st March, 1992, CSC reported U.S. revenues of \$1,908 million and European revenues of \$205 million. The company's European operations are concentrated primarily in the United Kingdom, Belgium, France, Germany and the Netherlands.

However, CSC is now seeking to redress this balance and is aiming for European revenues of \$1 billion by 1997. Assuming that the present profile of business remains constant, this would imply a target of \$600 million in 1997 for CSC's European professional services and systems integration revenues, a growth rate of 37% per annum.

The company's performance in marketing and delivering its business process re-engineering services will be a major factor in determining its success in meeting these targets. As indicated in Exhibit E-1, CSC regards business re-engineering—a term that the company has trademarked—as a critical starting point for its services and a key differentiation for the company.

CSC believes that business re-engineering is best approached by:

- Concentrating on a desired future not an inadequate present
- Encouraging aggressive exploitation of technology
- Utilising an interactive approach to system design

1. Concentrating on the Desired Future

CSC offers a complete service to enable clients to realise the benefits of business process re-engineering. The principal stages in this service are shown in Exhibit E-2.

EXHIBIT E-1

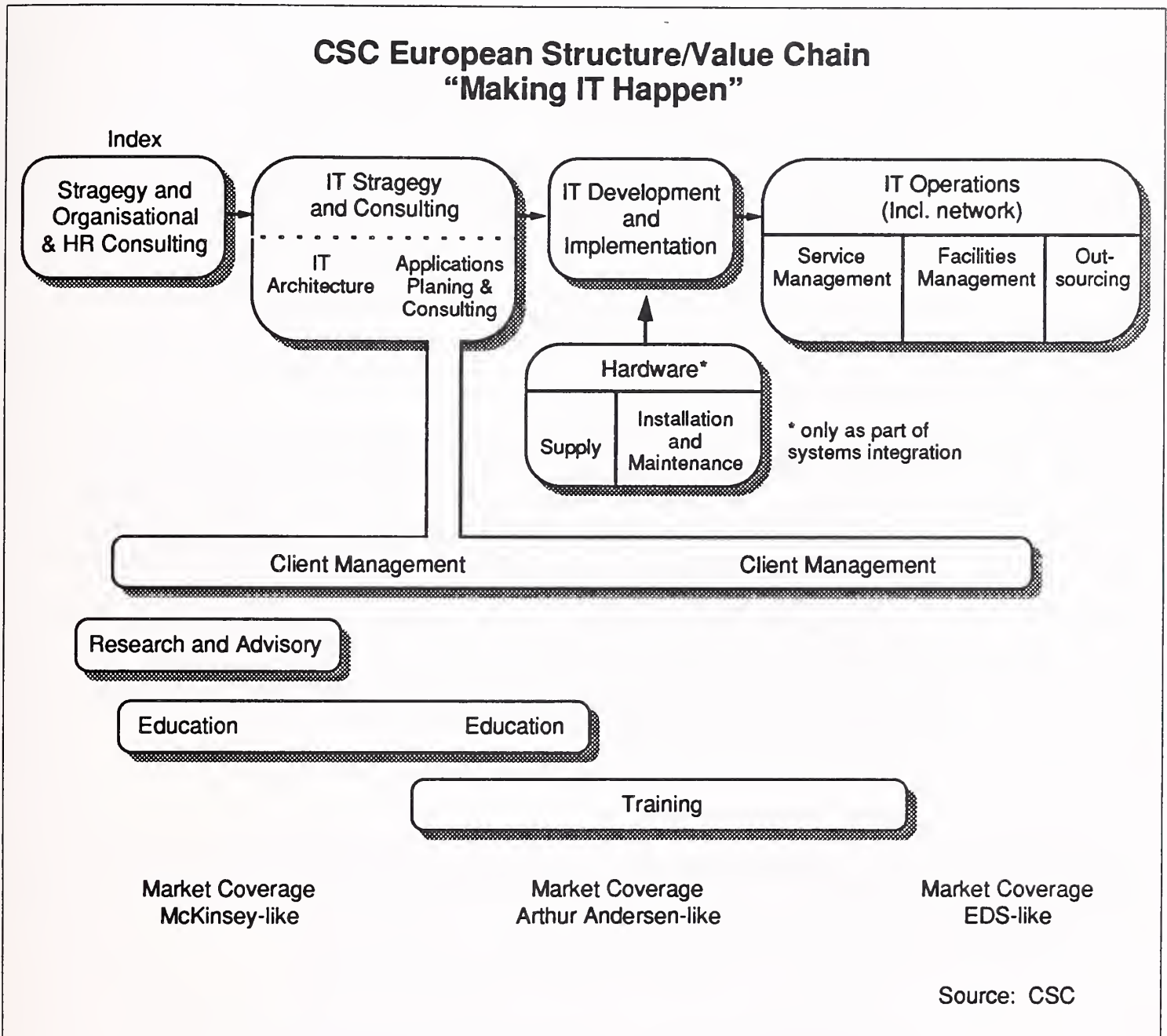
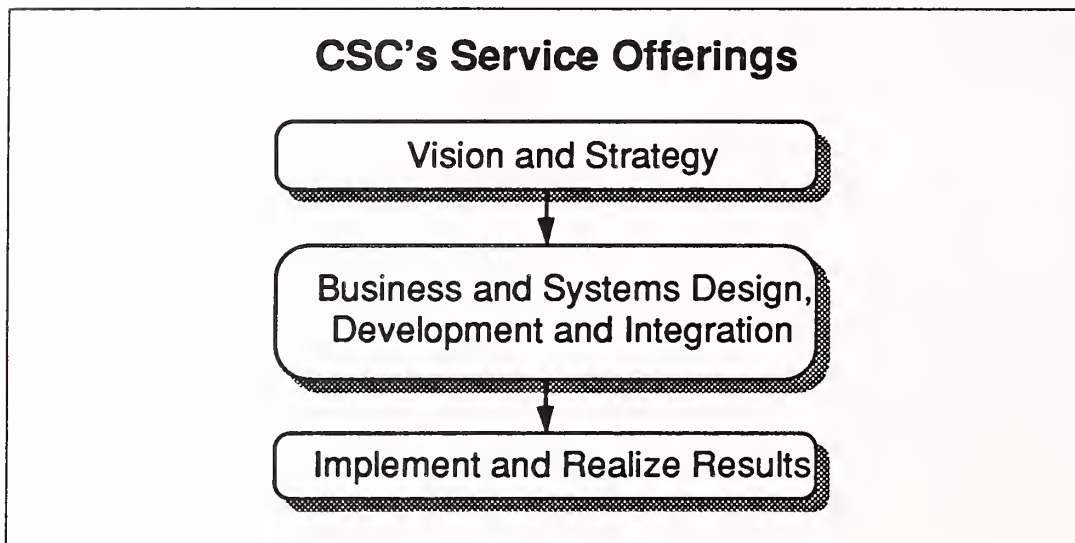


EXHIBIT E-2



CSC recognises that in the past, internal IS departments have been largely reactive in approach and have automated existing processes in response to user demand. Though this approach may produce administrative savings, it is unlikely to make a major contribution to the competitive positioning of the organisation. In order to achieve this goal, a much more proactive approach is required. The organisation should not waste time analysing present procedures in detail in order to automate them. Instead, the organisation should develop a vision in which it wants to be in the future and then remodel the organisation accordingly. Typically, this involves taking a cross-functional view of the organisation.

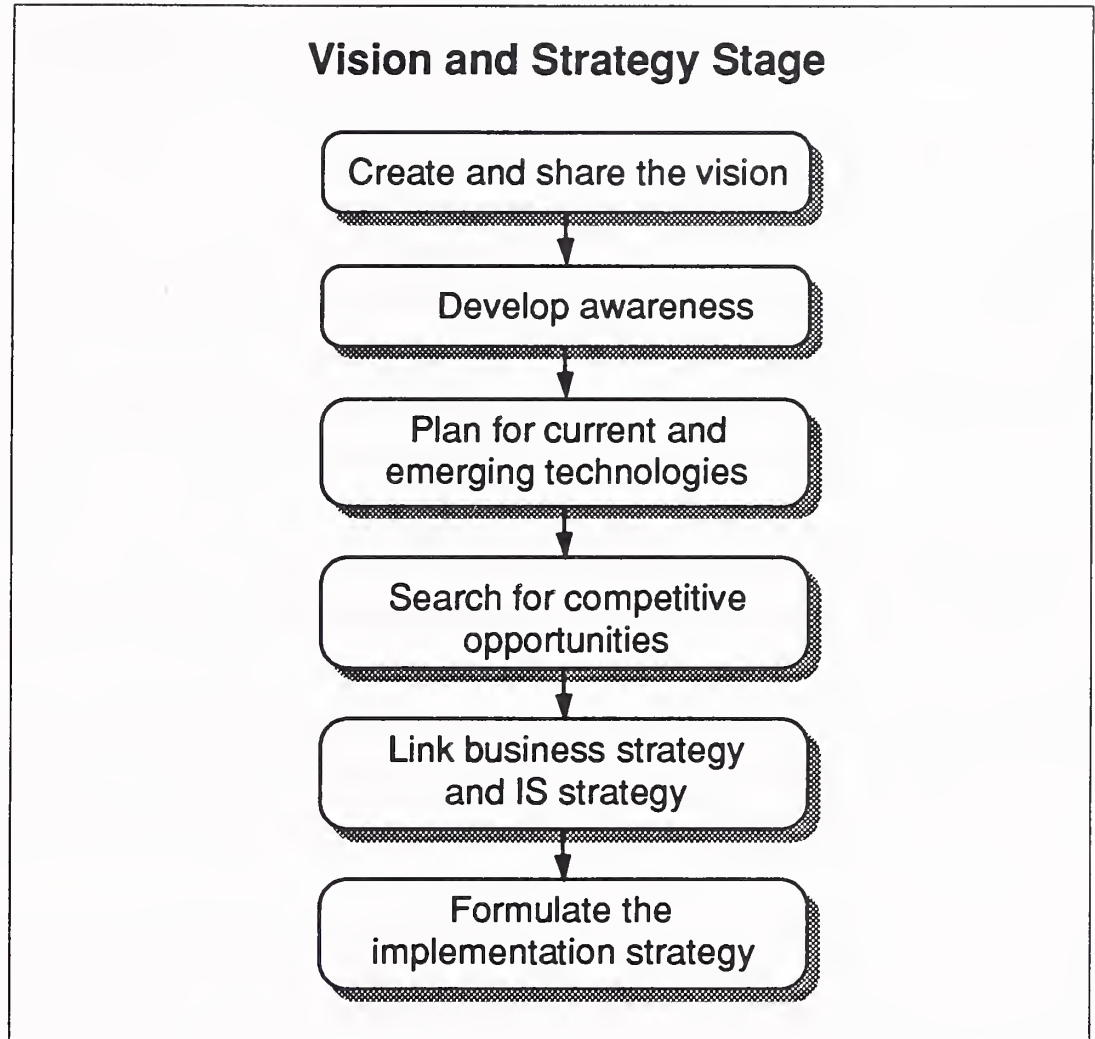
2. Aggressive Exploitation of Technology

CSC believes that another problem with the traditional development of IS has been that organisations have built complex models of business processes before considering how to apply technology to this model.

However, CSC perceives that technology not only provides new ways of solving business problems, but also affects the nature of the problem. Accordingly, it is important that organisations consider the possible applications of technology at all steps of the project, and particularly before the new business process models are developed.

The activities CSC believes are critical to the "Vision and Strategy" stage are listed in Exhibit E-3.

EXHIBIT E-3



This approach may differentiate CSC from a number of its competitors, who while stressing the importance of business process re-engineering, relegate the application of technology to a secondary level in supporting new business processes. CSC appears to attach equal importance to technology as a driving force for business process re-engineering in its own right.

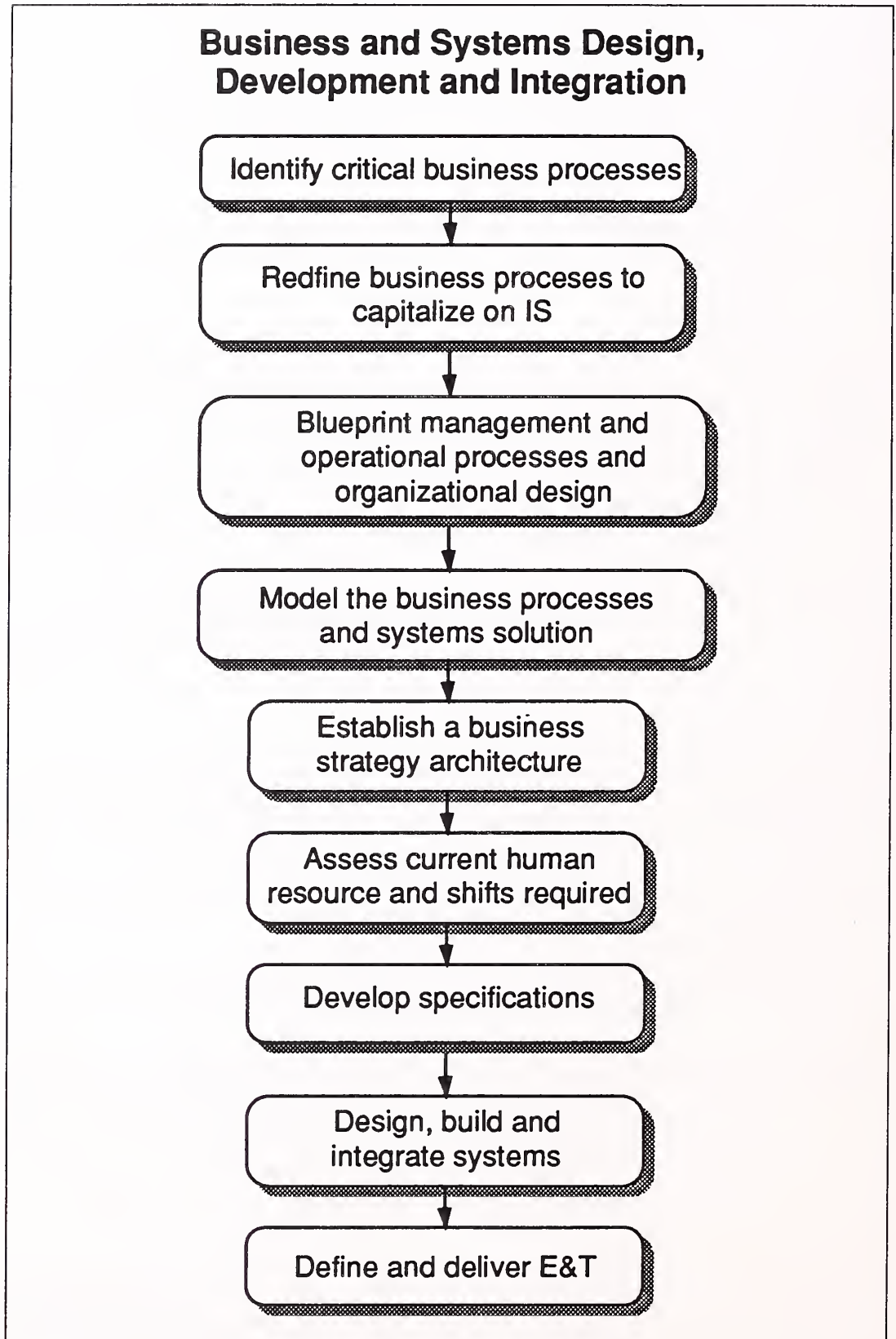
3. An Interactive Approach to System Design

Another drawback in the traditional approach to system design has been its apparent belief in the ability of users to specify their exact requirements well in advance of delivery. The developers have often fueled an adversarial relationship by insisting on delivering against this highly documented specification, regardless of users progression along the learning curve and the evolution of the business.

In contrast, CSC focuses on broad system architectures to support the new business vision and leaves detailed requirements to be defined at a later stage. In this way, CSC endeavours to reduce the time between requirements definition and delivery and to encourage a more participative

approach to systems development between users and developers. Increased user participation also leads to a decrease in resistance to change. The activities adopted by CSC within design and development are listed in Exhibit E-4.

EXHIBIT E-4



An example of a business re-engineering project undertaken by CSC is that for the Bradford & Bingley Building Society in the United Kingdom.

In the highly volatile financial service arena, the key to competitive edge and market share is customer service and product innovations.

Bradford & Bingley Building Society (BBBS), a leading building society in the U.K.'s savings and loans marketplace, determined that having an appropriate service and marketing system was crucial. Figuring out how to develop such a state of the art system was time consuming and complex, and because of the urgency of the need, BBBS turned to Inforem for help.

Drawing on Inforem's strategy, methodology and system development expertise, Inforem and BBBS are developing a system that will be able to launch a new financial product with full computerized support within a matter of hours.

In addition, Inforem's software building techniques have enabled BBBS's system to adapt to changing business conditions, minimizing the expense of re-writing applications every time a new financial service product is introduced.

F

Data Sciences Aims to Become a European Leader in Systems Integration

Although its activities are primarily concentrated in the United Kingdom, Data Sciences' mission is to become one of the European leaders in:

- Outsourcing (systems operations)
- Systems integration
- Technical consultancy

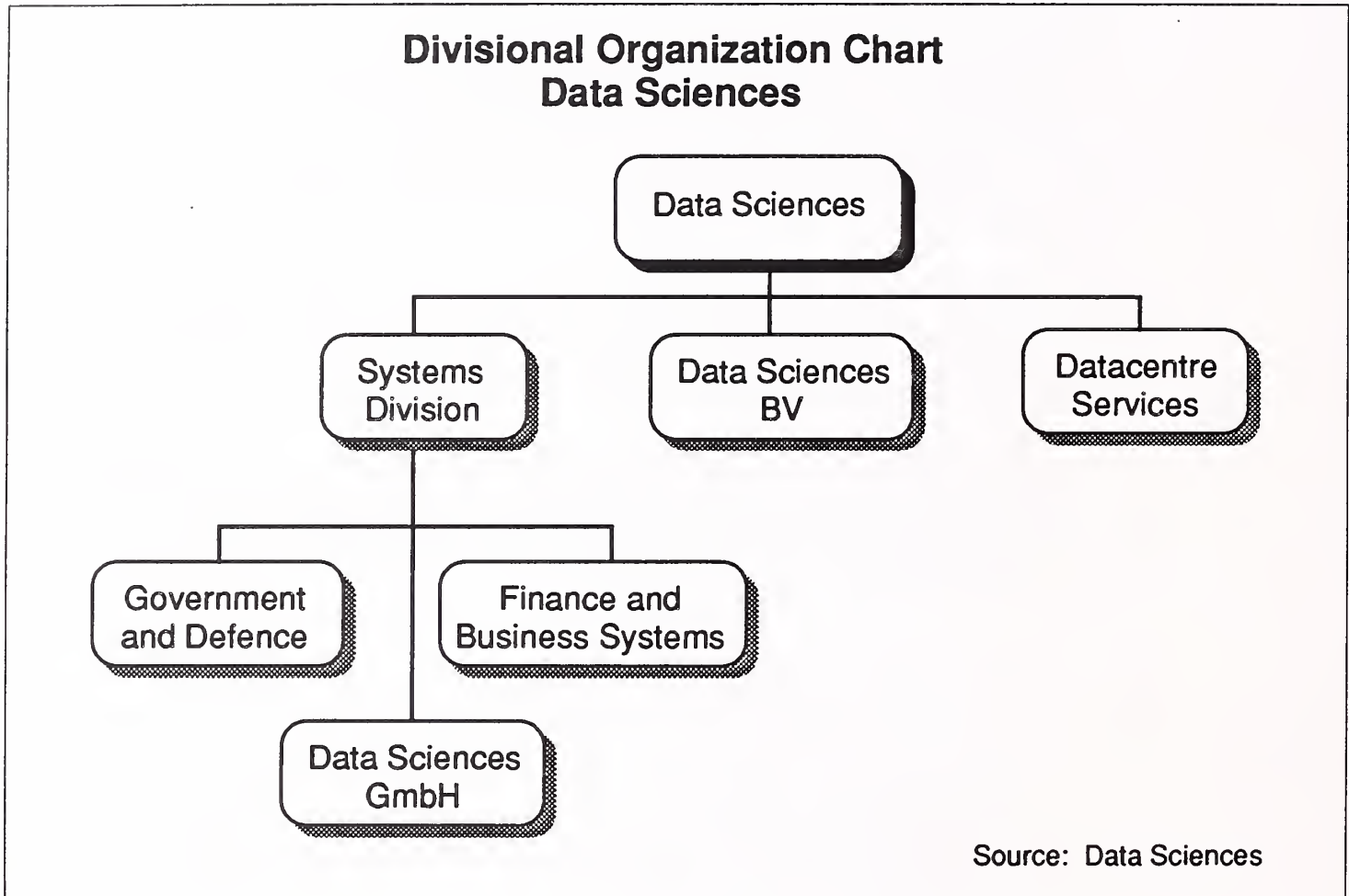
In order to achieve its goal within the systems integration market, the company needs to:

- Expand its industry sector coverage of the systems integration market
- Expand its geographic coverage
- Strengthen its partnerships with the leading equipment vendors

1. Expanding its Activities in Civil Government and Finance

Data Sciences' divisional structure is shown in Exhibit F-1.

EXHIBIT F-1



The prime activities of the two largest divisions based in the U.K. are as follows:

- The Datacentre Services Division is the company's systems operations unit. It includes direct marketing and media services, disaster recovery and contingency planning, IS strategic consultancy and data centre consultancy.
- The Systems Division caters for Data Sciences' project activity and is further subdivided, as is shown in Exhibit F-1.
 - Finance & Business Systems covers dealing, trading and settlement systems, unit trusts and mutual funds, retail financial services, payment systems, taxation and insurance, retail, hotels and leisure, payroll and personnel, distribution and accounting.

- Government and Defence covers defence-related systems, environment and space, government, public administration, command and control, air traffic control, training systems, trusted systems and software technology.

Data Sciences' estimates of its systems integration revenues by industry are provided in Exhibit F-2.

EXHIBIT F-2

Data Sciences' Key Markets Systems Integration, Europe

Sector	Revenue (\$M)	Percent
Defence and Aerospace	55	45
Manufacturing/ Industry	6	5
Commercial/Retail	18	15
Banking, Finance, and Insurance	18	15
Government	24	20
Total	121	100

Source: Data Sciences

Data Sciences holds a strong position within the defence sector, particularly for the U.K. Ministry of Defence (MoD). However, it is probable that spending by the defence sector will decrease over the next few years as the U.K. government reduces its defence spending.

Data Sciences needs to develop its systems integration business in new sectors. The obvious target sectors are national and local government in the U.K., in which spending on systems integration is expected to increase substantially. Examples of Data Sciences' systems integration projects are shown in Exhibit F-3.

EXHIBIT F-3

Major Systems Integration Projects Data Sciences

Client	Project	Value (\$M)
MoD	Secure database/office automation system	56
Post Office (U.K.)	Automation of 250 post office counters	32
U.K. Navy	Type 42 Frigate shore development facility	28
Passport Office (U.K.)	Passport issuing system	21
Earth Observation Data Centre	System to process satellite data	17
Rotterdam Harbour (NL)	Vessel traffic management system	9
Automobile Association (U.K.)	National command and control system for vehicle breakdown services	7

Source: Data Sciences

2. Major Systems Integration Projects, Data Sciences

Systems for the financial services sector currently account for 21% of Data Sciences' overall revenues. In this sector, Data Sciences has a range of kernels and building blocks to assist in its provision of systems integration solutions. The company's principal application software products for this sector are listed in Exhibit F-4.

Outside the defence sector, finance sector, and leisure industry, Data Sciences' application software product portfolio is less extensive, and the company is more reliant on one-off partnerships with vendors of suitable products.

EXHIBIT F-4

Principal Applications Software Products Data Sciences, Banking and Finance

Product	Description
VALUTA-IDS	Integrated dealing room system
THREADS	Unit trust management administration system
COLT	Securities dealing system
POSTS	Settlement system for securities and related tracking
ACTION 2000	Credit card and merchant accounting, financial switching, ATM management and card issue
CFRS	Consolidated financial operating system
SPOT	Automatic settlement of foreign payment transactions

Source: Data Sciences

Data Sciences wants to build a long-term portfolio of application software products by partnership to assist in marketing systems integration.

3. Expansion of Geographic Coverage

At present, 83% of Data Sciences' overall revenues are derived in the U.K. Outside the U.K., the company has subsidiaries in the Netherlands and Germany. Systems integration is a particular strength of the Dutch subsidiary, which has strengths in manufacturing systems, financial applications, and command and control systems.

The German subsidiary of Data Sciences is designated as a centre of excellence in finance and banking systems. It also focuses on automotive products and process control applications within the motor and electronics industries.

However, if Data Sciences is to become a European leader in systems integration, the company will need to expand its activities within the major European markets such as France and Germany. It is difficult to see how this can be achieved by organic means alone.

4. Strengthened Partnerships with Equipment Vendors

Data Sciences' prime contractor role in systems integration is increasingly under threat, as the much larger, major equipment vendors seek to take over this role. However, at present Data Sciences perceives that it is more experienced in large-scale project management than the equipment vendors. Data Sciences' core competencies are its software development culture and its project management expertise built over 20 years of managing complex projects. Yet, Data Sciences needs to establish how its relationships with each of the equipment vendors are best managed and how they will evolve over time.

G

Digital—In-depth Industry Targeting

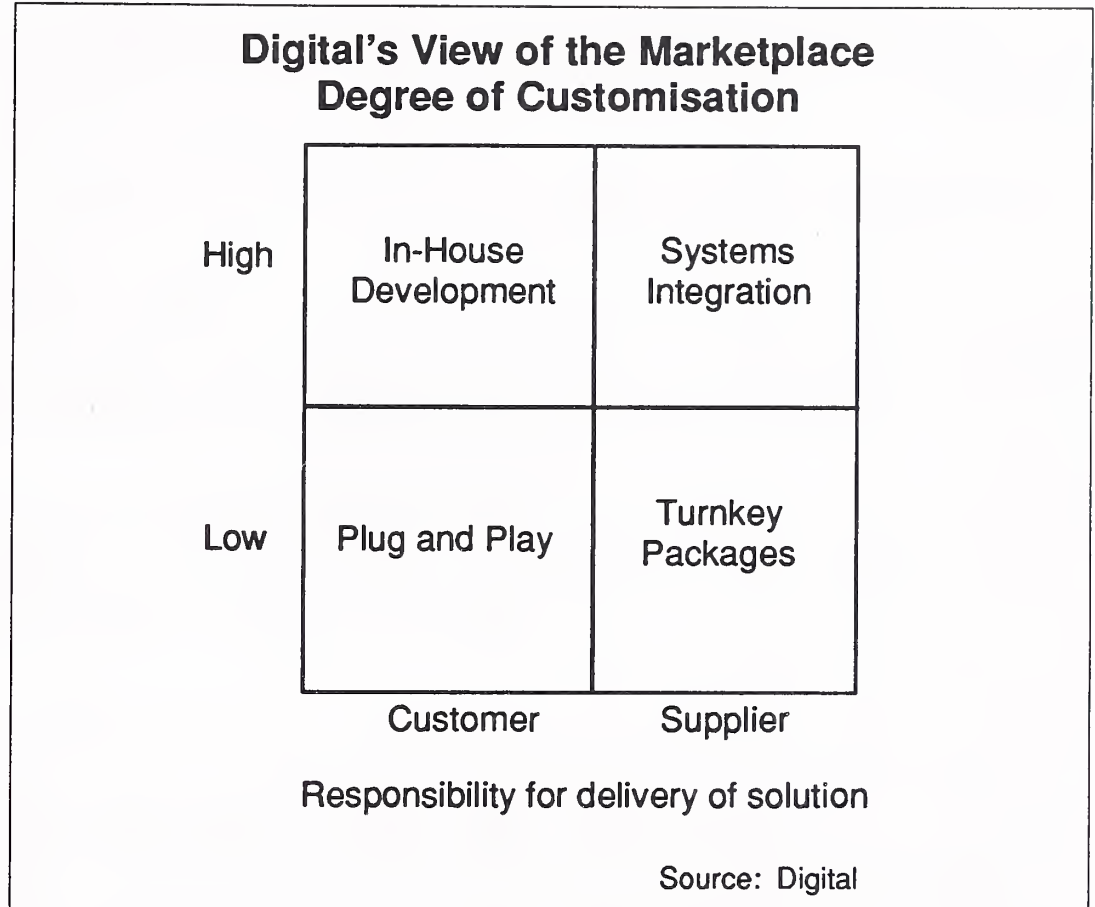
Digital estimates that it is currently in third or fourth place in the vendor rankings for the systems integration market worldwide. However, the company's systems integration activity in Europe has lagged significantly behind that in the U.S. Digital is now addressing this challenge by:

- Establishing systems integration as the main approach to large accounts
- Enhancing its focus on industry sectors
- Developing the company's image as a service provider

1. Systems Integration Becomes the Key to Large Accounts

Exhibit G-1 shows Digital's view of the trends in the market place arising as a result of the decline in in-house development. In particular, Digital expects clients to request that vendors take responsibility for the provision of complete solutions and accept the risk in doing so.

EXHIBIT G-1



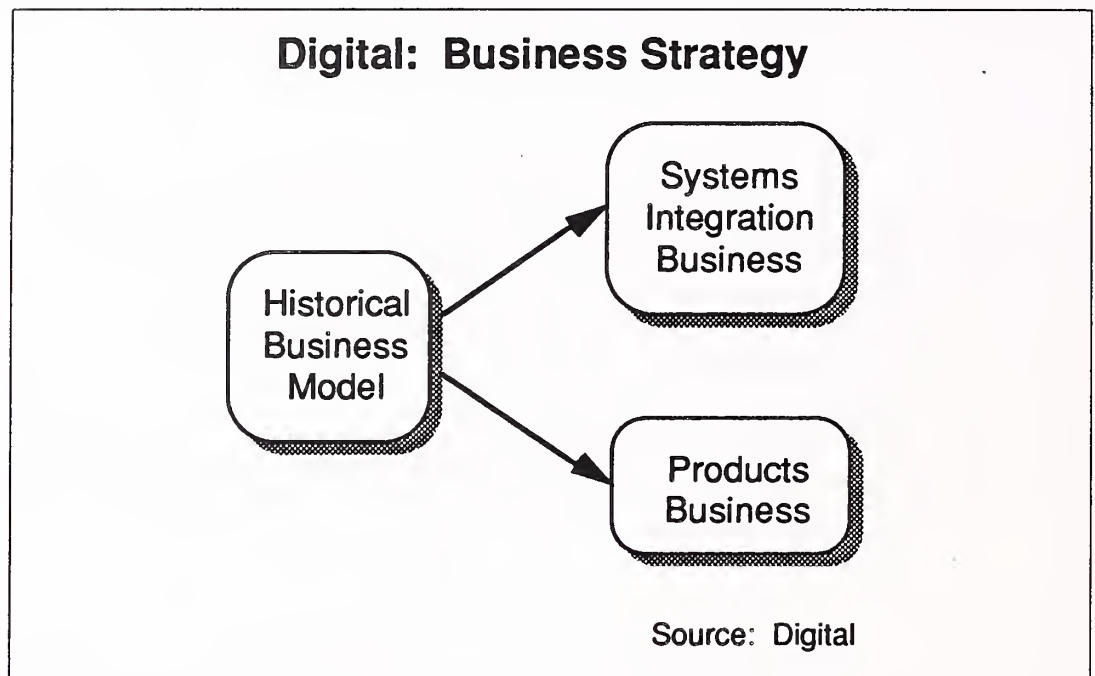
Digital perceives the principal driving forces causing clients to adopt systems integration to be:

- An increasing desire to subcontract activities that are not perceived to be part of the core business
- The increasing complexity of information systems and the tendency to move toward multivendor solutions
- The increasing dependence of businesses on their core information systems

Accordingly, Digital has found that its historical approach of providing hardware and software products that are applied to the business either by the in-house IS function or by a Complementary Solutions Organisation is no longer adequate. Clients frequently now require the vendor to provide the complete solution.

In response, Digital is adopting the strategy indicated in Exhibit G-2.

EXHIBIT G-2



This involves Digital separating its business into two main strands:

- A commodity products business delivered largely through indirect channels.
- Systems integration delivered through account managers to the major organisations.

Though Digital has no precise definition of the major organisations targeted in this way, they tend to be the top 100 organisations and their subsidiaries on a national basis. Small and medium-sized enterprises (SMES) are defined by Digital as organisations with revenues less than \$100 million.

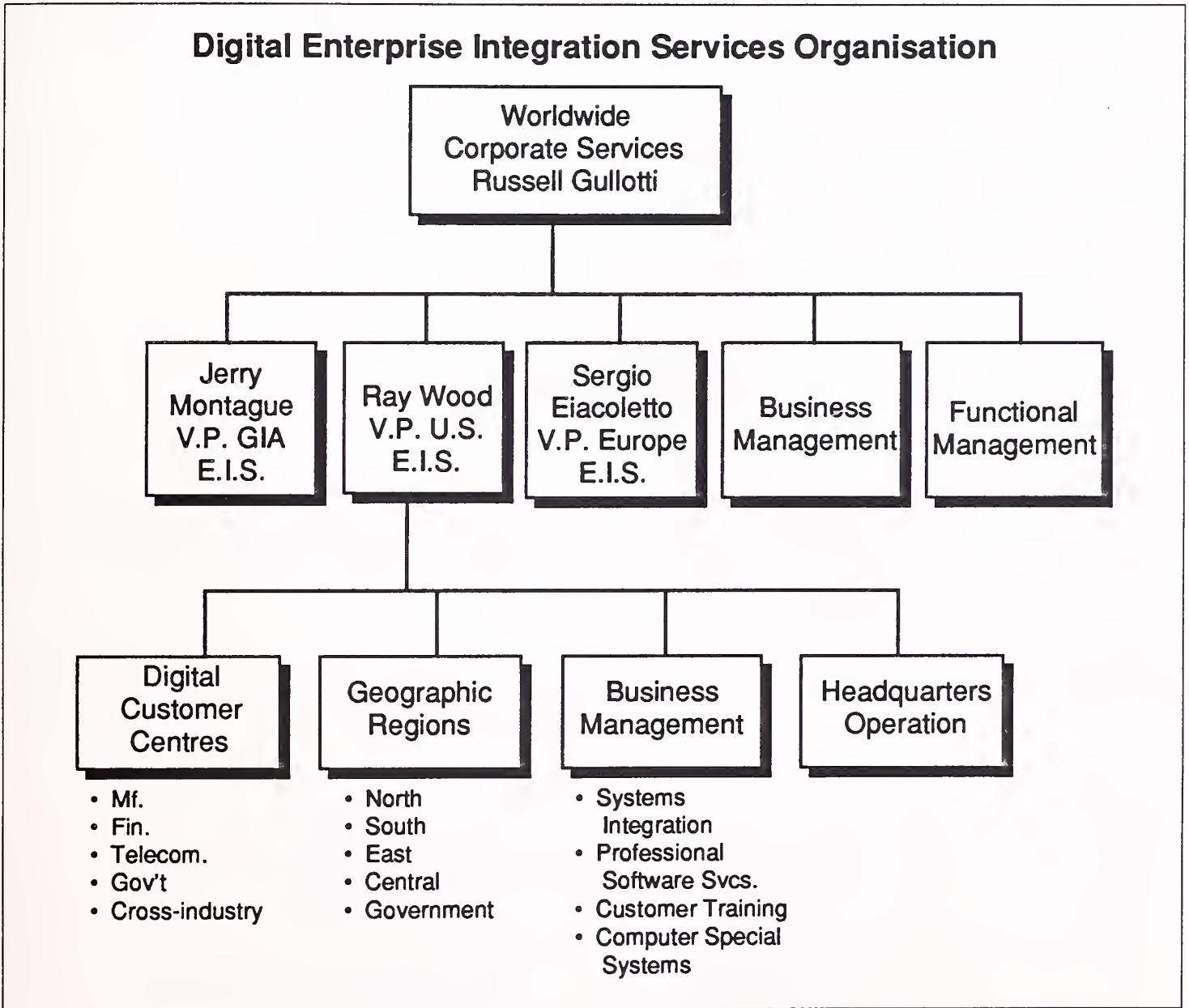
2. Digital is now Targeting 25 Industry Sectors

Detailed industry-specific knowledge along with the ability to supply the key building blocks relevant to that sector are increasingly the prime determinants of success in the systems integration market. As a result, most systems integration and professional services vendors currently organise their sales activities into approximately 5 industry sector facing units. From 1st July, 1992, Digital is re-organising its account management under 25 industry enterprise managers who are responsible for a particular vertical market. This increased focus should give Digital a significant advantage over many of its competitors with their less-focused sector targeting.

These industry enterprise managers will operate at a European level, abolishing the former organisation that initially operated at a country level.

The position of the Digital Enterprise Integration Services Organisation within Worldwide Corporate Services Group is shown in Exhibit G-3.

EXHIBIT G-3



The industry enterprise managers are supported at the European level by a number of European Integration Centres listed in Exhibit G-4 and, at the country level, by a number of Systems Integration Centres.

EXHIBIT G-4

European Integration Centres	
Specialisation	Location
Service Industries	London
Manufacturing	Munich
Research, Education and Science	Geneva
Government and Health Care	Brussels
Telecommunications and Corporate Information Systems	Sophia Antipolis (F)

For example, in the U.K., there are currently 8 systems integration centres, as shown in Exhibit G-5. Five of these centres concentrate on vertical markets, while another three concentrate on Digital's key horizontal specifications.

EXHIBIT G-5

Systems Integration Centres United Kingdom	
Vertical	Horizontal
Manufacturing and Utilities	Office Systems
Banking	Transaction Processing
Service Industries	Open Systems
Telecommunications	
Public Sector	

Overall Digital remains strongest in the sectors listed below:

- Manufacturing sector
- Utilities
- Financial services
- Telecommunications
- Public sector

Digital has traditionally been a strong competitor in the manufacturing sector, particularly in areas such as engineering design and shopfloor systems. Digital also has a separate subsidiary, Desisco, which targets financial trading systems. Desisco was formed from Digital's acquisition of Data Logic's activities in the area. One element in Digital's strategy will be an increase in acquisition activity aimed at providing Digital with entry into major new markets where it is not competing with its traditional Complementary Solution Organisation (CSO) partners.

Digital's relationship with its CSO's is changing in nature. Historically, the CSO provided the industry expertise in the partnership and was the prime contact with the customer. Now, Digital is developing its own business knowledge and seeks to be the prime contact with the client. Digital then subcontracts to the appropriate application provider.

However, Digital is being careful not to alienate the management consultants and systems integrators who remain important partners, such as EDS, Andersen Consulting and Logica. Digital expects these companies to remain important prime contractors using Digital as a major subcontractor. However, as Digital's expertise as a prime contractor increases, then so will the proportion of systems integration projects in which Digital assumes this role. For example, Digital would already frequently expect to be the prime contractor in areas such as financial trading systems and office systems in which the company has a high level of capability.

Similarly, Digital is being careful not to alienate its traditional clients in the in-house IS function. Unlike a number of leading systems integrators, Digital is not trying to bypass the IS department. However, the company does recognise the increasing need to work with business management rather than the IS Department.

3. Clients Must View Digital as a Key Service Provider

This need to work closely with a client's senior business executives presents Digital with two of its major challenges. The challenges Digital faces in the systems integration market are listed below:

- Acquisitions to fill capability gaps
- Change image to that of services company
- Consultative selling

- More precise vertical focus
- Increase role as prime contractor

These are needed to change the image of the company from an equipment provider to a services-based company capable of delivering total solutions, and the associated challenge of developing the existing sales force's consultative selling capabilities.

Digital perceives that it requires three core skills for the systems integration market, namely:

- Business consultancy skills
- Solution architect skills
- Project management skills

By "solution architect" skills, Digital means the ability to analyse a business problem and identify and design an IS system to tackle that specific business need.

Digital's current strengths in systems integration are listed as follows:

- Very strong technology capability
- Broad range of services and support
- Open architecture, multivendor and networking strengths
- Client-server approach
- Account-based organisation
- Strong balance sheet

Digital has a strong base in technology, particularly in the application of distributed systems, and is in a strong position to respond to the movement away from mainframe-based systems towards distributed systems as the basis of many systems integration projects.

Examples of systems integration projects in which Digital was prime contractor include the following:

- A digital records system for British Gas. This is a very large distributed system accessed by all the regions of British Gas, which digested details of British Gas's gas distribution network. The value of this project is well in excess of £10 million.
- An office automation project for Sussex Police. This system is based on All-In-One and provides financial applications, electronic mail, and details of persons detained in custody. This is an example of one of Digital's smaller systems integration projects.
- Systems for the management of the factory floor environment including interfaces to machine controllers.

H

EDS Aims to Close the “Impact Gap”

The integration of its acquisitions SD-Scicon and GFI into EDS presented the company with a potential clash of cultures. Should EDS in Europe continue its emphasis on high-value systems operations contracts, or should it adopt the typically more European technology focused approaches of SD-Scicon and GFI? The latter approach generated higher European revenues, but sometimes at the expense of profitability.

The answer appears to be that EDS will continue with its U.S. style approach typified by:

- An emphasis on targeting senior executives not IS managers
- An emphasis on business improvement rather than on technology provision
- An emphasis on profitability rather than revenue growth

In particular, EDS is positioning itself as providing clients with the means to bridge the impact gap between an organisation's investment in technology and its positive impact on business needs.

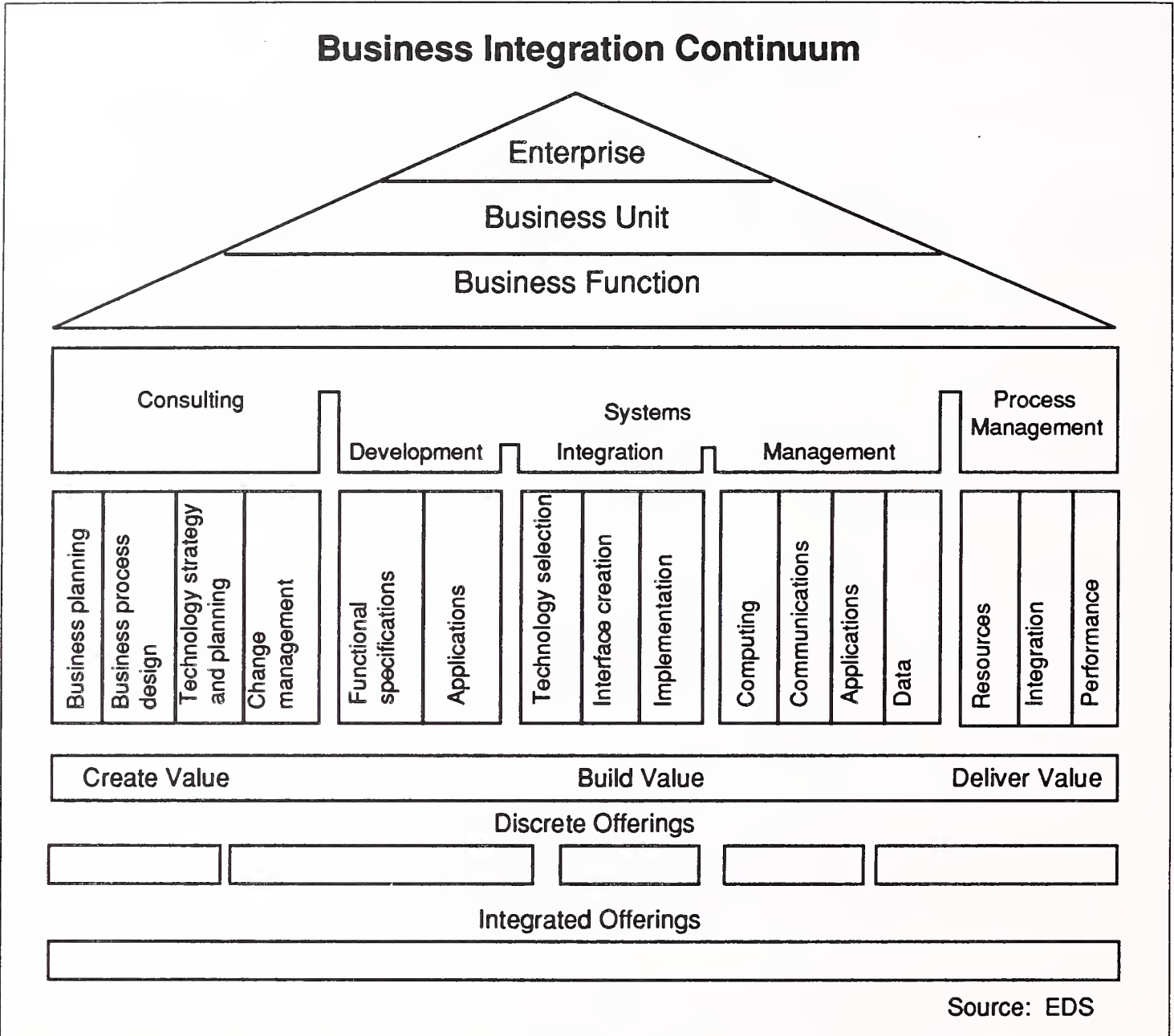
EDS will do this by:

- Placing increased emphasis on its ‘front-end’ activities
- Offering co-investments to its clients
- Adopting transnational positioning

1. Increased Emphasis on Front-End Activities

The range of services from consulting to business operations provided by EDS are illustrated in Exhibit H-1.

EXHIBIT H-1



The breakdown of revenues by service type for EDS' U.K. subsidiary (EDS-Scicon) is shown in Exhibit H-2.

EXHIBIT H-2

EDS-Scicon Revenues by Service Type

Service Type	Proportion of Revenues (%)
Consulting	12
Systems Development	22
Systems Integration	13
Systems Management	36
Process Management	7
Products	10
Total	100

Source: EDS

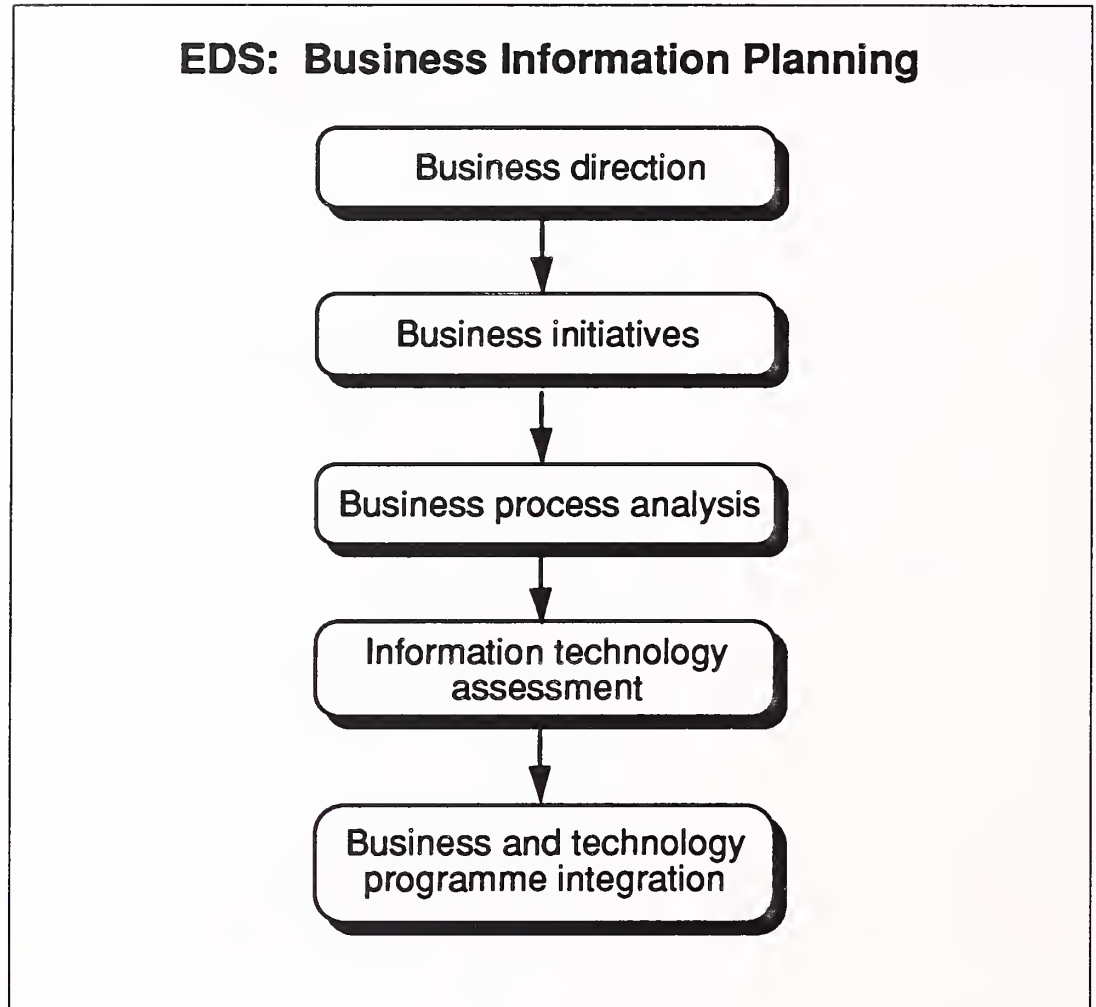
Traditionally, systems management has been EDS's most profitable activity and its major source of revenues. This situation is even more pronounced in France than in the United Kingdom.

However, EDS is looking to achieve an even spread of revenues across the 5 service types shown. In particular, the company emphasises its consultancy services and has formed a Strategic Business Consultancy Group. At present, this group employs 30 consultants in Europe, 100 in the U.S., and is expected to assist in funneling business along EDS' business integration continuum.

The Strategic Business Consulting Group employs a number of methodologies including Enabler and Business Information Planning. Enabler is a performance improvement methodology for manufacturing companies. Enabler begins with a benchmarking service to enable clients to compare their performance on critical success factors in their industry with the performance levels achieved by the leading organisations. EDS then assists the client in improving those business processes, which will lead to marked improvements in the client's competitive positioning.

Business Information Planning is EDS's methodology for linking business strategy definition and IS strategy definition. The flow of Business Information Planning is shown in Exhibit H-3.

EXHIBIT H-3



The activities within Business Information Planning (BIP) are defined as follows:

- Business direction establishes business goals, priorities and measures
- Business initiatives identify major opportunities to meet the goals
- Business process analysis applies formal methods to model the business and identify processes critical to success where re-structuring and the use of technology will benefit the business
- Information technology assessment to review and update the technical strategy aligning it with the business strategy
- Business and technology programme integration, in which the plans for the restructuring processes and the organisation are integrated with the changes in technology.

At the other end of the business integration continuum, EDS will increasingly seek business operations opportunities.

2. Offering Co-Investment with Clients

EDS, unlike its recently acquired subsidiaries, is not keen to offer platform operations services on the basis of IS cost savings because such services are extremely price sensitive. EDS prefers to look for business issues and relate its payment to delivered business benefits.

One example of such pricing was for Reinshagen U.K. Reinshagen U.K. is a subsidiary of the German-owned multinational, which produces wiring harnesses and electrical components for Ford, Lotus, Vauxhall, Triumph Motorcycles and other major names in the motor industry. In a 3 month project, with an estimated cost of £50 - £60,000, Reinshagen was benchmarked against its competitors to identify strengths and weaknesses. Using Enabler's cross functional analysis to produce the best case scenarios and through the use of ABC for profitability analysis, the concerns over the impact of change in one area upon another were overcome. Enabler was seen as a catalyst for change by the client and encouraged Reinshagen staff to take ownership of the aims and techniques.

The revised procedures introduced in disposal and rework will reduce scrap volumes by 66% in 12 months. The combined monitoring of stock and work in process has enabled a 49% reduction in inventory costs. The price charged by EDS was geared to results. Overall, a sum equivalent to 3% of turnover (25% of profits) has been saved, producing a beneficial result for Reinshagen U.K. and EDS-Scicon.

3. Adopting Transnational Positioning

In Europe, EDS is organized into six Strategic Business Units, namely,

- EDS-GFI in France
- EDS-Scicon in the United Kingdom
- Northern Division covering Benelux and Scandinavia
- Southern Division covering Italy, Spain and Portugal
- Central Division covering Austria, Switzerland, Germany, Hungary, and Czechoslovakia
- General Motors Europe

These six Strategic Business Units are organized into three regional groupings:

- Europe North - consisting of EDS-Scicon and Northern Division headed by John Bateman
- Europe South - consisting of EDS-GFI and Southern Division headed by Bob McCashin
- Europe East - consisting of the Central Division but also reflecting EDS' increasing emphasis on Eastern Europe

However, EDS is achieving unification of its Strategic Business Units as individual country offices work together to serve customers in multiple countries. Some examples of this can be found in the pan-European General Motors Development effort, the Electronic Data Interchange project for GM's suppliers, and services provided to companies such as Sacilor, and Caterpillar.

EDS has also introduced global Strategic Business Units, which are entities through which EDS will tie together the various organizations in multiple countries that serve specific industries. The first of these are in the energy, communications and transportation industries.

EDS' technical infrastructure is also a unifying factor in its European operations. Because all of EDS's Information Processing Centres are built to the same standards worldwide, and are all linked via EDS's private telecommunications network (EDSNET), it is possible to process transactions for a Spanish Company at the Paris IPC, or to migrate workloads from one IPC to another as required.

EDS has recently strengthened the capabilities of its Central Division with the acquisition of mbp Software and Systems in Germany. mbp employs 570 personnel and achieved a turnover of DM 129 million for 1991. The company's strength lies in services for the manufacturing sector.

I

Gemini Consulting—Seamless Delivery of Business Transformation

Many systems integration vendors have realised the importance of management consulting in initiating large systems development projects, and in establishing credibility at board level in major corporations. However, few vendors have yet succeeded in establishing access to credible management consultancy organisations.

One of the notable exceptions is Cap Gemini Sogeti, which is continuing to strengthen its links with Gemini Consulting. With 1991 revenues of \$270 million, Gemini Consulting estimates itself to be ranked third in the global market for the *strategy-driven, high-quality management consultancy*.

Gemini Consulting attributes its success to:

- A strong vision of business transformation
- Its formation as a separate entity
- Its close relationship with Cap Gemini Sogeti

1. The Vision of Business Transformation

At a time when many management consultancies in Europe have been reducing their head counts, Gemini Consulting has been expanding rapidly. The company now estimates that it employs 1,150 consultants. Revenues were expected to increase in excess of 30% during 1992.

Much of this success is attributed to the vision of business transformation. Gemini Consulting perceives that clients are no longer prepared to pay for good ideas. Companies wish to become lean and mean by transforming their business practices and are rarely prepared to pay for tangible results.

Gemini Consulting was formed in 1990 from the combination of 3 consultancies with individual specialisms as shown in Exhibit I-1.

EXHIBIT I-1

Constituents of Gemini Consulting	
Organization	Specialism
Mac Group	Strategy formulation
United Research	Operations improvement and change management
Gamma International	Information management

However, Gemini Consulting claims that it is no longer interested in isolated projects related to these individual disciplines. The company is only interested in pursuing multidisciplinary projects that accelerate the business transformation process, generating rapid and measurable results for its clients. The company is no longer in the business of marginal improvements.

In practice, Gemini Consulting estimates that all of its U.S. revenues in 1992 will be earned from business transformation projects, while a substantial element of its European 1992 revenues will derive from business transformation activities. This implies that business transformation project revenues worldwide in 1992 were in excess of \$250 million. The U.S. market will account for approximately \$175 million of these revenues, the European market accounting for \$75 million or more. Within Europe, there is a particular concentration of personnel within the U.K.

While Gemini Consulting is unable to provide examples of business transformation projects undertaken, the company claims to concentrate on tackling complex problems for Fortune 100 companies or organisations of similar stature.

The principal sectors for which work has been undertaken are:

- The manufacturing sector, particularly the oil and gas, and chemical subsectors
- The financial services sector

2. Formation as a Separate Entity

Gemini Consulting recognises Cap Gemini Sogeti's strong need for access to management consulting skills. However, Gemini Consulting perceived the importance of establishing the management consultancy unit as an independent entity, believing that a group of 1,000 consultants would have become culturally submerged as part of an organisation employing 17,000 personnel.

Gemini Consulting also believed that it was important for the consultancy to become a market leader in its own right. The new organisation was likely to fail if it remained a subsidised activity within the Cap Gemini Sogeti organisation.

3. Developing Close Relationships with Cap Gemini Sogeti

Gemini Consulting and Cap Gemini Sogeti will continue to strengthen their links over the next few years. The organisations intend to leverage each other's skills and mutually defend their core business.

Both organisations intend to target a small number of transnational companies. Gemini Consulting's ability to identify major systems integration projects to support its clients' business transformation needs are clearly of considerable value to Cap Gemini Consulting. However, Gemini Consulting stresses its ability to deliver business transformation, and not just identify opportunities for business transformation. Accordingly, Cap Gemini Sogeti's development capabilities are of high importance to Gemini Consulting in delivering these benefits.

Cap Gemini Sogeti and Gemini Consulting perceive that the leading transnational organisations are seeking suppliers that can deliver business transformations on a global basis.

Though Gemini Consulting typically generates leads for Cap Gemini Sogeti, it is not uncommon for Cap Gemini Sogeti to enlist Gemini Consulting's assistance when it perceives that the client's problem is of a wider scope than information services.

J

Groupe Bull—A Co-existing Services and Technology Company

Groupe Bull is aiming to be one of the leading three systems integration vendors in Europe by 1997, and globally to be one of the leading five.

To achieve these aims, Groupe Bull is:

- Building vertical and horizontal systems integration practices
- Establishing partnerships with leading management consultancies
- Developing its programme management capabilities

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 results from its clients' needs for services and solutions. Its large customers have a need for systems integration services as they see equipment architectures evolving in two related, but distinctly different directions.

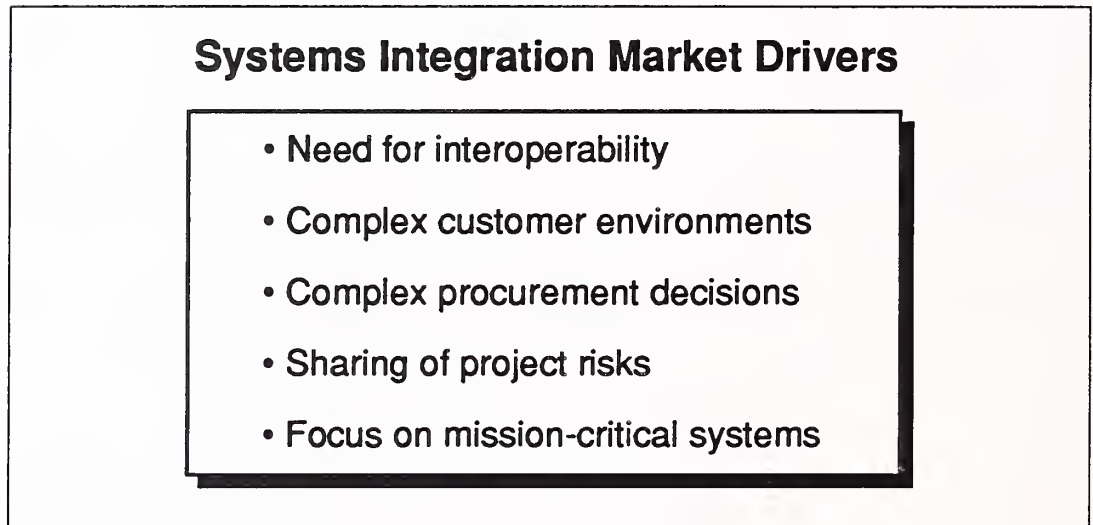
First, Groupe Bull's clients believe that open systems architecture is reaffirmed as vendors cooperate to find a common operating environment strategy. Users are planning new systems applications that are transportable across platforms and that will reduce their corporate investment in software development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

1. Market Evolution

The pattern that Groupe Bull's clients believe is emerging is that no one vendor will provide the entire solution; hence, there is the need for a system integrator. Groupe Bull wants to participate in that market as it evolves. Exhibit J-1 presents Groupe Bull's view of systems integration market drivers.

EXHIBIT J-1



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.

The procurement process will become complex in this environment. Along with this complexity will be a higher degree of risk. The client's MIS staff needs to focus 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 want the systems integrator to share in the project risk.

2. Groupe Bull's Integration Strengths

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

EXHIBIT J-2

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 focusing on vertical markets in order to develop a presence in systems integration, and has already penetrated selective niches in specific European market sectors. 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 J-3 illustrates, the company also claims a dominant position with European taxation and customs authorities. Overall, the company's principal successes are in the government and banking sectors.

The company's market penetration is summarised in Exhibit J-3.

EXHIBIT J-3

Groupe Bull's Market Penetration

Market Niche	Countries
Police 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 Sistribution	The Netherlands, U.S., Canada
Health and Human Services	U.S., Canada

Groupe Bull is well positioned to be a worldwide systems integrator serving the needs of its global clients. The 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 a positive move internally because the systems integration market is a clearly defined and maturing market that has been profitable for the vendor community. Open systems are critical for the development of systems integration opportunities by Groupe Bull.

3. Organising for Systems Integration

The organisational structure that pursues 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 re-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 J-4 summarises the role of the Systems Integration Group within the larger Groupe Bull organisation.

EXHIBIT J-4

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 are 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.

4. 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 jointly in R&D projects and joint marketing and sales activities.

Groupe Bull expects the relationships to vary in geographic scope—ranging from partnerships for specific countries to partnerships that span continents. 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 J-5 illustrates the types of firms with which Groupe Bull has established partnerships in national markets. For example, in France it is common 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 J-5

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

5. Typical SI Projects

Groupe Bull has extensive systems integration experience in Europe. Typical of its broad experience are the projects listed in Exhibit J-6. 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 J-6

Typical Groupe 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

6. Business Objectives

Groupe Bull has 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. The 1990 revenue for Groupe Bull's systems integration activities, exclusive of the Honeywell Federal Systems Inc. revenue, was \$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.

K

Hewlett-Packard Develops its Systems Integration Activities to Support its Computer Systems Business

Hewlett-Packard (HP), like many of its fellow systems vendors, wants to develop its presence in the systems integration market. The vehicle for expanding its presence is the Professional Services Organization (PSO), formed two years ago from the company's Application Engineering Organisation.

However, in contrast to many of its competitors, Hewlett-Packard's declared rationale for its commitment to systems integration is not primarily to maximise its position within the European systems integration market, but to support its computer systems business. The key elements of Hewlett-Packard's systems integration strategy are:

- To become a world-class open systems professional services provider
- To provide solutions for the manufacturing and telecommunications sectors
- To focus on technology integration

1. World-Class Open Systems Professional Services Provider

The goal of Hewlett-Packard's Computer Systems Organisation is "to lead the world in open, easy to use, client/server systems". However, this goal becomes more difficult if the distribution channels providing access to major accounts become dominated by rival equipment manufacturers' systems integration-based account management approaches. It may be impossible for Hewlett-Packard to gain access to large accounts unless HP develops its systems integration services.

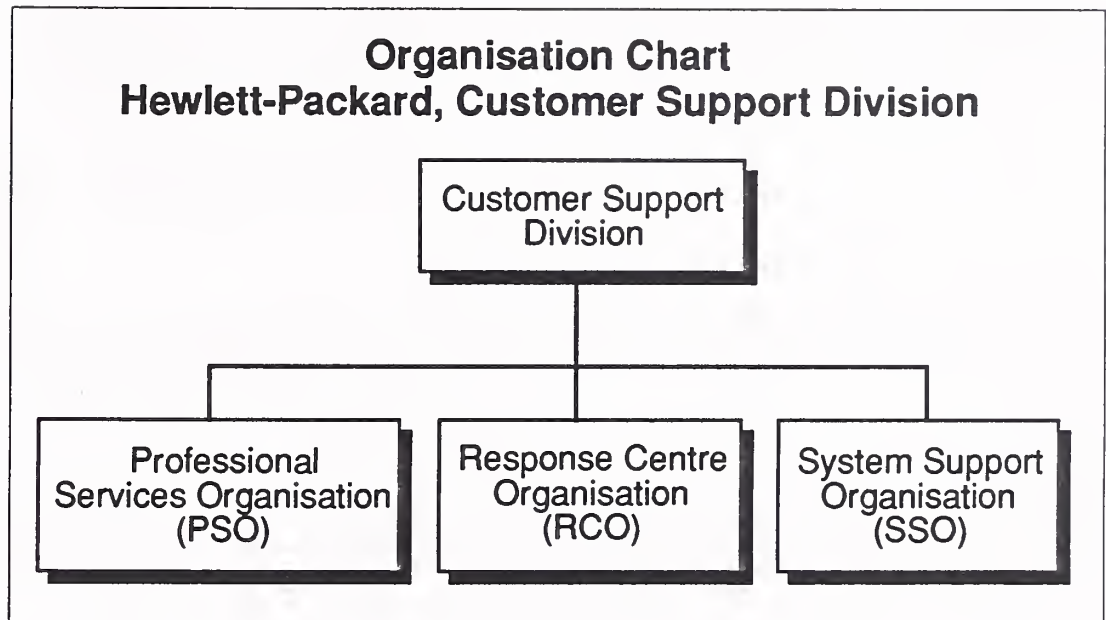
The difficulties of marketing mainly equipment to Hewlett-Packard's target and major accounts was confirmed by a survey indicating the following:

- Clients would like Hewlett-Packard to offer consulting, system integration, and education services in addition to equipment.
- Equipment sales would be assisted by provision of these services, and adversely affected if these services were not available.
- Hewlett-Packard was perceived as having an advantage over Digital and IBM in providing open systems, client/server solutions.

Accordingly, Hewlett-Packard's newly formed Professional Services Organisation (PSO) offers consulting, systems integration, and education services with the goal of "making Hewlett-Packard's computer strategy successful by making its customers successful with open, client/server systems".

The position of PSO within Hewlett-Packard's Customer Support Division is shown in Exhibit K-1.

EXHIBIT K-1



PSO provides all professional services including pre-sales support and project managers for systems integration projects. Software support is handled by a combination of the Response Centre Organisation and the System Support Organisation (SSO). In addition, SSO handles all field maintenance and environmental services. PSO is represented throughout Europe with its revenue base being strongest in Germany.

The key challenges facing Hewlett-Packard in becoming a world-class, open systems, professional services provider are:

- Developing a systems integration support infrastructure
- Developing multinational systems integration support capability

2. Providing Solutions for the Manufacturing and Telecommunications Sectors

Hewlett-Packard is targeting two industry sectors—manufacturing and telecommunications—in which the company has high levels of knowledge and experience.

The company recognises the need for a strong base of applications software products to support its development of these sectors, and hence the need arises to develop its long-term relationships with appropriate applications software products vendors. Hewlett-Packard's current partnerships are listed in Exhibit K-2.

EXHIBIT K-2

Current Partnerships Hewlett-Packard

- Software AG
- QAD
- Datalogic

In the manufacturing sector, Hewlett-Packard has its own mechanical CAD product, but is also targeting systems integration projects based on production management applications.

Examples of systems integration projects carried out in Europe by Hewlett-Packard are shown in Exhibit K-3.

EXHIBIT K-3

Example of Projects Hewlett-Packard, Systems Integration

Sector	Project Purpose
Oil	Executive information systems providing access to IBM, Digital, and UNIX equipment
Process Manufacturing	Implementation of customized production management systems across three countries
Telecommunication	Improve office productivity by integrating IBM Profs, and Digital All-in-One into an open environment

Hewlett-Packard also needs to form partnerships with professional services vendors that are prepared to undertake systems development activities as subcontractors to Hewlett-Packard on large projects. In other instances, Hewlett-Packard may be the subcontractor on a project. Ideally, Hewlett-Packard needs to develop working relationships with the major professional services vendors, such as Andersen Consulting and Cap Gemini Sogeti. Unlike these vendors, Hewlett-Packard does not offer

business consultancy, but sees its role as establishing the linkage between business strategy and information systems in areas such as transition planning and IS architecture planning.

3. Focusing on Technology Integration

Principal customer needs identified by Hewlett-Packard are as follows:

- Take advantage of new technologies while protecting current IS investments
- Improve access to information
- Reduce costs of managing and operating information systems
- Technical expertise to supplement own staff

Hewlett-Packard perceives that clients wish to move towards open systems, but in the short to medium term any systems will have to accommodate the client's existing applications. These existing applications have often been developed in-house on proprietary equipment.

However, this co-existence creates substantial technology/network integration opportunities as clients seek better access to information across distributed systems and organisations. One of the key skills of Hewlett-Packard's systems integration unit is the ability to network differing technologies. Another is the ability to assist clients in planning the transition between proprietary and open systems client/server architectures.

L

ICL—New Organisation Structure for Increased Emphasis on Services

For 1991, we estimated that ICL achieved \$95 million in revenues from the European systems integration market, putting the company in ninth position in the vendor ranking. However, ICL, like many of the major systems vendors, is determined to increase its emphasis on software and services and sees one of its key roles as being Fujitsu's European systems integration company.

The first steps in ICL's approach to this challenge include:

- The formation of Associated Services Division and its repositioning as ICL Enterprises in January 1993
- An aggressive partnering and acquisition programme
- Setting service revenue targets for the salesforce

1. Formation of Associated Services Division and Subsequently ICL Enterprises

In December 1991, ICL set up Associated Services Division (ASD) by merging ICL Secure Systems with a number of other services businesses within the ICL Group.

The rationale behind the formation of ASD was to create a single trading unit that offered the complete range of services necessary for systems integration, while preserving the independence of business units to pursue their own market niches.

ASD met its business targets in 1993, and its philosophy has been preserved in its successor—ICL Enterprises—formed in January 1993.

Exhibits L-1 and L-2 indicate the position of ICL Enterprises within the ICL Group.

EXHIBIT L-1

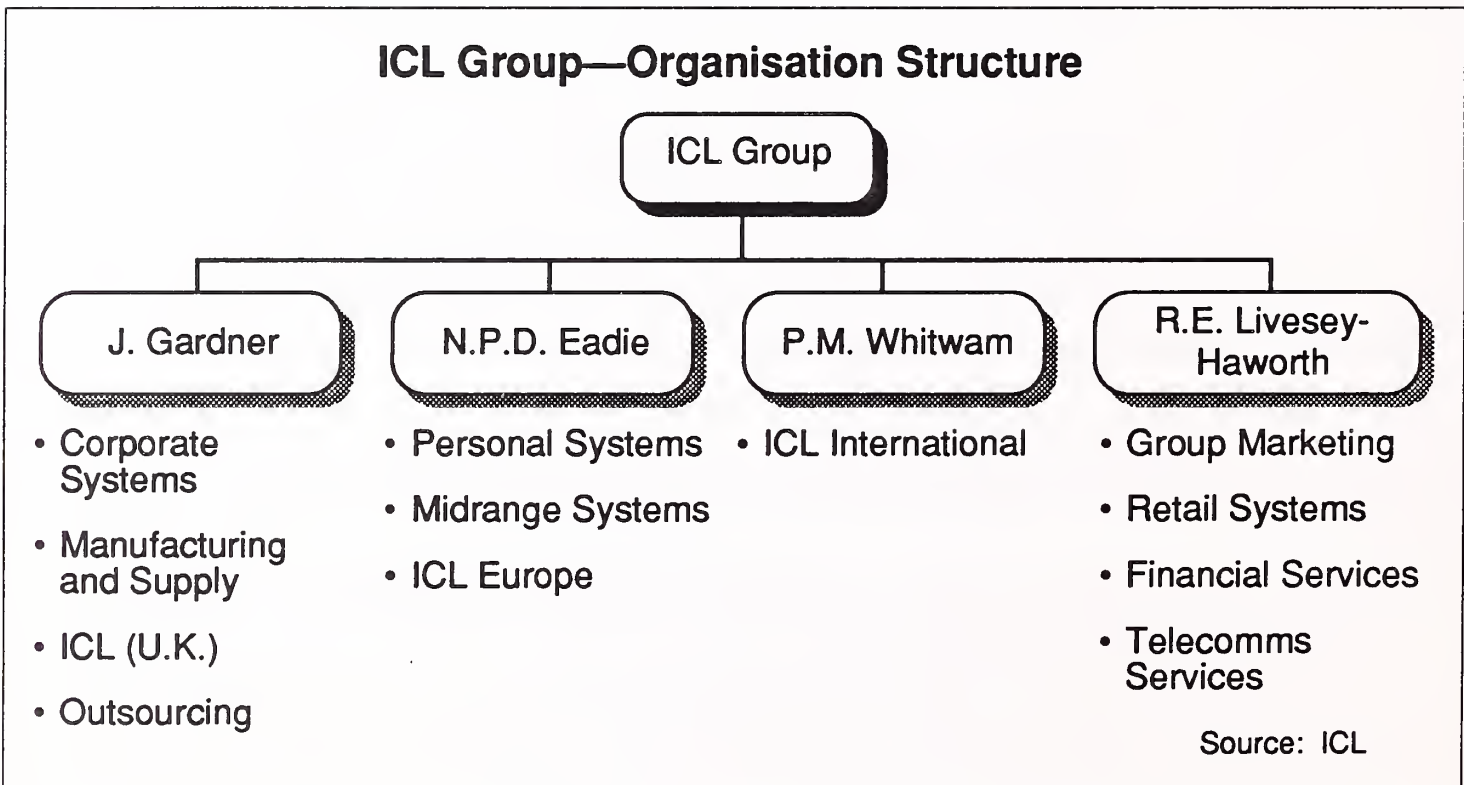
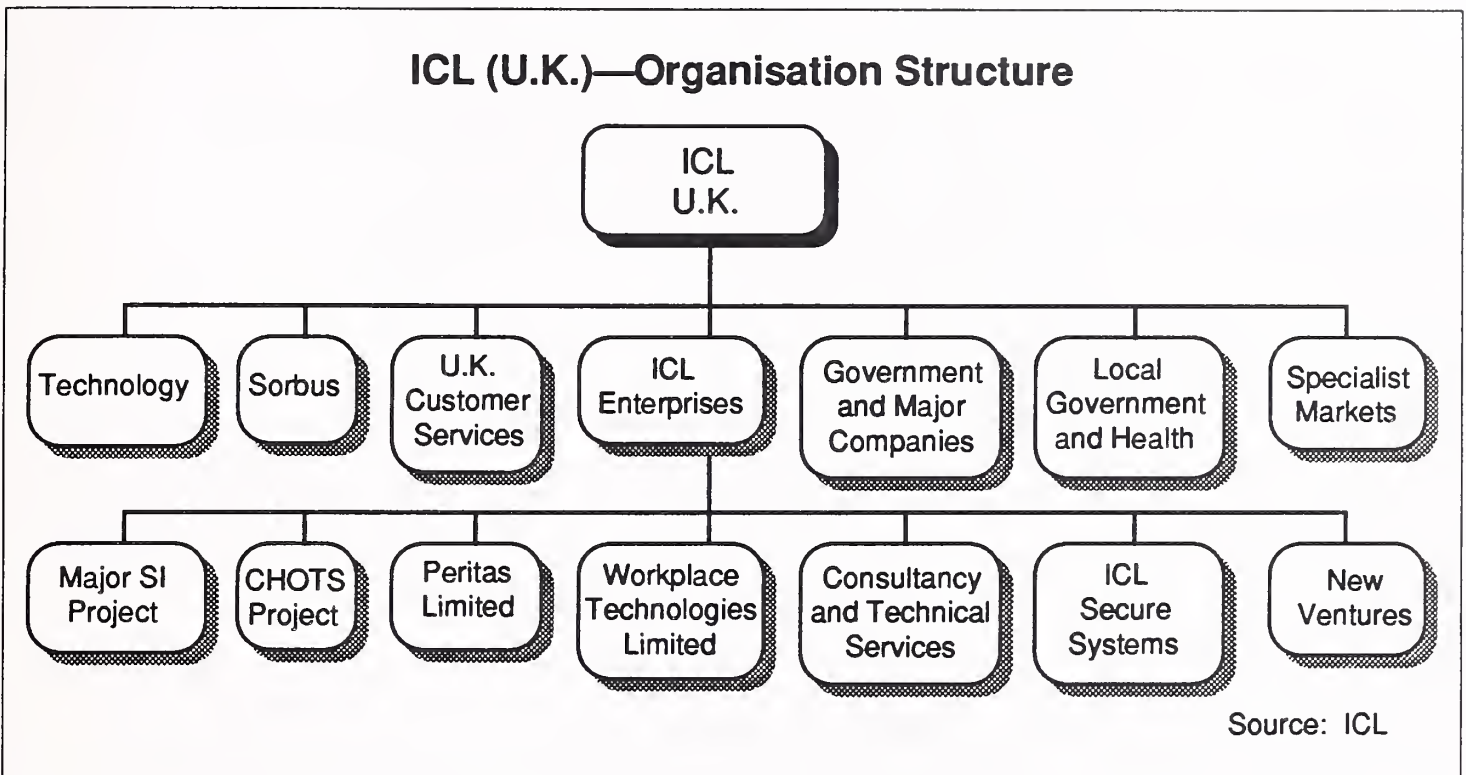


EXHIBIT L-2



ICL Enterprises consists of the following autonomous units:

- Peritas - formerly ICL's training division. The drive towards becoming a leading supplier of multivendor training has been accelerated through the two recent acquisitions, Protocol and Genus.
- Workplace Technologies - formerly ICTS. The company employs over 70 people based in Stevenage and Kidsgrove in the U.K.
- Consultancy and Technical Services (C&TS) - in addition to its technical consultants, C&TS now encompasses the personnel previously employed by IT Partners who specialise in strategic management consultancy and business process re-engineering.
- ICL Secure Systems - specialises in the design and implementation of secure networks and electronic office systems.
- New Ventures - includes the Far East operations in Singapore and Hong Kong and ICL's initiatives on the U.K. National Lottery.

In addition, there are two business units dedicated to individual, large systems integration projects.

Each business unit within ICL Enterprises has its own autonomous salesforce. There is no salesforce at the ICL Enterprises organisation level.

These salesforces work in conjunction with those from ICL's line of business organizations such as Retail Systems, or Government and Major Companies.

Overall, ICL Enterprises employs in excess of 1,000 personnel.

ICL's principal target markets are:

- Government and health
- Manufacturing
- Financial services
- Utilities
- Retail

Exhibit L-3 lists examples of recent systems integration projects.

EXHIBIT L-3

Examples of Projects		
Client	Value (\$M)	Comments
Ministry of Defence (U.K.)	500	Secure office system covering 30 sites and over 10,000 terminals
European Commission	10	Strategic health informatics networks for Europe
Eurostar Channel Tunnel	7.5	Departure control systems for passenger check-in
Bank Gdanski including network	2	Retail banking system fault-tolerant ATM

Source: INPUT

The CHOTS project for the U.K. Ministry of Defence is the largest systems integration project ever awarded to ICL and accounts for approximately 30% of ICL Enterprises's revenues. Partly as a result of increased contribution from this project, ICL expects its systems integration revenues for 1992 to be double those for 1991.

The role of the Consultancy and Technical Services unit is critical in assisting ICL to expand its systems integration business. ICL recognises that a strong business consulting presence is necessary to succeed in the systems integration market. Vendors lacking these skills will lose out in the systems integration process. ICL expects the majority of its business consulting activity to involve business-process re-engineering. The focus of this business-process re-engineering will be cost reduction by reducing the numbers of personnel utilised in business processes by major organisations.

2. Aggressive Partnering and Acquisition Programme

ICL's recent acquisitions/joint ventures are listed in Exhibit L-4.

EXHIBIT L-4

Recent Acquisitions

Company	Year	Description
Technology plc	1992	Leading PC and UNIX reseller in the U.K.
ICL-KMECS	1991	Joint venture in former Soviet Union
Sorbus	1991	Joint venture with Bell Atlantic for independent maintenance services
Datascan	1991	Malaysian retail sector systems integration
Task Management	1991	New Zealand systems integration company
Nokia Data	1991	Leading personal computer vendor in Scandinavia
Comdes	1991	Dutch company specializing in software for the health, financial services, and legal markets
Databolin	1990	Application software product vendor based in Scandinavia
Datachecker Inc.	1989	In-store retail systems specialist based in U.S.

Source: INPUT

ICL's acquisition of Nokia Data is particularly beneficial because it:

- Provides ICL with a major presence in Scandinavia
- Strengthens ICL's capabilities in personal computer and UNIX-based systems, which are beginning to dominate the European systems integration market
- Increases ICL's presence in the retail banking sector

Currently, ICL's large-scale systems integration revenues remain largely concentrated in the United Kingdom. If ICL is to meet its systems integration growth targets, then the company needs to continue to expand its presence in continental Europe by acquisition or partnership.

ICL shows every sign of doing this. The ICL Group currently consists of 35 separate trading entities, many of which are only part owned. One example of such a company is PSI, a retail sector systems integrator operating in both the U.S. and Europe. ICL expects this number to increase to 50 by the end of 1992 and to be approximately 100 by end 1993.

3. Setting Service Revenue Targets

One of the traditional problems experienced by many systems vendors is the difficulty of persuading clients to pay for services, especially services such as consultancy, which they have come to expect to be bundled within the price of any products purchased. The low margins now being achieved on product sales have made this not sustainable position for vendors.

ICL is tackling this problem by increasing the focus on services selling and providing appropriate incentives to the salesforce. This ensures that the client pays for systems integration and other services and that they are not absorbed within equipment sales. This approach has transformed the profitability of a number of trading units over the last 12 months.

M

KPMG Norton Nolan—Formed Strategic Business Management Unit to Address Business Process Re-engineering

KPMG Peat Marwick's (KPMG) services encompass the whole range of accounting, management consulting and IS consulting activities. Approximately five years ago, the organisation strengthened its IS consultancy activities with the acquisition of Nolan Norton, which retains its identity as the information systems arm of KPMG Management Consulting.

KPMG has recently established a Strategic Business Management Unit through which to focus its BPR service. It does not choose to break down the BPR service into smaller units, but recognises that the stimulus for the activity comes through any one of the disciplines in which it is operating with a client, and can be developed from there.

KPMG Norton Nolan has formed this Strategic Business Management Unit from a number of earlier groups and it comprises 100 staff under the partner Charles Symons. The unit contains accountants, IS consultants, human resources staff and industry focused groups; thus, it is strongly cross-functional as the BPR work demands.

Business process re-engineering is seen to be a major new and growing area of activity. It is defined as a project based activity in which business processes across many functions are studied from the customers' viewpoint, radically re-structured to gain significant performance improvements (for example, cost, time, or quality) through cultural and organisational changes and usually with the use of an enabling technology. It includes the use of a whole range of techniques from the macro to the micro processes of business, from business and IS strategies to implementation. There are almost always significant effects on 3 elements of the business: the process, the technology and the people and their skills. Greatest success occurs when only one or two major changes are implemented at one time.

KPMG Norton Nolan expects the major growth opportunities to be generated within:

- The services sector
- Government
- Utilities

The market will grow as awareness increases in these sectors following the initial successes of business process re-engineering.

The prime benefits to a client are the significant performance benefits that can sometimes be gained and the gaining of a strategic edge over their rivals in a competitive, recessionary market place.

The major market forces are seen as either an evolutionary or a natural development from earlier work in seeking business efficiencies. Process improvements in manufacturing were addressed by methods like Just In Time (JIT), quality circles, computer-aided design and manufacturing. There have been many attempts to improve the efficiency in the office and service areas through such techniques as organisation and methods, IS, and activity based costing or management (ABC or ABM). These have very often only dealt with a limited part of the business or total work flow and consequently have fallen into the trap of 'paving over the cow paths';

in other words, to make an inappropriate route more acceptable or slightly faster. The view taken at Norton Nolan is that of the old cliché, “if it ain’t broke, don’t fix it”, yet this is now irrelevant because BPR is the way to alter the effectiveness and efficiency of business processes. Revolutionary, rather than evolutionary, changes in business practice are necessary to restore an organisation’s competitive positioning in a recessionary market.

KPMG Norton Nolan targets large- or medium-sized companies in the services sector such as government, banking, insurance, distribution, retail and transport. Their strengths in offering business process re-engineering include senior contacts within major organisations, possession of the necessary multidisciplinary or cross-functional skills, and the ability to deliver significant performance improvements.

Contracts lengths vary enormously depending on the start point of the activity that led to the BPR work. Example contracts include the following:

- A city bank established a team of ten, comprising nine of its own staff and one from KPMG, to review the design of an IS system. This led to a redesign of the business process, followed by a redesign of the computer system. The elapsed time of the contract was 4 months and the revenue less than £100K.
- Aircraft maintenance for KLM . The start point was IS and the team worked backwards to understand work flows at a macro level. The result of BPR was to implement a team-based approach and to redesign the computer system. The value of the contract was approximately £150,000 - £250,000.
- A financial services organisation had been reviewing its activities using activity based costing, but realised this was operating at a micro level. With the aid of KPMG this was broadened into a BPR project worth £300,000 - £400,000 and led to the redesign and implementation of business processes.

KPMG views technology as an enabling mechanism for business process re-engineering rather than a prime driver of business process re-engineering. The redesign of business processes often leads to simplification of the process and the required technology. The impact on internal IS departments is variable, but is sometimes to stop some projects completely while the business processes are analysed. Following BPR, the systems application life cycle can resume. CASE is not seen as a key technology, whereas modeling tools and object- oriented analysis techniques are seen as important. However, use of these tools in BPR is variable. Document image processing is a major enabling technology. KPMG is proud of its independence concerning any technology and consequently will not form any strategic alliances with any hardware or software or network vendor to provide any facility required as a result of the BPR project.

N

Logica—Concentrating on Long-Term Partnership

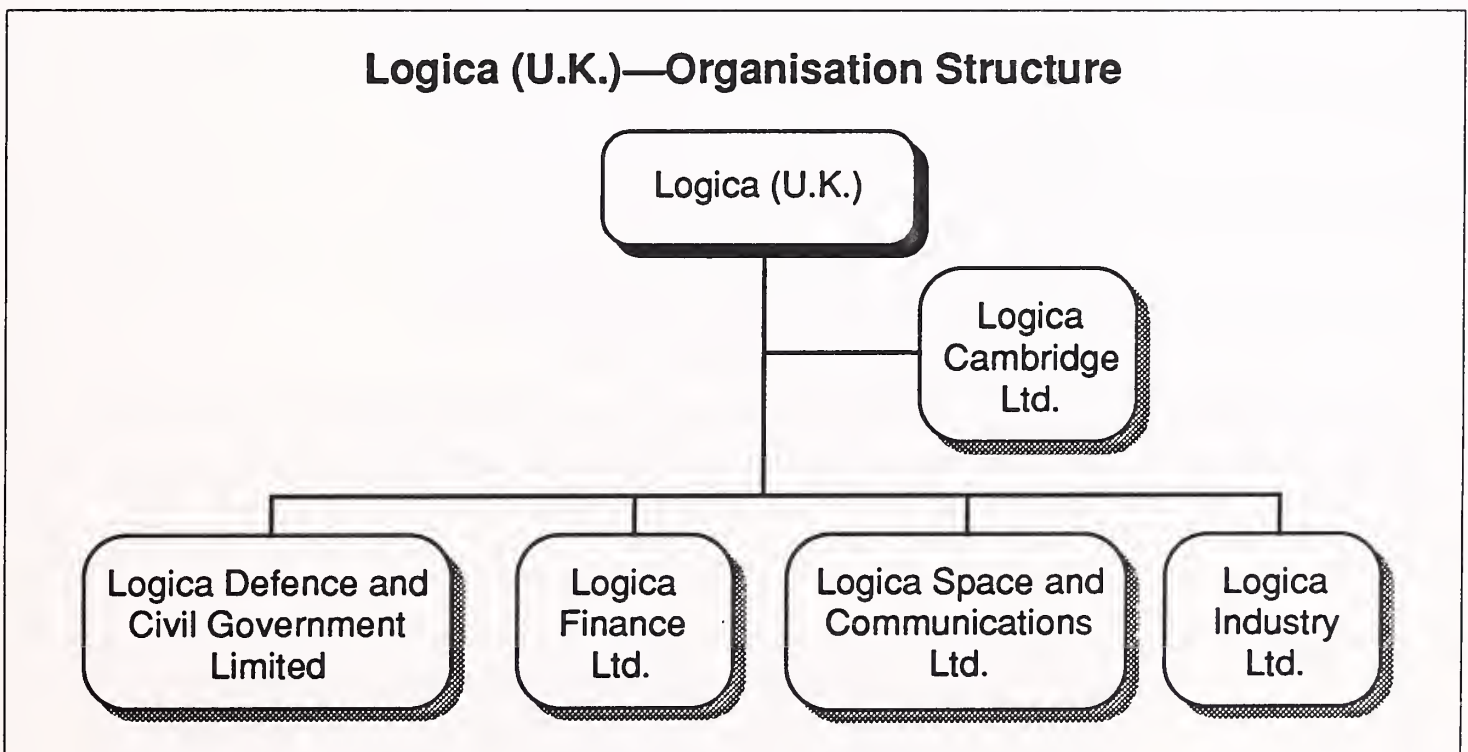
Logica is one of the last surviving, U.K.-owned, major independent professional services vendors and has a long history of custom software development. Despite strong take-over rumours throughout 1992, the company remains independent. The company has a turnover of £200 million and an attractive range of skills including:

- A strong presence in the finance sector
- Highly developed technical skills
- A history of developing long-term partnerships with both clients and fellow vendors

1. Strong Presence in the Finance Sector

As shown in Exhibit N-1, Logica is organised into four operating divisions serving vertical markets and its research organisation, Logica Cambridge Limited.

EXHIBIT N-1



The banking and finance sector is the largest and most international of Logica's defined market sectors. Logica recognises the growing importance of product and kernel-based solutions to optimise cost-effectiveness and delivery times for projects in the sector. The company's product range includes offerings for information distribution, financial message switching and communications, payments platforms, treasury, dealing and transaction processing applications, such as:

- ON/2, a financial transaction processing system
- BESS, a modular global funds transfer system
- FASTWIRE, communications product
- An X.400 product being developed in conjunction with Tandem
- Logica Transaction Director for interconnection of applications across differing hardware platforms

Examples of work carried out by Logica in the banking and finance sector include:

- The development of a custom interface to the SWIFT II Network for the Istituto Bancario San Paolo di Torino
- The development of a common front end to provide access to each of Norwich Union's mainframe-based financial services products
- A fully automated order matching system for the Stock Exchange of Hong Kong
- Participation in the project to build a global clearing house for foreign exchange dealings for the ECHO consortium

2. Highly Developed Technical Skills

In addition to the company's strong presence in the banking and finance sector, the company's main strengths lie in its technical capabilities in support of telecommunications and the utility defence and space industries.

3. Space

Logica is one of the leading suppliers of software and services to the space industry, providing software and systems in the areas of ground control operations, onboard systems and satellite-based control systems. The company's clients include many of Europe's space agencies and their main contractors.

Examples of projects carried out by Logica on behalf of the European Space Agency include:

- Support for BAe in the development of the Polar Platform spacecraft
- Design and development of software for spacecraft control and simulation, in particular for the Infra-red Space Observatory

4. Telecommunications

Logica is well-established in the telecommunications sector and its activities involved intelligent network infrastructure and applications, network management, messaging services, mobile radio networks, and communications satellites. Logica's client list includes a number of PTTs and also satellite organisations in which Logica's knowledge of telecommunications and the space sector are a significant strength. The company also believes that its range of products and kernels are a major strength, enabling its clients to deploy new services rapidly and with minimum risk in a highly competitive environment.

Examples of projects in which Logica has been involved include:

- The provision of intelligent network services to Finland Telecom
- The development of a customer billing and administration system for Hutchinson Hong Kong
- The development of the Dutch PTT Telecom's SAGITTA network and Tradeserver system
- The implementation of the Hong Kong Telecom International tariffs and traffic accounting system
- The design and development of a customer administration, billing and sales ledger system for Ferranti Creditphone

Logica has an international co-operative marketing agreement with Tandem Telecommunications Systems, Inc., covering the latter's intelligent network application software products.

5. Energy & Utilities

Logica has considerable experience in implementing monitoring and control systems for the oil and gas and water industries.

Examples of projects carried out by Logica include:

- A digital mapping system for Anglian Water

- Water pressure and flow monitoring systems for Anglian Water
- The Regional Telemetry Scheme for Yorkshire Water
- The Regional Operations Database for Yorkshire Water
- Enhancement of a system providing meteorological and oceanographical information for Shell Exploration and Production
- Regional gas control systems for British Gas
- National gas pipeline management system for Nederlandse Gasunie

Logica's Master Control systems kernel is the foundation for much of the company's work in pipeline operations management for the oil and gas and water industries.

Logica has a cooperative business agreement with Yorkshire Water to promote joint IS skills to the water industry worldwide.

6. Defence

Logica views its work in advanced technology, in areas such as signal processing, and computer security and communications as key to its success in the defence sector.

Examples of projects in which Logica has been involved include:

- Development of a system for interpreting reconnaissance pictures from military aircraft on behalf of the U.K. Ministry of Defence
- A system to automate the detection of engine and gear box failure in the helicopters of the Fleet Air Arm
- The development and installation of an operational connectivity management system for the shore end of the Royal Navy's ship-shore-ship communications network

7. High R&D Commitment

Logica's investment in research and development supports two main areas: firstly, the development of skills and expertise in new technologies that the company regards as important for the future of the business and secondly, the development of products and kernels, which form a basis for much of the company's systems implementation business, particularly in finance, telecommunications and energy and utilities.

A high proportion of the work on new technologies comes from its Cambridge-based research facility established five years ago. Specialist teams develop new tools, techniques and skills in four key technologies—advanced software engineering (ASE), human computer interaction (HCI), knowledge-based systems (KBS), and speech and language. Logica's research activities centre on collaboration with partners through a number of leading U.K. and Europeanwide research initiatives, including a growing number of projects with associates from British industry and academia.

Logica views Software engineering as a key growth area and is involved in research into formal specification methods, transformational techniques, object-oriented and logic programming, and integrated project support environments. Formal methods are important in safety critical systems, found in situations when undetected errors or failures would cause a risk of life, breach of security or mission failure.

In the area of knowledge-based systems, Logica has worked on a number of collaborative research projects across industry.

Logica is also involved in LINNET, the neural network technology transfer club run jointly by Logica, SD-Scicon and the University of London. It is funded by the Department of Trade and Industry, which introduces members to neural network technology in the context of their own business areas. The club, which was formed in 1990, totals 16 member companies. On behalf of the club, Logica is working with London Underground in a study to determine the use of neural networks to analyse video images of passengers concentrations on platforms. Other research work undertaken by the group includes the optimisation of mail shots, control of distillation column and trend forecasting.

In the area of speech and language technology, Logica is involved in longer term research projects such as SUNDIAL (Speech UNDERstanding and DIAlogue) in which the company is leading a consortium of 12 partners across Europe to develop computer systems that can be accessed by speech over the telephone. In Australia, the company forms part of the GLASS (Generalised Language and Speech System) consortium.

However, by far the largest proportion of Logica's R&D investment is in product development. Such development takes place in the context of client projects, jointly with partners, and as a discrete activity within Logica.

8. Emphasis on Long-term Partnerships

Logica is seeking to establish relationships with clients and other vendors. Recent examples include the formation of Speedwing, a joint venture with British Airways, and a cooperative business agreement with Yorkshire Water. The company has also established a strong relationship with Tandem involving a cooperative marketing agreement covering the latter's intelligent networking application software products and the joint development of an X.400 product.

Logica wants to develop its partnerships with the equipment vendors. The company has assisted IBM in developing a number of software products and views this activity as the way of gaining early product information.

An increasing trend in the systems integration market is long-term partnerships on joint ventures between users and vendors. One example is Speedwing Logica.

In September 1991, Logica and British Airways joined forces to create Speedwing Logica. Its mission was simply to become the pre-eminent supplier of applications software and services to the air transport industry. British Airways has detailed and substantial applications knowledge of its industry. Logica brings an international base of operations, high quality IT skills across many sectors and technologies, and proven project management methods.

Speedwing Logica has around 100 staff, many recruited or seconded from its parent companies, and has moved on from primarily British Airways developments to major new projects with external clients. The first module of British Airways' new revenue accounting system has been sold to Austrian Airlines and work is being undertaken on Iberia Airlines' revenue accounting system. Speedwing Logica has also recently secured its first major professional services contract to develop a travel agency management system that will improve operating effectiveness.

In addition to its own staff, Speedwing Logica has access to British Airways' own 2,600 strong information management function and Logica's 3,400 staff. This provides the joint venture with a considerable depth of industry knowledge, management and technical expertise.

O**Unisys—Aiming to Become Services Company with Strong Technological Skills**

Aware that the company is still largely viewed as an equipment vendor, Unisys is striving to change its strategy and image from that of a 'product driven' company with a strong technology base to that of a 'services driven' company with a strong technology base. Accordingly, Unisys aims to derive more than 20% of its business from professional services by 1995 or 1996.

Currently, Unisys estimates that its Europe Africa Division (EAD) has professional services revenues of \$250 million, with approximately \$100 million of these revenues coming from systems integration projects. This is approximately 10% of the division's total revenues.

To meet the required change in emphasis, Unisys:

- Has developed the Totality brand name to cultivate a change of image
- Is forming partnerships to offer strategic consultancy services
- Is changing its internal skills mix

1. Repositioning its Service Offerings

During 1991 and 1992, Unisys performed extensive customer research into its existing and planned services offering. The results of this work showed that the quality of existing service was felt to be good, but customers' real needs were not met. Unisys was seen as a hardware, mainframe-oriented vendor. The company was strong in services, despite the fact that almost half its revenues came from this source. Customers felt that the services offerings were not always relevant to their needs and that by having a number of delivery channels it was not always easy to deal with the company.

In order to improve the clarity of its offerings to clients, Unisys packaged its services under a single brand name—Totality. Totality was launched in the U.K. in April 1992, and elsewhere in Europe in November 1992.

The services provided within Totality are grouped into three categories:

- Planning and achieving strategic goals
 - High level consultancy and planning
 - Project based services

- Realising solutions
 - Applications development and implementation
 - Multivendor systems integration
 - Outsourcing
 - Network services
 - Education
 - Environmental services
- Effective day-to-day operations
 - Systems service and support
 - Disaster recovery
 - Performance management

2. Partnerships for Strategic Consultancy Services

Unisys has strong internal IS strategy consulting capability, and the company has developed its own methodology—Unisys Enterprise Information Technology Planning—to assist companies in integrating their present islands of automation.

Unisys is especially strong in multivendor systems integration and has carried out many projects of this type in Europe. One example is the Redacs project for the Royal Navy in the U.K. This project involved integrating proprietary mainframes, proprietary minicomputers, UNIX-based equipment, and personal computers across 40 sites. In 1992, Unisys has further developed its multivendor integration capability with the introduction of the Communications Access Processor (CAP). CAP integrates the two different network architectures of UNIX and SNA into a single SNA backbone, enabling terminals anywhere in an SNA network to access UNIX-based applications.

However, Unisys now needs to offer strategic consultancy to gain access to business process re-engineering projects at an early stage in their development.

Accordingly, Unisys has formed partnerships with Coopers & Lybrand in Europe and Peat Marwick in the US to gain access to their business process re-engineering skills.

Unisys has retained its focus on industry sectors with complex, on-line, transaction processing requirements. Eighty percent of the company's revenues are derived from the following sectors:

- Financial services
- Airlines
- Telecommunications
- Government

3. Changing Skill Mix

To market and deliver those new services—particularly business process re-engineering and systems integration—Unisys is in the process of changing its internal skills mix.

Firstly, the role of the company's account managers is evolving from that of sales executive to business adviser. The account manager needs to understand his client's business thoroughly and to become the client's right hand man on information systems issues. Accordingly, his role is no longer to sell products, but to introduce and coordinate Unisys' service units and their specialist sales teams.

Within the systems integration unit, Unisys is placing increased emphasis on project management, particularly the management of projects with values in excess of \$10 million. Another key skill is the ability to design integrated multivendor IS architectures.

In recognition of those needs, there is a shift taking place within Unisys' R&D expenditure towards service methodologies and service tools.

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