STRATEGIC MARKET PERSPECTIVE

The European Business Integration Market - 1994

Business Integration Programme

1 9 9 5

The European Business Integration Market — 1994

INPUT®

INPUT®
International IT Intelligence Services

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

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

SUBSCRIPTION SERVICES

- Information Services Markets
  - Worldwide and country data
  - Vertical industry analysis
- Business Integration Markets
- Client/Server Applications and Directions
- Client/Server Software
- Outsourcing Markets
- Information Services Vendor Profiles and Analysis
- EDI/Electronic Commerce
- U.S. Federal Government IT Markets
- IT Customer Services Directions (Europe)

SERVICE FEATURES

- Research-based reports on trends, etc. (Over 100 in-depth reports per year)
- Frequent bulletins on events, issues, etc.
- 5-year market forecasts
- Competitive analysis
- Access to experienced consultants
- Immediate answers to questions
- On-site presentations
- Annual conference

DATABASES

- Software and Services Market Forecasts
- Software and Services Vendors
- U.S. Federal Government
  - Procurement Plans (PAR)
  - Forecasts
  - Awards (FAIT)
  - Agency Procurement Requests (APR)

CUSTOM PROJECTS

For Vendors–analyse:

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

For Buyers–evaluate:

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

OTHER SERVICES

Acquisitions/partnerships searches

INPUT WORLDWIDE

Frankfurt
Sudetenstraße 9
D-35428 Langgöns-
Niederkleen
Germany
Tel. +49 (0) 6447-6055
Fax +49 (0) 6447-7327

London
Cornwall House
55-77 High Street
Slough, Berkshire
SL1 1DZ
Tel: 44 (0) 1753 530444
Fax: 44 (0) 1753 577311

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

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

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

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

Washington, D.C.
1921 Gallows Road
Suite 250
Vienna, VA 22182 3900
U.S.A.
Tel. 1 (703) 847-6870
Fax 1 (703) 847-6872

Abstract

The term Business Integration can be used to indicate the widest possible view of application solutions development opportunities, in contrast to those indicated by specific terms such as systems integration.

The report contains an overview of market opportunities for services vendors in the European *Business Integration* marketplace, comprising systems integration, professional services and turnkey systems. It provides market sizing analysis and forecasts for the European market and the major country economies of Germany, France, the United Kingdom and Italy.

The report discusses developments in the management consulting and IS consulting arenas, areas of crucial importance to business integrators. It also analyses the growth and future prospects of these delivery modes.

The report also contains an examination of the relative importance of key software, information architectures, communications and equipment technologies to the business integration community. It details the growth and impact that these technologies will have on the overall European integration marketplace.

Research by
INPUT
Cornwall House
55-77 High Street, Slough, Berkshire,
SL1 1DZ

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

**Business Integration Programme—
Europe**

*The European Business Integration
Market — 1994*

Table of Contents

List of Exhibits

Introduction

A
Objectives

This report looks at the dynamics driving changes in the Business Integration Market in Europe.

Due to many significant developments in this important part of the overall software and services market, which consists of vendors of systems integration, professional services and turnkey systems, IT services vendors need to gain an understanding of their positioning in relation to the widest possible market opportunity compatible with their objectives and capabilities.

The term Business Integration can be used to indicate this widest possible view of application solutions development opportunities, in contrast to that indicated by examining the systems integration opportunity in isolation.

This report sets out to provide an overview of this opportunity through three parallel and different perspectives:

- The services delivery mode perspective, encompassing professional services and turnkey systems as well as systems integration

- The competitive perspective, particularly the role of management consultants, as business objectives acquire increased significance and relevance to the delivery of the IT solution

- A technology perspective that evaluates the significance of new technologies of importance to Business Integrators.

B
Scope and Methodology

The report presents analyses of user and vendor views on the European *Business Integration* market, a term used in this part to denote services activity delivered to customers through the following delivery methods:

- Systems Integration

- Professional Services

- Turnkey Systems.

The research that contributed to this study was derived from a number of different sources.

Chapter's III and IV utilise:

- Non-report-specific user and vendor research undertaken in the second half of 1994.

- INPUT's ongoing detailed briefings programme with significant Business Integration Vendors.

The principal sources of information for Chapter V were:

- Interviews with an expert panel of key technology analysts and planners within business integration organisations (Ten formal, structured interviews and over a dozen informal interviews).

- The knowledge base of INPUT's senior staff

- Non-proprietary knowledge and insights gained from custom consulting projects

- Published reports and analyses in trade and technical publications.

C
Report Structure

The remaining chapters of this report are structured as follows:

- Chapter II is an executive overview offering a concise summary of the conclusions of the report

- Chapter III is an overview of market opportunities for services vendors in the European *Business Integration* marketplace, comprising systems integration, professional services and turnkey systems. This chapter provides market sizing analysis and forecasts for the European market and the major country economies of Germany, France, the United Kingdom and Italy.

- Chapter IV discusses developments in the management consulting and IS consulting arenas, areas of crucial importance to business integrators. This chapter also analyses the growth and future prospects of these delivery modes.

- Chapter V examines the relative importance of key software, information architectures, communications and equipment technologies to the business integration community. It also details the growth and impact that these technologies will have on the overall European integration marketplace.

- Appendix A details INPUT's definitional position on the *business integration* market and its component delivery modes.

D
Related Reports

- *Systems Integration Market Europe, 1994-1999*

- *European Professional Services Re-focus for the Mid 1990's*

- *Multimedia — Implications for Business Integrators*

- *Delivering Value Through IS Consulting, Europe 1993-1998*

- *European Market for Software and Services, 1994-1999*

Blank

Blank

II
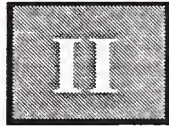
Executive Overview

A
The Business Integration Concept

The demand for Systems Integration (SI) as a specific services delivery model has been driven by a need to address increasing complexity in the course of delivering custom IT-based business solutions.

However, the rise of open systems, the increasing availability of standard software application products and intense cost and time pressures within organisations are creating a dynamic in which vendors of IT-related systems development services are assuming responsibility for delivery of both the IT system and the business processes it supports.

This trend is illustrated in Exhibit II-1.

Exhibit II-1

Integration of IT and Business Processes

Source: INPUT
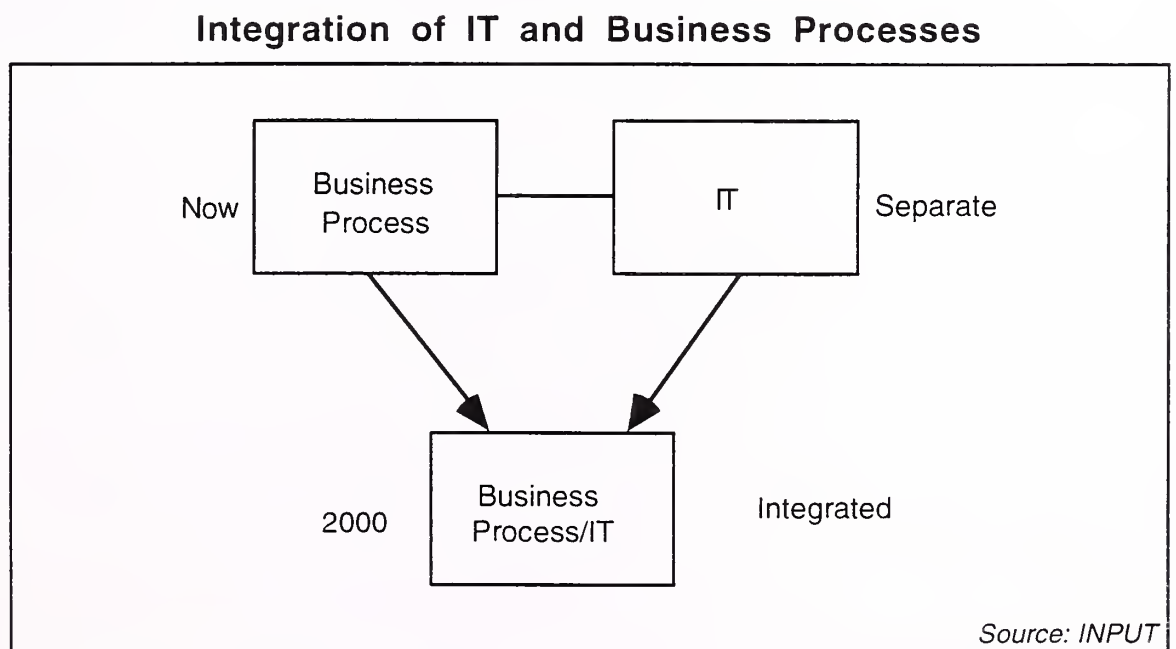
Consequently, IT services vendors need to gain an understanding of their positioning in relation to the widest possible market opportunity compatible with their objectives and capabilities.

The term Business Integration can be used to indicate this widest possible view of application solutions development opportunities, in contrast to that indicated by examining the systems integration opportunity in isolation.

This report sets out to provide an overview of this opportunity through three parallel and different perspectives:

- The services delivery mode perspective, encompassing professional services, turnkey systems and applications software products as well as systems integration

- The competitive perspective, particularly the role of management consultants as business objectives acquire increased significance and relevance to the delivery of the IT solution

- A technology perspective that evaluates the significance of new technologies of importance to Business Integrators.

B
The Market Opportunity Re-analysed

Systems integration and professional services markets are presently in a period of transition in which changes are occurring in some of the fundamental tenets which vendors, purchasers and commentators have understood and come to regard as constants.

There is a marked change in the systems integration market driven by increased user sophistication and expectation. This has resulted in growing demands from purchasers that vendors demonstrate and almost guarantee that a project will come in on budget, on time and with measurable value in business terms from the deliverable.

In assessing opportunities, it is important for vendors to consider the entire potential market for business integration services, effectively the combination of custom software development, systems integration and turnkey systems delivery modes.

Exhibit II-2 presents the European market for Business Integration Services in 1994.

Exhibit II-2
The European Business Integration Markets — 1994 ($ billion)

Delivery Mode Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	15.3	2.1	3.0	—	20.4
Software Products	—	1.3	3.0	10.1	14.4
Equipment	—	1.2	5.7	—	6.9
Other Services	—	0.1	—	—	0.1
Total	15.3	4.7	11.7	10.1	41.8

Source: INPUT

C
The Increasing Importance of Consulting

The IS Consulting Market is both a sub-sector of the software and services market (within the professional services delivery mode) and a significant element of the marketplace addressed by management consultants.

In fact, the overlap between the software and services market and the management consulting markets steadily increased throughout the 1980's.

The majority of this overlap was the result of management consulting firms extending their IT-related activities. They did not just extend their operations into IS consulting but also into software products, development and implementation services, and even into systems operations or outsourcing.

Late 1994 saw a noticeable movement of high profile consultants from audit-based consultancies towards vendors of business integration (BI) services.

BI vendors are pursuing strategic objectives to compete aggressively in the commanding heights of the project services industry with the "Big Six" management consultants.

However, it is anticipated that over the next five years information services vendors will begin to win back much of the business lost to management consultants during the 1980's.

This trend will be driven by development of management consulting as a distinct activity by these firms. Note the relationship between Gemini Consulting and Cap Gemini Sogeti, and the moves by EDS to build a significant presence in this area.

Exhibit II-3 shows the growth of the European IS consulting market between 1994 and 1999.

Exhibit II-3

IS Consulting Market in Europe

Source: INPUT
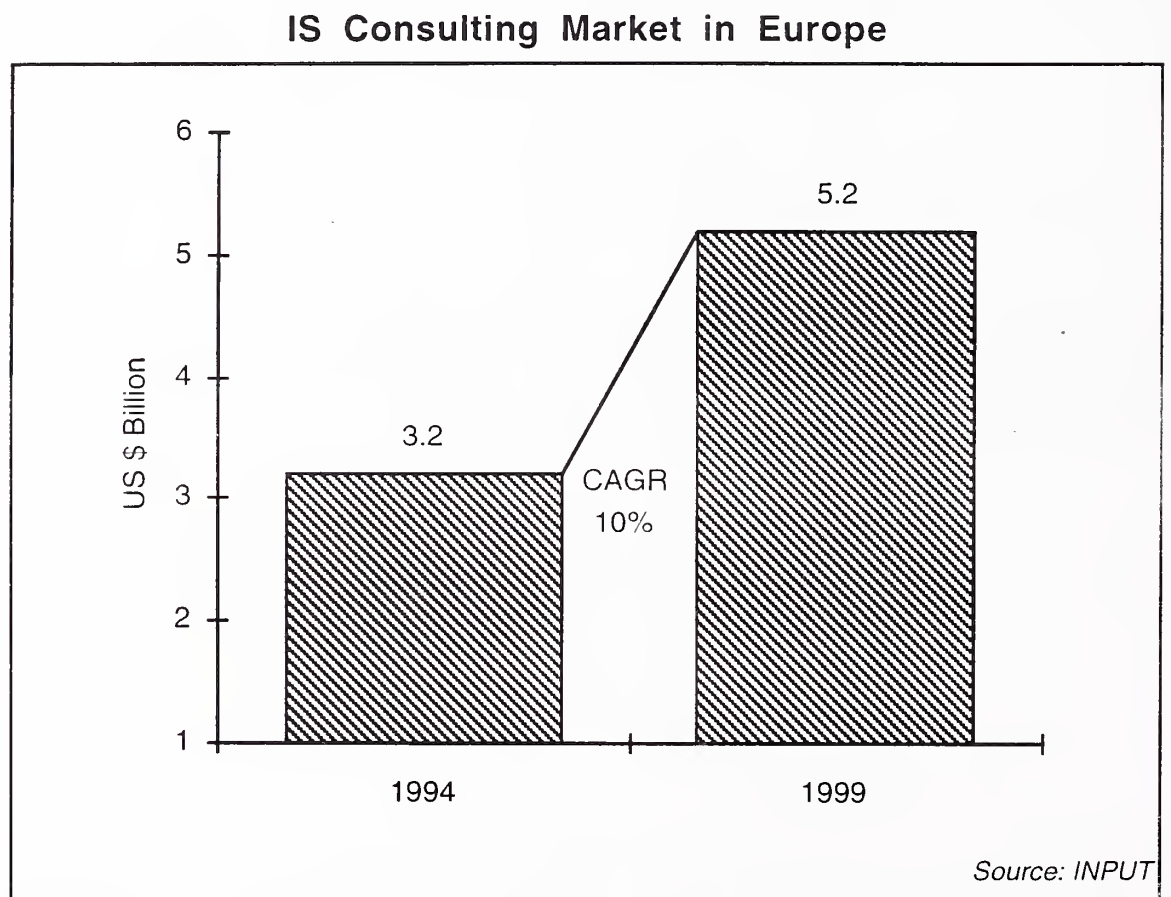
D
Technology Trends and Opportunities

The report also assesses which technologies are likely to be of key importance to systems development and integration vendors over the medium term.

These can be categorised as:

- Technologies that are so pervasive that every BI firm be capable of understanding them (although it may not necessarily have the resources to implement them)

- Specific technologies that will be important in the next five years. Every vendor may not necessarily need to be an expert in every technology; this will depend on a vendor's focus and direction.

These views have been correlated from a number of sources:

- Interviews with an expert panel of key technology analysts and planners within SI organisations (Nine formal structured interviews and over a dozen informal interviews)

- The knowledge base of INPUT's senior staff

- Non-proprietary knowledge and insights gained from custom consulting projects.

Exhibit II-4 shows an assessment of "High Importance" SI-Related Technologies in 1999 compared to 1994 Importance.

Exhibit II-4

SI-related Technologies with High Importance by the Year 2000

Technology

Client/Server
Databases

Communications
Management (Complex)

Client/Server
Applications

Low   Low/   Med.   Med./   High
        Med.   High

▨ 1994   ▧ 1999

Source: INPUT
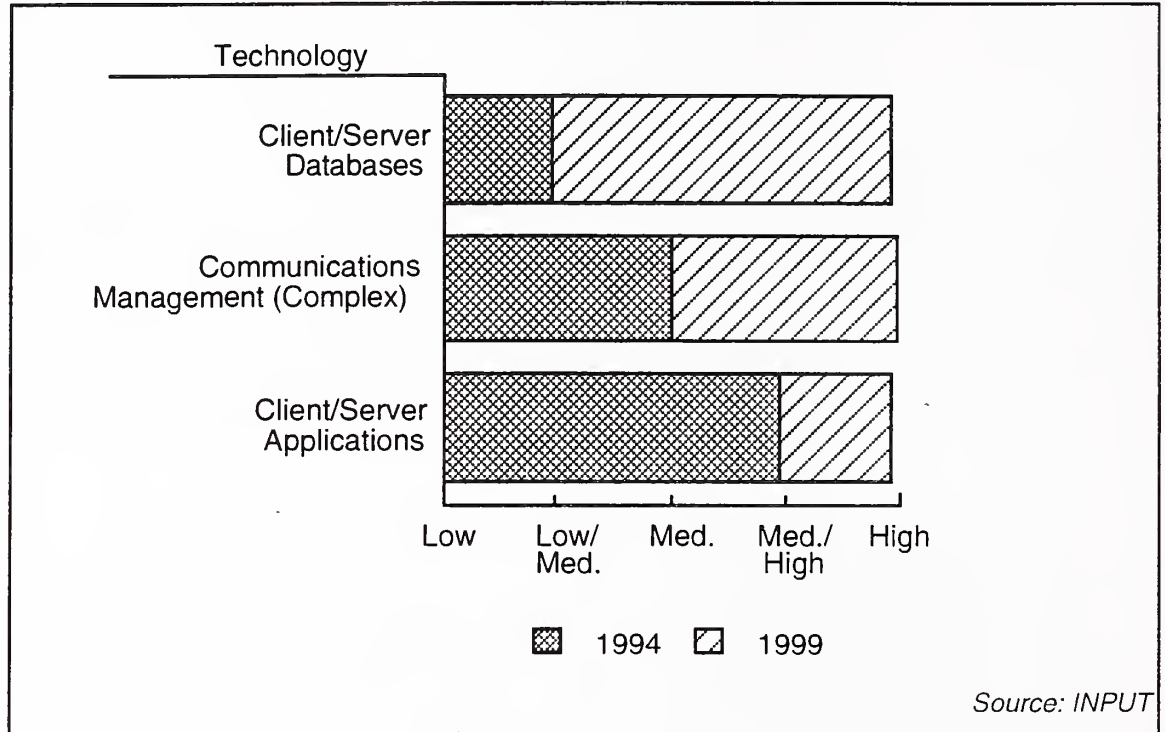
Market Opportunities for Business Integration Services

A
The Idea of Business Integration

In the assessment of any firm's business opportunities, whether they are a large multiple function operation or a niche vendor, it is important to place the assessment of available markets within the widest possible context.

The term *Business Integration* is used in this report to describe the wider perspective within which vendors of systems integration services, turnkey systems and professional services can position themselves to optimise their own specific individual opportunities.

The term *Business Integration* recognises that IT service vendors are being compelled to consider, and take responsibility for, the business objectives within which client's applications solutions are developed and implemented.

The convergence of IT systems and business processes is being driven by a number of interlinking and re-inforcing factors that marginalise IT experts and central IT departments, namely:

- The continued adoption of open systems

- The increasing availability of standard software application products

- Intense cost and time pressures within organisations

- Increased business unit responsibility for the IT systems that support core processes.

IT services organisations focused on the delivery of an applications solution to a customer can operate through a number of different service delivery modes:

- Systems integration

- Turnkey systems

- Professional services.

The broad environment for business integration services, represented by these three delivery modes, is described in this chapter. Firstly, it describes the definitional boundaries between these different delivery modes and the general market forces and trends affecting them.

Secondly, it provides market size and forecast data for these market opportunities in Europe and the four major country economies of Germany, France, Italy and the United Kingdom.

B
Delivery Mode Dynamics and Definitions

1. Changes in Development Projects

Systems integration and professional services markets are presently in a period of transition in which some of the fundamental tenets which vendors, purchasers and commentators have understood and come to regard as constants are changing.

There is a marked change in the systems integration market driven by increased user sophistication and expectation. This has resulted in growing demands from purchasers that vendors demonstrate and almost guarantee that a project will come in on budget, on time and with measurable value in business terms from the deliverable.

The most significant trends in the marketplace can be characterised as:

- As increasing proportion of smaller-sized projects

- Custom development being replaced by standard product integration

- Attempts by vendors to move away from fixed price contracts.

The market is witnessing a growing number of lower-cost projects, partly generated by the break-up of large projects into related steps. The imperative to cut costs and achieve short term results has led to a reluctance on the part of many executives to avoid *mega* SI deals and to be satisfied with more modest, and more realistic, project aims.

There is also clearly a movement away from custom development project delivery towards standard product integration. These projects utilise stable and proven packaged software products as opposed to a large element of custom-developed software. Such projects require a smaller, but more highly-skilled number of programmers.

There is also a move by vendors to consider innovative pricing strategies for system development contracting. From the vendor's perspective fixed-price contracts represent the highest level of risk whilst time and materials contracts represent the least risk exposure providing the project's business aims are met.

Vendors are considering pricing strategies that promote risk sharing and reduce profit erosion. Greater involvement in the client's business processes and applications is a necessary element of this approach.

2. The Continuing Role for Turnkey Systems

Turnkey systems, regarded as an antiquated delivery mode by some vendors, are still an important part of the overall software and services market. In the market it has been fashionable over the last few years to refer to almost anything as systems integration.

In definitional terms the distinction between turnkey systems and systems integration is very clear as shown in Exhibit III-1.

Exhibit III-1

The Customisation Spectrum

Systems Integration	Custom Turnkey	Turnkey
	Degree of Customisation	

| 100% | 50% | 25% | 0% |

Source: INPUT
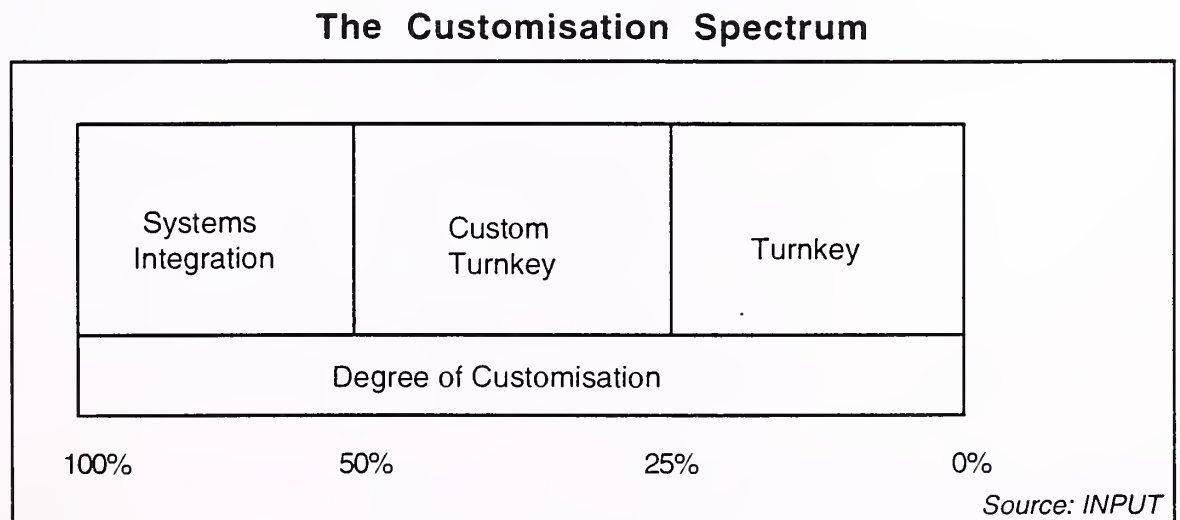
Increasing demand for turnkey projects is particularly evident in organisations such as hotels, vehicle retail outlets and medical centres where there is a relatively low cost/low function requirement, but where there is a significant opportunity for vendors to replicate a solution for a large number of organisations.

The boundary between the professional services activity within SI and that carried out on an independent basis is another area which needs careful consideration. The need to understand this complex interface is increasing as a result of the fierce battle being fought between established SI vendors, services firms, management consultancies, software product vendors, and new entrants from areas such as telecommunications.

Fiercely competitive conditions in the market for management consultancy have led management consultants to aggressively explore opportunities outside their traditional markets. This has also clearly contributed to increased pressure on systems integration vendors.

A further discussion of the impact of management consultants on business integration opportunities is provided in Chapter IV.

The changes present a number of challenges to vendors of business integration services in their continuing efforts to optimise their opportunities in the marketplace.

C
European Market Sizing and Forecasts

In assessing opportunities, it is important for vendors to consider the entire potential market for business integration services, effectively the combination of custom software development, systems integration and turnkey systems delivery modes.

This section provides an analysis of this total market opportunity for Europe as a whole.

Exhibit III-2 shows the progression of external spending on business integration-related activities for the whole of Europe compared to the total expected expenditure on IT over the period 1994 to 1999.

Exhibit III-2

Internal v External Spending on Applications Development, Europe 1994-1999

☐ Application Software ☐ Business Integration ☒ In-house IS Staff
Products

% of expenditures

1994
100%: In-house IS Staff 65%, Business Integration 25%, Application Software Products 10%
$115 B

1999
100%: In-house IS Staff 50%, Business Integration 35%, Application Software Products 15%
$120 B

Source: INPUT
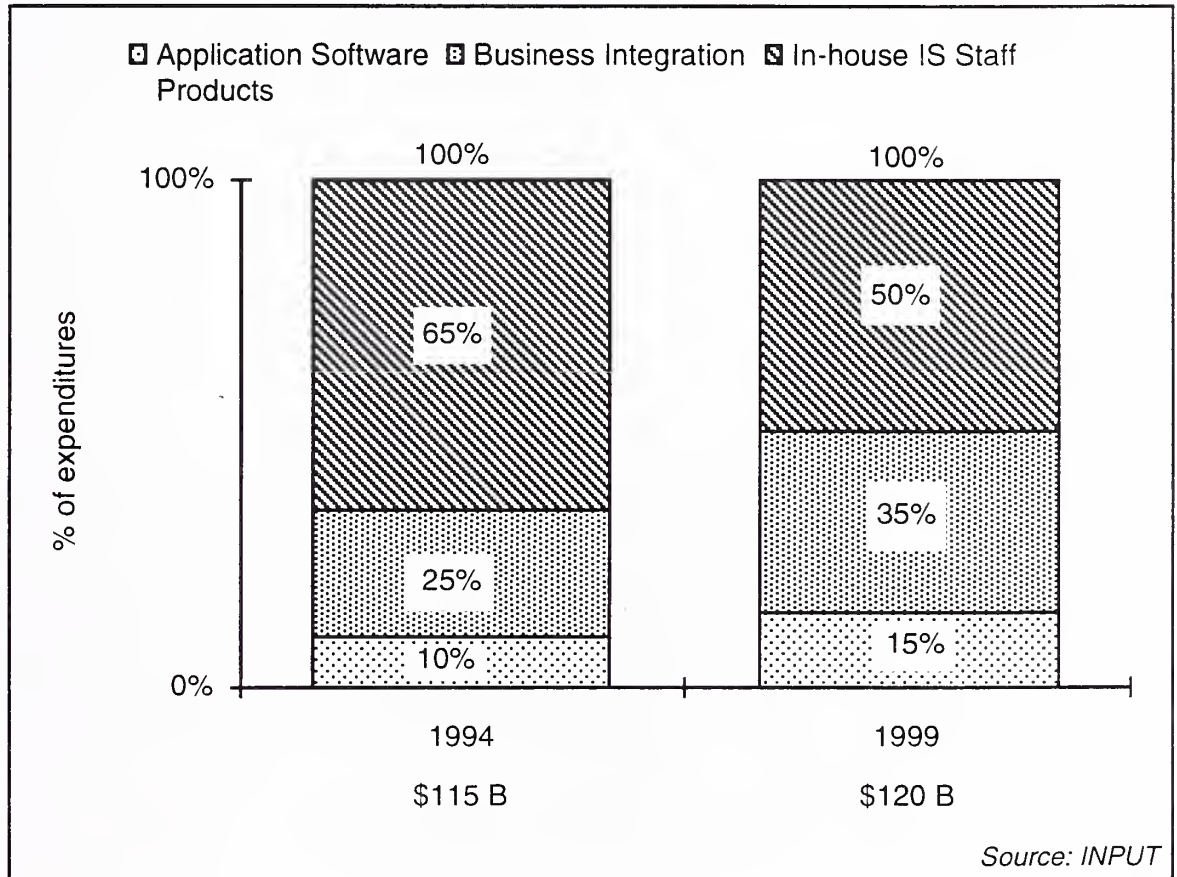
Exhibit III-3 presents a comparison of compound annual growth rates (CAGR) for the business integration markets in the major country economies over the period 1994 to 1999. The overall CAGR for Europe as a whole in this period is 7%. The major markets' share of the overall European market will decline from 68% to 65% by 1999 as a result of strong growth in some of the emerging markets, notably in eastern Europe.

Exhibit III-3

European Business Integration 1994-1999 Market Forecast

	1994	1999	1994-1999 CAGR (%)
Germany	8487	12788	8
France	10397	12730	4
United Kingdom	6425	8474	6
Italy	3653	5103	7

Source: INPUT

Exhibit III-4 and III-5 respectively present a consolidation of business integration delivery modes and their components for the years 1994 and 1999. It should be noted that the figures for the overall BI marketplace contain INPUT's analysis of revenues derived from the development of applications software products. Examples of these types of projects would include accounts payable systems, order entry and general office systems.

Exhibit III-4

European Business Integration Markets — 1994 ($ billion)

Delivery Mode Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	15.3	2.1	3.0	—	20.4
Software Products	—	1.3	3.0	10..1	14.4
Equipment	—	1.2	5.7	—	6.9
Other Services	—	0.1	—	—	0.1
Total	15.3	4.7	11.7	10.1	41.8

Source: INPUT

Exhibit III-5

European Business Integration Markets — 1999 ($ billion)

Delivery Mode Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	16.1	2.8	4.9	—	23.8
Software Products	—	3.2	5.0	17.2	25.4
Equipment	—	1.7	6.9	—	8.6
Other Services	—	0.2	—	—	0.2
Total	16.1	7.9	16.8	17.2	58

Source: INPUT

Exhibit III-6 shows the forecast growth for the professional services element of these delivery modes.

Professional Services Element of Business Integration CAGR — Europe, 1994-1999

Source: INPUT
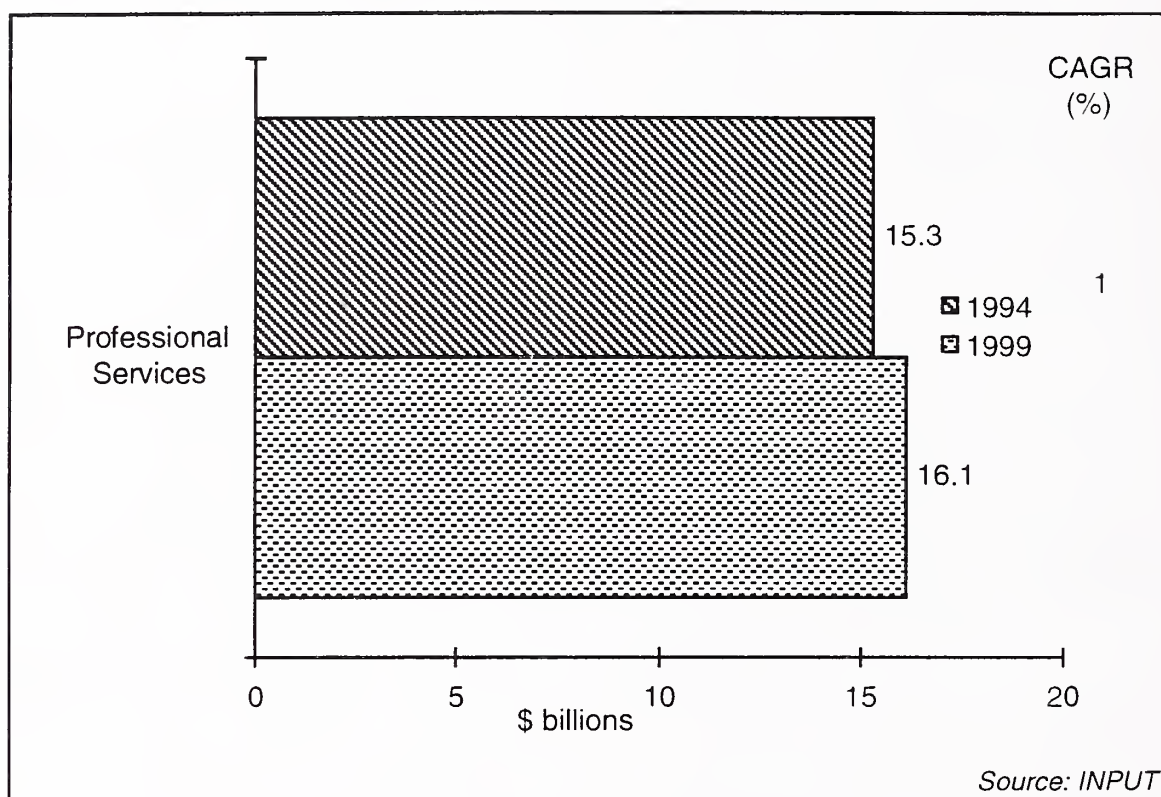
Key capabilities of systems integration, i.e. prime contracting and multi-platform/network integration will remain of undiminished importance.

As already indicated, the turnkey delivery mode is predicted to remain an important opportunity, significantly greater in size than that of systems integration.

This indicates that business integration vendors will need to adopt a fluid, adaptable approach, and be able to demonstrate the ability to recommend and implement different solutions to meet different customer requirements.

D
Major Country Markets — Sizing and Forecasts

This section of the report provides a similar type of analysis to that for the overall European BI marketplace for the major country markets of Germany, France, the United Kingdom and Italy.

1. Germany

Exhibit III-7 shows the German BI market in 1994 and Exhibit III-8 the forecast for 1999. Germany is estimated to grow at 8% in this period which is the highest rate for the major country markets.

This is partially due to the fact that the German market has been slightly slower to develop over the last five years than the market in the United Kingdom and especially in France. It is also a recognition of the *dynamo* effect the combination of growth in Eastern Europe and a more aggressive use of external professional services firms will have over the medium term.

The German market will witness significant growth in the software products arena and in applications software products. This style of growth will replace in-house custom development and will typically, as across the whole of Europe, be centred around major packages such as SAP and Oracle.

Exhibit III-9 presents a forecast for professional services growth over the next five years.

Exhibit III-7

1994 Business Integration Markets — Germany ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	1800	270	1010	—	3080
Software Products	—	199	1014	2100	3313
Equipment	—	180	1900	—	2080
Other Services	—	14	—	—	14
Total	1800	663	3924	2100	8487

Source: INPUT

Exhibit III-8

1999 Business Integration Markets — Germany ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	1600	340	1720	—	3520
Software Products	—	526	1738	4400	6664
Equipment	—	250	2180	—	2430
Other Services	—	34	—	—	34
Total	1600	1150	5638	4400	12788

Source: INPUT

Exhibit III-9

Germany — Professional Services Growth 1994-1999 ($ million)

	1994	1999	1994-1999 CAGR (%)
Professional Services	3000	3300	2
IS Consulting	530	910	11
Education and Training	630	750	3
Custom Software	1800	1600	−2
Application Management	19	71	30

Source: INPUT

BILQ   III-11

2. France

Exhibit III-10 shows the French BI market in 1994 and Exhibit III-11 the forecast for 1999. France is estimated to grow at 4% in this period which is the lowest rate for the major country markets.

Although the overall economic climate is expected to improve over the medium term, increased client expectation of greater value for money will suppress higher growth rates.

The French market will witness significant growth in the software products arena and in applications software products, as in Germany and the United Kingdom. As with those markets, growth of this type will replace in-house custom development, and be centred around SAP and other major packages. The French market will also witness a decline in the high levels of software house custom development projects.

Exhibit III-12 presents a forecast for professional services growth over the next five years.

Exhibit III-10

1994 Business Integration Markets — France ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	5100	420	470	—	5990
Software Products	—	245	472	2500	3217
Equipment	—	250	920	—	1170
Other Services	—	20	—	—	20
Total	5100	935	1862	2500	10397

Source: INPUT

Exhibit III-11

1999 Business Integration Markets — France ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	5000	560	750	—	5950
Software Products	—	593	751	3600	4944
Equipment	—	350	1080	—	1430
Other Services	—	46	—	—	46
Total	5000	1549	2581	3600	12730

Source: INPUT

Exhibit III-12

France — Professional Services Growth 1994-1999 ($ million)

	1994	1999	1994-1999 CAGR (%)
Professional Services	6600	7000	1
IS Consulting	810	1090	6
Education and Training	610	750	4
Custom Software	5100	5000	0
Application Management	44	134	25

Source: INPUT

4. United Kingdom

Exhibit III-13 shows the United Kingdom BI market in 1994 and Exhibit III-14 the forecast for 1999. The United Kingdom is estimated to grow at 6% during this period.

The UK professional services sector is witnessing an increasing preference for standard business solutions and package-based development. There is also a noticeable growth in demand for turnkey based systems and package-based systems integration.

Exhibit III-15 presents a forecast for professional services growth over the next five years.

Exhibit III-13
1994 Business Integration Markets — United Kingdom ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	1900	610	500	—	3010
Software Products	—	340	510	1200	2050
Equipment	—	330	1010	—	1340
Other Services	—	25	—	—	25
Total	1900	1305	2020	1200	6425

Source: INPUT

Exhibit III-14
1999 Business Integration Markets — United Kingdom ($ million)

Delivery Mode Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	1500	820	740	—	3060
Software Products	—	744	744	2100	3588
Equipment	—	480	1300	—	1780
Other Services	—	46	—	—	46
Total	1500	2090	2784	2100	88474

Source: INPUT

Exhibit III-15
United Kingdom — Professional Services Growth 1994-1999 ($ million)

	1994	1999	1994-1999 CAGR (%)
Professional Services	2900	3100	1
IS Consulting	670	1070	10
Education and Training	300	330	2
Custom Software	1900	1500	5
Application Management	67	237	29

Source: INPUT

5. Italy

Exhibit III-16 shows the Italian BI market in 1994 and Exhibit III-17 the forecast for 1999. The Italian market is estimated to grow at 7% in this period.

Exhibit III-16

1994 Business Integration Markets — Italy ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	1500	150	160	—	1810
Software Products	—	79	158	1200	1437
Equipment	—	80	320	—	400
Other Services	—	6	—	—	6
Total	1500	315	638	1200	3653

Source: INPUT

Exhibit III-17

1999 Business Integration Markets — Italy ($ million)

Delivery Mode / Component	Professional Services	Systems Integration	Turnkey Systems	Application Software Products	Total
Custom Software Development and other Professional Services	1600	200	250	—	2040
Software Products	—	190	251	2100	2541
Equipment	—	120	380	—	500
Other Services	—	12	—	—	15
Total	1600	522	881	2100	5103

Source: INPUT

Exhibit III-18

Italy — Professional Services Growth 1994-1999 ($ million)

	1994	1999	1994-1999 CAGR (%)
Professional Services	2000	2400	3
IS Consulting	320	530	10
Education and Training	150	200	5
Custom Software	1500	1600	1
Application Management	18	51	23

Source: INPUT

Blank

IV
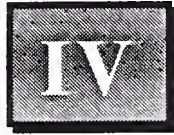
IS Consulting — Key Role in Business Integration

A
IS Consulting Forecast

The IS Consulting Market is both a subsector of the software and services market (within the professional services delivery mode) and a significant element of the market addressed by management consultants.

In fact, the overlap between the software and services market and the management consulting markets steadily increased throughout the 1980's.

Most of this overlap was the result of management consulting firms extending their IT-related activities. They did not just extend their operations into IS consulting but also into software products, development and implementation services and even into systems operations or outsourcing.

Exhibit IV-1 shows this overlap for 1994. Each of these market sectors is illustrated by a rectangle whose area is proportional to the market size.

Approximately one-third of management consultancy business fits within INPUT's market definitions of software and services. Similarly, about 4% of all software and services business is IS consulting.

The diagram shows that IS consulting is a similarly small proportion of the management consulting business mix and that IS vendors supply the large majority of IS consulting.

Exhibit IV-1

Overlap of Consulting Markets in Europe, 1994

Management Consulting $9 billion

IS Consulting $3.2 billion

Software and Services $83 billion

Source: INPUT
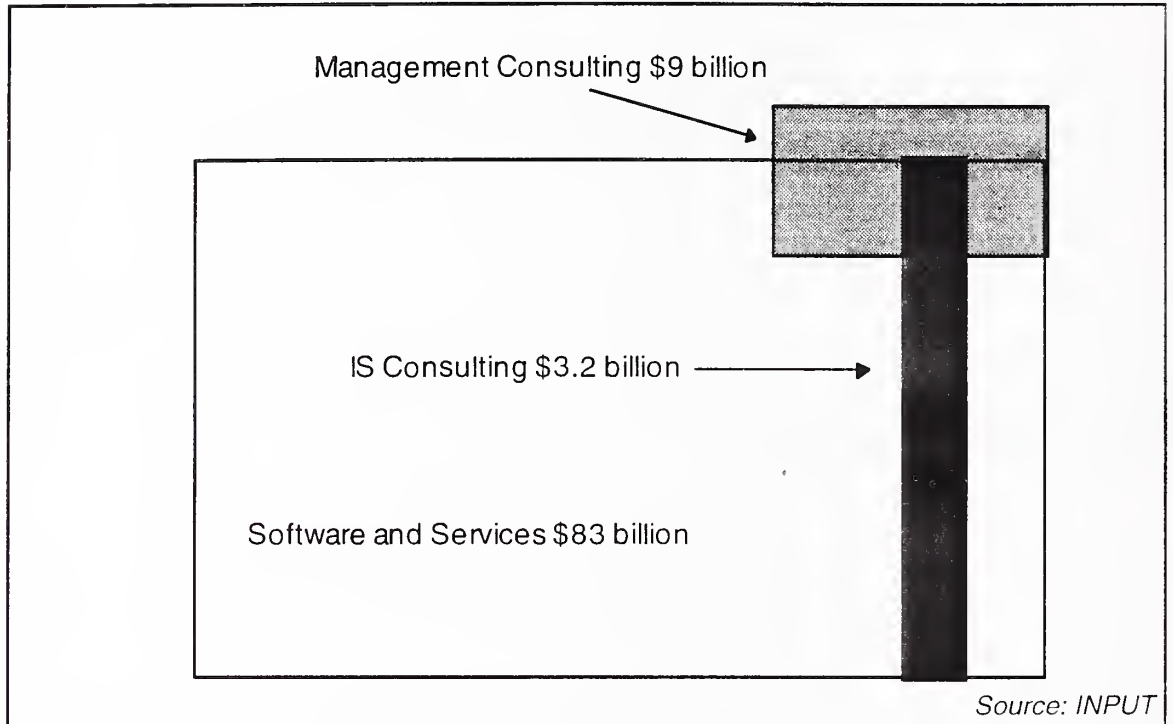
Exhibit IV-2 shows the average European growth in IS consultancy services in Europe over the next five years.

Exhibit IV-2
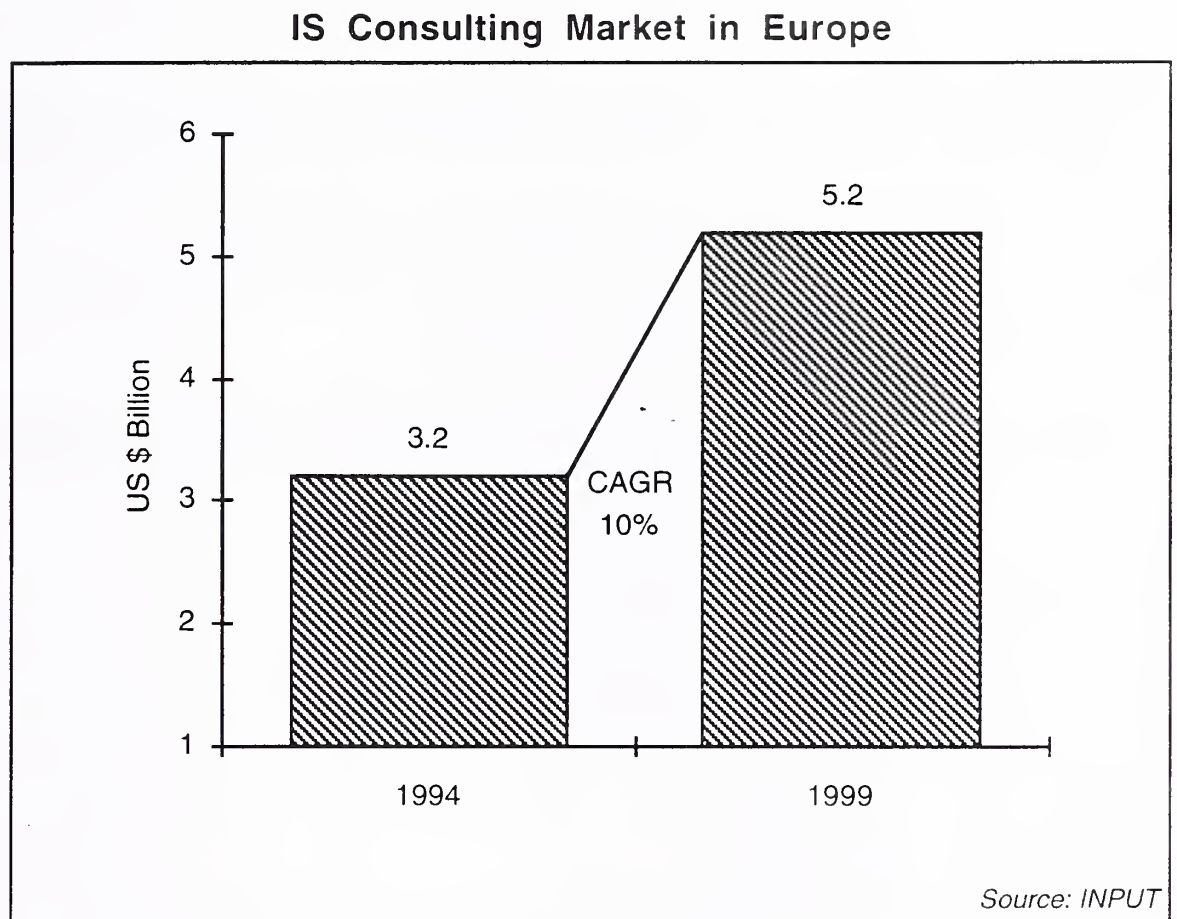
IS Consulting Market in Europe

Source: INPUT

It is anticipated that over the next five years information services vendors will begin to win back much of the business lost to management consultants during the 1980's.

This trend will be driven by development of management consulting as a distinct activity by these firms. Note the relationship between Gemini Consulting and Cap Gemini Sogeti, and the moves by EDS to build a significant presence in this area.

Late 1994 saw a noticeable movement of high profile consultants from audit-based consultancies towards vendors of business integration (BI) services.

BI vendors are pursuing strategic objectives to compete aggressively in the commanding heights of the project services industry with the "Big Six" management consultants.

The overall CAGR of the IS consulting market in Europe is 10% over the period 1994-1999. However, towards the end of the period under study, 1998, the overall growth rate is expected to rise to 12%.

Exhibit IV-3 shows the variation in average growth rate over the period 1994-1999 between different countries in Europe.

Exhibit IV-3

IS Consulting Market — Country Comparisons 1994-1999
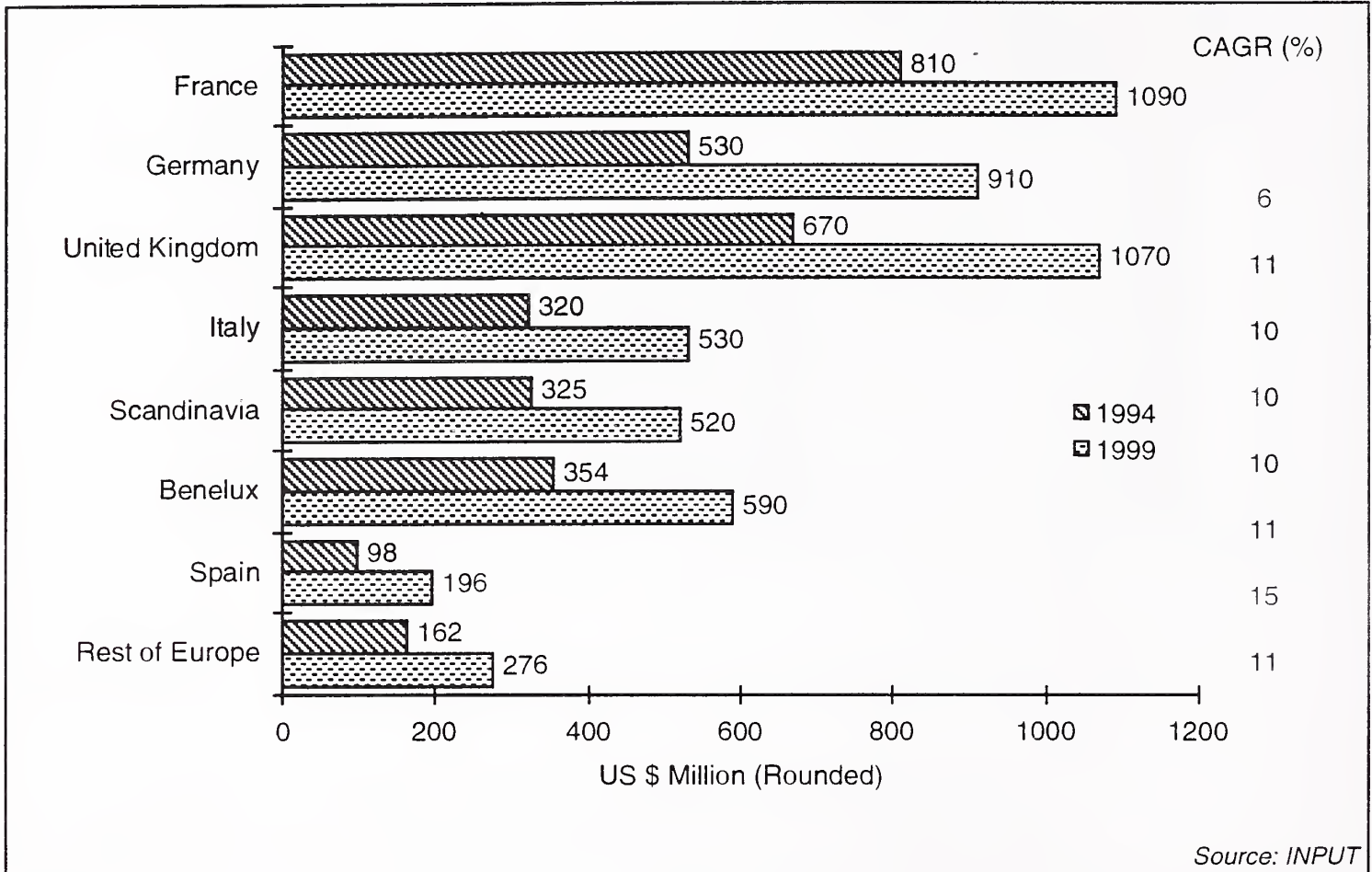
Spain shows the highest growth rate in this period, albeit from a low base figure. Italy also shows a high growth rate reflecting the expectation that Italian industry will attempt to approach IT investment levels similar to those of the other major European economies.

The UK and France show the lowest levels of growth.

Exhibits IV-4 to IV-8 list the leading IS consultancy vendors for Europe, France, Germany, the UK and Italy.

Exhibit IV-4

Leading Vendors — IS Consulting Services, Europe 1994

Rank	Vendor	Estimated Sector Revenues ($ Millions)	Market Share (%)
1	IBM	180	5.5
2	Oracle	165	5.0
3	Cap Gemini Sogeti	95	3.0
4	Andersen Consulting	90	2.7
5	Sema Group	80	2.5
6	Finsiel	65	2.0
7	ICL	55	1.6
8	Ollivetti	50	1.5
9	Unisys	50	1.5
10	Price Waterhouse	45	1.3
	Total Listed	875	26
	Total Market	3,250	100

Source: INPUT

Exhibit IV-5

Leading Vendors — IS Consulting Services, France 1994

Rank	Vendor	Estimated Sector Revenues (FF Millions)	Market Share (%)
1	Sema Group	145	3.3
2	Oracle	140	3.2
3	Cap Gemini Sogeti	115	2.6
4	SG2	90	2.1
5	CGI	75	1.7
6	Andersen Consulting	45	1.0
7	Axime	45	1.0
8	Syseca (Thomson)	40	0.9
9	EDS	40	0.9
10	AT&T	30	0.7
	Total Listed	765	17.6
	Total Market	4,350	100

Source: INPUT

Exhibit IV-6

Leading Vendors — IS Consulting Services, Germany 1994

Rank	Vendor	Estimated Sector Revenues (DM Millions)	Market Share (%)
1	Oracle	50	6.0
2	Datev	20	2.4
3	Cap Gemini Sogeti	20	2.4
4	Siemens-Nixdorf	20	2.4
5	Cap debis	15	1.8
6	Hewlett Packard	10	1.2
7	SAP	10	1.2
8	ComputerVision	10	1.2
9	IBM	10	1.2
10	AC Service (Raet)	10	1.2
	Total Listed	175	21.1
	Total Market	830	100

Source: INPUT

Exhibit IV-7

Leading Vendors — IS Consulting Services, United Kingdom, 1994

Rank	Vendor	Estimated Sector Revenues (PS Millions)	Market Share (%)
1	Oracle	35	8.5
2	Logica	20	4.9
3	ICL (Fujitsu)	20	4.9
4	Sema Group	15	3.7
5	Andersen Consulting	10	2.4
6	PE-International	10	2.4
7	AT&T	5	1.2
8	EDS UK	5	1.2
9	Hoskyns (CGS)	5	1.2
10	Coopers & Lybrand	5	1.2
	Total Listed	130	31.7
	Total Market	410	100

Source: INPUT

Exhibit IV-8

Leading Vendors — IS Consulting Services, Italy 1994

Rank	Vendor	Estimated Sector Revenues (Lira Billions)	Market Share (%)
1	Finsiel	80	16.0
2	Ollivetti	20	4.0
3	Oracle	15	3.0
4	S & M Group	15	3.0
5	Andersen Consulting	10	2.0
6	Logica	10	2.0
7	Cap Gemini Sogeti	5	1.0
8	Engineering	5	1.0
9	IBM	5	1.0
10	Unisys	5	1.0
	Total Listed	170	34.0
	Total Market	500	100

Source: INPUT

B
The Management Consulting Market

In order to understand the development and growth of management consultancy in Europe it is necessary to take a brief look at how the relationship between general management consultancy and IS consultancy has developed.

Management consultancy expanded rapidly in all the heavily industrialised parts of Europe in the 1980's. Partly this has been on the back of a progressive economic growth and partly as a result of the general increase in the level of sophistication of European management.

Many of Europe's senior managers had by this time had some exposure to the major business schools of the USA — and had seen the dramatic and beneficial effects of planned management.

Exhibit IV-9 presents an overview of trends in management consultancy and summarises the main forces driving the consultancy market during the late 1980's. The general management consulting firms grasped the importance of IS to their future success and realised that the time was ripe to begin to transfer control of IS from the technocrats to management.

Many of these general management consulting firms were involved in financial audit work and were exposed to the severe problems poorly-managed computer projects could cause.

During this period, IS-related consultancy grew from around 15% to 35% of the general management consultancy firms' business. In addition, the general management consulting firms increased their share of the computer services and software market by some 5% to 12%.

Exhibit IV-9

Management Consultancy Historic Trends — The Late 1980s

• IT-related	– Grew from 15% to 35% of business – Share of computer services market grew from 2% to 4% – Implementation main growth contributor –Share of IS Consulting sector held steady
• Client needs	– Cost and efficiency improvements – Need for competitive edge
• Demand drivers	– Privatisation – Deregulation – "Single European Market"

Source: INPUT

By the early 1990's economic growth had slowed. One of the most severe recessions to hit the world economy for 50 or more years slowed growth dramatically in all industry sectors.

Consulting firms were affected at least as hard as their clients and a period of zero or negative growth set in for some sectors of the consulting business.

In both technical design and IS strategy there is strong preference for implementation consultants. This is important when analysing the changes that recession has brought about in the consulting sector.

During the early 1990's, as a result of the recession many consulting firms cut back heavily on staff. Bain, Ernst & Young, KPMG and Coopers & Lybrand were just some of the firms who laid off partners and consulting staff. A few firms, however, expanded by acquisition. Sogeti (Gemini Consulting), CSC-Index and McKinsey all acquired specialist consulting firms.

These acquisitions have left the market with fewer small and medium-sized consulting firms and have expanded the influence of the larger management consultancies.

The market is dividing into two groups: those firms with a strong business strategy bias such as McKinsey, Bain, Boston Consulting Group and CSC Index; and those with strength in technology and systems implementation such as Sema Group, EDS, Digital and IBM.

Both groups are trying to extend their influence into both markets but only Andersen Consulting has been successful at projecting an image of strength in both business strategy and IS in Europe.

These changes mean that customers must consider carefully the match between their needs and the consulting firm they hire.

Exhibit IV-10 shows the number of respondents planning to use different consulting services over the next two years. Highest potential demand was for BPR with conventional business needs analysis following.

Exhibit IV-10
Early to Mid 1990's Management Consultancy Growth Sectors

Sample of 60 European Companies.   Source: INPUT
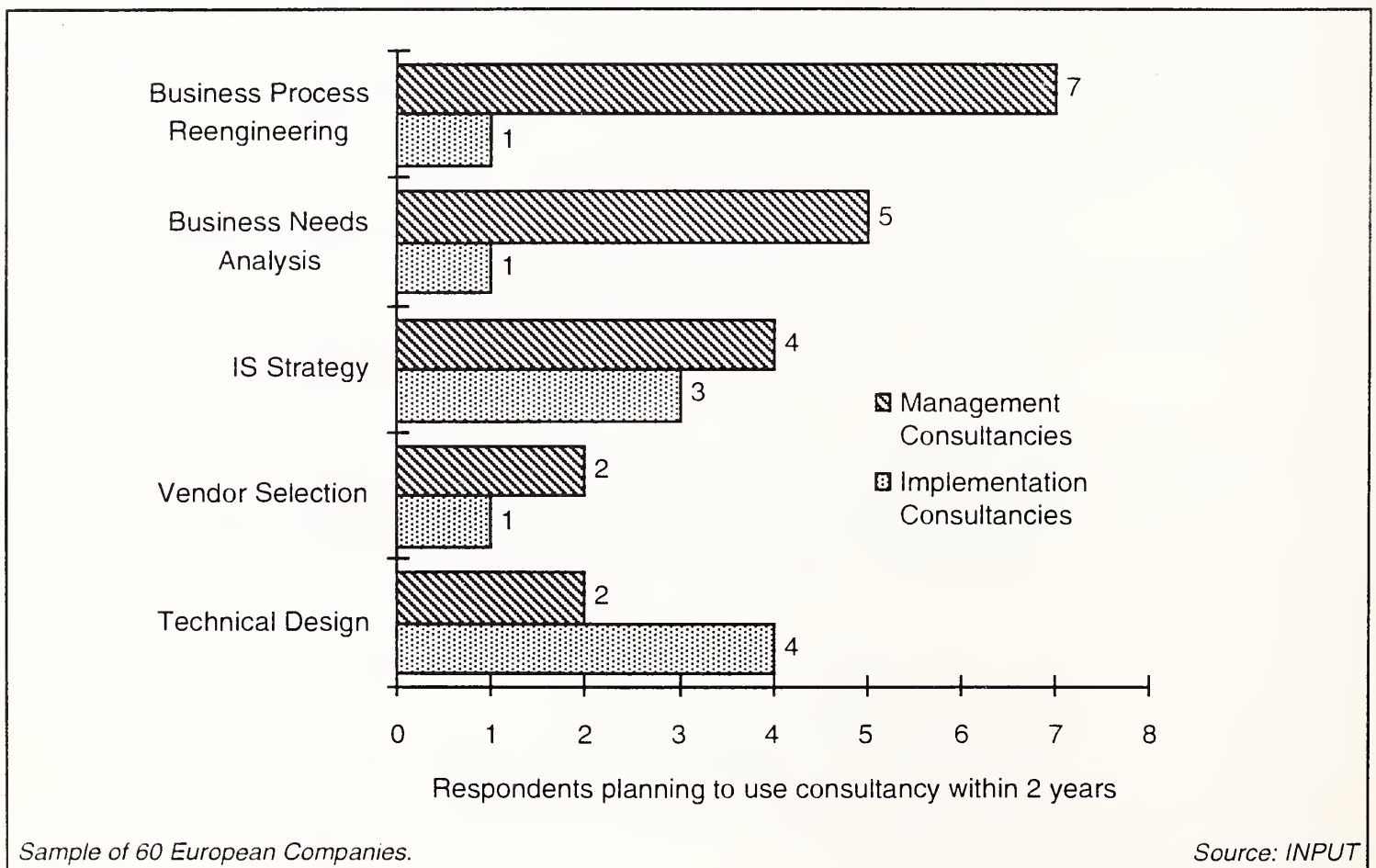
The business strategy consulting firms will find it easier to move into the provision of information services than information service vendors will find it to move into business strategy.

This is because technology skills are becoming more readily available and the success of IS projects is now seen to be strongly influenced by people and business issues rather than just IS system design.

However, it is also unlikely that business strategy consultancies will move more strongly into IS implementation. This is because the culture of strategic management consultancies is orientated around new business ideas, change and the scrapping of existing systems.

On the other hand, large-scale IS consulting requires a heavy investment in people, training and techniques and a strategy of building on existing systems. The two cultures are very different and attract different kinds of manager.

Exhibit IV-11 shows the profile of management consultancy in the early 1990's.

The IS-related proportion of the management consultancy firms remains static. Overall growth in IS consultancy, however, remains at about 9%. This growth derives from ongoing implementation work, outsourcing and IS implementation driven by BPR and traditional management consulting.

Factors driving IS growth are the length of the recession, the ever-increasing complexity of doing business, a strong focus on supporting customers and an ongoing desire to consider outsourcing IT.

Exhibit IV-11

Management Consultancy Trends in the Early 1990's

• IT-related	– Zero or negative growth – IT-related share stays constant or drops – IS growth slows to 9% – Implementation firms continue to grow
• Clients	– Still spending but new projects held back – Focus on fast and high-return projects – Focus on in-house added value – Focus on globalisation and internationalisation
• Demand drivers	– Cost reduction – Business complexity – Customer service support – Outsourcing

Source: INPUT

One of the trends clearly visible by the early 1990's is the increased business orientation of IS and IS managers. More and more frequently these managers are being drawn from the ranks of general management and financial specialists rather than the IS environment.

This trend was very clear in one company studied where the new IS director had almost no IT background at all, but was a senior manager, seconded from finance reporting directly to the organisation's chief executive.

This particular IS director was responsible along with his consultancy team for turning the entire IS operation from being focused inwards on operations to looking outwards to the customers and to their key business processes.

A related trend that was clearly visible by the 1990's was that although computing was getting more complex it was getting simpler from the user's point of view and from the management's point of view.

Computer application software development had become so costly, complex and specialised that many organisations moved to packaged solutions and to specialist suppliers for software solution development. They simply could not and did not want to support the level of technical skill required to develop major systems in-house.

Consequently, the need for in-depth technical knowledge has diminished and the need for business knowledge has increased.

One trend that seems absent from the development of the consultancy market is the development of European specialisation. Those consulting firms operating in Europe divide into national players and global players.

Increasingly, large European companies are having to become global operators in order to compete successfully with competitors based in the USA and the Far.

Exhibit IV-12 identifies the main factors that will drive the market for consultancy from the mid 1990's.

The increased commoditisation of IT will mean that although the technology will be very complex, this complexity will be almost entirely hidden from users and their business strategy consultants. Therefore, the value added by IS business strategy consultants may tend to reduce even though the pace of change within business will get still faster.

Exhibit IV-12

Management Consultancy Trends for the Mid-1990's

• IT-related	– Return to steady growth of 9% – IS specialist's share grows slightly faster – Management consultants' share stays static – IT market as a whole grows at under 5%
• Clients	– IT becomes more of a commodity – IS becomes more service-led – Management and users gain control of IS – Market polarised to high-level management consultancy and implementation specialists
• Demand drivers	– Customer service – Mergers and acquisitions – Efficiency – Speed of response to changing environment – Global competition

Source: INPUT

The European IS consulting market is expected to grow by about 9% over the next five years.

INPUT expects the IS specialist vendors will begin to take back market share from the management consultancy firms.

The reason for this is that user management and users will develop a clearer and more business-focused expression of their requirements and the IS specialists will have developed the skills to understand those requirements.

IS specialists will also begin to specialise in the application of their technical skills. No longer will knowledge of C or C++ or relational databases be sufficient; the IS specialists will need to develop specific industry function skills.

Increasing specialisation at the technical level implies that groups of specialists will need to cooperate in order to provide a complete business solution.

High-level management consultancy firms will be demanding that the technical specialists develop these complete business solutions ever more quickly. To do this, the specialists will focus on particular industries or industry sectors and a particular IS skill set.

Typical examples might be a specialist in using the SAP package set in the insurance sector or a specialist in applying object technology to retail banking.

No one "cell" will offer a complete solution but combinations of "cell" will be able to put systems together quickly and efficiently. The conceptual structure of this "cellular" market is shown in Exhibit IV-13.

Exhibit IV-13

Development of a Cellular Market Among the IS Specialists

Risk Management & Unix

Retail Banking & Oracle

Financial Services & Networks

Financial Services & SAP

Source: INPUT
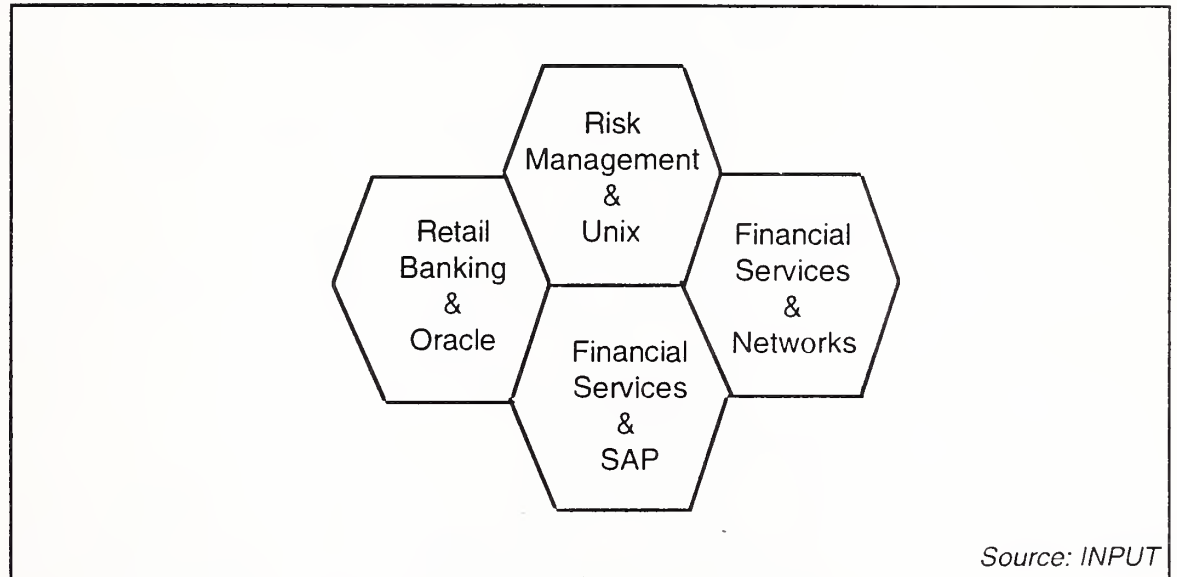
There is a similarity here between the construction industry and the software industry. The construction industry builds large, complex structures quickly and economically. These large structures are generally safe and reliable, despite having been built quickly.

The management structure that puts together complex buildings — architect, main contractor and subcontractors — has developed a functional and legal structure that clearly defines their separate and distinct responsibilities.

INPUT expects a similar structure to evolve within the consulting business. High-level management consulting firms will take the role of architects, some of the larger management and implementation consultants will evolve into main contractors and the rest will evolve into subcontractors.

However, it needs to be recognised that the building of major software systems is not entirely analogous to the construction of tangible physical structures. An attempt to draw too strong a parallel would inevitably lead to a misleading conclusion.

C
Business Process Reengineering

Business Process Reengineering (BPR) was developed in the USA as a concept in the mid-1980's and has grown to become a mainstream consultancy wave in the early 1990's.

BPR has produced three main reactions within the business community:

- An awareness that businesses could be run much better

- A concern that IS is failing to deliver significant benefits

- A serious concern regarding the ability of the BPR gurus to deliver results.

Exhibit IV-14 lists the main factors driving BPR in the early 1990's.

Dramatic change to IS systems is frequently, but not always, a consequence of BPR. Some IS systems are structured in a way that makes "plug and play" easy. For organisations based on this paradigm, BPR creates few problems at the IS level.

For many more organisations, their IS systems will need drastic revision to enable BPR to work. This means major rewrites of systems, involving major expense. Dramatic change is in danger of holding back continued growth in BPR consulting work while the changes work their way through the business and are reflected in profits.

Exhibit IV-14

Management Consultancy Issues Affecting Take-up of BPR

• IT-related	– Dramatically changes IS systems – Drives industry and sector experience – Functional boundaries defined
• Client needs	– Driven by top management – Executive level concerns – Change management
• Demand drivers	– Competition – Mergers and acquisitions – Globalisation and Internationalist

Source: INPUT

Implementation consultants will find that the need to understand complex business issues and implement systems quickly will force them into specialisation.

They will need to develop relationships with other specialists in order to develop large-scale business systems quickly. INPUT expects industry standards for functional and commercial interfaces between business subsystems will emerge. These standards will define the borders between the "cells" of the cellular market, illustrated in Exhibit IV-13.

BPR creates tension between the topmost level of organisations and the IS executive level. IS executives can remember too many impractical and naive "solutions" sold at chief executive level and passed on to IS for implementation.

Some IS directors regard the zeal of BPR consultants as a threat to their careers. BPR may have won the minds of many IS directors but it has not won the hearts of all of them.

Blank

Assessment of Key Technologies

A
Pervasive Versus Specific Technologies

This chapter assesses technologies which are likely to be of key importance to systems development and integration vendors over the medium term.

These can be categorised as:

- Technologies that are so pervasive that every BI firm should have the capability to understand them (although not every firm will have the resources to implement them)

- Specific technologies that will be important in the next five years. Every vendor may not necessarily need to be an expert in every technology; this will depend on a vendor's focus and direction.

These views have been correlated from a number of sources:

- Interviews with an expert panel of key technology analysts and planners within SI organisations. (Nine formal, structured interviews and over a dozen informal interviews)

- The knowledge base of INPUT's senior staff

- Non-proprietary knowledge and insights gained from custom consulting projects

- Published reports and analyses in trade and technical publications.

The different inputs were analysed through a methodology which is set out in V-1.

B
Categorisation of Technologies

Certain technologies are already so important that INPUT labels them "pervasive". These include:

Local Area Networks

- Enterprise and inter-enterprise networks

- Open systems and interoperability

- Software Engineering.

With the possible exception of software engineering, the technology areas in the "pervasive" group are obvious. There are other groupings, however, of specific technologies that will become more important in the course of the next five years.

"Importance" is a combination of the following factors:

- Overall market need (measured in dollars spent on the technology)

- Relative contribution of the technology to SI projects

  - This could be positive, in allowing "better, faster, cheaper" development

  - Or negative, in terms of bottlenecks that may arise due to the technology not being fully developed or fielded

- The relative maturity of the technology at the beginning and end of the time period

- The existence (or non-existence) of proven applications using the technology.

Exhibit V-1

Methodology Steps

```
┌──────────────────┐  ┌──────────────────────────┐
│   Review of      │  │ Extraction of non-proprietary │
│  publications,   │  │   commonalities from      │
│  seminars, etc.  │  │  consulting assignments   │
└────────┬─────────┘  └────────────┬─────────────┘
         │                         │
         ▼                         ▼
┌──────────────────────────────────────────────┐
│   Preparation of initial technology issues    │
└───────────────────────┬───────────────────────┘
                        ▼
┌──────────────────────────────────────────────┐
│        Expert panel interviews (structured)    │
└───────────────────────┬───────────────────────┘
                        ▼
┌──────────────────────────────────────────────┐
│        Reassessment of technology issues       │
└───────────────────────┬───────────────────────┘
                        ▼
┌──────────────────────────────────────────────┐
│     Additional vendor interviews (informal)    │
└───────────────────────┬───────────────────────┘
                        ▼
            ┌──────────────────────┐
            │    Initial analysis   │
            └───────────┬──────────┘
                        ▼
            ┌──────────────────────┐
            │    Internal review    │
            └───────────┬──────────┘
                        ▼
            ┌──────────────────────┐
            │     Formal report     │
            └──────────────────────┘
```

Source: INPUT
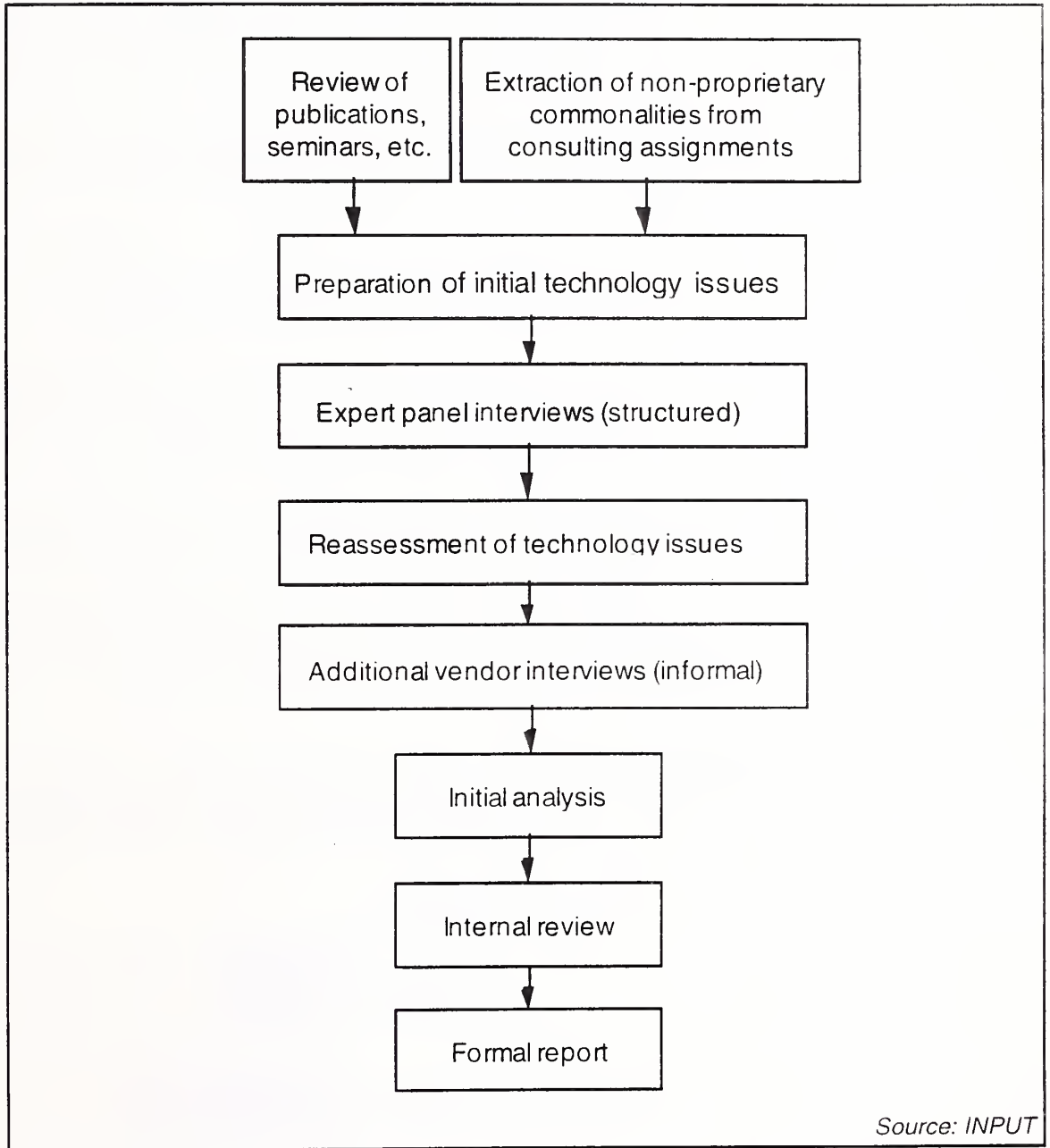
C
Expert Panel's Assessment of Key Technologies

INPUT's expert panel evaluated technology areas and the factors that would encourage or discourage the use of these technologies.

A constant thread in these comments is the overall balance between positive and negative vendor assessments. This balance means the following:

- There is little consensus over "winners" and "losers" and which technologies must be backed or avoided.

- Many positive and negative "votes" are tentative and likely to be changed, depending on developments in the underlying technology as well as market acceptance.

- Equally competent, capable vendors are likely to adopt strikingly different strategies on specific technological developments.

Exhibit V-2 shows the technologies that INPUT's expert panel considers will be the most important in 1999.

Exhibit V-2

Assessment of "High Importance" SI-related Technologies in 1999 Compared to 1994 Importance

Source: INPUT
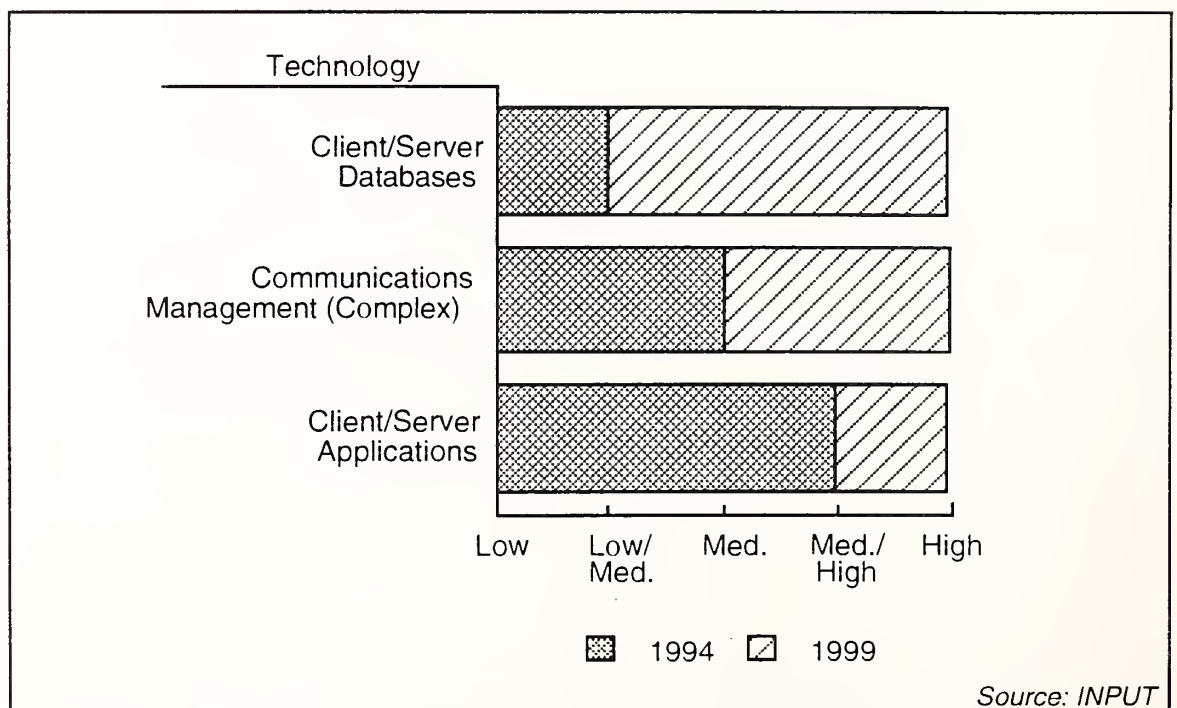
- Client/server applications are already extremely important. The increment is basically the last of the mainframe-based applications being pushed aside.

- The management of complex communications will become increasingly important as heterogeneous networks are developed in semi-isolation.

- Client/server database design and engineering will be a critical point of differentiation.

The technologies shown in Exhibit V-3 will be almost as important in 1999 as those in the previous group.

Exhibit V-3

Assessment of "Medium/High Importance" SI Technologies in 1999 Compared to Importance in 1994

Technology

- Reusable/Object-Oriented Software
- EDI/Electronic Commerce
- Recognition/ID Technology
- Groupware
- Communications Security

1994
1999

Low | Low/Med. | Med. | Med./High | High

Technology

- Mobile/Wireless Communications
- PDAs
- Multimedia Messaging/Interactive Communications
- Document/Image Processing
- Workflow Software/Systems

Low | Low/Med. | Med. | Med./High | High

Source: INPUT

- Object-Oriented (reusable) software will be very important to the extent that the technology is successful and accepted. INPUT does not expect this to occur until the second half of the time period. This is the major reason why it is not in the "high" category.

- The technologies now in the "low/medium" category are accepted, constantly improving technologies that will be increasingly used within SI projects.

- Imaging and workflow systems are already fairly well positioned and have continued growth and acceptance.

- Multimedia applications are different in the sense that they are potentially applicable across a wide range of industries. However, INPUT does not expect to see multimedia applications in widespread use until well into the late 1990's. (Note: INPUT expects multimedia messaging will become more important sooner, because the use of the technology will be essentially cross-industry in nature.)

- Open systems initiatives (Exhibit IV-5) show a fairly low (and variable) sense of importance. One respondent even thinks this area will be less important in 1995.

Exhibits V-4 to V-23, provide a combination of issues and ratings for INPUT's expert panel. For this section of analysis the panel was requested to rate the importance of technology in 1994 and 1996 on a scale of 1 to 5 (with 5 being highest importance).

This compressed timescale was used because respondents, typically, are too optimistic if given a five-year timescale; two-year horizons provide a more realistic framework for the indication of trends in markets.

Open systems initiatives, as shown in Exhibit V-4, demonstrate a fairly low, and variable, sense of importance. One respondent even thought that this area would be less important by 1996.

Exhibit V-4

Expert Panel Assessment of Open Systems Architecture

Source: INPUT
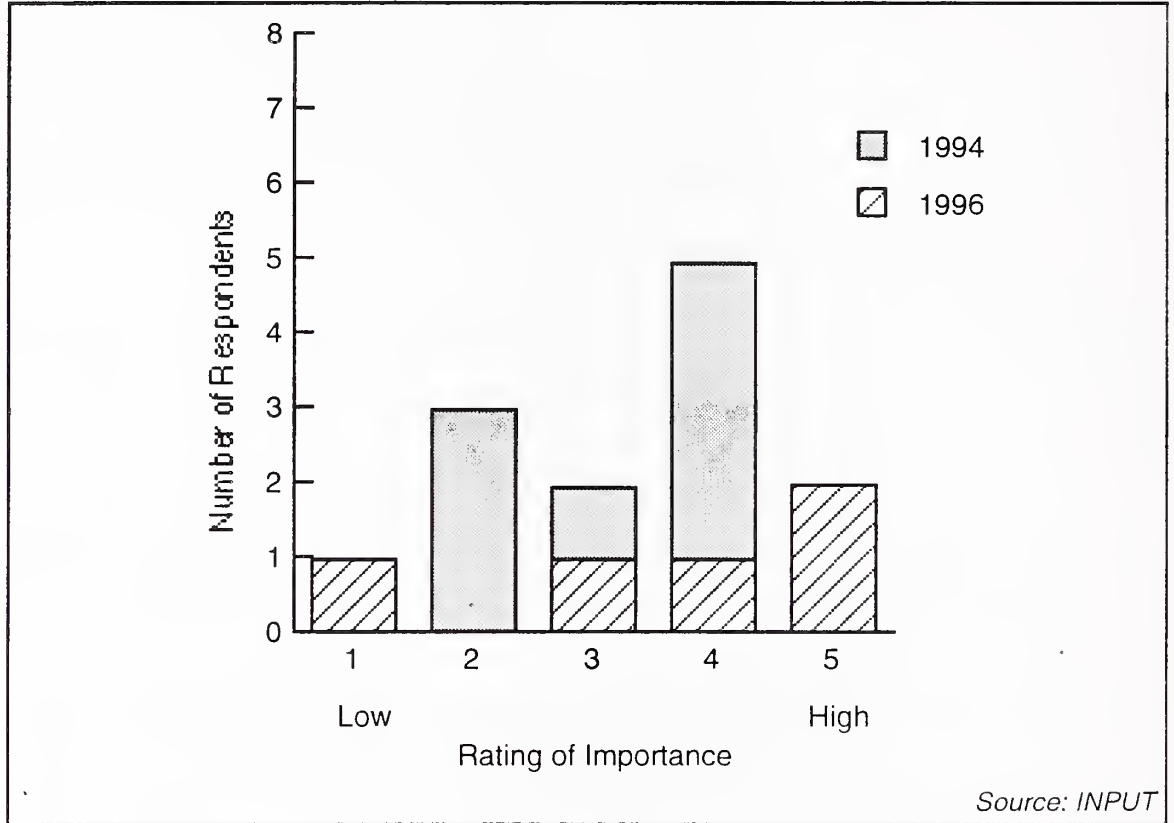
Exhibit V-5

Issues Raised by Expert Panel on Open Systems Architecture

- Factors Encouraging the Exploitation of

  - In spite of talk, there are a limited number of vendors who can actually execute the technology well.

  - Vendors who make the commitment now may have a head start – competitors won't be able to catch -

  - Most customer organisations already have some (especially in certain sectors).

  - The larger definition is "any-to-any" – this is where a opportunity may lie.

  - This looks like it is developing into a "superniche" area, encompassing a series of smaller niches (but may never become large-scale).

  - Will be very important if becomes closely associated with client/server systems (this is not the case now)

- Factors Inhibiting Exploitation of Technology

  - What is the definition (from a technology or business sense)? At best, a fuzzy concept.

  - An overall "embarrassment"–it never gets organized

  - No real standards–suppliers must get into line

  - "Getting divorced from one proprietary system to marry another one"

  - May never get really big in terms of market share

  - Hype or real?

Source: INPUT

- Software engineering is unusual amongst these other technologies. Software engineering itself is somewhat in eclipse because of over-identification with mainframe-based development. However, a new generation of more cautious software engineering, aimed at the client/server environment, will become a critical area of strength and differentiation by the late 1990's.

Exhibit V-6

Expert Panel Assessment of ISDN

Source: INPUT
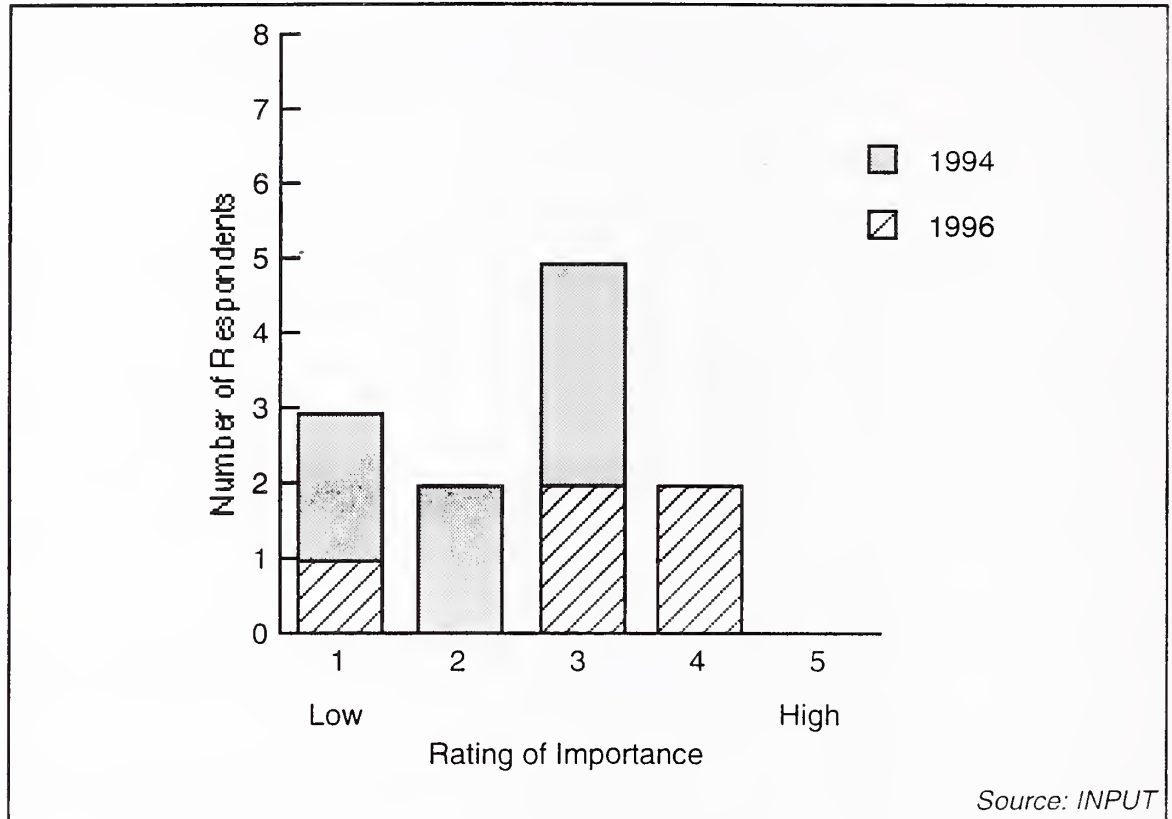
- Local-area networks are the basis for, or at least a part of, most new systems development.

- Larger networks are increasingly the core of systems and/or areas in which SI vendors add the most value. Specific technologies include the older ISDN as well as the newer ATM.

Exhibit V-7

Issues Raised by Expert Panel on ISDN

- Factors Encouraging Exploitation of Technology

  - "Exciting" in some niche areas (e.g., call centres)

- Factors Inhibiting Exploitation of Technology

  - Market is a peculiar combination of saturated
    ad empty niches.

  - Will probably be killed by a combination of ATM and fiber
    optics (but how will fibre optics get from curb to home?)

  - Has been talked about for a long time but never caught on

  - "Always on the horizon, but never gets any closer"

  - "Commodity technology" of the future

Source: INPUT

Exhibit V-8

Expert Panel Assessment of ATM
(Asynchronous Transfer Mode)
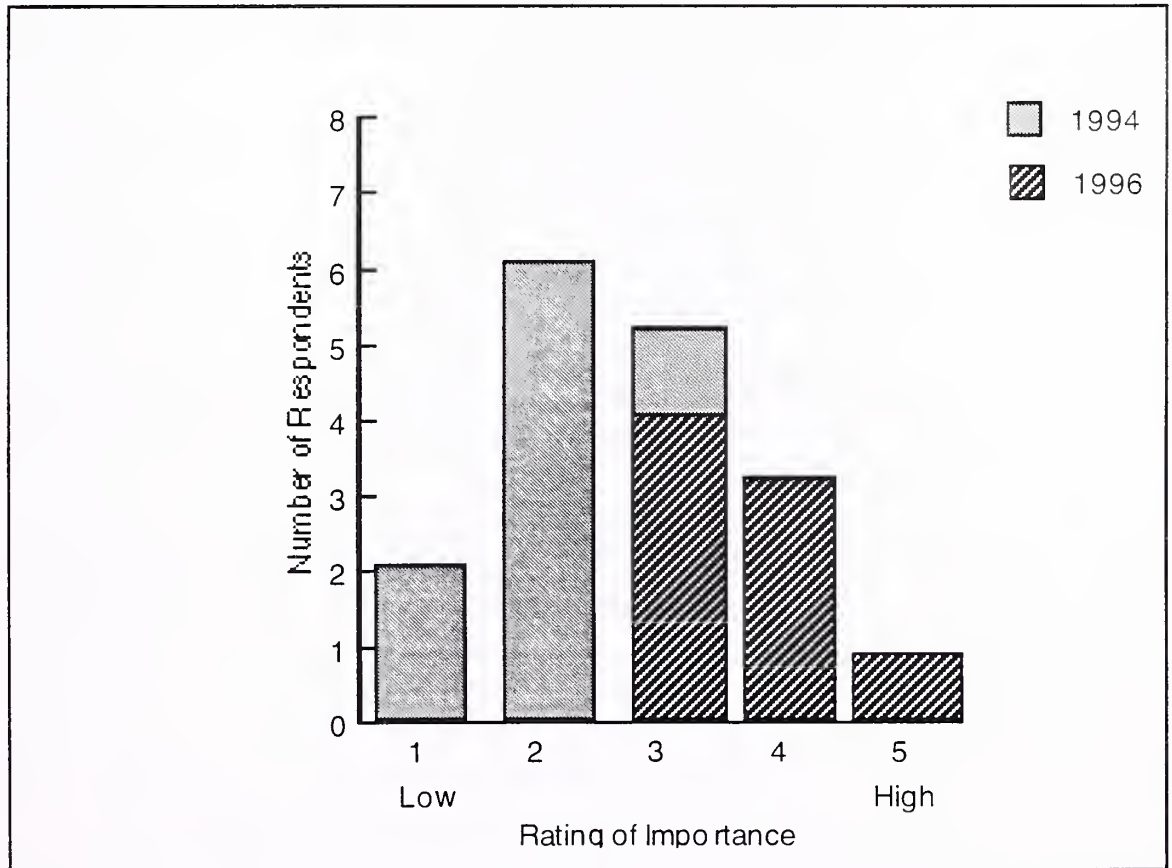
Source: INPUT

Exhibit V-9

Issues Raised by Expert Panel on ATM

• Factors Encouraging Exploitation of Technology

  - Is it really a standard, not new technology?

  - Will this be the broadband ISDN?
    (Or at least fulfil the promise that ISDN once

  - Closely tied to mobile computing
    (could be a minus because of

• Factors Inhibiting Exploitation of Technology

  - Territory of large telecomm vendors–hard for SI vendors
    to enter (technology, credibility)

  - How fast will it be established?

  - Could still evolve into something we wouldn't
    recognise–if so, current work might be wasted

  - Needs critical mass

  - Still very new, not totally understood

Source: INPUT

Open systems/interoperability issues are now very important because of mutually reinforcing trends:

• The network issues enumerated above and the decline of traditional, mainframe-driven networks.

If there is any problem with the open systems area it is its very breadth; taken too far, "open systems" can include practically all computing activities.

Client/server architecture issues are still rated relatively (and, in INPUT's opinion, surprisingly) low for 1994, although rising sharply by 1996 (see Exhibit V-10).

Exhibit V-10

Expert Panel Assessment of Client/Server Architecture

Source: INPUT
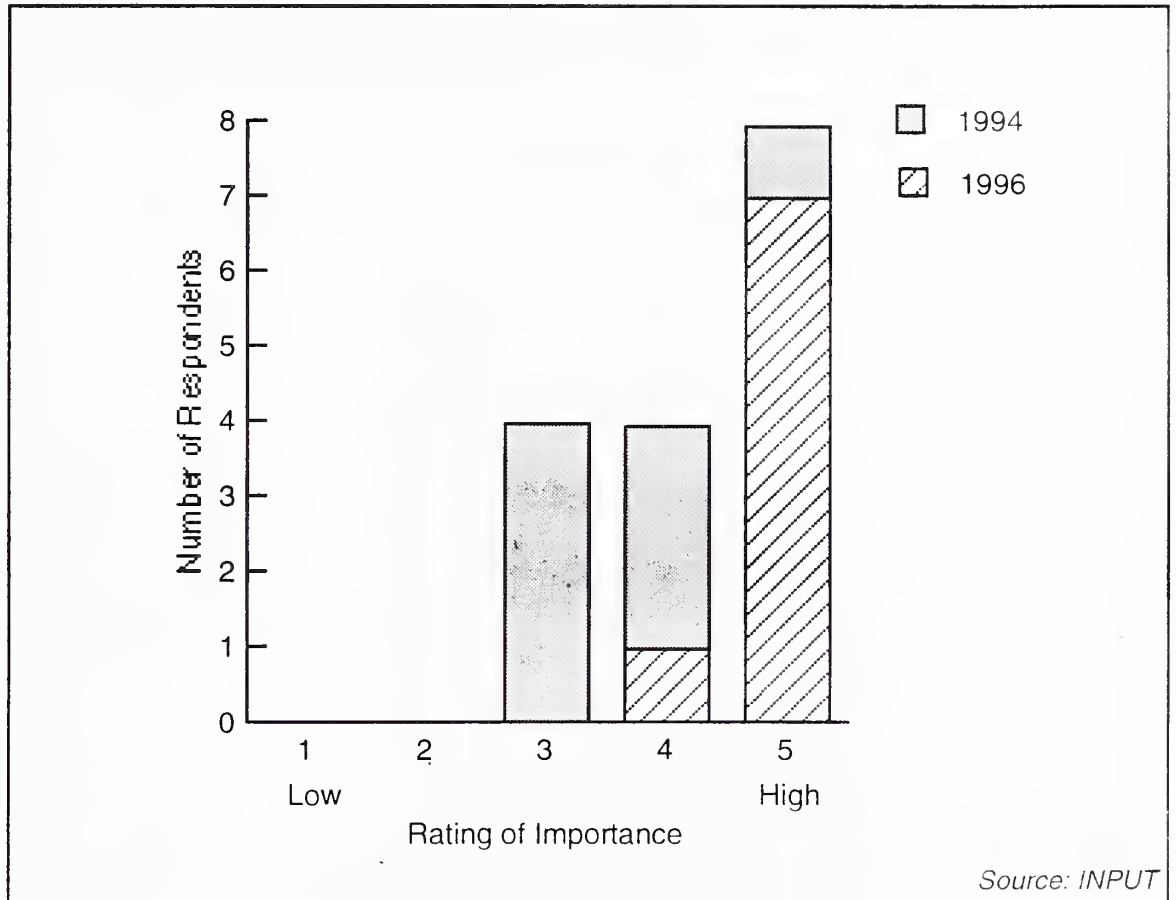
Exhibit V-11

Issues Raised by Expert Panel on Client/Server Issues

- Factors Encouraging Exploitation of Technology

  - Many customer organisations are there now (or at least part- way there)

  - Already represents 50% of respondent firms' IT

  - Will be well-defined by 1995

  - "Everything" the respondent firms are now doing

  - Technology is driving strategies

  - Ties closely into evolving systems management business

  - Leads the way for all new high-activity applications

  - Difficulty in performing well in this area is really an encouragement. Those who make the long-term commitment will be very well placed competitively in the future.

- Factors Inhibiting Exploitation of Technology

  - Many client/server applications crash and burn

  - No real or consistent client/server strategy "Strategy" changes from implementation to implementation

  - Real "struggle" in 1994 is to know how to maintain client/server applications. not be a general solution even by

Source: INPUT

V-14

Exhibit V-12

Expert Panel Assessment of Object-Oriented Software

Source: INPUT
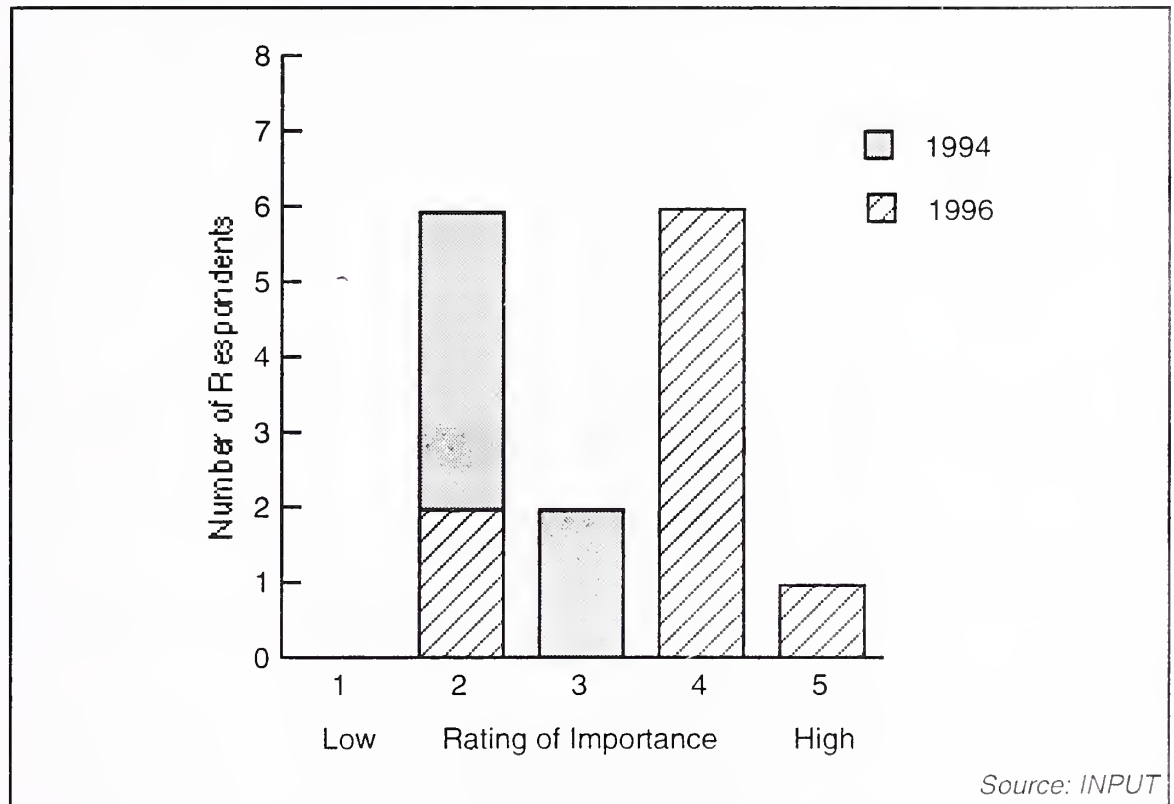
Exhibit V-13

Issues Raised by Expert Panel on Object-Oriented Programming

- Factors Encouraging Exploitation of Technology

  - This is the most important technology of all.

  - Key benefits: Enhancement, maintenance of applications

  - Faster system development

  - Just at beginning of learning/benefit curve

  - Natural paradigm for GUI (Which take up to half of programming resources)

- Factors Inhibiting Exploitation of Technology

  - No real standards yet – or on horizon

  - Have attempted to use NeXT environment: "Painful result"

  - "Too hard"

  - Too many vendors (both product and service)

  - Object-oriented is much more than just programming.

  - Over-hyped – phrase/concept which may be becoming both technically and in the marketplace

  - Not enough tools – especially those that work

  - In a sense tools are already too powerful: "You can go hang yourself and your neighbor".

  - Really a methodology or approach to systems development rather than a toolset; the technology *per se* is less important

  - Excellent single person productivity aid–but so far, poor for group efforts

  - Could end up building "standard libraries" forever, (i.e., libraries turn out not to really be standard, but contain modules with many subtle differences that contain more trouble than benefits).

Source: INPUT

Groupware (see Exhibit V-14) is seen as not very important now, but leaping upwards quite quickly by 1996.

Exhibit V-14

V-17

Expert Panel Assessment of Groupware

Source: INPUT
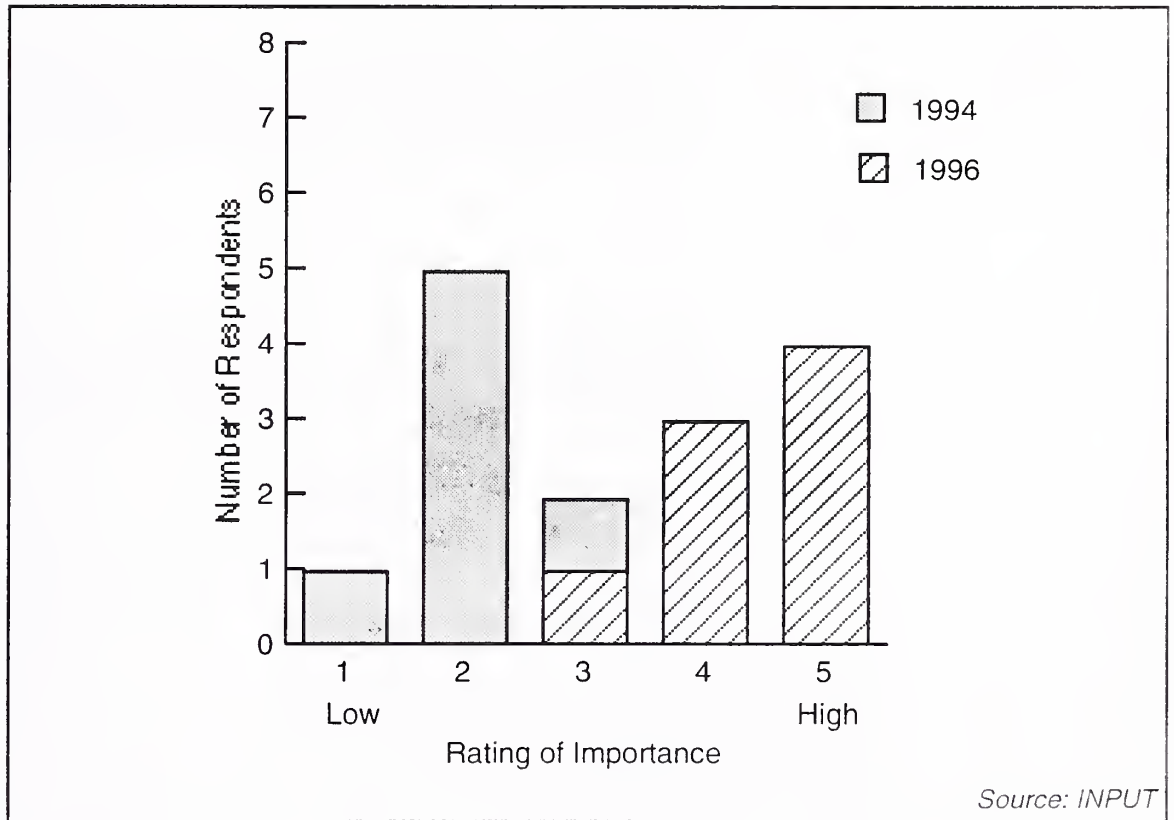
Exhibit V-15

Issues Raised by Expert Panel on Groupware

- Factors Encouraging Exploitation of Technology

  - Lotus Notes has done a lot to raise consciousness (both of vendors and in the customer community)

  - "Will shoot by object technology"

  - "Sensitive to the human metaphor"

  - Used internally (within respondent's firm) for transport/backbone/utility for communications; becoming embedded in way of working and because of this will ultimately have a big impact on building systems for customers

  -

  - Intersects with workflow (but not as directly as imaging)

  - Will probably have figured out how to get around problems (cultural, software, design) by 1995

  - This will be the next big revolution.

- Factors Inhibiting Exploitation of Technology

  - The industry has been talking about this "for ages".

  - Real uses are mostly in niche areas (e.g., engineering).

  - Not doing much actual business in this at the moment

  - Doesn't work very well today (but "mandatory" by 1995)

  - Often needs a culture change to get full benefit from applications using this technology

  - The enabling software needs to be less intrusive than at present.

Source: INPUT

There is a shift in importance in mobile computing between 1994 and 1996 (see Exhibit V-16).

Exhibit V-16

Expert Panel Assessment of Mobile Computing (Wireless)

Source: INPUT
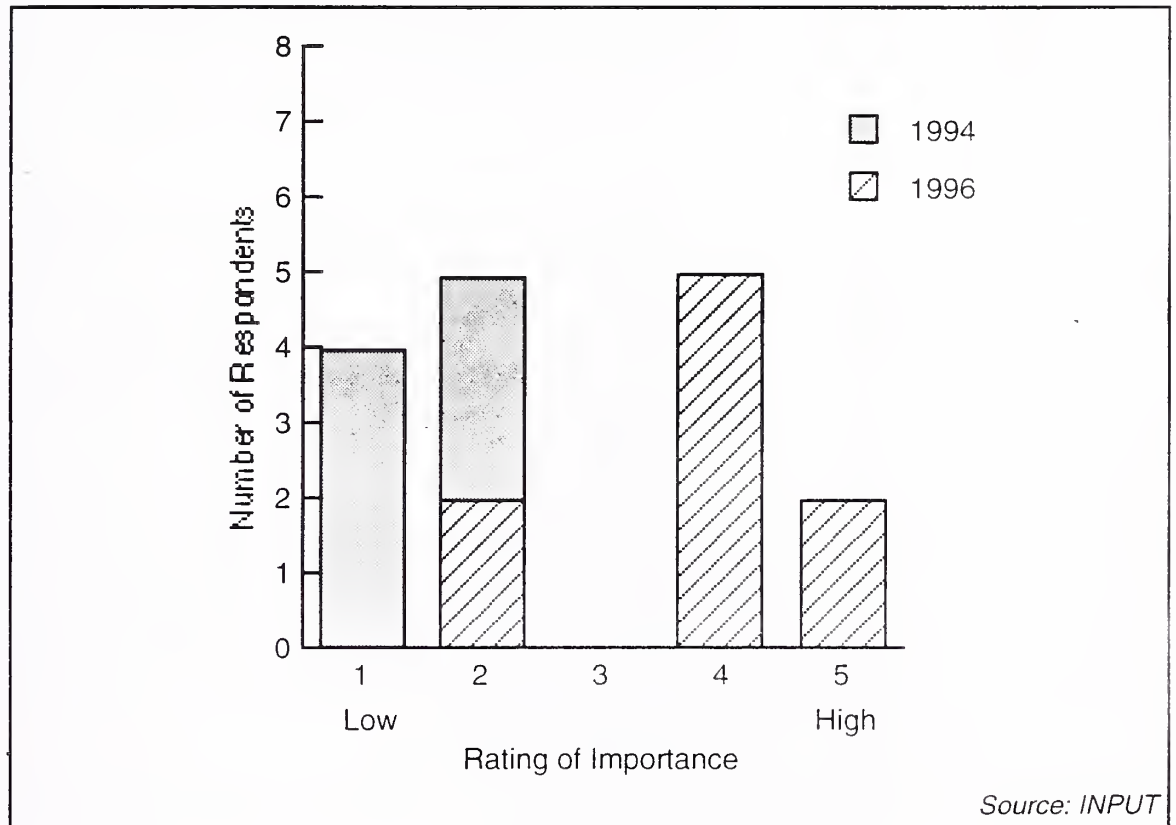
Exhibit V-17

Issues Raised by Expert Panel on Mobile Computing

- Factors Encouraging Exploitation of Technology

    - Demonstrations are creating demand.

    - Closely linked to PDAs

    - Software behind the hardware is advancing.

    - AT&T is behind it.

    - "Explosive growth" in a few vendor-client applications:
      Shows there is in fact potential

- Factors Inhibiting Exploitation of Technology

    - Could be a sleeper if "killer" applications are found.

    - Don't see much evidence of it today

    - Don't know where it is going.

    - Will Microsoft and Intel really support it?

    - Both awareness and cost are negatives now.

    - How will applications be maintained?

    - "Neat, but a bit player?"

Source: INPUT

Multimedia systems (see Exhibit V-18) are not seen as important now. However, the trend is definitely towards increased importance. A further analysis of multimedia-related developments are discussed in INPUT's 1995 report — "Multimedia; Implications for Business Integration".

Exhibit V-18

Expert Panel Assessment of Multimedia Systems

Source: INPUT
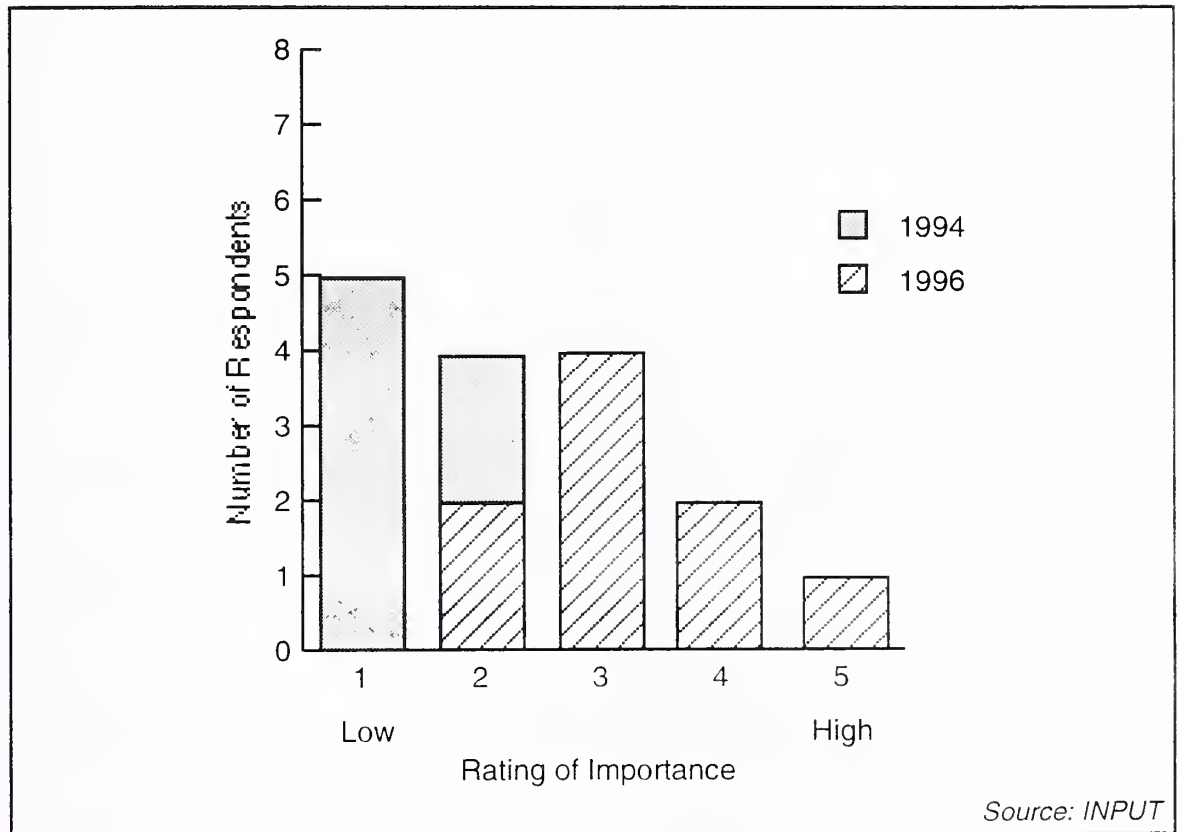
Exhibit V-19

Issues Raised by Expert Panel on Multimedia

- Factors Encouraging Exploitation of Technology

    - Increased use in training and direct customer interaction

    - Lots of excitement and vendors showing capabilities

- Factors Inhibiting Exploitation of Technology

    - No "killer" applications

    - Finding real life applications is a problem

    - Price/performance still an issue

    - Speech synthesis must get better.

    - Systems using multimedia need to be designed differently than conventional systems.

    - Full motion video is important.

    - Effort to make it work versus added value often not proportionate

Source: INPUT

Document/image processing and parallel processing are
already seen as fairly important and increasing in importance (see
Exhibits V-20 and V-21).

Exhibit V-20

Expert Panel Assessment of Document/Image Processing

Source: INPUT
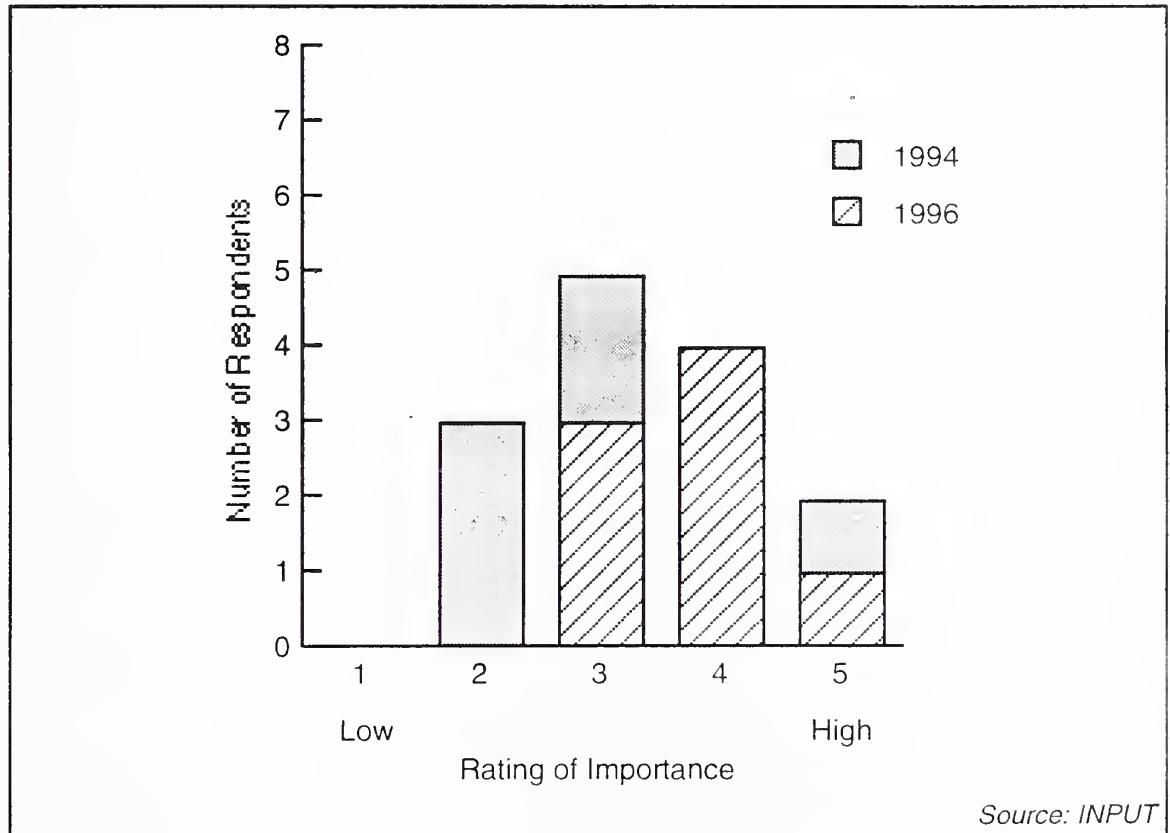
Exhibit V-21

Issues Raised by Expert Panel on Document/Image Processing

- Factors Encouraging Exploitation of Technology

    - Will be part of systems mainstream by 1995

    - A very important piece of workflow and BPR analysis

    - Still at an early stage

    - By 1995: Low-cost servers and cheap mass storage

    - "Poised for the masses"

    - "Hot", "A must-have"

- Factors Inhibiting Exploitation of Technology

    - Few solid implementations

    - Largely in the training and information gathering phase to date

    - Technology and costs are not quite there.

    - Not as pervasive as, say, PCs or DBMS (to put into perspective)

    - Still learning how to apply in many cases

Source: INPUT

Expert Panel Assessment of Artificial Intelligence/Expert Systems

Source: INPUT
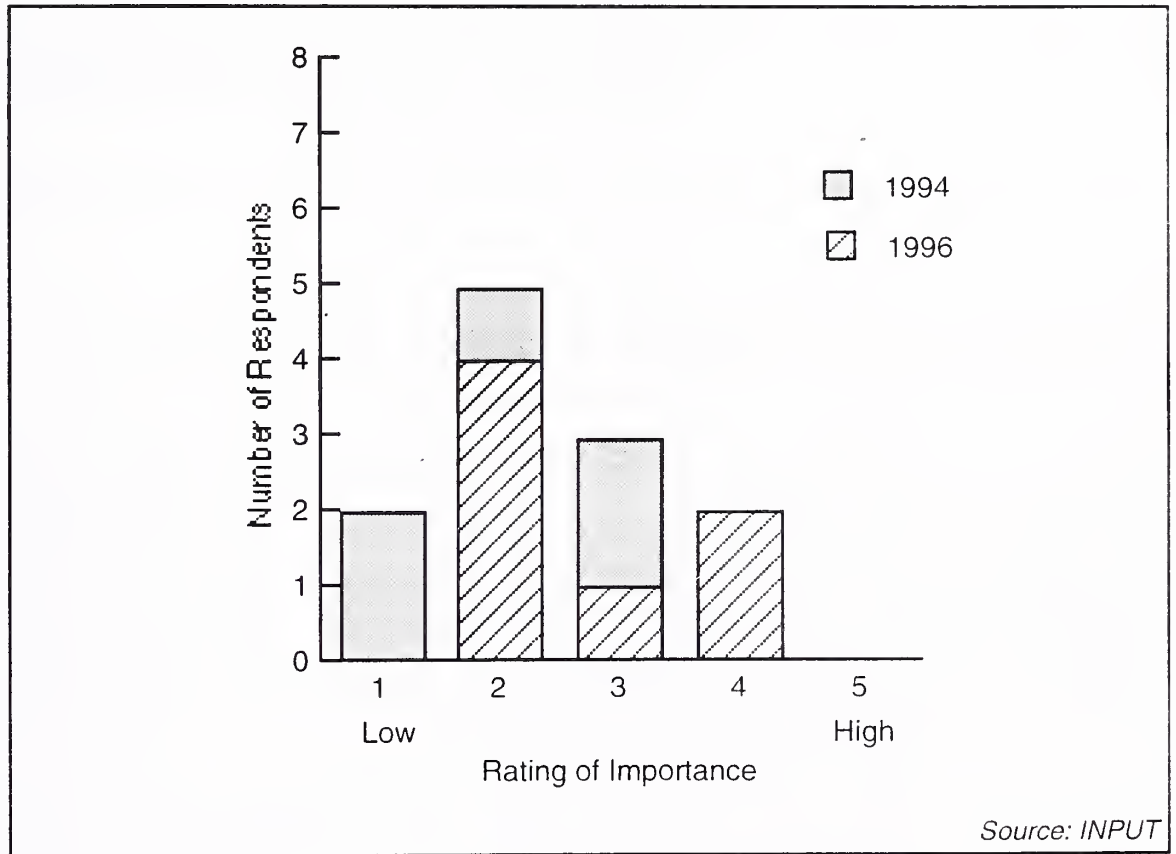
Exhibit V-23

Issues Raised by Expert Panel on Artificial Intelligence/Expert Systems

• Factors Encouraging Exploitation of Technology

- The respondent's firm in putting together a "knowledge base" to use on classes of applications

- Somewhat important but invisible—usually embedded within a larger system or application

- Good for some specialized applications

• Factors Inhibiting Exploitation of Technology

- What do you use it for?

- If there is an opportunity it is not AI, as usually understood, but fuzzy logic/neural networks—although maybe we're just exchanging an old fad for a new one

- Neural networks—but probably much later than 1995

- This is a niche market

- Not enough tools

- No "killer" application

- Formerly a silver bullet, now used from time to time where it makes sense

Source: INPUT

A
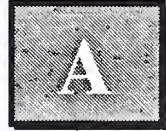
Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. The structure is defined in Exhibit A-1.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

B
Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)

- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)

- Packaged software products, including systems software or applications software products (called *Software Products*)

- People services that support users in developing and operating their own information systems (called *Professional Services*)

- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)

- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)

- Services that support the delivery of information in electronic form — typically network-oriented services such as value-added networks, electronic mail and document interchange (called *Network Applications*)

- Services that support the access and use of public and proprietary information such as on-line databases and news services (called *Electronic Information Services*)

- Services that support the operation of computer and digital communication equipment (called *Equipment Services*).

In general, the market for information services does not involve providing equipment to users. The exception is where the equipment is part of an overall service offering such as a turnkey system, a systems operations contract or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot be feasibly separated from other bundled services (e.g., some systems operations contracts), the transport costs are included as part of the services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products; services and revenues; distribution channels; and competitive issues.

2. Market Forecasts/User Expenditures

All information services market forecasts are estimates of *User Expenditures* for information services. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint: expenditures are categorised according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems which are related to the distribution channels for various categories of services:

- Double-counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)

- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers.

Captive Information Services User Expenditures are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

Noncaptive Information Services User Expenditures are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures which constitute the information services market analysed by INPUT and that are included in INPUT forecasts.

3. Delivery Modes

Delivery Modes are defined as specific products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Delivery Modes* specify *what* the user is buying.

Of the nine delivery modes defined by INPUT, six are considered primary products or services:

- Processing Services

- Network Services

- Professional Services

- Applications Software Products

- Systems Software Products

- Equipment Services.

The remaining three delivery modes represent combinations of these products and services, combined with equipment, management and/or other services:

- Turnkey Systems

- Systems Operations

- Systems Integration.

Section C describes the delivery modes and their structure in more detail.

C
Delivery Modes and Submodes

Exhibit A-1 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

Exhibit A-1

Information Services Industry Structure

System Software Products	Applications Software Products	Turnkey Systems	Equipment Services	Professional Services
- Mainframe	- Mainframe	- Equipment	- Equipment Maintenance	- Consulting
- Minicomputer	-Minicomputer	- Software Products	- Environmental Services	- Education & Training
- Workstation/PC	- Workstation/PC	- Professional Services		- Software Development/ Maintenance
				- Application Management/ Maintenance

Systems Integration	Systems Operations	Processing Services	Network Services
- Equipment	- Platform Operation	- Transaction	- Electronic Information Services
- Software Products	- Application Operations	- Utility	
- Professional Services		- Other	- Network Applications
- Other	- Desktop Services		
	- Network Management		

Source: INPUT

1. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organisation. Examples include accounts payable, order entry, project management and office systems. INPUT categorises applications software products into two groups of market sectors. (See Exhibit A-2)

- *Industry Applications Software Products* — Software products that perform functions related to fulfilling business or organisational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

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

INPUT also forecasts the applications software products delivery mode by platform level: mainframe, minicomputer and workstation/PC.

2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorises turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit A-2)

Most CAD/CAM systems and many small business systems are turnkey systems. Turnkey systems utilise standard computers and do not include specialised hardware such as word processors, cash registers, process control systems or embedded computer systems for military applications.

Exhibit A-2

Application Products and Turnkey Systems

```
                    ┌─────────────────┐         ┌─────────────┐
                    │   Applications  │         │   Turnkey   │
                    │Software Products│         │   Systems   │
                    └─────────────────┘         └─────────────┘
                              │                        │
                    ┌─────────────┐            ┌──────────────┐
                    │    Cross-   │            │  Industry-   │
                    │   Industry  │            │  Specific    │
                    └─────────────┘            └──────────────┘
```

Office Systems	Accounting	Human Resources	Education & Training
• Integrated Office Systems • Word Processing • Desktop Publishing • Image Systems • Electronic Publishing • Document Imaging Software	• General Ledger • Accounts Payable • Accounts Receivable • Billing/Invoicing • Costing • Fixed Assets • International Accounting • Purchasing • Taxation	• Human Resources Management • Payroll • Benefits	• Computer-Based Training • Authoring Languages

Industry-Specific

- Discrete Manufacturing
- Process Manufacturing
- Transportation Services
- Utilities
- Telecommunications
- Retail Distribution
- Wholesale Distribution
- Banking and Finance
- Insurance
- Health Services
- Education
- Business and Technical Services
- Federal Government
- State and Local Government
- Miscellaneous Industries

Planning & Analysis	Engineering & Scientific	Other Cross-Industry
• Executive Information Systems • Financial Modeling and Planning • Spreadsheets • Project Management	• Computer-Aided Design and Engineering • Structural Analysis • Statistics/ Mathematics/ Operations Research • Mapping	• Marketing Management • Sales Analysis

Source: INPUT

Computer manufacturers (e.g., IBM or DEC) that combine software with
their own general-purpose hardware are not classified by INPUT as
turnkey vendors. Their software revenues are included in the
appropriate software category.

Most turnkey systems are sold through channels known as value-added
resellers.

- *Value-Added Reseller (VAR):* A VAR adds value to computer
  hardware and/or software and then resells it to an end user. The
  major value added is usually applications software for a vertical or
  cross-industry market, but also includes many of the other
  components of a turnkey systems solution, such as professional
  services, software support, and applications upgrades.

Turnkey systems have three components:

- Equipment — computer hardware supplied as part of the turnkey
  system

- Software products — pre-packaged systems and applications
  software products

- Professional services — services to install or customise the system
  or train the user, provided as part of the turnkey system sale.

Exhibit A-3 contrasts turnkey systems with systems integration.
Turnkey systems are based on available software products that a vendor
may modify to a modest degree.

Exhibit A-3

The Customisation Spectrum

Systems Integration	Custom Turnkey	Turnkey
Degree of Customisation		

100%   50%   25%   0%
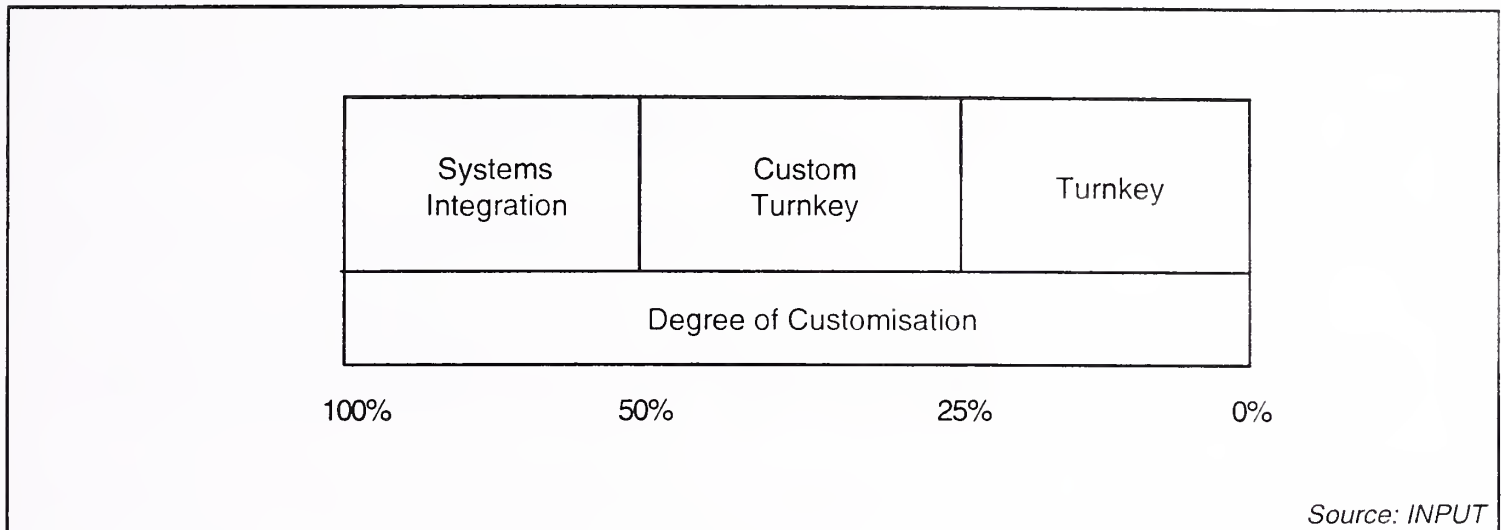
3. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-4)

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* — pre-packaged applications and systems software products

- *Professional services* — the value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and systems operations and maintenance

- *Other services* — most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

Exhibit A-4

Products/Services in Systems Integration Projects

Equipment

- Information systems

- Communications

Software Products

- Systems software

- Applications software

Professional Services

- Consulting

  - Feasibility and trade-off studies

  - Selection of equipment, network and software

- Program/project management

- Design/integration

  - Systems design

  - Installation of equipment, network, and software

  - Demonstration and testing

- Software development

  - Modification of software packages

  - Modification of existing software

  - Custom development of software

- Education/training and documentation

- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation

- Data processing supplies

- Processing/network services

- Data/voice communication services

Source: INPUT

A-11

4. Professional Services

This category includes four submodes: consulting, education and training, software development and applications management. Exhibit A-5 provides additional detail.
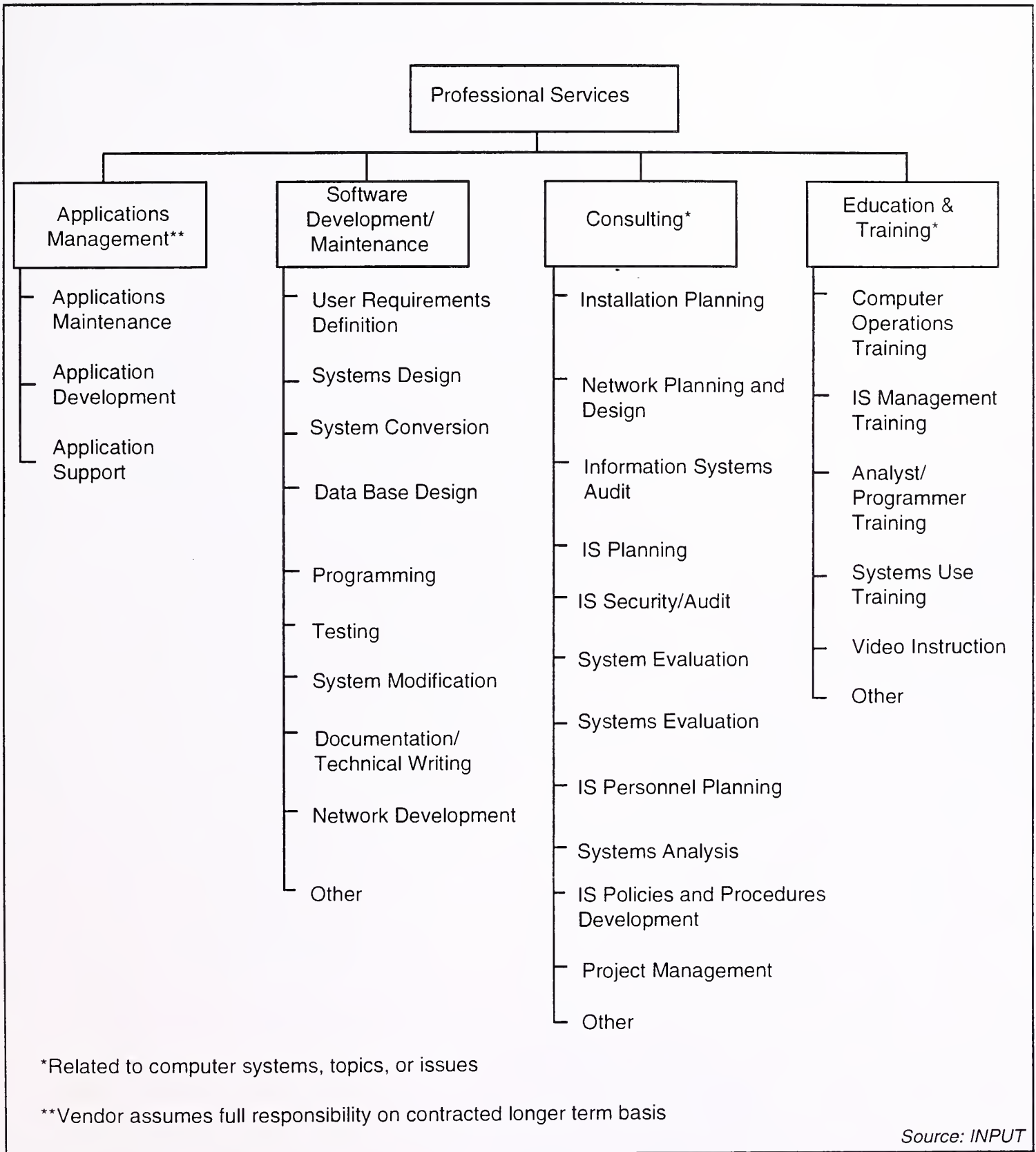
- *Consulting:* Services include management consulting (related to information systems), information systems reengineering, information systems consulting, feasibility analysis and cost-effectiveness studies and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.

- *Education and Training:* Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.

- *Software Development:* Services include user requirements definition, systems design, contract programming, documentation, and implementation of software performed on a custom basis. Conversion and maintenance services are also included.

- *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services the relationship is project based. Under applications management it is time and function based.

These services may be provided in combination or separately from platform systems operations.

Exhibit A-5

Professional Services Market Structure

```
                        ┌─────────────────────────┐
                        │  Professional Services  │
                        └─────────────────────────┘
```

Applications Management**	Software Development/ Maintenance	Consulting*	Education & Training*
Applications Maintenance	User Requirements Definition	Installation Planning	Computer Operations Training
Application Development	Systems Design	Network Planning and Design	IS Management Training
Application Support	System Conversion	Information Systems Audit	Analyst/ Programmer Training
	Data Base Design	IS Planning	Systems Use Training
	Programming	IS Security/Audit	Video Instruction
	Testing	System Evaluation	Other
	System Modification	Systems Evaluation	
	Documentation/ Technical Writing	IS Personnel Planning	
	Network Development	Systems Analysis	
	Other	IS Policies and Procedures Development	
		Project Management	
		Other	

*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

Source: INPUT

Blank

Blank