MAJOR WESTERN EUROPEAN MARKETS FOR INFORMATION SERVICES ANALYSIS AND FORECASTS, 1986-1991

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Software and Services Planning Service - Western Europe (SSPS)

Major Western European Markets for Information Services Analysis and Forecasts, 1986-1991

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ABSTRACT

This report examines the status and growth potential of the information services industry in the four major Western European country markets of France, Italy, the United Kingdom, and West Germany.

The information services industry is defined by INPUT as comprising four major sectors--processing and network services, software products, professional services, and integrated systems.

Each sector is examined in respect of major industry trends and issues from both a vendor and user standpoint. User expenditures on data processing and user expectations for future development are also examined. Estimates of sector and country market growth are given together with size and growth estimates up to 1991. Factors affecting this growth are described.

The report also discusses the economic and strategic position of the information services industry in Western Europe in comparison with the U.S. market.

This report contains 283 pages, including 115 exhibits.

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EXHIBITS

I INTRODUCTION

I INTRODUCTION

- This report is produced as one of a series of reports in INPUT's Software and Services Planning Service (SSPS) for the Information Services Industry in Western Europe.

A. SCOPE OF THE REPORT

- This report reviews and analyses the four major sectors which constitute INPUT's definition of the information service markets:

  - Processing and network services.
  - Software products.
  - Professional services.
  - Integrated systems.

- The report is designed to assist vendors in:

  - Identifying new markets and product opportunities.
  - Assessing product and marketing risk exposure.

- Allocating research, development, and operational resources.

- Obtaining insights into market developments.

- The report describes and reviews the state of the information services market in Western Europe in 1986 and presents a medium- and longer-term forecast through 1988 and 1991, respectively.

- The report discusses the key trends and strategic issues for vendors operating in the information services business.

- INPUT has analysed the four major Western European country markets of France, Italy, the United Kingdom, and West Germany. The term 'Western Europe' is used throught this report to imply these four individual countries as a group.

B. METHODOLOGY

- This report is based principally upon three specific research activities conducted by INPUT during July to September 1986.

  - A vendor research programme.

  - A user research programme.

  - INPUT's continuous research into the information services industry in Western Europe.

- For the vendor research programme, interviews were conducted in the four Western European countries included in this study (France, Italy, the U.K., and

West Germany). Many of these were conducted on a face-to-face basis, the remainder by telephone and mail.

- Efforts were made to include as wide a cross-section of information services vendors as possible with a bias towards the larger, leading edge organisations.

- The questionnaire used for the vendor research programme is included as Appendix C.

- The user research programme was carried out by means of a telephone survey among senior data processing executives in 109 Western European organisations.

- The questionnaire used for the user research program is included as Appendix D.

- The user sample was composed of organisations of varying size across a broad cross section of vertical markets.

- An analysis of both the vendor and user sample is included as Appendix B.

- The third element in the research efforts that contributed to this report was INPUT's continuing studies of the information services industry.

- Previous studies by INPUT of the market, company statements, press releases, news reports, and company financial information were all utilised by INPUT in researching this report.

- Individual country markets were assessed in local currency at current rates.

- For comparative purposes, the assessments of individual country markets have been converted into U.S. dollars. Conversion rate adjustments have been made in order to eliminate the distorting effect of different inflation assumptions.

- These assumptions and the conversion rates used are described fully in Chapter III, Section A, in particular in Exhibit III-1.

- Definitions of the terms used in this report are included in Appendix A.

- Enquiries and comments regarding this report and any related topics of interest are welcomed by INPUT.

- INPUT would like to express its thanks to all those companies and individuals who participated in the research undertaken for this report.

C. REPORT STRUCTURE

- The remaining chapters of the report are organised as follows:

  - Chapter II is an Executive Overview providing a summary of the contents of the entire report.

  - Chapter III describes INPUT's assessments of the dimensions of the information services market and its main constituent sectors, current and predicted growth rates, and forecasts for the medium and longer term.

  - Chapter IV assesses some of the major issues that are of concern to and are likely to affect the development of the information services business. These are analysed under the broad classifications of strategic, vendor, and user issues.

  - Chapter V through VIII provide more detailed analyses of each of the four main sectors of the information services industry defined by INPUT, respectively:

- Processing and network services in Chapter V.
- Software products in Chapter VI.
- Professional services in Chapter VII.
- Integrated systems in Chapter VIII.

- The appendices provide a definition of the terms used, the interview and sample profile, the questionnaires used, and a list of related INPUT reports.

II EXECUTIVE OVERVIEW

II EXECUTIVE OVERVIEW

- This Executive Overview is designed in a presentation format in order to:

  - Help the busy reader quickly review key research findings.

  - Provide a ready-to-go executive presentation, complete with a script, to facilitate group communication.

- The key points of the entire report are summarised in Exhibits II-1 through II-11. On the left-hand page facing each exhibit is a script explaining its contents.

A. 1986 SERVICES INDUSTRY OUTLOOK

- The distinct boundaries that once separated the various sections of the information services industry are increasingly blurring as knowledge of the customers' needs, rather than of a particular delivery mode or area of technical expertise, becomes the key competitive issue.

- Professional services are providing opportunities for vendors across all sectors of the market and are essentially the carrying plasma of the information services industry.

- The continued convergence of computing and telecommunications is driving user requirements for totally integrated business solutions.

- This increased emphasis on large integrated system implementation is driving the trend towards market dominance by a limited number of large corporations.

- It is becoming increasingly important for larger vendors to achieve a critical market position in terms of financial strength, image, and resource in order to meet increasingly complex user demands and to achieve higher user awareness.

EXHIBIT II-1

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1986 SERVICES INDUSTRY OUTLOOK

- The Professional Services Opportunity
- Computer/Communications Integration
- Critical Market Position

B. STRATEGIC DIRECTIONS

- The need to achieve critical market position, spread market development risks, and pool technical and market knowledge in order to meet increasingly complex user requirements is driving continued levels of interest in acquisitions, agreements, and especially strategic partnering arrangements.

- Levels of reported vendor activity and interest in these directions are shown in Exhibit II-2.

- Strategic partnering is an attractive growth strategy for the following reasons:

  - Increasing risk of formal acquisition.

  - Shortening technology and product life cycles.

  - Rapidly changing market structures.

  - Increasing product/market complexity.

  - Need to exploit narrowing market/product opportunity windows.

- The increasing desire of users for 'one-stop shopping' will lead to increased adoption of agreements and partnerships as future growth strategies.

- There is continued interest in international expansion as a growth strategy. To an extent, this reflects market fragmentation and the trend towards specialisation in key applications or vertical market areas. It is therefore vital to minimise risk and leverage investments by expanding across a number of geographical markets.

EXHIBIT II-2

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STRATEGIC DIRECTIONS

VENDOR INITIATIVES	ALREADY ACTIVE	HIGH INTEREST
Geographic Expansion	40%	20%
Agreements	35%	20%
Partnerships	25%	25%
Acquisition Initiatives	15%	25%

C. $48 BILLION INFORMATION SERVICES MARKET BY 1991

- INPUT estimates that the overall market for information services in the four major country markets of Western Europe (France, Italy, the U.K., and West Germany) exceeded $18 billion in 1986.

- INPUT also estimates that this market will grow at an average annual growth rate (AAGR) of 21% to reach $48 billion by 1991.

- The highest levels of growth will be in the software products and professional services sectors--24% AAGR. Each will increase its absolute share of the market, largely at the expense of processing and network services.

- The integrated systems sector is expected to grow at the slightly lower annual growth rate of 23% to represent nearly a quarter of the market in 1991 (up from 21% in 1985).

- Processing and network services is expected to achieve only 8% annual average growth to 1991. Thus, this sector, representing nearly 25% of the 1985 market, falls to a 13% share of the 1991 market.

- Each of these major industry sectors is discussed in more detail later.

EXHIBIT II-3

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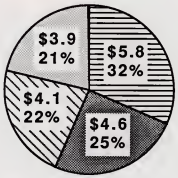
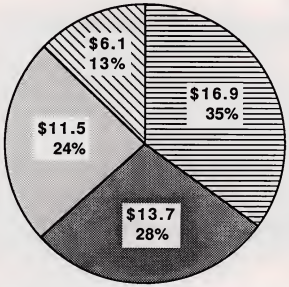
$48B INFORMATION SERVICES MARKET BY 1991 (Western Europe)



Total Market 1986 = $18.4B



Total Market 1991 = $48.2B

Integrated Systems | Processing and Network Services | Software Products | Professional Services

D. PROCESSING AND NETWORK SERVICES MARKET GROWTH

- INPUT forecasts that the processing and network services sector will achieve an AAGR of 8% to expand revenues from $4.1 billion in 1986 to $6.1 billion by 1991.

- The most significant driving force for growth during this five-year forecast period will be the convergence of computing and telecommunications technology.

- The development of value-added network services (VANS) is providing major new opportunities for services vendors in the increasingly liberalised Western European telecommunications environments.

- Processing facilities management and network facilities management are emerging as important opportunities. The market is being driven by new requirements for increasingly complex service solutions. The provision of professional services and software can far outweigh the processing element in the service.

- Processing and network service vendors must refocus their strategic thrust towards market niches in specialist application areas. In addition, it is important for vendors to develop a total service orientation that augments basic processing services with the provision of specialist applications software and consultancy expertise.

- Trends towards the development of departmental systems are providing total service opportunities as vendors can leverage their knowledge of specialised markets in combination with expertise in the provision of networked systems.

EXHIBIT II-4

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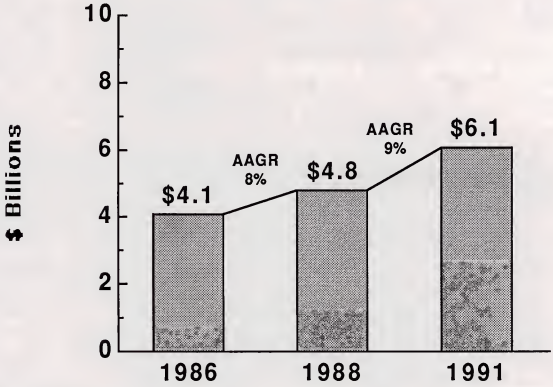
PROCESSING AND NETWORK SERVICES MARKET GROWTH (Four Major European Countries)



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E. NETWORK SERVICE DIRECTIONS

- The major impact of computer/communications convergence on the information services industry has been long heralded and is well understood.

- Within Western Europe, the particular role of the PTTs and the vast financial resources required to build a major network capability determine the emerging structure of this new sector.

- Fundamentally, this can be viewed at three levels.

- The monopoly or duopoly of basic telcommunications bearer services that exist in Europe determines the top level.

- At the next level exists the possibility to develop major service network capability. Clearly a number of service companies, notably GEISCO and McDonnell Douglas, already offer comprehensive services of this kind.

- Increasing technical capabilities as a result of convergence are making this a key area of focus for large companies like IBM and EDS to offer managed data network services or value-added network services (VANS).

- At the third level, INPUT anticipates a highly fragmented sector in which many organisations, many small and highly specialised, will offer particular services (value-added network services, VANS).

- These organisations are likely to purchase network capacity from the second level vendors and will generate value added on the basis of the data or related information service that they can provide to their clients.

- Examples of these services include electronic data interchange (EDI), on-line data base services, and electronic funds transfer (EFT).

EXHIBIT II-5

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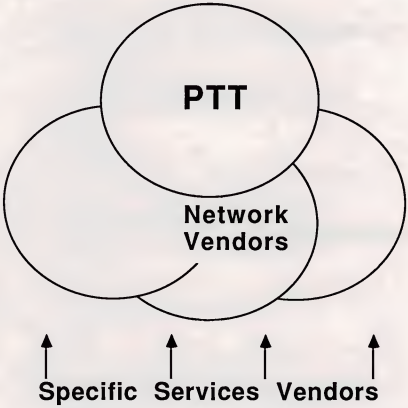
NETWORK SERVICES DIRECTIONS



F. SOFTWARE PRODUCTS MARKET GROWTH

- INPUT forecasts a gradual maturation of the software products market and a slowdown in rates of growth in the period up to 1991.

- It is anticipated that the four major European country markets will grow at an annual rate of 26% for the period through to 1988 to reach $7.3 billion. Growth is expected to fall to 23% during the period 1988 through 1991 with the market size expected to reach nearly $14 billion.

- One of the major threats to the growth of the software products market is the decline in prices for low-end products resulting largely from highly competitive 'commodity-like' characteristics in the PC area.

- Consideration has also to be given to the capability of organisations and individuals to continuously absorb new products.

- Nevertheless, marketing clearly superior value-added software products in key application areas will continue to offer major opportunities.

- Major customer bases, hitherto not great absorbers of software application packages (e.g., the VAX base), are likely to represent a sizeable opportunity in this five-year timeframe.

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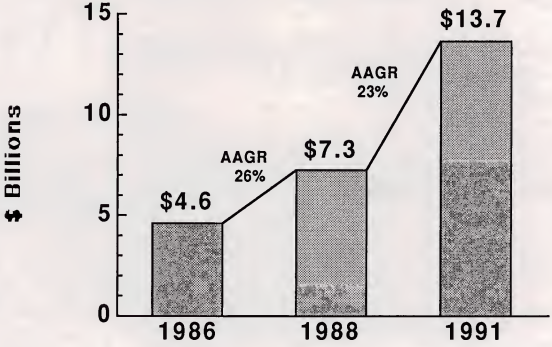
SOFTWARE PRODUCTS MARKET GROWTH
(Four Major European Countries)



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G. SOFTWARE VENDOR OUTLOOK

- The marketplace for software products remains a fast changing as well as rapidly growing opportunity.

- Key characteristics are the shortening life cycles for products, the competitive turmoil, the ever present threat in the complex systems area from the professional services approach, and the activity of the equipment manufacturers.

- Important vendor concerns must be to constantly improve or replace products in order to remain 'state of the art' and, perhaps more importantly, keep abreast of rapid changes in market demand.

- As 'low-end' product prices continue to fall greater emphasis will be needed on unique (and valuable) features to products which will be able to justify higher prices in order to cover heavy development and marketing costs.

- Major new opportunities over the next five years are seen in areas like the application of artificial intelligence technology to software products in general.

- An exciting area of opportunity is also seen in the area of productivity tools. The application of artificial intelligence technology to this area will be very significant.

- Increasing specialisation is also observed in the software products market. Vendors will need to provide products targetted at specialist markets and to demonstrate their knowledge of the relevant business area when marketing and supporting them.

EXHIBIT II-7

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SOFTWARE VENDOR OUTLOOK

- Increasing Competition
- Life-Cycle Contraction
- Professional Services Threat
- Opportunities
  - Artificial Intelligence
  - Productivity Tools
  - Specialist Markets

H. PROFESSIONAL SERVICES MARKET GROWTH

- The growth rate for the professional services sector is currently assessed by INPUT at around 25% per year, leading to an annual market of $9 billion in the four major countries of Western Europe by 1988.

- In the longer term, uncertainties concerned with the availability of skilled staff and the speed with which productivity development tools can be utilised are likely to represent supply-side constraints.

- On the demand side, there are many development opportunities as users increasingly seek total service solutions.

- Education and training has emerged as a major growth opportunity due to:

  - Rapid changes in technology.

  - Growing complexity of software development tools.

  - Increased penetration of microcomputers amongst inexperienced end users.

- The provision of consultancy services is growing in importance as users seek to implement company-wide systems strategies.

- Specialisation is the key to success for system implementation owing to the proliferation of increasingly complex technology and the need to demonstrate specific knowledge of target sectors.

EXHIBIT II-8

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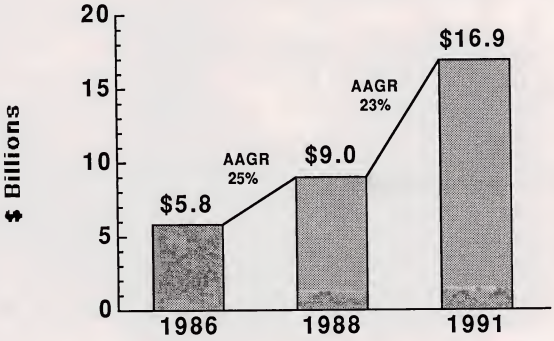
PROFESSIONAL SERVICES MARKET GROWTH
(Four Major European Countries)



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I. PROFESSIONAL SERVICES DRIVERS

- The trend towards the use of information systems as a key strategic weapon is driving the demand for professional services.

- The increased demand for large and complex systems, particularly with dependency on telecommunications networks, leads to the need for contractors to take on overall responsibility for systems integration projects.

- A key trend here is the move towards prime contracting and the emergence of systems integrators.

- Factors stimulating the systems integration marketplace include:

  - Scarcity of skills by one vendor for developing a total complex automated solution.

  - Proliferation of technological options which produce buyer challenges and system compatibility changes.

- Consultancy services are being utilised in areas where rapid technological development leads to a scarcity of in-house skills. Telecommunications and expert systems are good examples of this.

- The 'Big 8' accounting firms have increased the market for professional services and enhanced levels of professionalism in the sector. However, there is still a cloud over the ethical issue of impartiality in relation to their auditing activities.

EXHIBIT II-9

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PROFESSIONAL SERVICES DRIVERS

- Information Systems - A Competitive Weapon
- Systems Complexity
- Prime Contracting
- Skill Shortage
- The 'Big 8'

J. INTEGRATED SYSTEMS MARKET GROWTH

- The integrated systems market encompasses three main areas--CAD/CAM, small- to medium-sized business systems, and specialist vertical or niche market systems. Vendors typically provide a combination of hardware, software, and services.

- Currently, a relatively high rate of growth (25% AAGR) is being experienced in Europe. INPUT forecasts that the market will reach $11.5 billion in 1991, having reached $6.1 billion by 1988 from its level of $3.9 billion in 1986.

- The major forces driving this growth are:

  - Increased awareness of the use of automation as a major competitive weapon. This attitude is fuelling demand for rapid implementation which favours "ready-to-go" integrated systems solutions.

  - The increasing appeal of a "one-stop" service, which relieves confused buyers of a time-consuming, complex, and error-prone approach to hardware/software evaluation and selection.

  - The continuously improving price/performance of both mini and microcomputers which opens up new markets by lowering the entry threshold of integrated system solutions.

  - The healthy growth of the software products marketplace. Integrated system vendors will have a constantly expanding menu of innovative software solutions available for bundling into a total integrated system.

EXHIBIT II-10

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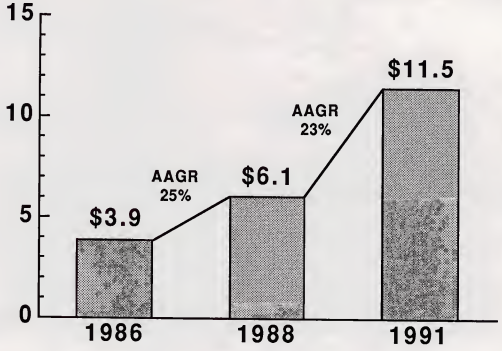
INTEGRATED SYSTEMS MARKET GROWTH
(Four Major European Countries)



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K. INTEGRATED SYSTEMS CHALLENGES

- Increasing specialisation of user needs has allowed vendors to leverage expertise in specific market segments. It is important that vendors provide all the value-added service factors for specialist markets.

- The provision of implementation consultancy and support is a key success factor. Specifically, it is suggested that vendors evaluate undertaking more extensive pre-installation systems consulting, education of users in the management principles underlying the architecture of the application, and innovative hardware/software problem reconciliation methods (e.g., remote diagnostics and on-line access to fault diagnostics data bases).

- Sophisticated software engineering is a major challenge, and it is suggested that vendors focus on multiuser applications and the customisation of standard modules of software in order to enhance development productivity and maximise market penetration.

- The CAD/CAM market has undergone a phase of mild 'shake-out' as vendors have adjusted to slowing growth rates, falling unit prices, and increasing implementation of CAD systems on standard hardware (especially micro-computers) rather than expensive proprietary systems. It is suggested that vendors concentrate on growing opportunities in software publishing and the provision of value added via comprehensive support, consultancy, and training services.

EXHIBIT II-11

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INTEGRATED SYSTEMS CHALLENGES

- Specialisation Is the Key
- Professional Services Orientation
- Software Engineering
- CAD/CAM

III MARKET ANALYSIS AND FORECAST

III MARKET ANALYSIS AND FORECAST

A. MARKET STRUCTURE

- The Western European information services market was researched during 1986, data from previous INPUT research was also considered, and the market was forecast for the five-year period 1986-1991. Market development for the 1985-1986 period was evaluated from in-depth face-to-face, mail, and telephone interviews with leading vendors in the information services business and supported by the analysis of other public doman information.

- The processing and network services sector was forecast for three constituent modes:

  - Processing services (including both remote computing and batch services).

  - Value-added network services (VANS).

  - Processing facilities management (FM).

- Software products were forecast:

  - By systems and applications packages.

  - By both independent suppliers and hardware vendors.

- Professional services were forecast for the following categories:
  - Consultancy.
  - Software development.
  - Education and training.
  - Contact programming and other professional services.
- For integrated systems, the forecasts were made by:
  - Hardware revenues.
  - Software and other charges.
- It is estimated that the four categories analysed in this report--France, Italy, the United Kingdom, and West Germany--account for around 65% of the entire Western European information services industry.
- The forecasts are made in local currency and converted into U.S. dollars for aggregation and comparative purposes.
- The forecasts include assumptions about the rate of inflation in each country as follows:
  - France 4.0%
  - Italy 6.0%
  - United Kingdom 5.0%
  - West Germany 1.5%

- In order to maintain a fair comparison between the different country markets throughout the five-year forecast period, the U.S. dollar conversion rates used have been adjusted to reflect the assumed differences in inflation rates.

  - U.S. inflation was assumed to be 3.5%.

  - Exhibit III-1 sets out the conversion rates assumed in calculating the aggregate forecast.

- In no regard should these conversion rates be interpreted as a forecast of exchange rates. They are calculated on the basis of prevailing exchange rates and used simply as an index to eradicate distortions that would otherwise arise as a result of the use of different inflation assumptions for different countries.

B. FORECASTS FOR INFORMATION SERVICES, 1986-1991

- INPUT forecasts that the Western European information services market will grow from $18 billion in 1986 to $27 billion in 1988, representing an AAGR of 22%.

- In the period up to 1991, INPUT forecasts growth continuing at around 21% AAGR to reach a market size just over $48 billion by 1991.

- Exhibit III-2 shows the breakdown of these market size and growth projections for the four individual country markets studied in this report.

- During this forecast period, the French market will continue to remain the largest individual country market by a substantial margin.

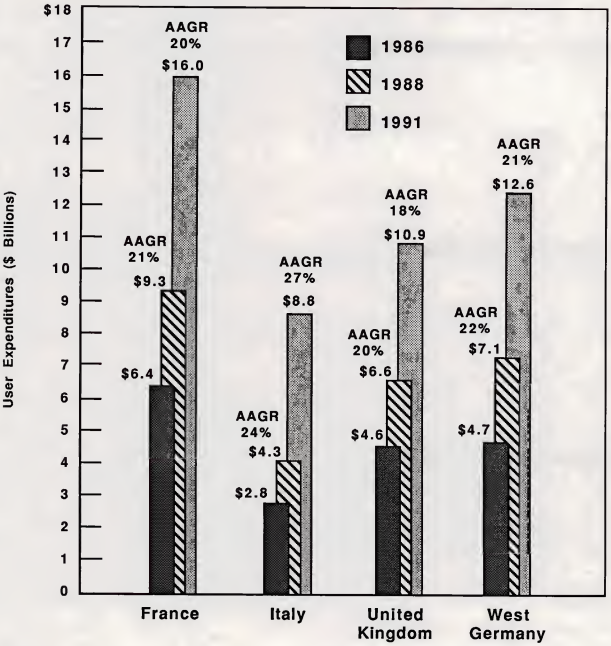
EXHIBIT III-1

U.S. DOLLAR CONVERSION RATE ASSUMPTIONS
$ 1 =

CURRENCY	ASSUMED U.S. DOLLAR CONVERSION RATE						
	1985	1986	1987	1988	1989	1990	1991
French Francs	8.00	6.99	7.02	7.06	7.10	7.13	7.16
Italian Lira	1,770	1,492	1,529	1,567	1,606	1,646	1,688
Pounds Sterling	0.70	0.65	0.66	0.67	0.68	0.69	0.70
Deutsche Marks	2.62	2.18	2.14	2.09	2.04	2.00	1.97

EXHIBIT III-2

FORECAST OF INFORMATION SERVICES MARKET BY COUNTRY 1986-1991



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- The West German market which is growing at around 22% AAGR has overtaken the United Kingdom as the second largest market. Italy, despite its relatively high growth rate (AAGR 24%), continues to remain as the smallest market.

- Growth development for the few major sectors of the total market is shown in Exhibit III-3.

- In 1986, the professional services sector remained the largest sector, however, its growth rate (AAGR 25%) is not as rapid as the software products sector (AAGR 26%) which has now overtaken processing and network services as the second largest sector.

- Processing and network services (AAGR 8%) will be the smallest of the four sectors by 1988.

- Exhibits III-4 and III-5 show, respectively, individual country and market sector growth forecasts from 1985 through 1991.

- The market development of the four major market sectors (processing and network services, software products, professional services, and integrated systems) is discussed in Chapters V through VIII, respectively).

- The development of each individual country market in relation to the forecast is discussed in the subsections below.

I. FRENCH MARKET DEVELOPMENT

- The French market for information services continues to be the largest individual country market in Western Europe. INPUT forecasts that this will continue to be so through to 1991.

EXHIBIT III-3

FORECAST OF INFORMATION SERVICES MARKET BY MARKET SECTOR 1986-1991

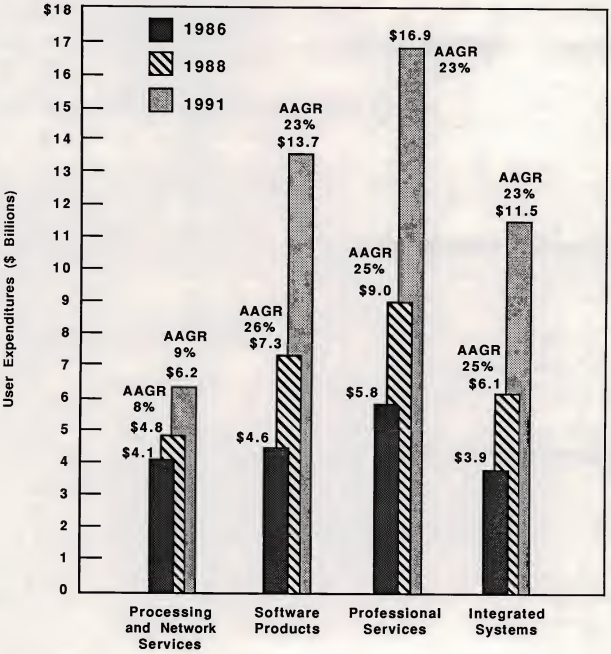

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EXHIBIT III-4

COMPARISON OF INFORMATION SERVICES MARKETS BY COUNTRY IN WESTERN EUROPE, 1985-1991

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
France	$4,730	$6,410	25%	$9,340	20%	$15,980
Italy	1,835	2,780	33%	4,290	27%	8,820
United Kingdom	3,460	4,560	24%	6,605	18%	10,955
West Germany	3,250	4,730	30%	7,105	21%	12,605
Total	$13,275	$18,480	27%	$27,340	21%	$48,360

EXHIBIT III-5

COMPARISON OF INFORMATION SERVICES MARKETS BY MARKET SECTOR IN WESTERN EUROPE 1985-1991

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing and Network Services	$ 3,285	$ 4,105	14%	$ 4,830	9%	$ 6,195
Software Products	3,200	4,630	32%	7,345	23%	13,700
Professional Services	4,060	5,815	30%	9,045	23%	16,950
Integrated Systems	2,735	3,930	30%	6,120	23%	11,515
Total	$13,280	$18,480	27%	$27,340	21%	$48,360

- INPUT notes, however, that France's share of the combined four major country markets will show a mild regression in comparison with the other major country markets.

- Exhibit III-4 shows that the French share of the total is at 35% in 1986 and will be 34% in 1988 and 33% in 1991, in part due to a relatively faster slowdown in market growth rates than in other countries.

- French companies continue to play a major role in the Western European markets; amongst the larger information services vendors, 5 of the top 10 and 9 of the top 20 are French.

- Growth in the French information technology industry is being actively encouraged by the government. In spite of the reduction in the government's 1985 contributions to Eureka, 400 million francs instead of the promised 1 billion francs, the contribution still represents twice as much as the German and four times as much as the U.K. government contributions.

- Major projects funded by Eureka include 'European Silicone Structures', which specialises in the automatic design and production of custom chips by means of direct printing on silicon, and the 'Eureka Software Factory', which has now been in existence for nearly a year.

- The largest European company, measured by total international revenue, is the French services group Cap Gemini Sogeti, whose 1986 revenues are estimated in the following approximate proportions:

  - France 1/3
  - Rest of Europe 1/3
  - USA 1/3

- Cap Gemini Sogeti's flotation on the Paris stock exchange was one of the major events of the year for the French services industry.

- The flotation followed a restructuring of the group under a new holding company so that 51% of the shares would continue to be held by manager-shareholders.

- Initially offered at 650 francs each, the shares were oversubscribed 123 times. The shares were then offered again at 875 francs each and the quotation was made; this time demand was only 30 times greater than supply.

- The market reaction to this issue reflects the high level of interest expressed by the financial community in the information services industry.

- Exhibit III-6 shows the breakdown of the French information services market across the four main segments of the information services business.

- The processing and network services sector is expected to maintain an average annual growth rate of 7% between 1986 and 1988 and then increase to 8% per year to 1991.

- Further developments in value-added network services, especially videotex, will be the major drivers of growth in this sector.

- In the other three market segments (software products, professional services, and integrated systems), INPUT's forecasts a mild regression of growth rates.

- Software products, forecasted to grow at 27% to 1988, are then expected to grow at an AAGR of 26% per year to 1991.

- Professional services are forecast to grow at 23% per year to 1988 and thereafter at an AAGR of 21% to 1991, while integrated systems will show a similiar pattern, the growth rate of 24% to 1988 easing to 22% for the period to 1991.

EXHIBIT III-6

INFORMATION SERVICES MARKET FORECAST, 1986-1991
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing and Network Services	FF9,960	FF10,695	7%	FF12,265	8%	FF15,450
Software Products	7,300	9,250	27%	14,850	26%	29,700
Professional Services	12,650	15,565	23%	23,540	21%	41,700
Integrated Systems	8,000	8,960	24%	15,250	22%	27,690
Total	FF37,910	FF44,470	20%	FF65,905	20%	FF114,540

2. ITALIAN MARKET DEVELOPMENT

- The Italian market, although the smallest of the four country markets, shows the strongest growth rates. The average annual growth rate, forecast at 33% per year to 1988, will fall slightly to 27% per year for the period to 1991. Exhibit III-7 shows the breakdown of the Italian information services market.

- These growth rates indicate the increasing importance of the Italian market. Italy's share of the total Western European services market is forecast to grow from 13% in 1986 to 18% in 1991.

- The principal reasons noted for the delay in the growth of the Italian market include:

  - Poor telecommunications infrastructure provided by S.I.P.

  - Low availability of information services to users.

  - Lowest levels of information services investment by major industrial and commercial concerns in comparison to other countries.

- However, positive factors, which include the increasing strength of Olivetti-- both domestic and international markets-- and the increased levels of interest in the Italian market shown by international and particularly U.S. vendors, will serve not only to arouse greater user awareness but also to stimulate competition and corporate efficiency amongst Italian services vendors.

- The dominance of the processing and network services sector which INPUT noted last year has been swiftly eroded. Morever, this trend seems unlikely to be reversed. INPUT forecasts that processing and network services' 20% share of the Italian market will be almost halved by 1991, since the average annual growth rates projected for this sector are much lower than in other sectors.

EXHIBIT III-7

INFORMATION SERVICES MARKET FORECAST, 1986-1991
ITALY

SUBSECTOR	MARKET FORECAST (Lira Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing and Network Services	Lira 795	Lira 890	13%	Lira1,145	16%	Lira1,785
Software Products	870	1,130	29%	1,885	28%	3,925
Professional Services	850	1,150	35%	2,090	35%	5,140
Integrated Systems	735	950	30%	1,615	36%	4,060
Total	Lira3,250	Lira4,120	28%	Lira6,735	30%	Lira14,910

- Growth in the software products sector is expected to remain strong at 29% per year to 1988 with only a mild deceleration to 28% per year for the period 1991.

- The professional services market shows the greatest potential for growth. Average annual growth rates for the period to 1988 are forecast at 35% to 1991, indicating a growth in the share of all services revenues from 29% in 1986 to 35% in 1991.

3. U.K. MARKET DEVELOPMENT

- INPUT forecasts that the U.K. market will grow from $4.6 billion in 1986 at an average annual rate of 20% to 1988 and thereafter at 18% per year to 1991.

- This forecast, shown in Exhibit III-8, also gives the individual growth rates for the four market sectors for the same period.

- Processing and network services, which in 1986 represented 19% of the total U.K. information services market, is forecast to grow at an average annual rate of 11% to 1991 indicating a fall in share of the total market to 12%.

- The structure of the U.K. value-added network services (VANS) market has changed considerably via strategic partnering agreements.

- British Telecom has commenced trials of its pilot X.400 message handling service with DEC and ICL. This will provide OSI connectivity for potentially all private and public electronic mail services after a planned launch in Spring 1987.

- British Telecom, however, faces a major challenge from the new Cable and Wireless/ICL joint venture who plan to offer an X.400 service. This market

EXHIBIT III-8

INFORMATION SERVICES MARKET FORECAST, 1986-1991
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing and Network Services	£ 515	£ 565	11%	£ 700	11%	£ 945
Software Products	600	740	25%	1,165	21%	2,050
Professional Services	830	1,040	25%	1,620	23%	3,015
Integrated Systems	480	600	25%	940	21%	1,665
Total	£2,425	£2,945	22%	£4,425	20%	£7,675

position has been further enhanced via partnership with GEISCO, and they are emerging as major European players especially in the market for electronic data interchange (EDI).

- Mercury's competitive network tariff, new packet switched service, and U.S. services are threatening B.T.'s market position and are planning to launch satellite services in combination with IBM, EDS, and the Stock Exchange.

- Growth in the market of VANS services is being further stimulated by the government's firm commitment to back OSI as reflected in recent licensing conditions. In addition, the development of VANS is being stimulated via the Vanguard programme.

- The software products sector is expected to show a growth rate of 25% to 1988 and then at 21% to 1991 which represents a market value of over two billion pounds.

- Legal developments in the U.K. which occurred during 1985 included the extension of the 1956 Copyright Act to cover software and the passing of this amendment by parliament.

- Legislation on strategic export controls was also expanded to include software during 1985, but the issue of an open general export license for software meant that in practice the export earnings of U.K. software houses were not affected.

- The highest level of growth is expected in the professional services sector. Growth is forecast at around 25% a year in the period up to 1988, slowing slightly to 23% per year to 1991.

- This growth is being driven by continued shortages of skilled in-house data processing personnel, especially in the areas of telecommunications and also in the public sector.

- Increasing user pressure to provide total integrated business solutions and the trend towards prime contracting has led to renewed interest in acquisitions and partnering agreements.

- In the integrated systems sector, INPUT forecast buoyant annual growth of 25% in the period up to 1988, slowing to 21% per year to reach $1.7 billion by 1991.

4. WEST GERMAN MARKET DEVELOPMENT

- West Germany in spite of having the largest computer equipment marketplace in Western Europe has, paradoxically, a relatively small information services market.

- This phenomenon is most noticeable in the processing and network services sector where the use of outside services is generally viewed as a second-best solution and in-house development is preferred, unless these are clear economic arguments against.

- Exhibit III-9 illustrates the projected growth of the information services market in West Germany. INPUT forecasts a growth rate of 20% overall to 1988, followed by a growth rate of 19% for the period to 1991.

- In the processing and network services sector, INPUT anticipates a low growth rate of 7% per year to 1988, followed by 5% per year to 1991.

- The software products sector will show the fastest growth--25% per year to 1988 and then 21% per year, reaching over 2 billion by 1991.

- The decline in the growth rate is expected because of the domination of 'IBM and compatibles' equipment (which includes the popular domestic vendor, Siemens) which will lead to saturation of the considerable market for 'IBM-compatible' software.

EXHIBIT III-9

INFORMATION SERVICES MARKET FORECAST, 1986-1991
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing and Network Services	DM2,250	DM2,440	7%	DM2,765	5%	DM3,220
Software Products	2,460	3,075	25%	4,800	21%	8,500
Professional Services	2,150	2,670	24%	4,100	22%	7,445
Integrated Systems	1,670	2,060	24%	3,185	21%	5,640
Total	DM8,530	DM10,245	20%	DM14,850	19%	DM24,805

- Both professional services and integrated systems are forecast to grow at 24% per year to 1988, but thereafter professional services will grow at 22% and integrated systems at 21% per year to 1991.

- The Deutsche Bundespost, which already uses optical fibers for local telephone network transmission, intends to add 70,000 Ku of monomode fibres to the long-distance and international telephone network.

- Plans are also well developed to provide an integrated digital services network (IDSN) by 1988. This will permit the simultaneous digital transmission of data, text, voice, and graphics.

- Germany also has a shortage of skilled data processing personnel. The Bundesaustaff fur Arbeit noted that the demand for qualified data processing personnel exceeded supply by 40%. Fifty percent (50%) of the jobs offered are for qualified and experienced software engineers.

- New arrivals on the German stock market during 1985 included DEC, whose shares are now quoted on the exchanges in Frankfort, Munich, and Berlin.

- The main reason for this move appears to be DEC's desire to raise the company's image within the German market; a separate quotation for DEC Germany indicates DEC's commitment to the German market and provides existing and potential clients with a public reference of the company's succes in that market.

C. COMPETITIVE ENVIRONMENT

- Detailed research and analysis of published accounts of leading service companies and other information has enabled INPUT to establish rankings of these vendors by:

- Overall revenues in calendar 1985.

- Revenues in major market sectors.

- A number of adjustments have been made to the vendors' stated revenues in order to normalise them for comparative purposes.

  - Captive revenues have been subtracted (see Appendix A for a definition of captive revenues).

  - Export revenues have been separated out for markets outside the individual country markets.

  - Where reported results were for noncalendar financial years, an adjustment was made.

  - Hardware and hardware maintenance revenues were extracted, unless these were associated with integrated systems.

- Exhibit III-10 lists the top 20 information services vendors in Western Europe ranked by their estimated market share within the four major country markets as a group.

- Exhibits III-11 through III-14 list the top 10 vendors in each of the four major country markets, and Exhibits III-15 through III-18 list the top 10 vendors in each of the four main sectors of the information services industry.

EXHIBIT III-10

THE TOP TWENTY INFORMATION SERVICES VENDORS IN WESTERN EUROPE IN 1985

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues ($ Millions)
1	IBM-INS	1.3%	$ 170
2	SCICON	1.2%	156
3	CISI	1.2%	154
4	CAP GEMINI SOGETI	1.1%	147
5	DATEX	1.0%	137
6	GSI	1.0%	133
7	COMPUTERVISION	1.0%	130
8	REUTERS	0.9%	128
9	SGZ	0.9%	125
10	SLIGOS	0.9%	118
11	THORN-EMI IT	0.8%	112
12	CCMC	0.8%	111
13	TELESYSTEMES	0.7%	94
14	SEMA-METRA	0.7%	92
15	GEISCO	0.7%	91
16	SESA	0.7%	89
17	LOGICA	0.7%	86
18	HOSKYNS	0.6%	74
19	INTERGRAPH	0.5%	70
20	CAP	0.5%	61
	OTHERS	82.8%	$10,947
	TOTAL MARKET	100%	$13,225

EXHIBIT III-11

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INFORMATION SERVICES
FRANCE

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (FF Millions)
1	CISI	2.8%	FF 1,080
2	CAP GEMINI SOGETI	2.5%	955
3	SGZ	2.5%	950
4	SLIGOS	2.4%	907
5	GSI	2.3%	875
6	CCMC	2.2%	845
7	TELESYSTEMES	1.9%	707
8	SEMA-METRA	1.9%	702
9	SESA	1.5%	579
10	STERIA	1.3%	463
	Others	78.7%	FF29,847
	Total Market	100.0%	FF37,910

EXHIBIT III-12

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INFORMATION SERVICES
ITALY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (Lira Millions)
1	FINSIEL GROUP	10.2%	Lira330,400
2	ENI DATA	4.0%	131,400
3	DATA MANAGEMENT GROUP	1.9%	61,000
4	IBM-INS	1.8%	60,000
5	CERVED	1.6%	51,700
6	SYNTAX	1.6%	51,000
7	CNI (CONSORZIO)	1.4%	45,000
8	DATAMONT	1.3%	43,500
9	GEIS	1.3%	43,000
10	SICIT	1.0%	32,000
	Others	73.9%	Lira2,401,000
	Total Market	100.0%	Lira3,250,000

* Includes captive revenue

EXHIBIT III-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INFORMATION SERVICES
UNITED KINGDOM

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (£ Millions)
1	THORN-EMI IT	2.6%	£ 63
2	HOSKYNS	2.3%	56
3	REUTERS	1.9%	47
4	LOGICA	1.7%	41
5	CAP	1.6%	39
6	SCICON	1.6%	38
7	CENTRE-FILE	1.4%	34
8	IBM-BNS	1.3%	31
9	MBS	1.2%	30
10	ISTEL	1.0%	25
	OTHER	83.4%	£ 2,021
	TOTAL MARKET	100.0%	£ 2,425

EXHIBIT III-14

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INFORMATION SERVICES
WEST GERMANY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (DM Millions)
1	DATEV	4.2%	DM 359
2	IBM-INS	2.1%	180
3	COMPUTERVISION	1.9%	160
4	TAYLORIX	1.8%	154
5	SCS (SCICON)	1.5%	128
6	FCS	1.3%	109
7	FIDUCIA	1.2%	102
8	EDV PLOENZKE	1.0%	86
9=	GEI	0.9%	75
9=	APPLICON	0.9%	75
	Others	83.2%	DM 7,102
	Total Market	100.0%	DM 8,530

EXHIBIT III-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROCESSING AND NETWORK SERVICES

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues ($ Millions)
1	IBM-INS	5.3%	$ 170
2	REUTERS	4.0%	128
3	DATEV	3.9%	126
4	GSI	3.7%	120
5	CISI	2.8%	92
6	CCMC	2.8%	89
7	GEISCO	2.5%	82
8	SLIGOS	1.8%	59
9	SGZ	1.5%	50
10	TELESYSTEME	1.4%	45
	OTHERS	70.3%	$2,269
	TOTAL MARKET	100.0%	$3,230

EXHIBIT III-16

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
SOFTWARE PRODUCTS
(Independent Vendors)

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues ($ Millions)
1	COMPUTER ASSOCIATES	2.7%	$ 34
2	SCICON	2.1%	26
3	THORN-EMI IT	1.9%	24
4	MBP	1.8%	23
5	CINCOM	1.7%	22
6	SOFTWARE AG	1.6%	20
7	CGI	1.6%	20
8	SGZ	1.4%	18
9=	SAP	1.3%	16
9=	ADV-ORGA	1.3%	16
	OTHERS	82.7%	$1,046
	TOTAL MARKET	100.0%	$1,265

EXHIBIT III-17

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROFESSIONAL SERVICES

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues ($ Millions)
1	CAP GEMINI SOGETI	4.5%	$ 132
2	FINSIEL GROUP	2.4%	96
3	SCICON	2.1%	85
4	SEMA-METRA	1.5%	60
5	SGZ	1.5%	59
6	LOGICA	1.3%	51
7	CISI	1.1%	46
8	ARTHUR ANDERSEN	1.0%	41
9	THORN-EMI IT	0.9%	38
10	EDS	0.9%	36
	Others	82.8%	$3,416
	Total Market	100.0%	$4,060

* Includes captive revenue

EXHIBIT III-18

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INTEGRATED SYSTEMS

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues ($ Millions)
1	COMPUTERVISION	3.2%	$ 88
2	INTERGRAPH	2.6%	70
3	APPLICON	2.3%	62
4	MBS	1.6%	43
5=	CALMA	1.4%	38
5=	RACAL REDAC	1.4%	38
7	SESA	1.3%	35
8	SLIGOS	1.1%	31
9=	METIER	1.0%	28
9=	HOSKYNS	1.0%	28
	Others	83.1%	$2,274
	Total Market	100.0%	$2,735

D. COMPARISON WITH THE UNITED STATES MARKET

- The information services market in the U.S. is considerably larger than that of Western Europe, not only in absolute terms but also relative to population size and GNP.

- Many reasons are propounded for this, but certainly among the most important factors are:

  - The very large, unified U.S. market in comparison with Western Europe.

  - Generally lower costs for computer hardware, software, and telecommunications.

  - The more developed 'service orientation' of the U.S. economy in comparison with Western Europe.

  - The more widespread acceptance of information technology.

- Exhibit III-19 provides a comparison between the United States market for information services and that of Western Europe.

- INPUT suggests that the current downturn in the information services business in the U.S. will not reach Europe for the following reasons:

  - European economies are still undergoing major structural adjustements from manufacturing into services industries which are major consumers of information technology.

  - Increased confidence among European companies to compete in world markets has seen continued high rates of investment in productivity tools.

EXHIBIT III-19

COMPARISON OF U.S. AND WESTERN EUROPEAN INFORMATION SERVICES MARKET DEVELOPMENT 1985-1991

SUBSECTOR		MARKET FORECAST ($ Billions)					
		1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing and Network Services	U.S.	$16.3	$18.4	13%	$23.6	13%	$34.5
	W.E.	3.2	4.0	14%	4.8	9%	6.1
Software Products	U.S.	13.0	15.8	21%	23.2	23%	43.2
	W.E.	3.2	4.6	32%	7.3	23%	13.7
Professional Services	U.S.	10.6	12.5	17%	17.1	18%	28.2
	W.E.	4.1	5.8	30%	9.0	23%	16.9
Integrated Systems	U.S.	7.1	8.2	16%	11.2	16%	17.5
	W.E.	2.7	3.9	30%	6.1	23%	11.5
Total	U.S.	47.0	54.9	17%	$75.1	18%	$123.4
	W.E.	13.2	18.3	27%	$27.2	21%	$48.2

- Unlike the U.S., the European information services industry has not reached a mature stage, even in traditional application areas.

- Unlike U.S. companies, European businesses tend to plan for the longer term and do not make adjustments to data processing investment plans in response to short-term results.

IV INFORMATION SERVICES MARKET ISSUES

IV INFORMATION SERVICES MARKET ISSUES

- This chapter provides a review and analysis of general issues of importance facing participants in the information services market.

A. STRATEGIC ISSUES

1. ECONOMIC BACKGROUND

- As the information services industry continues to grow at a faster rate than the economy as a whole, it assumes increasing economic significance.

- This has certain implications for information services vendors, namely an increasing dependency on the overall state of the economy (particularly critical for the integrated systems market) and an increasing visibility to government.

- This latter point is illustrated by the high degree of government focus on the new and rapidly developing area of VANS.

- This trend is likely to continue as an increasing proportion of company revenue is spent on information systems and information processing.

- Exhibit IV-1 provides basic comparative economic statistics on the four major Western European countries and the United States.

- Within Europe the information services business represents an average of only 0.6% of the Gross National Product (GNP). In contrast, in the United States the information services business represents 1.23% of GDP.

- The greater degree of 'service orientation' that exists in the United States in comparison with Europe and the generally greater acceptance of information systems are important causal factors.

- Nevertheless, the statistics provided in Exhibit IV-1 do underline the enormous potential for the growth of the information services business.

2. TELECOMMUNICATIONS ENVIRONMENT

- INPUT's vendor research programme revealed that this is only a potential problem area inhibiting market development and is presenting many opportunities for external services companies. However, there are some marked differences between the four major country markets.

- The most significant concern among French and West German vendors was the monopoly function of the PTTs.

- The French DGT is, however, committed to gradual liberalisation in the area of data communications after the enactment of the first deregulation law in July 1986.

- The policy of the DGT would appear to be that it does not intent to directly compete with independent vendors. The future role of the DGT will be to act as a carrier or bearer service; i.e., apparently giving carte blanche to software houses and VANS suppliers.

EXHIBIT IV-1

COMPARATIVE ECONOMIC STATISTICS, 1985

	FRANCE	ITALY	UNITED KINGDOM	WEST GERMANY	TOTAL	U.S.
Gross National Product* ($ Billions)	$573	$387	$502	$705	$2,167	$3,800
Current Level of GNP Growth* (Percent)	+1.2%	+2.3%	+3.6%	+2.4%	-	+4.5%
Size of Information Services Business ($ Billions)	$4.7	$1.8	$3.5	$3.3	$13.3	$46.9
Percent of GNP	0.82%	0.47%	0.70%	0.47%	0.61%	1.23%
Total Working Population† (Millions)	23.3	23.0	27.2	27.3	100.8	101.4
Total Employed In Service Industries† (Millions)	12.6	11.3	15.6	13.4	52.9	68.6
Percent Service Employees of Total Working Population*	54%	49%	57%	49%	52%	68%
Current Inflation Rate* (Percent)	+5.8%	+8.6%	+6.1%	+2.2%	-	+3%

*Source: Nomura Research Institute.
†Source: Eurostat.

- The DGT is also encouraging the developoment of joint ventures to exploit opportunities in the VANS area and has evaluated proposals from a joint venture of Olivetti and Compagnie Financiese de Suez and also from GEISCO linked with BULL.

- CIGREF (Club Informatiques des Grandes Enterprises Francais), the user group representing over 50 of the largest French companies, expressed strong concern that if liberalisation on the lines of the U.K. model progressed too quickly, a former PTT monopoly would be replaced by an IBM monopoly. IBM has already formed a consortium with bank Poribas and software house Sema Metra with the objective of optimising future usage of their proprietary SNA products. IBM already has a 60% share of the European hardware market.

- West Germany, however, remains the most highly regulated market with the Bundespost making no legal distinction between basic bearer services and VANS--both are public utilities.

- However, liberalisation in Germany will slowly emerge, especially after the current commission into telecommunications reports after the federal elections in autumn 1987.

- In the U.K., liberalisation has reached an advanced stage with the DTI having issued a revised VANS licence in October 1986. Under the terms of the new licence, telex is the only regulated service. To prevent VANS vendors from monopolising equipment supply, the licence requires services to use OSI standards.

- Liberalisation in the U.K. has opened up the communications area as a major opportunity for market development. The U.K. represents an attractive steppingstone for U.S. companies entering the European market.

- A number of vendors pointed to the problem of standards and communications compatibility as a significant problem. There is a strong need for a standard definition of X.400 and OSI at a Western European level.

- Some vendor comments on the telecommunications environment are given as Exhibit IV-2.

- INPUT's 1986 user research program revealed a dissatisfaction with the services provided by the national PTTs, especially in the highly regulated continental European markets.

- In addition, respondents pointed to the need to establish firmer standards at both domestic and international levels in order to facilitate effective and efficient communications.

- Some user comments on the telecommunications environment are given as Exhibit IV-3.

B. ANALYSIS OF VENDOR ISSUES

1. GROWTH STRATEGIES

- Exhibit IV-4 illustrates a profile of strategies adopted by Western European vendors in order to maintain market position, minimise risk, maximise profitability, and capitalise on new opportunities.

- There is continued interest in international expansion as a growth strategy. To an extent this reflects the fragmented nature of the industry, as the vendor rankings shown in Chapter III indicate, with no one vendor being able to establish a dominant position in any one market.

- In comparison with last year's analysis, the distribution of responses indicates a lowering of interest in acquisition and merger activity. This activity slowdown is partially a reflection of the increased size of an individual transaction.

EXHIBIT IV-2

VENDOR COMMENTS ON THE TELECOMMUNICATIONS ENVIRONMENT

- The PTT monopoly is restrictive and undesirable. (France)
- The PTT environment is confusing; it inhibits market entry. (United Kingdom)
- There is a need for firmer standards at an application level. (Italy)
- Deregulation has provided an attractive steppingstone into the European market for U.S. companies. (United Kingdom)
- Communications is a major opporutnity. . . it is the most vibrant and expanding sector. (United Kingdom)
- The DBP monopoly blocks rapid market development. (West Germany)
- The DBP inhibits growth via its pricing policy. . . there are no volume discounts. (West Germany)

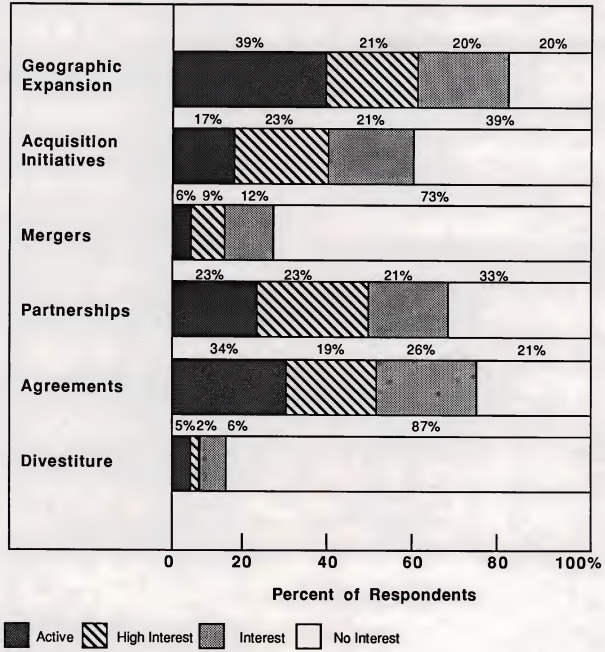
EXHIBIT IV-3

USERS' COMMENTS ON THE TELECOMMUNICATIONS ENVIRONMENT

- United Kingdom
  - There is little conformity (of equipment standards) between manufacturers.
  - There is a shortage of skilled people with an understanding of the telecommunications.
  - Better domestic standards are needed.
  - There is a lack of international standards.
- France
  - The level and quality of service is inadequate.
  - We have doubts about the security of data on PTT lines.
  - The service is too expensive.
- Germany
  - The Datex/packet switched network is unsatisfactory.
- Italy
  - The PTT is disorganised, inefficient, and unreliable.
  - The costs are too high.
  - There is a lack of communications standards.

EXHIBIT IV-4

STRATEGIC DIRECTIONS



- However, there are continued high levels of interest in strategic partnerships. Strategic partnering remains an attractive option due to the following factors:

  - Increasing risk of formal acquisition.

  - Shortening technology cycles.

  - Shortening product life cycles.

  - Rapidly changing market structures.

  - Increasing product/market complexity.

  - Need to exploit narrowing market/product opportunity windows.

- Several vendors pointed to the difficulties of finding suitable partners. When evaluating potential partnerships, it is important to assess the nature of complimentary skills in a matrix combination of technology, marketing, and business presence.

- Vendor comments on the benefits of strategic partnering are listed in Exhibit IV-5.

2. THE COMPETITIVE ENVIRONMENT

- High levels of growth in the information services industry continue to make it an area of high investment interest. In particular, the increasing convergence of computer and communications technologies is leading to the introduction of even more potential competitors, most obviously the telecommunications authorities.

EXHIBIT IV-5

BENEFITS OF STRATEGIC PARTNERSHIP

- Enhanced Expertise
- Improved Market Knowledge
- New Market Penetration
- Shared Investment Risk
- Broader Product Range
- Enhanced Marketing Infrastructure
- Strengthened Market Position
- Improved Customer Service
- Faster Product Development
- Enhanced Credibility

- However, as shown in Exhibit IV-6, the majority of respondents interviewed by INPUT did not forsee the competitive environment as a factor inhibiting growth.

- The diverse and specialised nature of end-user needs continues to provide many opportunities for vendors who understand the customer service needs and provide cost-effective solutions.

- Some vendor comments on the level of competition to be found amongst Western Europe's major markets are shown in Exhibit IV-7. Generally, vendors were optimistic about the competitive environment, especially those who have been able to exploit new areas of opportunity and specialist market niches.

3. STAFF SHORTAGES

- As illustrated in Exhibit IV-6, staff shortages are emerging as a significant problem for Western European information services vendors, especially in France and the United Kingdom.

- The problem most closely impacts vendors in the software and professional services fields where shortage of experienced specialist staff is a major inhibitor on business development.

- As illustrated in Exhibit IV-8, shortage of experienced personnel was the most significant problem, and there was no mention of difficulties in the area of graduate recruitment.

4. INDUSTRY-SPECIFIC MARKETING

- An important product marketing decision for any information services vendor is the choice between cross-industry applications and industry-specific applications.

EXHIBIT IV-6

KEY VENDOR ISSUES

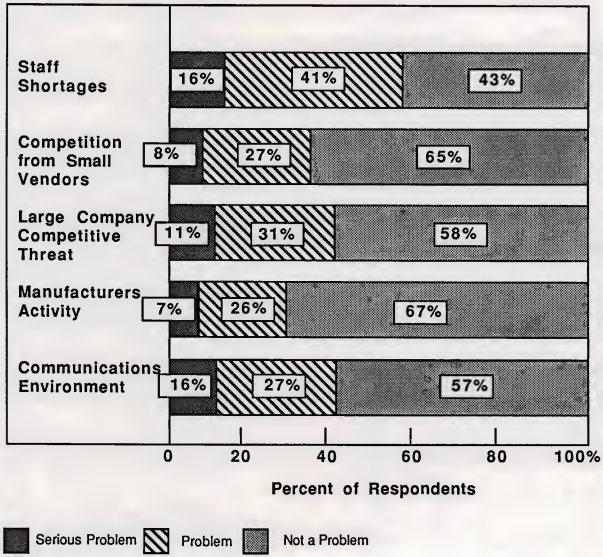


EXHIBIT IV-7

VENDOR COMMENTS ON THE COMPETITIVE ENVIRONMENT

- Competition is restricted by substantial barriers to entry. (France)
- Competition is not a problem owing to market expansion. (Italy)
- Competition is increasing due to diversification into new markets. (United Kingdom)
- Small competitiors are only a threat in specialised niche markets. (United Kingdom)
- Generally, there is increased price competition except in some market niches. (West Germany)
- Competition is not increasing in a steady mature market. (Italy)
- The CAD/CAM market is undergoing a shake out - the super nova effect. (United Kingdom)
- The market is highly turbulent and fracturing as users are increasingly unsure of how to meet requirements. (United Kingdom)
- We have reduced the competitive threat by specialisation and diversification. (France)

EXHIBIT IV-8

STAFF SHORTAGES
(Most Frequently Mentioned Areas)

- Experienced Personnel
- Specialist Programmers
  (4GL/UNIX/RPG III/A.I./C)
- Project Managers
- Business Analysts/Applications Specialists
- Sales
- Systems Analysts
- Telecommunications
- Marketing

- INPUT's 1985 vendor research revealed that only 40% of respondents placed emphasis on a cross-industry approach.

- INPUT's 1986 research revealed a trend towards increasing industry specialisation and focus on niche market applications. This trend is especially marked amongst smaller organisations.

5. MANUFACTURER ACTIVITY

- The increasing trend towards the use of third-party agreements by manufacturers in order to plug gaps in areas of product and market expertise and expand their marketing infrastructure is illustrated as part of Exhibit IV-4.

- Exhibit IV-6 illustrates that the majority of vendors did not see manufacturers as a threat, and many commented on the benefits of teaming arrangements and distribution agreements.

- However, a number of vendors, especially in the software products and integrated systems sectors, saw the manufacturers as an increasing threat to their activities.

- The threat from manufacturers is expected to increase as they refocus their activities around industry sector marketing and captive market share, especially in the applications software area.

- The top 10 Western European manufacturers software and services revenues are given as Exhibit IV-9.

- Some vendor comments on manufacturers' activities are shown in Exhibit IV-10.

EXHIBIT IV-9

THE TOP TEN MANUFACTURERS, 1985
SOFTWARE AND SERVICES, WESTERN EUROPE
(All Countries)

RANK	MANUFACTURER	EUROPEAN REVENUE PERCENT OF TOTAL WORLDWIDE REVENUE	SOFTWARE AND SERVICES REVENUE PERCENT OF TOTAL REVENUE	SOFTWARE AND SERVICES ESTIMATED REVENUE ($ Millions)
1	IBM	28%	9.2%	$1,236
2	Siemens	85%	6.8%	$188
3	Sperry	30%	12.3%	$176
4	Burroughs	24%	15.3%	$172
5	Nixdorf	89%	14.3%	$171
6	NCR	24%	18.0%	$168
7	Hewlett-Packard	27%	13.6%	$135
8	Bull	93%	6.4%	$107
9	STC (ICL)	78%	9.8%	$102
10	Digital	31%	4.3%	$93

EXHIBIT IV-10

VENDOR COMMENTS ON MANUFACTURER ACTIVITY

- Our relationship with manufacturers are an interesting blend of competition and cooperation. (United Kingdom)
- Manufacturers' activities are unfocussed and they lack expertise in specific markets. (France)
- Agreements with manufacturers gives us the chance to be closer to the customer. (West Germany)
- Manufacturers need our help to provide total solutions to customers. (United Kingdom)
- DEC are very aggressive and IBM are an increasing threat. (United Kingdom)
- IBM have no clear strategy on software applications products but are increasing pressure for market share. (Italy)

C. ANALYSIS OF USER ISSUES

- As part of INPUT's SSPS programme research, a sample of 109 senior data processing professionals were interviewed by telephone. The questionnaire used as the basis of this survey is given as Appendix D. An analysis of the user sample is included in Appendix B.

- The purpose of this survey was to assess levels of use of data processing systems and services and to highlight changes and trends across the user population.

- The major areas covered were:

  - The major problems faced by data processing managers during the past year.

  - Proposed areas for applications development.

  - Benefits and problems associated with the use of outside computer services.

1. DP PROBLEM AREAS

- Exhibit IV-11 shows the problems reported by 95 European DP managers. One hundred and sixty-five (165) comments were recorded since 45 managers mentioned two problem areas and a further 23 cited three problem areas.

- Seven of the 95 DP managers stated that they had no serious problems at the time of the interview.

- Of the comments recorded, 21% related to financial or budgetary problems, and these represent the largest single category.

EXHIBIT IV-11

D.P. PROBLEM AREAS
(Analysis by Company Size and Manufacturing Sector)

PERCENTAGE OF ALL COMMENTS BY:	COMPANY SIZE			TOTAL	INDUSTRY SECTOR
Type of Problem	Less than 500 Employees	500 to 1,000 Employees	More than 1,000 Employees	Western Europe	Manufac-turing
Financial Problems	32%	16%	18%	21%	16%
Staff Problems	14%	16%	19%	17%	19%
Organization Problems (Within Company)	22%	14%	15%	17%	21%
Software Problems (Systems & Applications)	6%	27%	9%	12%	9%
Organisational Problems (Within DP Department)	12%	14%	15%	10%	9%
Time Problems (Deadlines, Schedules,etc.)	8%	8%	3%	5%	7%
Problems with Users	2%	5%	4%	4%	4%
Hardware Problems	2%	3%	12%	7%	10%
No Problems at Present	2%	7%	15%	7%	5%
Total	100%	100%	100%	100%	100%
No. of Companies in Sample	28	22	45	95	37
No. of Comments Recorded	50	37	74	165	70

Note: Multiple responses were allowed.

- Organisational problems within the company and problems with staff were also common and represented 17% of all comments.

- Problems with both systems and applications software accounted for a further 12% of all comments, whilst organisation within the DP department was also perceived as a problem (10% of comments).

- Analysis showed that the response of U.K. DP managers followed this pattern closely; the three main problem areas quoted were:

  - Financial problems — 27% of comments
  - Staff problems — 23% of comments
  - Organisational problems within the company — 17% of comments

- Whilst the comments on financial problems all referred to a shortage of funds, the staff problems noted in the U.K. seem to be of two types.

  - First are remarks on general staffing levels, which reinforce the comments on financial problems, and second are comments relating to difficulties experienced in obtaining staff of a certain standard or with experience of specific fields or programming languages.

- The most common organisational problem at the corporate level appears to be the lack of awareness or interest in computing departments shown by senior managers which creates a barrier to effective communication within the firm.

- In France too, financial problems are cited most frequently, but staff and software problems are also significant.

- In Germany the most serious problems seem to be organisational ones within the company, with DP managers reporting a lack of commitment to DP on the part of senior commercial managers.

- Although staff and software associated problems are also important, INPUT notes that 16% of the German respondents reported that they were not experiencing any major problems at the time of the interview.

- In Italy, where software problems were most frequently mentioned, the most commonly reported comments referred to a lack of applications software or applications software development tools.

- This sample was also analysed by company size (defined by the number of employees in the company), and the results are shown in Exhibit IV-12.

- The major problem areas for the smaller companies (those with less than 500 employees) are clearly financial and organisational.

- Amongst the medium-sized companies, software problems are most significant and refer to development tools as well as systems and applications software.

- The largest number of comments (74) were received from companies with more than 1,000 employees, and here the pattern is less clear since staff and financial problems are accompanied by organisational problems at both corporate and DP department level and also hardware problems.

- Thirty-seven companies of the total sample of 95 are active in either the process or discrete manufacturing sectors.

- Amongst these companies, the single largest problem area (21% of all comments) was organisational issues within the company.

EXHIBIT IV-12

D.P. PROBLEM AREAS
(Analysis by Country and Western Europe Total)

TYPE OF PROBLEM	PERCENT OF ALL COMMENTS BY COUNTRY				
	United Kingdom	France	Germany	Italy	Western Europe
Financial Problems	27%	31%	14%	5%	21%
Staff Problems	23%	16%	12%	11%	17%
Organisation Problems (Within Company)	17%	13%	22%	17%	17%
Software Problems (Systems and Applications)	5%	16%	12%	28%	12%
Organisational Problems (Within DP Department)	12%	8%	8%	11%	10%
Hardware Problems	5%	0%	10%	17%	7%
Problems with Time (Deadlines, Schedules, etc.)	5%	10%	4%	0%	5%
Problems with Users	3%	3%	2%	11%	4%
No Problems at Present	3%	3%	16%	0%	7%
Total	100%	100%	100%	100%	100%

Number of Companies In Sample	27	29	25	14	95
Number of Comments Recorded	60	38	49	18	165

- All the comments previously noted referring to a lack of understanding by or lack of commitment from senior management were to be found in this cross-analysis.

- Staff problems accounted for 19% and financial problems for a further 16% of the comments made by this subset.

- European DP managers were asked to rate various types of common DP problems according to their seriousness. The results are shown in Exhibit IV-13.

- The problem most commonly perceived to be 'very serious' was a large applications backlog, reported by 22% of the sample of 108 managers.

- The lack of industry communications standards was considered to be a serious problem by 19% of respondents, but the development of communications systems was reported as 'very serious' by only 11% of respondents.

- Although staff-related problems such as the lack of end-user involvement, the lack of management awareness, and staff recruitment were rated as very serious by 15% of respondents, staff training (which might provide some solutions to these problems) was only regarded as a 'serious' problem by 9% of respondents and and as 'fairly serious' by 18% of respondents.

2. DP DEVELOPMENT - MARKET OPPORTUNITIES

- Respondents indicated the importance they attached to possible areas of development within their DP departments and also stated whether they were planning to use or were currently using the facilities listed. These results are shown in Exhibit IV-14.

- PC-based software was the area rated as most important in terms of future developments, and 22% of respondents indicated that they were planning to use new PC-based software during the course of 1987.

EXHIBIT IV-13

SERIOUS ISSUES FOR D.P. DEPARTMENTS

PROBLEM TYPE	VERY SERIOUS	FAIRLY SERIOUS	NOT VERY SERIOUS	NOT A PROBLEM
Large Applications Backlog	22%	33%	19%	26%
Lack of Industry Communications Standards	19%	29%	19%	33%
Lack of End-User Involvement	15%	28%	28%	29%
Lack of Management Awareness	15%	21%	26%	38%
Recruiting Staff	15%	30%	22%	33%
Data Processing Costs	14%	30%	34%	22%
Changes of Operating System	12%	19%	22%	47%
Development of Communications Systems	11%	26%	24%	39%
Training Staff	9%	28%	22%	41%
Coping with Technological Change	9%	26%	26%	39%
Managing Growth	8%	25%	25%	42%
Need to Improve Operations	8%	28%	30%	34%
Inadequate Systems Software	8%	15%	28%	49%

Total Sample = 108

EXHIBIT IV-14

D.P DEVELOPMENT AREAS - MARKET OPPORTUNITIES

POTENTIAL D.P. DEVELOPMENT AREAS	RANK	PERCENT OF RESPONDENTS		
		PLANNING TO USE	CURRENTLY USING	NEITHER/ NOR
PC-Based Software	1	22%	58%	20%
Micro-Mainframe Links	2	40%	60%	Nil
Local Area Networks	3	40%	41%	19%
Software Productivity Tools	4	16%	45%	39%
Development Centre	5	7%	55%	38%
UNIX-Based Software	6 =	22%	11%	67%
Mini-Based Software	6 =	17%	23%	60%
Information Centre	8	22%	37%	41%
PICK-Based Systems	9	2%	3%	95%

Total Sample = 100 Respondents

- Of the remainder, 58% reported that they were already using PC-based software while 20% indicated that they were neither using nor planning to use PC software.

- Of the other development areas analysed, the following market opportunities are noteworthy:

  - Forty percent of respondents indicated that developments in micro to mainframe links were planned.

  - Developments in local area networks were also planned by 40% of the sample.

- Twenty-two percent of respondents were planning to develop Unix-based systems or information centres but the relatively low installed bases of these systems (in comparison with PC-based software or micro to mainframe links) should also be noted; such markets are best suited to vendors already active in these areas.

- Ninety DP managers throughout Western Europe indicated their plans for applications development in 1987. Since multiple responses were allowed, a total of 144 comments were noted and examined.

- The results of this analysis are shown in Exhibit IV-15, which identifies the top nine application development areas.

- The single most important area, which accounted for 14% of all comments received, was factory and manufacturing production. This includes both production planning and production control applications.

- Financial and accounting applications were noted as an area for development during 1987 in 13% of all comments.

EXHIBIT IV-15

APPLICATIONS DEVELOPMENT AREAS

PRIORITY APPLICATIONS DEVELOPMENT AREAS	Percent of Those Who Responded
Factory and Manufacturing Production	14.0%
Financial and Accounting	13.0%
Order Entry and Invoicing	8.0%
Sales and Marketing	7.5%
Purchasing and Stock Control	7.5%
General Business Administration	6.5%
Office Automation	5.0%
Communications	5.0%
Pay and Personnel	5.0%
Subtotal	71.5%
Others (Individually Less than 5%)	28.5%
Total	100.0%

Number of Companies Responding = 92

Total Number of Responses = 141

N.B. Multiple Responses Allowed

- 'General business opportunities' refers to integrated applications solutions which comprise accounts payable, personnel, order entry, invoicing, and purchasing modules.

- Of the total mentions for this group (6.5% of responses), 3% were from France, where this approach to a general business solution is known as 'back-room software' and is particularly popular amongst companies with up to 500 employees.

3. USAGE OF EXTERNAL COMPUTER SERVICES

- Exhibit IV-16 shows the benefits of using outside computer services as perceived by users, analysed by size of company. Since multiple answers were permitted, 102 comments were noted from 64 respondents.

- Of the total sample, 10 respondents stated that they did not use external services and a further 10 indicated that they did not perceive any benefits from using external services.

- The primary reason for using external services was better cost/performance in comparison with in-house DP departments.

- The second most important reason was to benefit from additional resources not available in-house. This can also be linked with a desire to avoid further capital investment in DP equipment (ranked 5th).

- Similarly, the third reason--to benefit from specialist knowledge or experience not available in-house--is connected with the need to obviate increases in the number of DP staff (ranked 4th).

- Amongst companies with less than 500 employees, the motivation for using external services is primarily economic--using specialists outside the company

EXHIBIT IV-16

USER PERCEPTIONS OF BENEFITS OF OUTSIDE COMPUTER SERVICES

COMMENTS ON THE BENEFITS OF OUTSIDE COMPUTER SERVICES	FREQUENCY OF COMMENTS BY COMPANY SIZE			
	<500 Employees	>500-<1,000 Employees	>1,000 Employees	ALL COMPANIES
Better Cost/Performance	6	6	8	20
Use Additional Resources/ Facilities	3	7	6	16
Specialist Knowledge or Experience	6	1	3	10
Obviates Staff Increases	0	2	7	9
Avoids Capital Investment	4	0	4	8
Delegated/Subcontracted Responsibility	2	1	5	8
Accelerated Project Development	1	3	2	6
Greater Security	2	0	3	5
No Benefits Perceived	5	0	5	10
Do Not Use External Services	1	2	7	10
Number of Respondents	16	14	34	64
Number of Comments	30	22	50	102

N.B. Multiple Responses Allowed

to achieve greater cost/performance while avoiding capital investment in areas that are peripheral to the main activity of the company.

- For companies in the range 500-1,000 employees, accelerated project development is perceived to be one result of using additional resources and facilities not available in-house to achieve better cost/performance.

- For large companies with more than 1,000 employees, the preferred benefits of obviating increases in staff and specialist knowledge available outside together with using external resources and avoiding capital investment combine to give better cost/performance while at the same time delegating or subcontracting the responsibility for quality and deadlines to others.

- These last comments must, however, be weighed against the fact that 7 out of 34 companies with more than 1,000 employees (20%) do not use external services compared with:

  - Up to 500 employees — 1 out of 16 (≙ 6%)

  - 500 to 1,000 employees — 2 out of 14 (≙ 14%)

- An analysis of users' perceptions of the drawbacks of using external computer services is shown in Exhibit IV-17. The data is analysed by company size as defined by the number of employees.

- For the total sample of 109 comments obtained from 65 respondents, the largest single drawback to the use of external DP services is perceived to be the cost when compared with an in-house department.

- The lack of direct control and managerial involvement is also perceived to be a serious disadvantage.

EXHIBIT IV-17

USER PERCEPTION OF DRAWBACKS OF OUTSIDE COMPUTER SERVICES

COMMENTS ON THE BENEFITS OF OUTSIDE COMPUTER SERVICES	FREQUENCY OF COMMENTS BY COMPANY SIZE			
	<500 Employees	>500-<1,000 Employees	>1,000 Employees	ALL COMPANIES
Costs	9	3	11	23
Lack of Control	10	3	7	20
Data Security	6	2	3	11
Time Factors	5	4	2	11
Subcontractors Do Not Understand Company Needs	2	4	4	10
Arrangement Is Inflexible	1	3	5	9
Dependence on Others	4	0	2	6
Others	6	5	2	13
No Drawbacks Perceived	1	0	4	5
Do Not Use External Computer Services	0	0	1	1
Number of Respondents	23	14	28	65
Number of Comments	44	24	41	109

N.B. Multiple Responses Allowed

- Other drawbacks perceived include data security and time factors--the general perception was that the total project time was considerably longer when using an external company because of the lead-in tasks of tendering, evaluating proposals, selecting the subcontractor, detailed briefing, and so on.

- Some users also commented on slower communications during a project than is used between the in-house department and noted the effects of this upon deadlines.

- The aspects of control, data security, time factors, and a dislike of depending on others were of particular concern to small companies with less than 500 employees.

- For the medium-sized companies, the time factors and problems involved in communicating the company's needs were of greatest importance.

- Comments noted under 'others' refer to one-off remarks relative to companies' specific needs and showed no consistent pattern.

- Although cost and control aspects were also a source of criticism amongst the large companies, the problems of communicating the company's needs were also considered a drawback, linked this time to remarks on the inflexibility of subcontracting.

- Of the three groups, however, four of the five respondents who perceived no drawbacks in the use of external services came from companies with more than 1,000 employees which concurs with the preference of some large companies for delegated or subcontracted responsibility.

V PROCESSING AND NETWORK SERVICES

V PROCESSING AND NETWORK SERVICES

A. INTRODUCTION

- The processing and network services sector is undergoing radical change as traditional bureau services and timesharing continue to decline and new types of services emerge onto the market.

- INPUT has noted that, increasingly, processing and network services vendors in Europe are classifying their business in new ways. In particular, most vendors do not make any internal distinction between batch processing and remote computing services (RCS).

- Consequently, INPUT has redefined the processing services sector as comprising three modes:

  - Processing services.

  - Value-added network services (VANS).

  - Processing facilities management (FM).

- Following high growth in this sector in the 1970s, the rapid decline in growth rates in the first half of the 1980s has led many people to write off processing services as an industry sector without a future.

- Many processing and network services vendors are countering this threat by refocusing their strategic thrust around the provision of professional services and exploiting the opportunities provided by new developments in the sector.

- An important development is the growth of the on-line database services business, especially financial data. However, less volatile database applications are being increasingly threatened by developments in CD ROM technology.

- The rapid growth of the financial markets and the growing sophistication of software systems has continued to encourage the entry of new competitors into the market for information networks.

- For example, the top ten information providers (ranked according to penetration of City of London organisations) are as follows:

  - Reuters.

  - Telerate.

  - Topic.

  - Datastream.

  - Finsbury Data Services.

  - ADP Comtrend.

  - Dialog.

  - Pergamon Info-Line.

- Quotron.

- Dun & Bradstreet.

- The most significant driving force over the next few years will be computer/communications convergence. This will have a profound effect on the processing and network services markets of the future.

- Market growth is also being driven by developments in the area of value-added network services (VANS). These opportunities are encouraging new 'startup' companies, joint venture organisations, communications vendors, and banks to enter this sector.

B. MARKET DEVELOPMENT, 1986-1991

- The processing and network services sector achieved an overall market size of $3.3 billion in 1985 and is expected to reach $4.8 billion in 1988.

- INPUT forecasts that this market will grow at an annual average growth rate of around 8% to reach $6.1 billion by 1991.

- Exhibits V-1 through V-5 provide summary tables of the forecast growth for processing and network services in Western Europe as a whole (shown in U.S. dollars) and for the four individual major country markets of France, Italy, the United Kingdom, and West Germany (all shown in local currency).

- Each table shows market assessments for the years 1985 and 1986, a medium-term forecast for 1988, and a longer-term forecast through to 1991. In each case, the processing and network services market is analysed by its three principal components.

EXHIBIT V-1

PROCESSING AND NETWORK SERVICES MARKET FORECAST 1986-1991 WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing Services	$2,965	$3,640	11%	$4,020	3%	$4,445
Value-Added Network Services	105	190	59%	425	42%	1,220
Facilities Management	215	275	21%	385	11%	530
Total	$3,285	$4,105	14%	$4,830	9%	$6,195

EXHIBIT V-2

PROCESSING AND NETWORK SERVICES MARKET FORECAST
1986-1991
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing Services	FF8,800	FF9,240	4%	FF10,000	3%	FF11,000
Value-Added Network Services	470	700	40%	1,300	35%	3,200
Facilities Management	688	755	10%	965	11%	1,250
Total	FF9,958	FF10,695	7%	FF12,265	8%	FF15,450

EXHIBIT V-3

PROCESSING AND NETWORK SERVICES MARKET FORECAST
1986-1991
ITALY

SUBSECTOR	MARKET FORECAST (Lira Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing Services	Lira 695	Lira 775	12%	Lira 970	9%	Lira1,290
Value-Added Network Services	<5	<5	-	40	96%	300
Facilities Management	97	101	4%	136	14%	195
Total	Lira 795	Lira 890	13%	Lira1,145	16%	Lira1,785

EXHIBIT V-4

PROCESSING AND NETWORK SERVICES MARKET FORECAST 1986-1991 UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing Services	£ 450	£ 470	4%	£ 500	1%	£ 510
Value-Added Network Services	30	50	59%	120	37%	310
Facilities Management	35	45	32%	80	16%	125
Total	£ 515	£565	11%	£ 700	11%	£ 945

EXHIBIT V-5

PROCESSING AND NETWORK SERVICES MARKET FORECAST
1986-1991
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Processing Services	DM2,175	DM2,350	6%	DM2,600	3%	DM2,800
Value-Added Network Services	9	20	107%	80	55%	300
Facilities Management	66	70	5%	85	12%	120
Total	DM2,250	DM2,440	7%	DM2,765	5%	DM3,220

C. USER ATTITUDES AND TRENDS

- In determining user satisfaction levels for processing and network services for 1986, the sector has been divided into more accurate subsectors to reflect the changes taking place in the industry.

- The results, shown in Exhibit V-6, indicate that on-site hardware services and value-added network services (7.6 and 7.4, respectively) are more highly rated than traditional processing services (6.7).

- On-line database services, still a relatively new area of activity, show a need for continued improvement, while the lowest rating of 6.2 for facilities management is in part due to the low level of market penetration.

D. VENDOR ISSUES

1. MARKET ENVIRONMENT

- Vendors' viewpoints of factors driving and inhibiting the development of the processing and network services markets are illustrated in Exhibit V-7. The most frequently mentioned comments have been ranked in order of importance.

- INPUT's research reveals that there are three major forces affecting the market environment for processing and network services--the continuing impact of low-cost minis and microcomputers, the convergence of communications and departmental computing, and the rapid development of opportunities in value-added network services.

EXHIBIT V-6

LEVELS OF USER SATISFACTION WITH PROCESSING AND NETWORK SERVICES

SERVICE CATEGORY	AVERAGE RATING*†
Processing Services	6.7
On-Site Hardware Services	7.6
On-Line Data Base Services	6.8
Value-Added Network Services	7.4
Facilities Management	6.2

*Rating: 1 = Dissatisfied, 10 = Very Satisfied

† Average Standard Error = 0.4

EXHIBIT V-7

PROCESSING AND NETWORK SERVICES MARKET DRIVERS AND INHIBITORS - VENDORS' VIEWPOINTS

Market Drivers

- Technological Development
- New Communications Technologies
- New Communications Services
- Government Policy and Legislation
- Convergence Departmental Computing and Communications

Market Inhibitors

- Competition - Micro Systems
- PTT's Strategy
- Economic Environment
- In-house Competition
- Price Competition
- Market Complexity - User Confusion

- In the traditional processing area there has been a significant change away from single-user business towards multiuser and higher-value transaction systems.

- Traditional bureau solutions are now seen by many vendors as short-term palliatives for users at early stages of the data processing learning curve.

- This has led to a refocusing of strategic thrust towards market niches in specialist application areas; for example, the critical trading environments of banking, energy, and securities which demand 24-hour a day support for real time applications.

- Demands for distributed processing have led vendors to include micros as part of a services solution.

- Vendors have also recognised the need to support the emergence of departmental systems by offering more specialist and comprehensive services to support specific new applications.

- The third major factor affecting the market environment for processing and network services is that of computer/communictions convergence and the resulting opportunities for value-added network services.

- A factor affecting the future development of VANS markets is the increasing awareness of the importance of telcommunications among European companies. Coupled with trends towards increased internationalism in business, especially in manufacturing and financial services, this points to the strong niche opportunity of focused international applications, for example, trade data interchange.

- The development of the VANS market is highly dependent upon the PTT environment that exists in each country.

- In the U.K., although total liberalisation has led to the development of many VANS opportunities in an increasingly competitive environment, the market is hindered by the lack of a coherent national telecommunications policy, especially in the area of standards.

- The French market is beginning to open up following deregulation moves by the DGT in the area of data communications. However, the position in both West Germany and Italy is less clear, in the former because of the monopoly position of the Deutsche Bundespost, in the later as a response to a poorly developed, high-priced telecommunications infrastructure.

- There are signs of liberalisation in West Germany for specific services. For example, the attitude expressed by the DBP (Deutshe Bundespost) towards the development of EDI services operated by private VANS is that it does not present a problem except in the straight resale of bit transmission.

- Vendors should be sensitive to the increased user requirements for improved security and reliability as systems becoming increasingly dependent on on-line operation and communications links. This will be particularly true of systems concerned with electronic funds transfer (EFT).

- Existing processing and network services vendors should also be conscious of the arrival of new competitors into either their existing markets or areas of targetted future growth.

- In addition to the major equipment manufacturers and communications vendors such as British Telecom and Mercury, there is also the continued threat from other commercial organisations reaching to leverage their in-house investment in sophisticated computer systems, for example, banks and airlines.

2. BUSINESS OPPORTUNITIES

- Exhibit V-8 illustrates the range of vendor references to potential business development opportunities in the area of processing and network services.

- The strategic shift in the focus of the sector is reflected in high levels of vendor activity in the areas of:

  - Professional services.

  - Micro-mainframe links.

  - On-line database.

  - Departmental systems.

  - VANS (especially Videotex and EDI).

- Areas of opportunity for future business development most highly rated by vendors are:

  - Departmental systems.

  - VANS.

  - Facilities management.

- In general, vendors placed strong emphasis on communications network processing as a major business development factor. In addition, vendors see strong market growth possibilities in harnessing PCs to formulate new types of distributed processing services, for example, departmental systems.

EXHIBIT V-8

PROCESSING AND NETWORK SERVICES BUSINESS DEVELOPMENT OPPORTUNITIES

POTENTIAL OPPORTUNITY AREAS	PERCENT OF RESPONDENTS		
	ACTIVE	HIGH INTEREST	NO INTEREST
Videotex	40%	10%	50%
Facilities Management	26%	30%	44%
VANS	32%	36%	32%
On-line Database	62%	21%	17%
EDI	41%	27%	32%
E-Mail	29%	29%	42%
Micro-Mainframe Links	60%	20%	20%
Departmental Systems	35%	38%	27%
Disaster Recovery	31%	19%	50%
Printing Services	42%	21%	37%
Third-Party Maintenance	10%	24%	66%
Software Products	75%	14%	11%
Professional Services	76%	14%	10%

- The VANS area remains the key strategic development in the sector over the next five years.

- Since the term VANS is still being used loosely in many instances, INPUT has been concerned to carefully define its use in the formation of market assessments and forecasts.

- Exhibit V-9 provides a representation of the structure of the VANS market as defined by INPUT. The VANS market is shown as comprising those elements surrounded by the thick black line.

- Within the VANS market, electronic data interchange (EDI) is emerging as a key area of opportunity. Vendors are able to allow companies to gain the considerable commercial benefits of systems integration with suppliers and customers during the time window before international OSI standards and intelligent public networks become well established.

- As illustrated in Exhibit V-10, there are a confluence of factors that will lead to significant growth in markets for third-party EDI services during the forecast period.

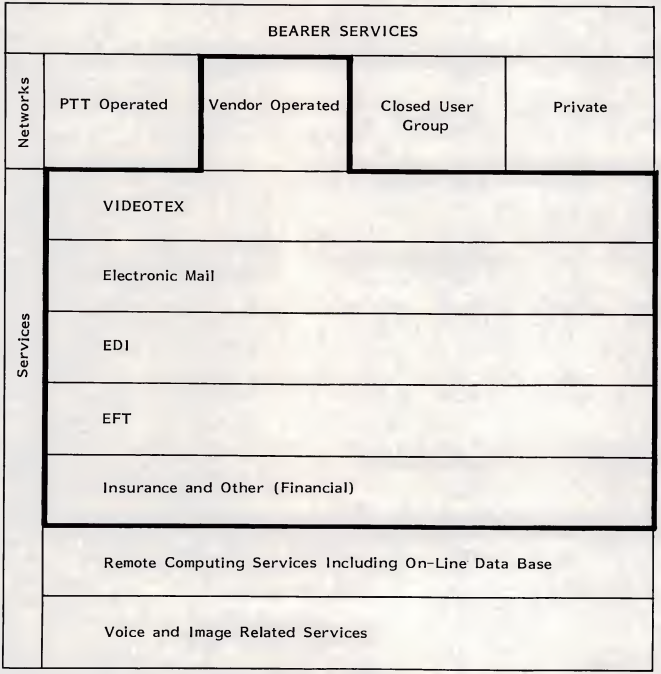
- Electronic data interchange (EDI) has been the subject of a detailed market assessment by INPUT in 1986, the results of which are available in the report Western European Market Opportunities for Electronic Data Interchange, 1986-1991.

3. MARKETING ISSUES

- Processing and network service vendors generally had a clear perspective of the need to change in response to market conditions and a turbulent business environment.

EXHIBIT V-9

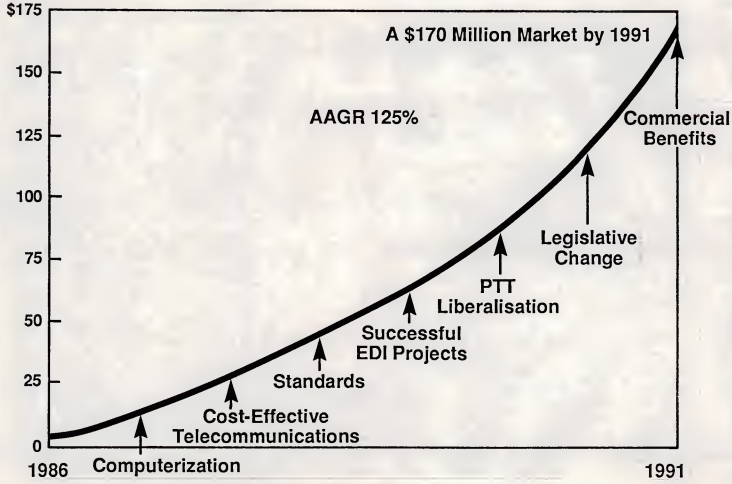
VANS MARKET STRUCTURE IN EUROPE



Boundary of INPUT's European VANs Market Definition

EXHIBIT V-10

EDI - EMERGING FROM THE CHRYSALIS



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INPUT

- Several vendors, however, pointed to the difficulties of organisational change and the management of transition towards a business focused around communications and professional services. Successful vendors will be careful to reorientate corporate culture towards providing high-quality service.

- Marketing initiatives cited by vendors included:

  - Leveraging expertise in specialist areas of technology.

  - Enhancing levels of product quality.

  - Focusing on specialist industry-specific application areas.

  - Enhancing relationships with hardware manufacturers and system houses.

  - Introducing new methods of PC marketing.

  - Increasing use of users marketing techniques, such as direct mail.

E. COMPETITIVE ENVIRONMENT

- Exhibits V-11 through V-14 show the rankings of the leading processing and network services vendors by market share in each of the four country markets studied in this report. The market shares are estimated for the calendar year 1985.

EXHIBIT V-11

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROCESSING AND NETWORK SERVICES
FRANCE

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (FF Millions)
1	GSI	7.9%	FF 787
2	CCMC	6.8%	676
3	CISI	6.5%	648
4	SLIGOS	4.5%	453
5	SG2	3.8%	380
6	TELESYSTEMSES	3.4%	315
7	IBM-INS	3.2%	205
8=	GFI	2.1%	205
8=	SPI	2.1%	185
10	SITB	1.5%	154
	OTHERS	58.2%	FF 5,795
	TOTAL MARKET	100.0%	FF 9,958

EXHIBIT V-12

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROCESSING AND NETWORK SERVICES
ITALY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (Lira Millions)
1	FINSIEL GROUP	18.8%	Lira149,340*
2	IBM-INS	7.5%	60,000
3	ENIDATA	7.4%	59,130*
4	CERVED	6.5%	51,700*
5	GEIS	5.4%	43,000
6	COOPELD	3.0%	23,460*
7	CNI (CONSORZIO)	2.8%	22,500
8	SIME	2.6%	20,762*
9	CSI PIEMONTE	2.5%	19,920*
10	DATAMONT	1.9%	15,300*
	OTHERS	41.6%	Lira329,888
	TOTAL MARKET	100.0%	Lira795,000

* Includes captive revenue

EXHIBIT V-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROCESSING AND NETWORK SERVICES
UNITED KINGDOM

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (£ Millions)
1	REUTERS	9.1%	£ 47
2	IBM-INS	6.0%	31
3	DATASOLVE (THORN-EMI IT)	5.4%	28
4	CENTRE FILE	4.9%	25
5	GEISCO	3.9%	20
6	HOSKYNS	3.5%	18
7	DATASTREAM	3.3%	17
8	ISTEL	3.1%	16
9	CMG	2.1%	11
10	SIA	1.9%	10
	OTHERS	55.8%	£ 292
	TOTAL MARKET	100.0%	£ 515

EXHIBIT V-14

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROCESSING AND NETWORK SERVICES
WEST GERMANY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (DM Millions)
1	DATEV	14.7%	DM 331
2	IBM-INS	8.0%	180
3	FIDUCIA	4.5%	102
4	TAYLORIX	3.4%	77
5	REUTERS	2.6%	59
6	GEISCO	1.7%	38
7	DSR-VRZ	1.2%	28
8	DVO	1.1%	24
9	DPS	1.0%	23
10	AC-SERVICE	1.0%	22
	OTHERS	60.8%	DM 1,366
	TOTAL MARKET	100.0%	DM 2,250

VI SOFTWARE PRODUCTS

VI SOFTWARE PRODUCTS

A. INTRODUCTION

- During 1986, the software market maintained steady growth, and INPUT's research has revealed that the expected downturn has yet to materialise in Western Europe.

- The U.S. software market, however, has been in recession with well-established software companies facing difficulties, especially in terms of profitability, by offering mature products into a stagnating market.

- It is noticeable that leading U.S. vendors such as ADR and Cullinet are now gearing their strategies around heavy expenditure on R&D, range extension via licensing agreements, and strengthening of their non-U.S. marketing infrastructure.

- The Western European market, although not growing at the high rates of the early 1980s, is still far from reaching saturation levels.

- Vendors are shifting their product development focus from traditional cross-industry application areas such as accounting and finding success in the exploitation of specialised vertical application niches.

- The European PC market, while showing signs of slowdown in growth, still expanded by 35% during 1986 and provided continued opportunities for vendors.

- A key trend in the PC area is the shift in the structure of the market as large accounts assume a greater share of the total market. This has led to increasing demand for complex and expensive software solutions provided to large accounts who (unlike the U.S.) have adopted networked rather than standalone PC solutions.

- Nevertheless, the software industry is now entering a challenging phase as a consequence of increasing competition, shortening product life cycles, and the increasing ability of professional services vendors to offer cost-effective solutions.

- Successful software vendors will need to find the balance between several key factors:

  - Product research and development.

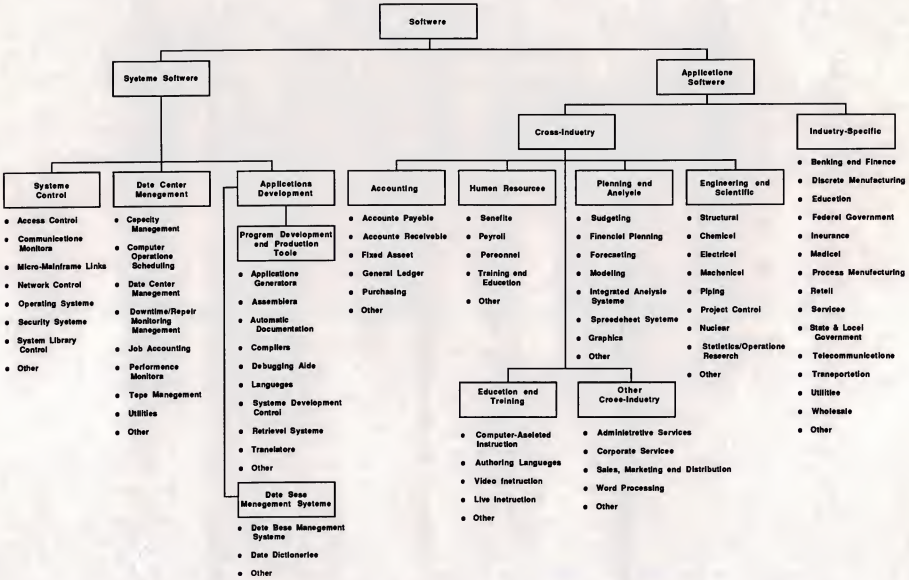
  - Marketing (particularly pricing and contractual arrangements).

  - People (i.e., industry knowledge, applications knowledge, service, and support).

- Exhibit VI-1 provides a schematic representation of INPUT's classification of the software products market showing the definitions used for systems and applications software.

EXHIBIT VI-1

SOFTWARE PRODUCTS MARKET STRUCTURE



B. MARKET DEVELOPMENT, 1986-1991

- Following a period of rapid growth in the software products markets throughout Europe, INPUT is forecasting a gradual market maturation and a gradual slowdown in market growth for the period up to 1991.

- INPUT forecasts the market to expand at an annual average growth rate of 26% for the period 1986-1988 and a slowdown to an annual average growth rate of 23% for the period 1988 through 1991.

- On this basis it is forecast that the Western European software market, assessed at $4.6 billion in 1986, will exceed $7 billion in 1988 to reach nearly $14 billion by 1991.

- Exhibits VI-2 through VI-6 are summary tables of forecast growth for the software products markets in Western Europe and the four individual country markets.

- Equipment manufacturers will continue to pay increasing attention to software products in order to support their hardware revenues and maintain or expand their market position.

- Owing to falling hardware prices and margins the major manufacturers are adopting an increasingly aggressive strategy in the software and services areas in order to maintain revenue and profitability.

- The major manufacturers are seeking to capture market share from independent vendors, especially in the area of applications software.

- This trend will have an impact upon total market development as users decision cycles may well become more oriented towards the manufacturers' product life cycles.

EXHIBIT VI-2

SOFTWARE PRODUCTS MARKET FORECAST, 1986-1991
WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Hardware Manufacturers						
Systems	$1,615	$2,320	31%	$3,630	23%	$6,675
Applications	320	475	35%	785	27%	1,625
Subtotal	$1,935	$2,795	32%	$4,415	23%	$8,300
Independents						
Systems	$ 390	$ 575	35%	$ 950	25%	$1,850
Applications	875	1,260	31%	1,980	21%	3,550
Subtotal	$1,265	$1,835	32%	$2,930	23%	$5,400
Total Market						
Systems	$2,005	$2,895	32%	$4,580	23%	$8,525
Applications	1,195	1,735	32%	2,765	23%	5,175
Total	$3,200	$4,630	32%	$7,345	23%	$13,700

EXHIBIT VI-3

SOFTWARE PRODUCTS MARKET FORECAST, 1986-1991
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Hardware Manufacturers						
Systems	FF3,500	FF4,375	25%	FF6,850	27%	FF14,000
Applications	600	775	29%	1,300	32%	3,000
Subtotal	FF4,100	FF5,150	26%	FF8,150	28%	FF17,000
Independents						
Systems	FF1,200	FF1,550	29%	FF2,600	25%	FF5,050
Applications	2,000	2,550	27%	4,100	23%	7,650
Subtotal	FF3,200	FF4,100	28%	FF6,700	24%	FF12,700
Total Market						
Systems	FF4,700	FF5,925	26%	FF9,450	26%	FF19,050
Applications	2,600	3,325	28%	5,400	25%	10,650
Total	FF7,300	FF9,250	27%	FF14,850	26%	FF29,700

EXHIBIT VI-4

SOFTWARE PRODUCTS MARKET FORECAST, 1986-1991
ITALY

SUBSECTOR	MARKET FORECAST (Lira Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Hardware Manufacturers						
Systems	Lira 500	Lira 650	30%	Lira1,100	27%	Lira2,275
Applications	120	165	36%	300	30%	650
Subtotal	Lira 620	Lira 815	31%	Lira1,400	28%	Lira2,925
Independents						
Systems	Lira 90	Lira 115	26%	Lira 180	30%	Lira 400
Applications	160	200	24%	305	25%	600
Subtotal	Lira 250	Lira 315	25%	Lira 485	27%	Lira1,000
Total Market						
Systems	Lira 590	Lira 765	29%	Lira1,280	28%	Lira2,675
Applications	280	365	29%	605	27%	1,250
Total	Lira 870	Lira1,130	29%	Lira1,885	28%	Lira3,925

EXHIBIT VI-5

SOFTWARE PRODUCTS MARKET FORECAST, 1986-1991
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Hardware Manufacturers						
Systems	£ 280	£ 340	24%	£ 535	22%	£ 910
Applications	60	75	26%	120	28%	250
Subtotal	£ 340	£ 415	24%	£ 655	23%	£1,160
Independents						
Systems	£ 60	£ 75	26%	£ 120	22%	£ 220
Applications	200	250	25%	390	20%	670
Subtotal	£ 260	£ 325	25%	£ 510	20%	£ 890
Total Market						
Systems	£ 340	£ 415	24%	£ 655	20%	£1,130
Applications	260	325	25%	510	22%	920
Total	£ 600	£ 740	25%	£1,165	21%	£2,050

EXHIBIT VI-6

SOFTWARE PRODUCTS MARKET FORECAST, 1986-1991
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Hardware Manufacturers						
Systems	DM1,300	DM1,600	23%	DM2,420	19%	DM4,085
Applications	240	305	26%	480	24%	915
Subtotal	DM1,540	DM1,905	24%	DM2,900	20%	DM5,000
Independents						
Systems	DM 270	DM 350	30%	DM 600	25%	DM1,200
Applications	650	820	26%	1,300	21%	2,300
Subtotal	DM 920	DM1,170	27%	DM1,900	23%	DM3,500
Total Market						
Systems	DM1,570	DM1,950	24%	DM3,020	21%	DM5,285
Applications	890	1,125	26%	1,780	22%	3,215
Total	DM2,460	DM3,075	25%	DM4,800	21%	DM8,500

- However, as end-user markets continue to fragment into more and more specialised segments, the greater will be the manufacturer's need for the value-added reseller (VAR) mechanism and the more these specialised applications software requirements will be met by the independents.

- Consequently, the trend towards specialisation and the need to provide specific vertical market application solutions is a potential inhibitor to growth, especially for large independents.

- There is an increasing threat from custom-built software based around efficient and flexible 4GL system development tools and standard kernels which is supported by strategic and tactical implementation consultancy.

- In addition, the trend towards specialisation is leading software houses to focus on key areas of application expertise and prime vendor contractors are increasingly mixing modules from a variety of software houses in order to deliver a total solution. Success in the packaged software market will depend on a vendor's ability to deliver seamless solutions in a multi-brand environment.

- Vendors' viewpoints of drivers and inhibitors on the development of the software product market are given in Exhibit VI-7. The most frequently mentioned comments have been ranked in order of importance.

- The trend towards the development of distributed systems and the growth of departmental computing is providing many opportunities for vendors and plays a significant part in driving market demand.

- In addition, continued shortages of skilled data processing personnel to support rising applications backlogs will remain as a significant driving force for software product demand.

EXHIBIT VI-7

SOFTWARE PRODUCTS MARKET DRIVERS AND INHIBITORS VENDORS' VIEWPOINTS

Market Drivers

- Economic Growth
- Technological Change
- Shortage of In-house DP Skills
- Distributed Systems
- Increasing User Awareness Technology

Market Inhibitors

- Increased Levels of Competition among Independents
- IBM Initiatives in Applications Software
- Software Price War
- Economic Recession
- Constraints on New Product Development
- Increasing Competition in PC Area

C. USER ATTITUDES AND TRENDS

1. LEVELS OF SATISFACTION

- Exhibit VI-8 shows users' satisfaction ratings with software under three headings:

  - Systems software.

  - Applications software.

  - PC software.

- The data was further analysed by country and by size of company.

- At the total Western Europe level, users reported greater satisfaction with systems software than with applications or PC software.

- Italian users reported above average satisfaction with systems and PC software whilst the U.K. respondents noted better than average satisfaction with applications and PC software.

- When analysed by company size, expressed in terms of the number of employees, the smaller companies with less than 500 workers reported higher than average satisfaction with systems and applications software.

- Ratings for PC software analysed by company size shows no significant difference in satisfaction levels.

EXHIBIT VI-8

USER SOFTWARE SATISFACTION RATINGS
(Analysed by Country and by Company Size)

CATEGORY OF ANALYSIS	AVERAGE RATINGS BY SOFTWARE CATEGORY*		
	SYSTEMS SOFTWARE	APPLICATIONS SOFTWARE	PC SOFTWARE
Analysis by Country			
United Kingdom	7.5	7.5	7.3
France	7.5	6.9	6.6
Germany	7.0	7.1	6.3
Italy	7.9	6.8	7.3
Western Europe	7.4	7.1	6.9
Analysis by Company Size			
< 500 Employees	7.9	7.6	6.9
≥ 500, < 1,000 Employees	6.6	6.8	6.9
≥ 1,000 Employees	7.5	7.0	7.0
All Companies	7.4	7.1	6.9

Note: Ratings were expressed on a scale of 1 to 10, where 1 = dissatisfied and 10 = very satisfied.

*Average Standard Error = 0.2.

2. MARKET OPPORTUNITIES FOR APPLICATIONS PACKAGES

- Respondents gave details of their use of software applications packages and indicated those which they were planning to purchase. The results are shown graphically in Exhibit VI-9.

- Accounts and finance applications packages had been purchased by 62% of the total sample of 109 respondents with a further 6% reporting that they were planning to purchase in the short term.

- In Germany and Italy, market acceptance of such software is high--70% of users having purchased accounting and finance packages with slightly lower rates of use noted in the U.K. (62%) and France (50%).

- A further 14% of U.K. respondents were planning to purchase such applications, compared to 7% in France, and 3% in Germany.

- Packages for pay and personnel applications also show a high level of acceptance amongst respondents. Sixty-one percent (61%) of Western European respondents have already purchased such applications packages, and a further 8% are planning to do so.

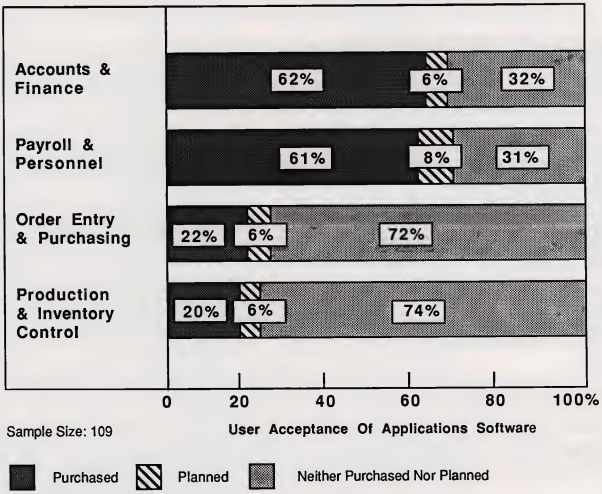
- The highest level of acceptance appears amongst Italian respondents (95%), while French and German respondents also indicate a high level of acceptance of pay and personnel applications at 60% of the sample.

- Although the U.K. sample showed the lowest acceptance of pay and personnel applications (41%) among the major Western European markets, the U.K. showed the largest number of those planning to purchase at 14%, with German users reporting a similar potential market growth at 13%.

- In comparison with the above types of applications, order entry and purchasing packages appear to be at an earlier stage of market development. Taking the

EXHIBIT VI-9

USER ACCEPTANCE OF APPLICATIONS SOFTWARE



Sample Size: 109

four countries together, only 22% have already purchased such packages with an additional 5% planning to do so.

- The market growth opportunities for order entry and purchasing software packages appear to be greatest in the U.K. and Germany.

- Not only is the current installed base relatively large (U.K. 31%, Germany 30%), but the proportions of those planning to purchase (U.K. 14%, Germany 7%) indicate growing acceptance of this type of application when compared with the caution of users in Italy (purchased 15%, planning nil) and France (purchased 10%, planning nil).

- The use of production and inventory control software also indicated much lower levels of user acceptance then noted for accounting and personnel packages.

- For Western Europe as a whole, 20% of the sample reported that they had purchased production and inventory control applications and a further 6% were planning to purchase such packages.

- Currently, levels of usage are comparable for Italy (25%), Germany (25%), and the U.K. (21%) while the level of acceptance in the French market is lower at 13%.

- Amongst those planning to purchase, the German and Italian users both show growing interest in production and inventory control software with 13% and 5% respectively planning to purchase these applications.

3. INTEGRATION OF APPLICATIONS AND DBMS

- Seventy-three repondents gave their views on the importance of integration between applications and database management systems.

- The analysis of these responses, shown in Exhibit VI-10, clearly indicate the high level of user interest in integration.

- The same sample of users was then asked what they believed to be the benefits of applications--DBMS integration. These free-format replies are categorised and given in Exhibit VI-11.

- The most frequently mentioned benefit was the improved efficiency resulting from the centralisation of data administration. This comment is reinforced by the other remarks which INPUT interprets as specific examples of increased efficiency.

- 'Island solutions' refers to the independent purchase or development of applications by one department of a company (or one company within a group), the application then being used in isolation. The consequence is data output which, although useful to the department, cannot be used constructively by others.

4. DBMS MARKET OPPORTUNITIES

- Exhibit VI-12 shows the market opportunities for database management systems in Western Europe.

- Fifty-eight of the 93 respondents in the sample currently use a database management system (62%).

- Of these, 37 are satisfied with the system currently installed and are not planning to change their DBMS.

- Of the 35 respondents planning to purchase a DBMS, 14 are new users and 21 are planning to change because of dissatisfaction with their current system. These respondents (38% of the sample) represent the current market opportunities for DBMS in Western Europe.

EXHIBIT VI-10

USERS' RATINGS OF IMPORTANCE OF INTEGRATION BETWEEN APPLICATIONS AND DBMS

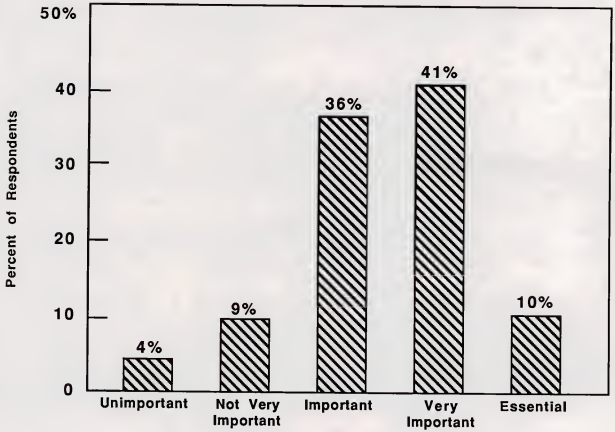


EXHIBIT VI-11

BENEFITS OF INTEGRATION BETWEEN APPLICATIONS AND DBMS

COMMENTS ON PERCEIVED BENEFITS	PERCENT OF ALL COMMENTS
Data Administration Is More Efficient When Centralised	36%
Double-Entry of Data Is Avoided	15%
Data Is Consistent and Up-to-Date	12%
Fast, Easy Data Retrieval	9%
End Users Need Direct Access to Data Base	9%
Applications Development Is Easier	6%
It Is Important to Stop "Island Solutions"	6%
Others (Individually Less than 2%)	7%

EXHIBIT VI-12

DBMS MARKET OPPORTUNITIES

COUNTRY	USING A DBMS BUT NOT PLANING TO CHANGE	USING A DBMS AND PLANNING TO CHANGE	PLANNING TO USE A DBMS	NEITHER/ NOR	TOTAL SAMPLE
United Kingdom	8	3	3	7	21
France	9	5	7	4	25
Germany	14	5	3	8	30
Italy	6	8	1	2	17
West Europe	37	21	14	21	93

- Of the total sample, 21 respondents (23%) neither use nor are planning to use a DBMS.

- Amongst the user sample, the greatest acceptance of DBMS is in Italy (32%) but 8 of the 14 Italian respondents noted that they were planning to change their system.

- Use of DBMS is also high in Germany (63%), France (56%), and the U.K. (52%) and in these countries the respondents reported greater satisfaction with the DBMS currently in use and proportionally fewer users planning to change their current DBMS than in Italy.

- The market opportunity for first-time DBMS users is greatest in France at 28%.

5. MARKET OPPORTUNITIES FOR FOURTH GENERATION LANGUAGES

- Exhibit VI-13 shows the current usage of, and market opportunities for, fourth generation languages.

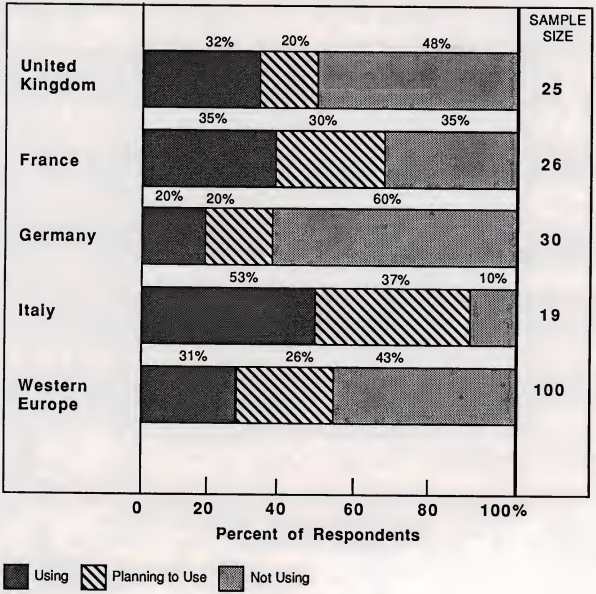
- Thirty-one percent of the Western European sample of 100 respondents are currently using fourth generation languages with a further 26% planning to use them.

- The highest levels of acceptance appear amongst the Italian sample (53% using) where an additional 37% are planning to use fourth generation languages.

- However, Italian respondents did note that in their experience 4GLs were difficult to use and utilised large amounts of memory storage.

EXHIBIT VI-13

FOURTH GENERATION LANGUAGES MARKET OPPORTUNITIES



- In Germany where the lowest acceptance rate is noted (20% currently using 4GLs), respondents commented that in addition to end-user difficulties and memory usage, they had experienced performance problems or that after a pilot test on a PC the 4GL did not correspond to their requirements.

- User acceptance in France and the U.K. is 35% and 32% respectively though respondents in both countries found 4GLs harder to use than they had anticipated, requiring in consequence higher levels of staff training.

D. VENDOR ISSUES

1. BUSINESS DEVELOPMENT

a. Key Challenges

- The relative maturation of the software products market and the increase in levels of competition points to the need for:

  - Development of new highly focused quality products with emphasis on unique facilities.

  - Increased marketing professionalism.

  - Effective cost control.

  - The development of continuous revenue streams either through pricing mechanisms (e.g., software rental) or increased support services revenues.

  - Reduced market development risk either through strategic partnering, agreements, and/or diversification.

- The levels of investment required for new product development in the software market is a continuing concern for European vendors.

- However, to a certain extent the development of 4GLs and prototyping methodologies which are improving the cost-effectiveness of custom software solutions are also available to the package software vendors to reduce development costs and enhance the speed of new product commercialisation.

- The fragmented nature of the European market in comparison to that of the United States is a major drawback in successful new product development. Consequently, it is not surprising that the U.S., as well as markets in the Far East and Australia, are seen by European vendors as attractive opportunities, despite the problems of establishing adequate marketing infrastructures.

- Increasing shortages of skilled, experienced staff was also identified by a number of vendors as a significant inhibitor to business development.

- Vendors must fully recognise the importance of the development of their 'knowledge base' and plan positive steps to attract the right staff, retain them, and thus exploit the competitive advantage of their skills.

- The need to develop continuous revenue streams has led some vendors to charge for consultancy and support services and intensify competition in the professional services area.

- The drive towards differentiation in the low-margin, highly competitive PC market has led vendors to strengthen custom support services and refocus their marketing efforts around more profitable segments.

- For example, the replacement market among users who have experienced problems with their first micro system and received little or no vendor support is a potentially attractive opportunity.

b. Key Opportunities

- Software vendors were questioned on what areas were considered to offer the best market opportunity areas. An analysis of their responses is shown in Exhibit VI-14.

- In systems software the two most important areas of opportunity mentioned were telecommunications software and artificial intelligence/expert systems. Opportunities for expert systems are covered in more detail in a separate INPUT report entitled Artificial Intelligence - European Market Opportunities, 1986.

- The majority of vendors saw applications software as the most attractive market opportunity. Specific target areas of interest ranked in order of importance are as follows:

  - Personnel.

  - Distribution.

  - Manufacturing automation; i.e., production control, material requirements planning, stock control, and CAD.

- In addition, a significant proportion of vendors pointed to a refocusing of product development strategy towards specific industry or cross-industry specialist niches.

- This development has led to significant increases in penetration levels for departmental systems (i.e., 57% of vendors are already active in this area).

- However, there still remain many specialist markets to be exploited. Most computers only have adequate packages available for less than 50% of potential application areas.

EXHIBIT VI-14

SOFTWARE PRODUCTS BUSINESS DEVELOPMENT OPPORTUNITIES

POTENTIAL OPPORTUNITIES	PERCENT OF RESPONDENTS			
	ACTIVE	ATTRACTIVE OPPORTUNITY	POSSIBILITY	NOT ATTRACTIVE
IBM Mainframe Systems Software	30%	14%	5%	51%
IBM Systems Software	22%	14%	8%	56%
Fourth-Generation Languages	62%	13%	13%	12%
DEC Systems Software	22%	9%	13%	56%
Telecommunications Software	21%	24%	15%	40%
Artificial Intelligence/ Expert Systems	28%	33%	10%	29%
Programmer Productivity Aids	71%	11%	3%	15%
Departmental Software	57%	9%	9%	25%
UNIX and PICK	42%	8%	24%	26%

- INPUT's research also reveals a high level of penetration in the area of system development productivity tools. Fourth generation languages and programmer productivity tools have penetration rates of 62% and 71%, respectively.

- There has also been a significant change from 1985 in the penetration of advanced operating systems. Forty-two percent of respondents are already active in the areas of UNIX and PICK.

2. MARKETING

- Despite increasing levels of competition, few software vendors have adopted innovative marketing methods.

- Although there is evidence that some software vendors have been most progressive in the use of marketing methods such as complex distribution channels and advertising, there is little evidence that these approaches are being adopted to any great extent by the majority of vendors.

- The key marketing challenge is that of adequate product differentiation as potential users are faced with increased difficulties in evaluation as an increasing array of products are launched onto the market.

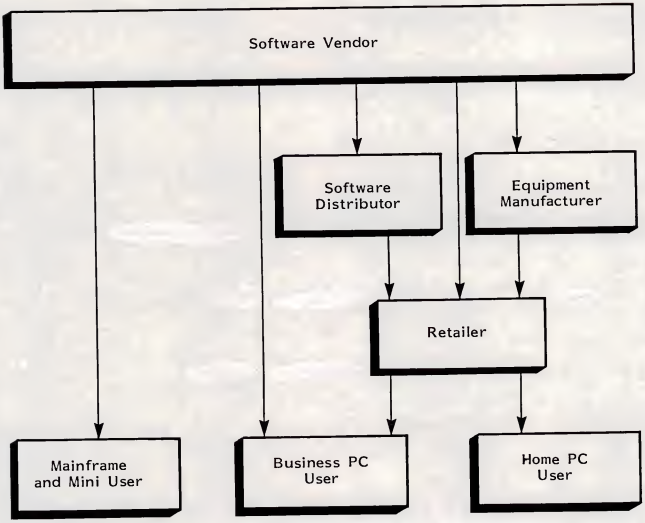
- In terms of marketing methods and techniques, the majority of vendors were tending to place more efforts on sales promotion techniques such as mail shots and seminars but still saw the field sales force as vital.

- Exhibit VI-15 summarises the principal distribution channels through which software vendors seek to promote their products.

- One direct sales option is to use a mail order approach. This has attractions in respect of eliminating the expensive field sales force, but of course will have its own costs and needs to be backed by advertising expenditures.

EXHIBIT VI-15

SOFTWARE PRODUCT DISTRIBUTION CHANNELS



- However, direct mail techniques may well be used to enhance profitability in the PC software area to reduce the high existing costs of selecting, administering, incentivising, and supporting retail distributors.

- Vendors also expressed strong concern about pricing issues, especially site licenses in the PC area. Although many regarded PC site licenses as necessary, there were concerns expressed about the problems of corporate dishonesty and inadequate copyright protection legislation.

- Other pricing concerns included problems with multiple discounts and chargeable maintenance fees tied into software revision levels.

- The majority of vendors were active in the bundling of software prices, and this depicts a trend towards a greater level of integration of modular applications packages as well as of systems and applications products.

- Some vendors were concerned that discounting was severly impacting upon profitability. This may well point to a need for participants to move towards value-based pricing.

- In specialist markets high pricing can be used to convey a high-quality image. In addition, it is possible to emphasise service aspects in order to justify higher prices.

- In general, the constant level of change taking place in the marketplace is placing increasing emphasis on the pricing process. Vendors should consider internal procedures for pricing reviews and ensure that these take place at regular intervals.

3. SERVICE AND SUPPORT

- Software support is second only to marketing in labour intensiveness. It is, therefore, an important cost factor and a vital element in the overall user perception of vendor service.

- The vast majority of vendors offer telephone hotline services as the basis for customer support. Generally, these are only available between normal working hours, but several internationally-based vendors are offering a full 24-hour service.

- In recognition of the fact that purely relying on people to provide information and training is an inexact way of answering customers' queries, just over 50% of vendors said that they utilise fault diagnostics databases of standard error correction procedures and user details; e.g., configuration data.

- In addition, nearly 30% of vendors are now supporting remote diagnostics for at least some of their product range.

- One vendor pointed to the cost effectiveness of offering remote self-service access into a fault diagnostics database.

- Exhibit VI-16 shows a conceptual view of a remote support system of the future. As far as INPUT is aware, no vendor has yet developed a system which is as comprehensive as this, although many vendors have implemented parts of it as referred to above.

- The natural language interface/expert system front end is only feasible for products that warrant significant investment. Exhibit VI-17 shows the criteria involved; most of these need to be rated as high to justify proceding with expensive development work.

EXHIBIT VI-16

REMOTE SUPPORT OF THE FUTURE

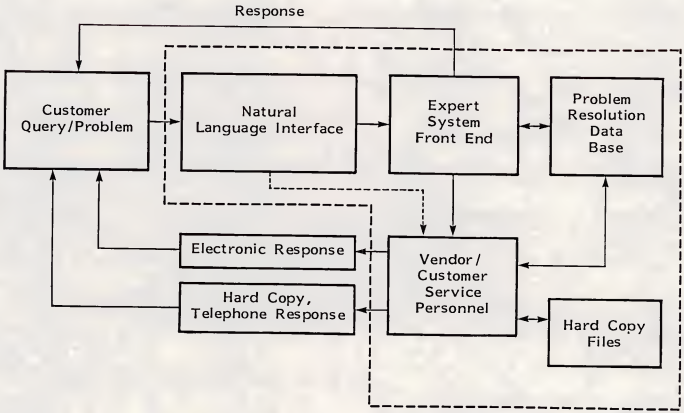


EXHIBIT VI-17

REMOTE SUPPORT SYSTEM: INVESTMENT CRITERIA

- Unit Price
- Volume
- Criticality to Customer
- Product Complexity
- Lack of Customisation
- Product Life

- Although it may not always be cost effective to have a computer driven expert system, the natural language interface can assist customers in putting their problems into commonly understood terms.

- This would alleviate one of the problems of electronic mail, ambiguity and misunderstanding, making customers far more likely to use the 'electronic mailbox' aspects of an electronic support system.

- Eliminating initial person-to-person contact is helping vendor support operations in:

  - Smoothing peaks in demand.

  - Ranking problems.

  - Documentation.

  - Assigning problems to the correct specialist.

- The perceived benefits include:

  - Much faster response to known problems, especially if the expert system interface were used.

  - Much less vendor involvement in problems/queries which turn out to be in customer documentation already.

E. COMPETITIVE ANALYSIS

- Exhibits VI-18 through VI-21 rank the leading suppliers of software products by market share of all software product user expenditures in 1985 for each of the four individual country markets.

EXHIBIT VI-18

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
SOFTWARE PRODUCTS
FRANCE
(Independent Vendors)

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (FF Millions)
1	CGI	4.5%	FF 148
2	SG2	4.3%	142
3	SESA	3.5%	116
4	STERIA	3.2%	106
5	SEMA-METRA	3.2%	105
6=	COMPUTER ASSOCIATES	3.0%	100
6=	SLIGOS	3.0%	100
8	CAP GEMINI SOGETI	2.9%	95
9	ANSWARE	2.7%	90
10	UNILOG	2.1%	69
	OTHERS	67.6%	FF2,129
	TOTAL MARKET	100.0%	FF3,200

EXHIBIT VI-19

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
SOFTWARE PRODUCTS
ITALY
(Independent Vendors)

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (Lira Millions)
1	DATA MANAGEMENT GROUP	7.6%	Lira 18,910*
2	SYNTAX	7.4%	18,500*
3	DATAMONT	6.0%	15,000*
4	IPACRI	5.6%	14,000*
5	COMPUTER ASSOCIATES	5.2%	13,000
6	ITP GROUP	4.4%	10,980
7	ENGINEERING	4.0%	9,900
8	SELESTA GROUP	3.5%	8,7300
9	PRAXIS CALCOLO	3.4%	8,400
10	O. GROUP	3.2%	8,000
	OTHERS	49.7%	Lira 124,580
	TOTAL MARKET	100.0%	Lira 250,000

* Includes captive revenue

EXHIBIT VI-20

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
SOFTWARE PRODUCTS
UNITED KINGDOM
(Independent Vendors)

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (£ Millions)
1	THORN-EMI IT	5.0%	£ 13
2	SCICON	4.6%	12
3	CAP	3.1%	8
4=	McCORMACK & DODGE	2.7%	7
4=	PPL	2.7%	7
4=	MSA	2.7%	7
7=	PETERBOROUGH	2.3%	6
7=	COMPUTER ASSOCIATES	2.3%	6
7=	BIS	2.3%	6
10	CINCOM	1.9%	5
	OTHERS	70.4%	£ 183
	TOTAL MARKET	100.0%	£ 260

EXHIBIT VI-21

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
SOFTWARE PRODUCTS
WEST GERMANY
(Independent Vendors)

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (DM Millions)
1	MBP	6.6%	DM 61
2	SOFTWARE AG	5.9%	54
3	SAP	4.7%	43
4	ADV ORGA	4.6%	42
5	TAYLORIX	3.4%	31
6	GEI	3.3%	30
7	CINCOM	2.6%	24
8	COMPUTER ASSOCIATES	2.5%	23
9	FCS	2.4%	22
10	SCS (SCICON)	2.0%	20
	OTHERS	62.0%	DM 570
	TOTAL MARKET	100.0%	DM 920

VII PROFESSIONAL SERVICES

VII PROFESSIONAL SERVICES

A. INTRODUCTION

- In 1985, the professional services sector contributed 30% of the Western European information services market and is the largest sector.

- Professional services cuts across the sector boundaries in INPUT's definition and in essence is the carrying plasma of the information services industry.

- As a discrete sector, the professional services market is defined by INPUT as consisting of four principal subsectors:

  - Consultancy.

  - Custom software systems development.

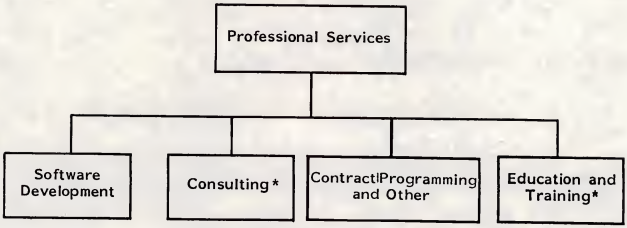
  - Contract programming and other services.

  - Education and training.

- Exhibit VII-1 gives a schematic representation of INPUT's classification of the professional services market structure.

EXHIBIT VII-1

PROFESSIONAL SERVICES MARKET STRUCTURE



- User Requirements Definition
- Systems Design
- Data Base Design
- Programming
- Testing
- System Modification
- Documentation

- Software Installation Planning
- Information Systems Audit
- Security Audit
- Personnel Planning
- Policies and Procedures Development (Other than related to Software Development)
- Contractual Negotiation Advice
- IT Strategy

- Contract Programming
- FM Using Customer-Owned Hardware
- Other Services

- Computer Operations Training
- Management Training
- Analyst/Programmer Training
- Systems Usage Training
- Video Instruction (Related to Computer Topics)

* All related to computer systems, topics or issues

- INPUT forecasts that growth will remain bouyant in this sector expanding at an annual average rate of 25% between 1986 and 1988. However, this growth rate is expected to fall to 23% for the period 1988 through 1991.

- The major driving forces for growth are as follows:

  - Increased recognition by companies of the need to use information technology as a strategic resource.

  - Shift in emphasis from data processing being regarded as a cost centre to being a key competitive tool and revenue generator.

  - Continued shortages of key in-house data processing staff, particularly in areas like telecommunications.

  - Increased size and complexity of systems development projects as organisations increasingly pursue the implementation of company-wide information technology strategies.

  - Increasing convergence between computing and telecommunications leading to systems integration needs.

B. MARKET DEVELOPMENT, 1986-1991

- Exhibits VII-2 through VII-6 provide summary tables of the forecast professional services market growth between 1986 and 1991 for Western Europe and the individual country markets.

- Growth in France, the United Kingdom, and West Germany is expected to continue throughout the five-year forecast period in the range of 20-25%. In Italy, starting from a relatively lower base position, growth is expected to maintain a consistently higher rate--around 35% per annum.

EXHIBIT VII-2

PROFESSIONAL SERVICES MARKET FORECAST, 1986-1991
WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Consultancy	$ 450	$ 625	26%	$ 910	18%	$1,505
Software Development	2,630	3,785	31%	5,950	24%	11,380
Contract Programming and Other	530	745	28%	1,120	21%	1,975
Education and Training	450	660	33%	1,065	25%	2,090
Total	$4,060	$5,815	30%	$9,045	23%	$16,950

EXHIBIT VII-3

PROFESSIONAL SERVICES MARKET FORECAST, 1986-1991
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Consultancy	FF1,050	FF1,240	17%	FF1,680	15%	FF2,555
Software Development	9,000	11,160	24%	17,160	22%	31,160
Contract Programming and Other	1,700	2,040	20%	2,945	17%	4,720
Education and Training	900	1,125	25%	1,755	23%	3,265
Total	FF12,650	FF15,565	23%	23,540	21%	FF41,700

EXHIBIT VII-4

PROFESSIONAL SERVICES MARKET FORECAST, 1986-1991
ITALY

SUBSECTOR	MARKET FORECAST (Lira Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Consultancy	Lira 120	Lira 160	33%	Lira 280	30%	Lira 615
Software Development	500	675	35%	1,230	37%	3,160
Contract Programming and Other	155	210	34%	375	32%	860
Education and Training	75	105	40%	205	35%	505
Total	Lira 850	Lira1,150	35%	Lira2,090	35%	Lira5,140

EXHIBIT VII-5

PROFESSIONAL SERVICES MARKET FORECAST, 1986-1991
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Consultancy	£ 110	£ 132	20%	£ 190	16%	£ 295
Software Development	540	680	26%	1,080	24%	2,060
Contract Programming and Other	80	96	20%	140	20%	240
Education and Training	100	130	28%	210	26%	420
Total	£ 830	£1,038	25%	£1,620	23%	£3,015

EXHIBIT VII-6

PROFESSIONAL SERVICES MARKET FORECAST, 1986-1991
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
Consultancy	DM 250	DM 305	21%	DM 445	17%	DM 715
Software Development	1,200	1,500	25%	2,345	23%	4,365
Contract Programming and Other	300	365	21%	530	20%	915
Education and Training	400	500	25%	780	23%	1,450
Total	DM2,150	DM2,670	24%	DM4,100	22%	DM7,445

- The Italian market will be largely driven by the needs of medium and large companies to get up-to-date, network-based systems implemented in an environment of rapid improvement in the telecommunications infrastructure.

- The highest sustained rate of growth is expected in the education and training sectors, the lowest in consultancy. Consultancy growth is limited by shortages of suitable staff.

C. USER ATTITUDES AND TRENDS

1. LEVELS OF SATISFACTION

- Exhibit VII-7 shows user satisfaction ratings with four categories of professional services on a scale of 10 (extremely satisfied) and 1 (not at all satisfied). The bottom row indicated the numbers of respondents in the four country samples.

- At the total Western Europe level, the 90 respondents gave satisfaction ratings of 7.1 for each of custom system development and contract staff.

- In the U.K., contract staff services gave the greatest satisfaction and consultancy services the lowest.

- In France, users were most satisfied with education and training services (7.1) and least satisfied with contract staff (5.6).

- In Germany, a far smaller range of ratings were reported (6.7 to 7.1--a range of 0.4) and in Italy a range of only 0.3 was noted between custom system development and education and training services.

EXHIBIT VII-7

USER SATISFACTION RATINGS FOR PROFESSIONAL SERVICES

SERVICE CATEGORY	AVERAGE RATINGS BY COUNTRY*				
	UNITED KINGDOM	FRANCE	GERMANY	ITALY	WESTERN EUROPE
Consultancy	6.1	6.5	6.7	7.5	6.6
Education and Training	6.7	7.1	6.9	7.7	7.0
Custom System Development	7.1	6.7	6.7	7.4	7.1
Contract Staff	8.0	5.6	7.1	7.6	7.1
Number of Respondents in Sample	23	21	27	19	90

* Average Standard Error = 0.2

Note: Ratings were expressed on a scale of 1 to 10, where 1 = dissatisfied and 10 = very satisfied

- Comparisons across national boundaries within a given subsector (e.g., contract staff U.K. versus Germany, etc.) are not valid since the samples are different and respondents yardsticks for comparison may not be equivalent.

2. CONSULTANCY SERVICE OPPORTUNITIES

- Users interviewed by INPUT were asked to express their opinions as to the consultancy services most beneficial to their organisation. There was a wide variety of responses which indicated that there are many opportunities to be exploited in this sector.

- The 10 most frequently mentioned areas, ranked in order of importance, are shown in Exhibit VII-8.

D. VENDOR ISSUES

1. BUSINESS DEVELOPMENT

- The continuing rapid pace of development of information technology and the shift in emphasis towards the use of data processing as a key strategic resource has opened up new opportunities for professional services organisations.

- However, these opportunities have to be exploited in an environment which is increasingly competiive and in which many new problems and challenges need to be faced. Exhibit VII-9 illustrates vendors viewpoints of factors that are driving and inhibiting market demand, ranked in order of frequency of mentions.

EXHIBIT VII-8

CONSULTANCY SERVICE OPPORTUNITIES

- Application Software Development
- Telecommunications
- General Managerial
- Training
- Manufacturing Systems
- Vendor Selection
- Hardware Systems Design/Development
- Systems Software Development
- Custom Software Development
- Expert Systems

EXHIBIT VII-9

PROFESSIONAL SERVICES MARKET DRIVERS AND INHIBITORS VENDORS' VIEWPOINTS

Market Drivers

- Technological Change
- Increased Automation Industrial Manufacturing
- Deregulation and Telecommunications Developments
- Government Policy
- Convergence of Computing and Communications
- Shortage of In-house Skills

Market Inhibitors

- Recruitment of Specialist Staff
- Increasing Competition
- Economic Recession
- Government Budget Cuts
- Staff Costs

a. Key Challenges

- The principal challenge facing vendors is the increasing difficulty to maintain adequate levels of profitability.

- In order to combat this problem vendors are becoming more specialised and focusing on specific vertical markets.

- The trend towards specialisation is also being driven by the proliferation of increasingly complex technologies and the consequent demands that these make on system implementors.

- A specialisation strategy also supports a principal marketing objective of enhancing professional image.

- Some vendors, however, pointed to the need for diversification. This strategy is largely to reduce a company's dependence on large government contracts.

- However, increasing awareness of the need for information technology and lack of specialist in-house skills is leading to increasing demand for external professional services in the public sector. In the U.K., the Central Computing and Telecommunications Agency (CCTA) is predicting budget growth of over 50% per annum for central government spending on external computer services and consultancy.

- In addition, the threat of falling margins is being countered by vendors becoming more product based, and there is a general trend towards the use of standard system kernels.

- Other important business challenges mentioned, i.e., increased competition, software development productivity, and new business relationships and services, are discussed in the sections below.

b. Key Opportunities

- Areas of particular attraction mentioned by vendors were:

  - Computer integrated manufacturing (CIM).

  - Telecommunications.

  - Artificial intelligence and expert systems.

  - Education and training.

  - Financial markets.

- On this last area, financial markets, deregulation in the City of London has created major opportunities for vendors to provide new dealing room systems, telecommunications networks, and systems integration with back-office accounting suites.

- Failures of computer systems that accompanied the 'Big Bang' on October 27 have led to substantial demand for professional services on short decision cycles in order to support the increasingly internationally-based and highly competitive trading environments.

- However, this development has a double-edged sword as specialist and experienced staff are being attracted towards the 'golden hellos' of financial institutions.

- Telecommunications has assumed increased importance as an opportunity for three reasons:

  - Increasing awareness of communications as a potential competitive weapon.

- Increasing product complexity and choice arising out of liberalisation.

- Increasing convergence between computing and telecommunications.

- It is in this last area, telecommunications, that professional services vendors are experiencing the most difficulty in recruiting professional staff. Clearly, controlling skilled and knowledgeable human resources is a vital ingredient for professional services firms.

2. COMPETITIVE ENVIRONMENT

- Sustained high rates of growth in this sector have intensified competition and encouraged new entrants into the market.

- The continued convergence between management and information technology consultancy has lead to rapid expansion of the IT consultancy divisions of the management consultancy firms.

- However, the major threat to traditional mainline computer consultancies such as Cap Gemini Sogeti, Scicon, Logica, Systems Designers, Software Sciences, and Hoskyns is coming from the 'Big 8' accountancy firms.

- Although the strength of the traditional firms lies in their technical skills, the accounting and management consultancy firms have in-depth business expertise to bring to clients problems and have refocused their activities towards the provision of full implementation support; i.e., structured design and methodology services in addition to strategic advice.

- The Management Consultants' Association reported that work in the IT sector generated as much as 24% of association members' fees which totalled 142 million pounds in the U.K. alone during 1985.

- The 'Big 8' accounting firms are focusing on the sector in their drive to diversify away from traditional auditing work. The 1985 non-auditing revenues of the major accountants which includes management consultancy, systems development, software products, tax consultancy, and other financial services are as follows:

	Total Fees	Non-Auditing Fees
	Million pounds (U.K.)	
- Coopers and Lybrand	119	61
- Peat Marwick Mitchell	114	34
- Price Waterhouse	109	51
- Deloitte Haskins & Sells	99	40
- Ernst & Whinney	83	N/A
- Touche Ross	77	31
- Arthur Young	75	43
- Arthur Andersen	67	37

- An EEC directive on company law which seeks to ensure the integrity and independence of statutory auditors has raised the ethical issue of the impartiality of accounting firms when providing consulting and systems development services to audit clients.

- The traditional firms argue that the big accountants abuse their privileged position as auditors to win large professional service contracts and are not in a position to give impartial advise on systems development as they are afraid of losing lucrative audit business.

- However, the overlap between audit and consultancy clients is not as large as is suggested. At Arthur Andersen, it is around 10%, Price Waterhouse 35%, and Deloitte 60%.

- In addition, the problem of conflict of interest applies to all firms in the sector. The traditional firms face similar problems of impartiality regarding the products divisions of their business. Nevertheless, it is vital for successful firms to establish independence, especially with regard to the public sector.

- This debate about the problems of "Chinese walls" is currently the subject of a Department of Trade and Industry (DTI) enquiry in the U.K.; however, it is unlikely to result in the sell off of the accountants consultancy divisions.

- The activities of the accountancy firms in the sector has increased the market place for consultancy and enhanced levels of professionalism.

- In order to meet the competitive challenge, the traditional firms will need to refocus their services in order to provide systems solutions that are directly supportive of an organisations' business strategy.

- Although decisions concerning information technology strategy often centre around the most appropriate database and integrated applications environment, it is important that vendors implement technical solutions that ensure computer services positively contribute to an organisation's effectiveness, competitive edge, and ultimate profitability.

- In addition, vendors are seeking to strengthen their marketing image. Amongst strategies being adopted were:

  - Improving the professionalism of the staff via training and selective recruitment.

  - Using consultancy services as a market development tool to create business opportunities in custom system development.

3. CONSULTANCY TRENDS

- Increasing sophistication and awareness of the potential benefits of information technology as a competitive weapon has led to a shift in emphasis from vendors undertaking specific data processing projects to providing complete planning services, including strategic consultancy.

- The size of professional services projects is also expanding as companies are pursuing integrated companywide information technology strategies.

- Consultancies' services are being utilised in areas where rapid technological development leads to a scarcity of in-house skills and knowledge. Telecommunications and expert systems are both good examples of this.

- In addition, the most frequently mentioned areas of consultancy activity were the provision of contractual negotiation advice, hardware and software selection services, and feasibility studies.

- The general trend amongst professional services vendors towards vertical market specialisation was also observable in regard to consultancy.

4. SYSTEMS DEVELOPMENT PRODUCTIVITY

- The search for increased productivity is a key concern for professional services vendors. The most frequently mentioned responses to the question of which is the most important factor in improving system development productivity are given as Exhibit VII-10.

- Increasing levels of user sophistication and demands for rapid system development has led to the widespread use of software development tools such as 4GLs and RDBMS. In addition, prototyping approaches facilitate enhanced user involvement in system development.

EXHIBIT VII-10

FACTORS IMPROVING SYSTEM DEVELOPMENT PRODUCTIVITY

- Software Development Tools; i.e., RDBMS/4GLs
- Use of Structured Methodologies
- Project Management
- Prototyping Approaches
- Increased Involvement of Users in Development
- Use of Microcomputers
- Artificial Intelligence
- Software Engineering Tools
- Team Organisation

- Widespread usage of structured methodologies is improving quality and system reliability from design stage through to implementation. However, methodologies have limited impact on short-term productivity.

- INPUT recommends that vendors should consider automating their support for the use of methodologies as well as developing support programmes and training workshops aimed at a programmer level.

- Investments in microcomputing are leading to reduced response times. These investments will be repaid in terms of improved customer service and increased profitability.

5. NEW BUSINESS RELATIONSHIPS AND SERVICES

- The distinct boundaries that once separated the various sectors of the information services industry in the 1970s are becoming increasingly blurred. It is increasingly difficult to separate the market sectors of processing and network services, software products, professional services, and integrated systems.

- The market structure is changing because the key strategic factor for vendors is their knowledge of customers' system needs, not knowledge of a particular delivery mode.

- A number of possibilities exist for professional services vendors when leveraging their market knowledge. These include providing new services and/or entering new distribution channels.

- Avenues of opportunity for professional services vendors include:

  - Software product implementation services.

  - Providing software products.

- Education and training services.

- Systems integration.

- Systems integration and education and training are discussed in more detail in the next two subsections.

- Exhibit VII-11 is a graphic which illustrates the channels of distribution available to professional services vendors.

- An important aspect for professional services vendors developing new distribution channels will be that of developing relationships with other organisations.

- Developing relationships with equipment manufacturers is a key need for some vendors. These relationships can be temporary, e.g., teaming agreements for large system development projects, or longer term, e.g., OEM agreements.

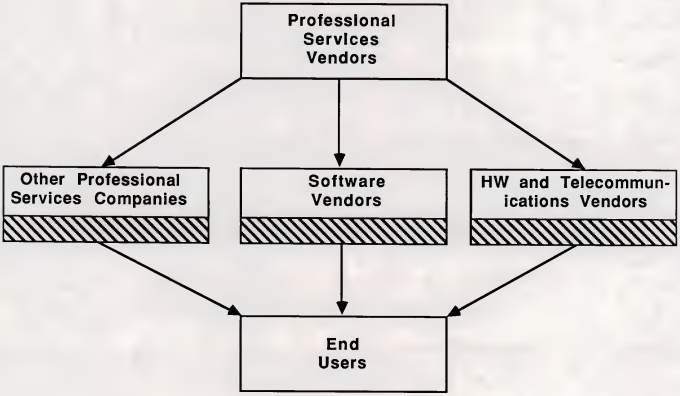
- Subcontracting for large projects was an opportunity area mentioned by a number of vendors. This will lead to short- or long-term relationships with other services vendors.

- Software product vendors need to have some type of professional services solution whereby they will increase the potential revenue from software product sales as well as increase the likelihood of future sales. This leads to active alliances with professional services vendors.

- There is an increasing trend of software product vendors to solicit and professional services firms to respond to consulting and installing software products at users' sites. For example, Computer Associates International (CAI) Micro Products Division's 'qualified installer' program under which the 'Big 8' accounting firms recommend, install, and train clients on the company's accounting packages.

EXHIBIT VII-11

EMERGING PROFESSIONAL SERVICES DISTRIBUTION CHANNELS



- Many mainframe/mini software product vendors are porting versions of their large software products to micro versions; e.g., Information Builder's PC-FOCUS. These products in most cases are used by nonprogrammers and will then require to be supported by enhanced documentation and training programmes. Opportunities exist for professional services vendors in this area of documentation and remote training.

6. SYSTEMS INTEGRATION

- The word 'integration' has unfortunately become overused within the computer industry during the 1980s.

- It is, however, a key concept for the computer industry, implying the bringing together of various systems components, hardware, software, telecommunications equipment or facilities, and associated services.

- The term 'systems integration' is used to imply a very specific form of this integration process used to distinguish it from 'integrated systems' and from any generic use of the term.

- 'Integrated systems' as a sector of the information services defined by INPUT as the packaging of hardware and software as a single entity and marketed as a product line. Appendix A 'Definitions' provides a more detailed description. The term 'turnkey' is often used interchangeably with 'integrated systems'.

- The key distinction between 'systems integration' and 'integrated systems' is that:

  - 'Systems integration' implies a large one-off project for one specific purpose. Typically any project under $5 million in value is unlikely to be a 'systems integration' project.

- In contrast, 'integrated systems' are delivered as a complete product line to multiple customers and are typically in the price range $50,000 to $1 million in contract value.

- 'Systems integration' is a type of major system development project that is distinguished by its size and the degree of total responsibility for its execution assumed by the prime contractor.

- Penalty clauses associated with nondelivery to specified dates and failure to match contracted system performance levels are another important feature of this type of contracting.

- Systems integration is a process in which a vendor or team of vendors assumes total responsibility for providing the information products/services which result in a comprehensive solution to an information systems problem. In this process the customer-integrator arrangement is such that the customer is made to feel that one vendor is providing all aspects of the solution. The customer interacts with the systems integrator, and, to the extent possible, other vendors who may be subcontractors to the integrator for portions of the solution are transparent to the customer.

- While the integrator may be providing some or all of the products and services that comprise the solution, the integrator's first responsibility is to the customer and to the assurance that, within the constraints of the project, the best solution will be implemented. In essence, the integrator sits on the customer's side of the buyer-vendor dyad, representing the customer and acting as the customer's advocate. The integrator, among other things, provides comprehensive project management for every aspect of the project.

- Activities of the integrator's role are depicted in Exhibit VII-12. Typical tasks in complex integration projects towards which these activities are directed include:

EXHIBIT VII-12

TYPICAL ACTIVITIES OF A SYSTEMS INTEGRATOR

- Project Management
- Technical Counselling
- Configuration Management
- Subcontractor Negotiations
- Operations Management
- System Development
- Customer Support

- Feasibility and tradeoff studies.
- Systems design.
- Selection/configuration of hardware and network.
- Selection of systems software.
- Selection/modification of applications software.
- Installation of hardware systems.
- Installation of software systems.
- Demonstration and test.
- Documentation.
- Client staff training.
- Operation and maintenance of hardware/software systems.
- Other customer support services.

- The integrator's role in actually providing the products/services that comprise the solution is secondary to the complex project management role.

- To date, the 'systems integration' phenomenon is primarily a U.S. market that exists largely to serve the complex needs of the federal government, particularly the Department of Defense.

- EDS has had a key role in the development of this market, and consequently 'systems integration' is a key strategy for that company. IBM and other major hardware manufacturers are also highly involved in this market.

- INPUT recognises that the development of a commercial systems integration market in the U.S. and the influence of key vendors like EDS and CSC is likely to lead to significant opportunities occuring in Western Europe.

- Factors that are likely to stimulate the systems integration marketplace include:

  - Scarcity of skills by one vendor for developing a total complex automated solution.

  - Proliferation of technological options which produce buyer confusion and system compatibility challenges. A single systems integration vendor to coordinate procurement and connectivity with compatibility becomes increasingly necessary.

- In the U.S., INPUT has estimated the 1985 federal systems integration market at $800 million and the embryonic commercial systems integration market at $64 million.

- However, by 1990, anticipated growth rates of in excess of 20% per annum will lead to a total market for this type of service of nearly $2.5 billion.

- For a comprehensive analysis of the U.S. systems integration market, see INPUT's 1985 study Commercial Systems Integration, Opportunities, and Challenges.

7. EDUCATION AND TRAINING

- Education and training services help people acquire new skills, techniques, or knowledge related to computers. This mode of the professional services market does not include services to educational institutions.

- The education and training mode is 11% of the professional services sector in 1985 and will grow to 12% in 1991. It is the market segment that is expected to have the highest AAGR 1985-1991 (29%), starting from 0.45 billion in 1985 and growing to $2.1 billion in 1991 (see Exhibit VII-2).

- Stimulating the education and training markets specifically are:

  - The rapid changes in hardware, software, and communications technology that quickly render knowledge of the best ways to develop, install, and use automated systems obsolete.

  - The growing complexity of software development tools which increase the need for training for programmers and analysts.

  - The increasing number of microcomputers that are being placed on workers' desks; most of these workers have little or no computer experience.

- One major factor that is preventing this market from having an even higher growth rate is the increasing role of automation in the training process (i.e., CD ROM combined with software or videodisks).

- For a comprehensive analysis of the education and training market and other major opportunities in professional services, see INPUT's 1985 study U.S. Professional Services Market.

E. COMPETITIVE ANALYSIS

- Exhibits VII-13 through VII-16 show the rankings of the leading professional services vendors by market share in each of the four country markets studied in this report. The market shares are estimated for calendar year 1985.

EXHIBIT VII-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROFESSIONAL SERVICES
FRANCE

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (FF Millions)
1	CAP GEMINI SOGETI	5.4%	FF 860
2	SEMA-METRA	3.6%	456
3	SG2	3.4%	428
4	CISI	2.6%	324
5	ANSWARE	2.1%	268
6	SESA	1.8%	232
7	STERIA	1.7%	220
8	TELESYSTEMES	1.4%	177
9	CERCI	1.4%	175
10	GFI	1.3%	166
	OTHERS	75.3%	FF9,344
	TOTAL MARKET	100.0%	$12,650

EXHIBIT VII-14

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROFESSIONAL SERVICES
ITALY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (Lira Millions)
1	FINSIEL GROUP	20.1%	Lira170,610 *
2	ENI DATA	8.5%	72,270 *
3	SYNTAX	3.7%	31,500 *
4	DATA MANAGEMENT GROUP	2.2%	18,910 *
5	DATAMONT	1.8%	15,300 *
6	SOPIN	1.4%	11,610
7	SOFTWARE SISTEMI (SSS)	1.3%	10,850 *
8	PIRELLI INFORMATICA	1.3%	10,800 *
9	O. GROUP	1.2%	10,750
10	DATA BASE INFORMATICA	1.2%	10,440 *
	OTHERS	57.3%	Lira486,960
	TOTAL MARKET	100.0%	Lira850,000

* Includes captive revenue

EXHIBIT VII-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROFESSIONAL SERVICES
UNITED KINGDOM

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (£ Millions)
1	LOGICA	4.2%	£ 35
2	THORN-EMI IT	3.3%	27
3	EDS	3.0%	25
4	CAP	2.4%	20
5=	ARTHUR ANDERSEN	2.2%	18
5=	DATA LOGIC	2.2%	18
5=	SYSTEMS DESIGNERS	2.2%	18
8	PRICE WATERHOUSE	2.0%	17
9=	PEAT MARWICK MITCHELL	1.9%	16
9=	SCICON	1.9%	16
	OTHERS	74.7%	£620
	TOTAL MARKET	100.0%	£830

EXHIBIT VII-16

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
PROFESSIONAL SERVICES
WEST GERMANY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (DM Millions)
1	SCS (SCICON)	5.0%	DM 108
2	FCS	3.0%	65
3=	EDV-PLONZKE	2.7%	58
3=	KEINBAUM	2.7%	58
5	IKOSS	1.4%	30
6	PDV	1.3%	28
7	PSI	1.0%	21
8	INTERGRATA	0.9%	20
9	CSID	0.9%	19
10	CAP GEMINI SOGETI	0.8%	17
	OTHERS	80.3%	DM 1,726
	TOTAL MARKET	100.0%	DM 2,150

VIII INTEGRATED SYSTEMS

VIII INTEGRATED SYSTEMS

A. INTRODUCTION

- The integrated systems market can be considered as consisting of three broad groups:
  - The CAD/CAM market.
  - The small- to medium-sized business systems market.
  - A number of specialist vertical or niche markets; for example, wine cooperatives.
- The integrated systems market has developed largely from the small- to medium-sized business category, an area often referred to as the market for turnkey systems.
- The rapid proliferation of low-cost hardware, initially minis and subsequently personal computers and micros, has widened this market extensively.
- This extension of the market has forced equipment manufacturers to reasses their distribution channels which in many cases were simply direct to the user through a field sales force.

- Mass markets and increasingly specialised software applications requirements have caused the creation of complex distribution channels within the computer industry. Examples are OEMs, VARs, computer retailers, etc.

- The expression value-added reseller (VAR) has come into prominence in response to a distribution process in which at various stages there is the addition of some element of value.

- This value might be represented by some specific piece of hardware, reconfiguration of a complete system, or software.

- Equally, value is added to products in more intangible forms; for example, through the provision of services (like installation support) and by providing the utility of geographical location and timeliness.

B. MARKET DEVELOPMENT, 1986-1991

- Exhibits VIII-1 through VIII-5 provide summary tables of the forecast integrated systems market growth between 1986 and 1991 for Western Europe and the individual country markets.

- Growth in France, the United Kingdom, and West Germany is expected to fall from an average rate of approximately 25% during the period 1985 to 1988 to just over 20% during the period 1988 through 1991.

- In Italy, starting from a lower base position, growth is expected to increase from 30% during the period 1985 to 1988 to over 35% during the period 1988 through 1991.

- High levels of growth in the Italian market are forecast as medium-/small-sized companies are catching up with the benefits of computerisation and the market for CAD/CAM systems is just reaching a takeoff phase.

EXHIBIT VIII-1

INTEGRATED SYSTEMS MARKET FORECAST, 1986-1991
WESTERN EUROPE

SUBSECTOR	MARKET FORECAST ($ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
System Hardware	$1,520	$2,145	28%	$3,195	21%	$5,735
Software and Other Charges	$1,215	$1,785	34%	$2,925	25%	$5,780
Total	$2,735	$3,930	30%	$6,120	23%	$11,515

EXHIBIT VIII-2

INTEGRATED SYSTEMS MARKET FORECAST, 1986-1991
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
System Hardware	FF4,500	FF5,490	21%	FF7,930	19%	FF13,290
Software and Other Charges	3,500	4,480	28%	7,320	25%	14,400
Total	FF8,000	FF9,970	24%	FF15,250	22%	FF27,690

EXHIBIT VIII-3

INTEGRATED SYSTEMS MARKET FORECAST, 1986-1991
ITALY

SUBSECTOR	MARKET FORECAST (Lira Billions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
System Hardware	Lira 430	Lira 540	26%	Lira 855	34%	Lira2,070
Software and Other Charges	305	410	36%	760	38%	1,990
Total	Lira 735	Lira 950	30%	Lira 1,615	36%	Lira4,060

EXHIBIT VIII-4

INTEGRATED SYSTEMS MARKET FORECAST, 1986-1991
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
System Hardware	£ 250	£ 310	24%	£ 480	20%	£ 835
Software and Other Charges	230	290	26%	460	22%	830
Total	£ 480	£ 600	25%	£ 940	21%	£1,665

EXHIBIT VIII-5

INTEGRATED SYSTEMS MARKET FORECAST, 1986-1991
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1985	1986	1985-1988 AAGR (Percent)	1988	1988-1991 AAGR (Percent)	1991
System Hardware	DM 940	DM1,135	21%	DM1,690	19%	DM2,875
Software and Other Charges	730	925	27%	1,495	23%	2,765
Total	DM1,670	DM2,060	24%	DM3,185	21%	DM5,640

- It is anticipated that the proportion of system hardware as a proportion of overall revenues will decrease over the forecast period in line with falling hardware prices.

- End users' expenditures on software development, maintenance, and other professional services is, however, forecast to grow at rates of nearly 30% during the period 1985 to 1988, falling to under 25% during the period 1988 through 1991.

C. USER ATTITUDES AND TRENDS

1. LEVELS OF SATISFACTION

- In the 1986 INPUT survey, user satisfaction ratings (shown in Exhibit VIII-6) were studied in greater detail than in previous years, the integrated systems sector being subdivided into three categories:

  - Production control systems.

  - General business systems.

  - CAD/CAM systems.

- The highest user satisfaction rating (7.7) was recorded for production control systems with general business systems slightly behind and rated 7.5.

- CAD/CAM systems, however, were relatively poorly rated by users (6.3). This may, in fact, reflect users' doubts about the practical benefits of CAD where productivity improvements have often not met expectations.

EXHIBIT VIII-6

LEVELS OF USER SATISFACTION WITH INTEGRATED SYSTEMS

SYSTEM CATEGORY	AVERAGE RATING*†
Production Control Systems	7.7
General Business Systems	7.5
CAD/CAM Systems	6.3

*Rating: 1 = Dissatisfied, 10 = Very Satisfied
† Average Standard Error = 0.5

2. THIRD-PARTY SUPPLIERS - USAGE AND ATTITUDE

- Fifty-six percent of respondents reported that they purchased data processing equipment from third-party suppliers and gave satisfaction ratings for three third-party distribution channels. These are shown in Exhibit VIII-7.

- The average rating of 7.2 on a scale of 1 (dissatisfied) to 10 (very satisfied) indicates a high level of general satisfaction with third-party suppliers.

- The three channel types were closely grouped around this average; OEMs who were used least as a third-party distribution channel were rated 7.4 by respondents.

- Value-added resellers were used to a greater extent than OEMs and received the highest respondent satisfaction rating of 7.5.

- Computer dealers, however, received the lowest average respondent rating of 7.1 in spite of the fact that two-thirds of respondents purchased computer equipment from them.

D. VENDOR ISSUES

1. BUSINESS DEVELOPMENT

- As can be seen from the market dimension data given in Section B above, the integrated systems sector is showing strong growth potential.

- Important driving forces behind this growth are:

  - The increasing availability of lower-cost, more powerful hardware that has allowed vendors to open up new markets at a lower price threshold.

EXHIBIT VIII-7

USER SATISFACTION RATINGS FOR THIRD-PARTY SUPPLIERS

TYPE OF DISTRIBUTION CHANNEL	PERCENT USING THIS CHANNEL	AVERAGE SATISFACTION RATING*
Value-Added Resellers	21%	7.5
OEMs	13%	7.4
Computer Dealers	66%	7.1
Total	100%	7.2

Note: Satisfaction ratings are based on a scale of 1 to 10, where 1 = most dissatisfied, 10 = very satisfied.

*Average Standard Error = 0.4.

Respondent Total Sample:	62
Percentage of Respondents Purchasing Equipment from Third-Party Suppliers:	56%

- The availability of 'supermini' hardware that has allowed vendors to challenge the functionality of mainframe systems. Departmental integrated system solutions have been able to challenge large-scale centralised computer systems.

- The convergence of computing and telecommunications has created opportunities for departmental branch systems in specialist market niches.

- The increasing specialisation of user needs has allowed vendors to leverage expertise in specific market segments. This has increased the attraction of a total solution in specialised areas and is driving the trend towards integrated system solutions to more complex projects than has traditionally been the case.

- The needs of equipment manufacturers to reach volume outlets that are met through the extensive distribution network of the integrated system vendors.

- Increasing market specilisation and the volume production needs of major equipment manufacturers are the two key market forces that are driving the growth of value-added resellers (VARs) and value-added dealers (VADs).

- These vendors, who operate primarily on a local or regional basis, are adept at carving out niche markets that are too specialised for larger organisations.

- VAR and VAD vendors work very closely, usually via formal agreements, with major hardware vendors in terms of sales, lead exchange, sales strategy, and most importantly, ongoing post-sales support.

- IBM, as well as other major hardware suppliers, continues to support the VAR/VAD concept, recognising the limitations of its own in-house sales force

to deliver the sales volume that can only be found amongst a wide collection of specialty markets.

- However, relationships with manufacturers are becoming strained as the fall in margins consequent upon declining hardware prices has not only reduced incentives but also reduced the cost effectiveness of direct sales effort by VARs and VADs.

- In addition, vendors pointed to the problems caused by fluctuations in manufacturers' distribution policies and some faced competition from the manufacturers own direct sales force.

- Vendor viewpoints on factors that are driving and inhibiting the growth of the integrated systems market are shown in Exhibit VIII-8.

- Key business development factors for integrated system vendors can be summarised as:

  - Selection of viable specialist vertical markets.

  - Development of the appropriate specialised software strategy; e.g., focusing on multiuser UNIX applications and/or customising standard modules of software to meet clients' requirements.

  - Capability to provide the necessary value-added service factors; e.g., implementation, consulting, and support.

- Exhibit VIII-9 illustrates some of the specialist areas of opportunity mentioned by vendors in this survey.

- Discrete manufacturing probably represents the largest opportunity and the development of the CAD/CAM market is reviewed separately below.

EXHIBIT VIII-8

INTEGRATED SYSTEMS MARKET DRIVERS AND INHIBITORS VENDORS' VIEWPOINTS

Market Drivers

- Telecommunications Development
- Technological Change
- Government Legislation
- Development of Departmental Systems

Market Inhibitors

- Fall of Hardware Prices
- Investment Cutbacks
- Manufacturers Distribution Policy
- Unstable Business Environment
- User Confusion

EXHIBIT VIII-9

SPECIALIST MARKET OPPORTUNITIES FOR INTEGRATED SYSTEMS

- CAD/CAM/CAE
  - Small-/Medium-Sized Companies
- Telecommunications
- Banking and Finance
  - "Dealer Aids"
  - Back Office Accounting Systems
- Insurance Brokers
- Retail Distribution
  - POS/Eft
- Solicitors
- Estate Agents
- Hotels and Catering
- Dentists
- Local Authorities
- Desktop Publishing

- The rapid pace of telecommunications development and deregulation has also presented significant opportunities for vendors.

- Banking and finance also offer attractive opportunities, particularly in the U.K. where deregulation in the City of London has opened up demand for a wide range of specialist dealing systems linked to integrated departmental systems.

- Retail distribution is expected to show strong growth as automated integrated system solutions linked with networking are implemented to enhance competitiveness. EFT-POS and EDI are important opportunities for development in this area.

- Business development opportunities for integrated system vendors also exist in respect of the expansion of services to the customer and increase in value-added beyond the traditional boundaries.

- For example, professional services can help increase client satisfaction through greater assurance that the system and its implementation are tailored to the customer's environment.

- It is important that vendors meet the challenge of a shift in emphasis in added value in integrated systems away from hardware towards software development and the provision of professional services.

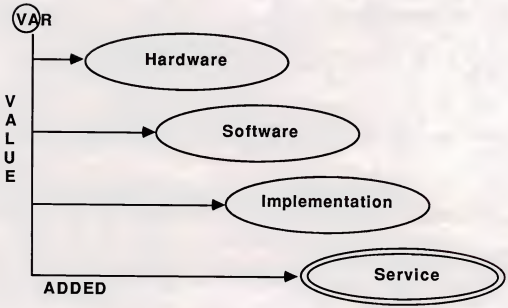
- Exhibit VIII-10 illustrates this trend graphically.

- Other major challenges and problems reported by integrated system vendors can be summarised as falling into three main categories.

  - Having to become even more specialised, move into new technical areas, and develop more specialised application knowledge.

EXHIBIT VIII-10

THE 'VALUE-ADDED' OF THE FUTURE WILL BE MOSTLY SERVICE



- Key Components Include:
  - Education in Underlying Management Principles
  - More Pre-Installation Consulting
  - Innovative Problem Resolution Methods

- Adapting to changes in policy of value-added reselling by equipment manufacturers.

- Meeting financial problems, for example, obtaining finance for development and maintaining adequate levels of profitability.

2. THE CAD/CAM MARKET

- The CAD/CAM market has been viewed as an area of major opportunity. High rates of growth in this area have been driven by increasing levels of competition in international manufacturing industry.

- The U.S. market has been seriously affected by the so-called 'shakeout' syndrome as well-established CAD/CAM vendors (for example, Computervision and GE-CALMA) have encountered difficulties.

- High rates of industry growth have attracted large numbers of participants. As the rate of growth contracts, vendors with weak products, poor market positions, weak capital structures, and those who are not able to react quickly to changing demands either lose market share or are squeezed out entirely. Thus, results the 'shakeout' phenomenon.

- This 'shakeout' has not occurred in Europe in such a dramatic form, but there is no question that growth has slowed. For some vendors this has severely affected profitability as unit prices have fallen dramatically.

- Market shakeout has resulted in the increasing dominance of the 'deep-pocket' international corporations; i.e., IBM and McDonnell Douglas.

- Falling growth and profitability are due to two factors:

  - Increasing trend towards the use of standard hardware, especially microcomputers, which has severely affected vendors of expensive proprietary systems.

- Increased user caution about capital spending. In fact, this is caused by user doubts about the practical benefits of CAD. Productivity improvements have often not fulfilled expectations.

- Successful vendors (for example, McDonnell Douglas) have refocused their CAD/CAM strategy by concentrating on growing opportunities in software publishing and introducing low-cost PC-based solutions.

- In addition, there is an increasing trend towards the use of networked systems and distributed processing. However, this raises additional problems in terms of disparate communication standards for intersystem connection.

- Several vendors pointed to developments in industry standards, particularly UNIX and the IGES (initial graphics exchange specification) standard as major factors driving the development of the market.

- However, conformity to the IGES standard requires considerable interfacing work and data processing expertise on behalf of users and is far from being universally accepted as a common standard for commercial use.

- Generally, the introduction of CAD/CAM technology requires users to undertake a lengthy learning process and it is important that vendors play close attention to ease of use in system design and provide comprehensive support and training services.

- Some vendors also pointed to lack of management awareness of the benefits of CAD/CAM in small- and medium-sized companies. This may well point to the need for vendors to instigate missionary marketing programmes in order to stimulate market demand in this area.

3. SERVICE AND SUPPORT

- Innovative support and service strategies are important because they address key areas of customer concern, namely hardware maintenance and software support.

- In Exhibit VIII-11, users researched for INPUT's 1986 European field service survey were asked to rate from 1 (low) to 10 (high) the level of service they required from various categories of hardware. Then they were asked to rate their perceived level of support from their particular hardware supplier.

- The results are interesting--in the main those cateories rated low in terms of need were rated high in terms of support and vice versa.

- Exhibit VIII-12 illustrates users responses with respect to required and received service levels for software maintenance. Here is a noticeable that there is a general shortfall in levels of software service, especially in the areas of documentation and training.

- INPUT's research indicates that hardware and software post-sale service and support is a major opportunity, particularly as competition intensifies in the integrated systems marketplace.

- INPUT suggests vendors investigate new ways to provide a higher quality of hardware and software support service in a more cost-effective manner.

- Areas to be considered (which are already being utilised by some software vendors) include remote support; i.e., on-line interaction with the system, customer self-support for software (must include proper incentives to the user), and electronic support (two-way vendor/customer on-line interaction). See Chapter VI concerning service and support issues for software products.

EXHIBIT VIII-11

USER HARDWARE SERVICE RATINGS
EUROPE

HARDWARE SERVICE CATEGORY	LEVEL OF SERVICE		RATIO OF RECEIVED TO REQUIRED
	REQUIRED	RECEIVED	
Documentation	6.86	6.82	0.99
Training	7.41	7.00	0.95
Consulting	7.36	6.88	0.94
Planning	7.90	6.98	0.88
Installation	8.35	7.90	0.95
Remote Support	7.85	7.42	0.95
Engineer Skill Level	9.15	8.21	0.90
Overall Maintenance	8.76	7.94	0.91
Availability of Spares	9.18	8.13	0.89
Engineer Continuity	7.87	8.01	1.02

Average Number of Respondents: 754
Average Standard Error: 0.1

Source: INPUT User Survey

EXHIBIT VIII-12

USER SYSTEMS SOFTWARE SERVICE RATING
EUROPE

SYSTEMS SOFTWARE SERVICE CATEGORY	LEVEL OF SERVICE		RATIO OF RECEIVED TO REQUIRED
	REQUIRED	RECEIVED	
Documentation	9.11	7.07	0.78
Training	8.63	6.94	0.80
Consulting	8.18	6.86	0.84
Planning	8.04	6.84	0.85
Installation	8.33	6.99	0.84
Remote Support	8.14	6.93	0.85
Engineer Skill Level	8.98	7.57	0.84
Overall Maintenance	8.45	7.23	0.86

Average Number of Respondents: 713
Average Standard Error: 0.1

Source: INPUT User Survey

- Vendors should also consider increasing levels of user involvement in system development from design stage through implementation. Close customer support and user training will ensure that systems provide cost-effective solutions to business problems.

- In general, higher levels of customer service develop higher customer satisfaction and, consequently, lead to additional sales. Customer service designed specifically to enhance system performance and customer satisfaction will allow vendors to differentiate themselves from the competition in a fragmented market.

- An additional advantage in adopting a service improvement strategy is that it is something that competitors will probably find very difficult to follow and probably impossible to follow in the short term.

- A price cut, in contract, is an action that a competitor can follow almost immediately, negating the market advantage sought by the initiator.

- In addition, it will generally take time to implement product quality improvements because resources and ingenuity will be required to develop additional services and inherent improvements.

E. COMPETITIVE ANALYSIS

- Exhibits VIII-13 through VIII-16 show the ranking of the leading integrated systems vendors by market share in each of the four country markets studied in this report. The market shares are estimated for calendar year 1985.

EXHIBIT VIII-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INTEGRATED SYSTEMS
FRANCE

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (FF Millions)
1	SLIGOS	3.0%	$ 236
2	SESA	2.9%	232
3	SEMA-METRA	1.8%	140
4	STERIA	1.7%	139
5	COMPUTERVISION	1.6%	128
6	INTERGRAPH	1.5%	120
7	CGI	1.4%	111
8	McDONNELL DOUGLAS I.S.	1.3%	100
9	TELESYSTEMES	1.2%	99
10	APPLICON	0.9%	78
	OTHERS	82.7%	$6,617
	TOTAL MARKET	100.0%	$8,000

EXHIBIT VIII-14

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INTEGRATED SYSTEMS
ITALY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (Lira Millions)
1	SICIT	3.0%	Lira 22,400
2	DATAMAT	2.0%	15,000
3	SIRIO INFOMATICA	1.8%	13,000
4	ELSI GROUP	1.5%	11,000
5	GEPIN	1.4%	10,500
6	SIXCOM	1.4%	10,350
7	DATAMONT	1.4%	10,000
8	CORTIS & LENTINI	1.2%	9,100
9	CNI (CONSORZIO)	1.1%	8,100
10	DATA MANAGEMENT GROUP	1.1%	7,930
	OTHERS	84.1%	Lira617,620
	TOTAL MARKET	100.0%	Lira735,000

EXHIBIT VIII-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INTEGRATED SYSTEMS
UNITED KINGDOM

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (£ Millions)
1	MBS	6.0%	£ 30
2	COMPUTERVISION	4.6%	22
3	INTERGRAPH	4.4%	21
4	CONTROL DATA-FIS	4.2%	20
5	HOSKYNS	4.0%	19
6	APPLICON	3.3%	16
7	RACAL REDAC	3.1%	15
8	METIER	2.9%	14
9	KALAMAZOO	2.7%	13
10	CAP	2.5%	12
	OTHERS	62.3%	£ 298
	TOTAL MARKET	100.0%	£ 480

EXHIBIT VIII-16

TOP VENDOR RANKINGS AND MARKET SHARES, 1985
INTEGRATED SYSTEMS
WEST GERMANY

RANK	VENDOR	Market Share Percent Rounded	Estimated Revenues (DM Millions)
1	COMPUTERVISION	6.4%	DM 107
2	APPLICON	4.5%	75
3	INTERGRAPH	3.1%	52
4	CALMA	2.6%	43
5	RACAL REDAC	2.3%	38
6=	TAYLORIX	1.8%	30
6=	GEI	1.8%	30
8	GF-MOV	1.6%	27
9	SOFTLAB	1.5%	25
10	METIER	1.2%	20
	OTHERS	73.2%	DM1,223
	TOTAL MARKET	100.0%	DM1,670

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

- INFORMATION SERVICES - The provision of:

  - Data processing functions using vendor computers (processing services).

  - The provision of data base access where computers perform an essential role in the processing or conveyance of data.

  - Services that assist users to perform functions on their own computers (software products and/or professional services).

  - A combination of hardware and software, integrated into a total system (integrated systems).

A. REVENUE

- All revenue and user expenditures reported are available (i.e., noncaptive) revenue, as defined below.

- NONCAPTIVE INFORMATION SERVICES REVENUE - Revenue received for information services provided within the four Western European country markets of France, Italy, the U.K., and West Germany from users who are not part of the same parent corporation as the vendor.

- CAPTIVE INFORMATION SERVICES REVENUE - Revenue received from users who are part of the same parent corporation as the vendors.

- OTHER REVENUE - Revenue derived from lines of business other than those defined above.

B. SERVICE MODES

- PROCESSING SERVICES - Remote computing services, batch services, and processing facilities management.

  - REMOTE COMPUTING SERVICES (RCS) - Provision of data processing to a user by means of terminals at the user's site(s) connected by a data communications network to the vendor's central computer. There are four submodes of RCS:

    - INTERACTIVE (timesharing) - Characterised by the interaction of the user with the system, primarily for problem-solving timesharing but also for data entry and transaction processing; the user is on-line to the program/files.

    - REMOTE BATCH - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resources requirements.

    - DATA BASE - Characterised by the retrieval and processing of information from a vendor-provided data base. The data base may be owned by the vendor or a third party.

- USER SITE HARDWARE SERVICES (USHS) - These offerings provided by RCS vendors place programmable hardware on the user's site (rather than in the EDP center). USHS offers:

  - Access to a communications network.

  - Access through the network to the RCS vendor's larger computers.

  - Significant software as part of the service.

- BATCH SERVICES - This includes data processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunications media) to and/or from those sites. Data entry and data output services, such as keypunching and computer output microfilm processing, are also included. Batch services include those expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing.

- PROCESSING FACILITIES MANAGEMENT (PFM) (Also referred to as 'resource management' or 'systems management') - The management of all or a major part of a user's data processing functions under a long-term contract (more than one year). This would include both remote computing and batch services. To qualify as PFM, the contractor must directly plan, control, operate, and own the facility provided to the user, either on-site, through communications lines, or in a mixed mode.

- Processing services are further differentiated as follows:

  - Function-specific services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general edger, accounts receivable,

payroll, and personnel applications fall into this category. Function-specific data base services where the vendor supplies the data base and controls access to it (although it may be owned by a third party) are included in this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific.

- Industry-specific services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications 'tool' that the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation. Industry-specific data base services, where the vendor supplies the data base and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry-specific applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

- Utility services are those where the vendor provides access to a computer and/or communications network with basic software that enables users to develop their own problem solutions or processing systems. These basic tools include terminal-handling software, sorts, language compilers, data base management systems, information retrieval software, scientific library routines, and other systems software.

- SOFTWARE PRODUCTS - This category includes users' purchases of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the users' sites. Fees

for work performed by organisations other than the package vendor are counted in professional services. There are several subcategories of software products.

- APPLICATIONS PRODUCTS - Software that performs processing to service user functions. They consist of:

  - CROSS-INDUSTRY PRODUCTS - Used in multiple-user industry sectors. Examples are payroll, inventory control, and financial planning.

  - INDUSTRY-SPECIFIC PRODUCTS - Used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.

- SYSTEMS PRODUCTS - Software that enables the computer/communications systems to perform basic function. They consist of:

  - SYSTEMS CONTROL PRODUCTS - Function during applications program execution to manage the computer system resource. Examples include operating systems, communication monitors, emulators, and spoolers.

  - DATA CENTER MANAGEMENT PRODUCTS - Used by operations personnel to manage the computer system resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.

  - APPLICATION DEVELOPMENT PRODUCTS - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include

languages, sorts, productivity aids, data dictionaries, data base management systems, report writers, project control systems, and retrieval systems.

- PROFESSIONAL SERVICES - Made up of services in the following categories:

  - EDUCATION SERVICES - EDP products and/or services - related to corporations, not individuals.

  - CONSULTING SERVICES - EDP management consulting and feasibility studies, for example.

  - SOFTWARE DEVELOPMENT - Including system design, contract programming, and 'body shopping'.

  - PROFESSIONAL SERVICES FACILITIES MANAGEMENT (PSFM) - The counterpart to processing facilities management, except that in this case the computers are owned by the client, not the vendors; the vendor provides people to operate and manage the client facility.

- INTEGRATED SYSTEMS (Also known as Turnkey Systems) - An integration of systems and applications software with hardware, packaged as a single entity. The value added by the vendor is primarily in the software. Most CAD/CAM systems and many small business systems are integrated systems. This does not include specialised hardware systems such as word processors, cash registers, and process control systems.

- Integrated systems revenue in this report is divided into two categories.

  - INDUSTRY-SPECIFIC systems; i.e., systems that serve a specific function for a given industry sector such as seismic processing systems, automobile dealer parts inventory, CAD/CAM systems, discrete manufacturing control systems, etc.

- CROSS-INDUSTRY systems; i.e., systems that provide a specific function that is applicable to a wide range of industry sectors such as financial planning systems, payroll systems, personnel management systems, etc.

- Revenue includes hardware, software, and support functions.

- SYSTEMS INTEGRATION - Services associated with systems design, integration of computing components, installation, and acceptance of comuter/communications systems. Systems integration can include one or mre of the major information services delivery modes--professional services, turnkey systems, and software products. System components may be furnished by separate vendors (not as an integrated system by one vendor, called the prime contractor); services may be furnished by a vendor or by a not-for-profit organisation. Integration services may be provided with related engineering activities, such as SE&I (Systems Engineering and Integration) or SETA (Systems Engineering and Technical Assistance).

C. HARDWARE/HARDWARE SYSTEMS

- HARDWARE - Includes all computer communications equipment that can be separately acquired, with or without installation by the vendor, and not acquired as part of a system.

  - PERIPHERALS - Includes all input, output, communications, and storage devices, other than main memory, that can be locally connected to the main processor and generally cannot be included in other categories, such as terminals.

- INPUT DEVICES - Includes keyboards, numeric pads, card records, barcode readers, lightpens and trackballs, tape readers, position and motion sensors, and A-to-D (analog-to-dialog) converters.

- OUTPUT DEVICES - Includes printers, CRTs, projection television screens, microfilm processors, digital graphics, and plotters.

- COMMUNICATION DEVICES - Modems, encryption equipment, special interfaces, and error control.

- STORAGE DEVICES -Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories.

• TERMINALS - There are three types of terminals:

  - USER PROGRAMMABLE (Also called 'intelligent terminals'):

    . Single-station or standalone.

    . Multistation-shared processor.

    . Teleprinter.

    . Remote batch.

  - USER NONPROGRAMMABLE:

    . Single-station.

    . Multistation-shared processor.

    . Teleprinter.

- LIMITED FUNCTION - Originally developed for specific needs, such as POS (point of sale), inventory data collection, controlled access, etc.

- HARDWARE SYSTEMS - Includes all processors, from microcomputers to super (scientific) computers. Hardware systems require type- or model-unique operating software to be functional, but the category excludes applications software and peripheral devices, other than main memory and processor or CPUs, not provided as part of an integrated (turnkey) systems.

  - MICROCOMPUTER (or personal computer or PC) - Combines all of the CPU, memory, and peripheral functions of an 8- or 16-bit computer on a chip, in the form of:

    . Integrated circuit package.

    . Plug-in board with more memory and peripheral circuits.

    . Console--including keyboard and interfacing connectors.

    . Personal computer with at least one external storage device directly addressable by CPU.

  - MINICOMPUTER - Usually a 12-, 16-, or 32-bit computer which may be provided with limited applications software and support, and may represent a portion of a complete large system.

    . Personal business computer.

    . Small laboratory computer.

    . Nodal computer in a distributed data network, remote data collection network, connected to remote microcomputers.

- MAINFRAME - Typically a 32- or 64-bit computer, with extensive applications software and a number of peripherals in standalone or multiple CPU configurations for business (administrative, personnel, and logistics) applications, also called a general-purpose computer.

  - Large computer mainframes are presently centered around storage controllers but likely to become bus-oriented and to consist of multiple processors (CPUs) or parallel processors; they are intended for structured mathematical and signal processing and are generally used with general purpose von-Newmann-type processors for system control.

  - Supercomputer mainframes are high-powered processors with numerical processing throughout that is significantly greater than the largest general-purpose computers, with capacities in the 10-50 MFLOPS (million floating point operations per second) range, in two categories:

- REAL TIME - Generally used for signal processing.

- NONREAL TIME - For scientific use, with maximum burst-mode (but sustained speed) capacities of up to 100 MFLOPS, in one of three configurations:

  - Parallel processors.

  - Pipeline processors.

  - Vector processors.

- Newer supercomputers--with burst modes approaching 300 MFLOPS, main storage size up to 10 million words, and on-line storage in the one-to-three gigabyte class--are also becoming more common.

- EMBEDDED COMPUTER - Dedicated computer system designed and implemented as an integral part of a weapon or weapon system, or platform that is critical to a military or intelligence mission, such as command and control, cryptological activities, or intelligence activities. Characterised by MIL SPEC (military specifications) appearance and operation, limited but reprogrammable applications software, and permanent or semipermanent interfaces. May vary in capacity from microcomputers to parallel-processor computer systems. Information services forecasts in this report do not include applications for this type of computer.

D. TELECOMMUNICATIONS

- NETWORKS - Interconnection services between computing resources, provided on a leased basis by a vendor to move data and/or textual information from one or more locations to one or more locations.

  - COMMON CARRIER NETWORK (CCN) - Provided via conventional voice-grade circuits and through regular switching facilities (dial-up calling) with leased or user-owned modems (to convert digital information to voice-grade tones) for transfer rates between 150 and 1,200 baud.

  - LOCAL-AREA NETWORK (LAN) - Restricted limited-access network between computing resources in a relatively small (but not necessarily contiguous) area, such as a building, complex of buildings, or buildings distributed within a metropolitan area. One of the two types:

    . BASEBAND - Voice bandwidth at voice frequencies (same as telephone, teletype system) limited to a single sender at any

given moment and limited to speeds of 75 to 1,200 baud, in serial mode.

. BROADBAND - Employs multiplexing techniques to increase carrier frequency between terminals, to provide:

- Multiple (simultaneous) channels via FDM (Frequency Division Multiplexing).

. Multiple (time-sequenced) channels via TDM (Time Division Multiplexing).

- High-speed data transfer rate via parallel mode at rates of up to 96,000 baud (or higher, depending on media).

• TRANSMISSION MEDIA - Varies with the supplier (vendor) and with the distribution of the network an its access mode to the individual computing resource location.

- MODE - may be either:

. ANALOG - Typified by the predominantly voice-grade network of AT&T's DDD (Direct Distance Dialing) and by operating telephone company distribution systems.

. DIGITAL - Where voice, data, and/or text are digitised into a binary stream.

- MEDIA varies with distance, availability, and connectivity:

. WIRE - Varies from earlier single-line teletype networks to two-wire standard telephone (twisted pair) and balanced line to four-wire full-duplex balanced lines.

- CARRIER - Multiplexed signals on two-wire and four-wire networks to increase capacity by FDM.

- COAXIAL CABLE - HF (High Frequency) and VHF (Very High Frequency), single frequency, or carrier-based system that requires frequent reamplification (repeaters) to carry the signal any distance.

- MICROWAVE - UHF (Ultra High Frequency) multichannel, point-to-point, repeated radio transmission, also capable of wide frequency channels.

- OPTICAL FIBER - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers and with TDM for multichannel applications.

- SATELLITES - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but requiring suitable groundstation facilities for up- and down-link operation.

- CELLULAR RADIO -Network of fixed, low-powered, two-way radios that are linked by a computer system to track mobile phone/data set units; each radio serves a small area called a cell. The computer switches service connection to the mobile unit from cell to cell as the unit moves among the cells.

E. OTHER CONSIDERATIONS

- When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint. Expenditures are then categorised according to what users perceive they are buying.

APPENDIX B: INTERVIEW AND SAMPLE PROFILE

APPENDIX B: INTERVIEW AND SAMPLE PROFILE

A. VENDORS

- The vendor sample included significant information services vendors in each of the four country markets. In many cases, these vendors offered a combination of services from amongst the four major sectors defined by INPUT as:

  - Processing and network services.

  - Software products.

  - Professional services.

  - Integrated systems.

- In total, 143 vendor organisations were interviewed, many of them on an in-depth, face-to-face basis.

- The profile of organisations interviewed is shown in Exhibit B-1.

EXHIBIT B-1

PROFILE OF VENDOR INTERVIEWS

COUNTRY	Processing and Network Services	Software Products	Professional Services	Integrated Systems	Total Number of Companies
United Kingdom	12	13	10	10	45
France	10	7	11	12	40
West Germany	7	10	12	9	38
Italy	5	4	5	6	20
Total	34	34	38	37	143

B. USERS

- The use sample included organisations of varying size across a broad cross section of vertical markets.

- The user respondent sample analysis by country is given below:

- France	30
- Italy	20
- United Kingdom	29
- West Germany	30
Total	109

- The user respondent sample analysis by company size is as follows:

- Less than 500 employees	32
- 500-999 employees	25
- Greater than 999 employees	52
Total	109

- The user sample analysis by industry/market sector is:

- Discrete manufacturing	25
- Process manufacturing	19

-	Retail distribution	10
-	Wholesale distribution	9
-	Transportation	3
-	Utilities	5
-	Banking	9
-	Insurance	3
-	National government	5
-	Local government	6
-	Services	8
-	Other	7
	Total	109

APPENDIX C: VENDOR QUESTIONNAIRE

APPENDIX C

VENDOR QUESTIONNAIRE

QA First of all, may I just check on the total number of full-time employees in your company, not just at this location.
Is it:

___ 1 - 9

___ 10 - 19

___ 20 - 49

___ 50 - 99

___ 100 - 199

___ 200 - 499

___ 500 - 999

___ 1000+

QB And how many of these would you describe as professional staff?

_____

QC Is your company a public company? _____Yes _____ No

private company? _____ Yes _____No

or a subsidiary of another organisation? _____Yes _____No

QD (If it is a subsidiary) Could you please tell me the name of your parent company?

_____

QE i. What are the principal business activities of your firm?

_____

_____

ii. Approximately what percentage of your overall sales revenue does each one represent?

*	i.	ii. (Percent)
o Processing/Network Services	1	_____
o Packaged Software Products	2	_____
o Professional Services	3	_____
o Integrated Systems (VAR, Dealer Distributor)	4	_____
o Other (please state) _____	5	_____

_____

*See separate definitions.

GENERAL COMMON ISSUES

I would now like to ask you a few questions about the general market situation that you are experiencing.

1. **I am now going to read out a list of protential business approaches. For each one could you tell me whether you are actively pursuing, have high interest, are interested, or have no interest?**

	Active	High Interest	Interest	No Interest	DK
o Geographic Expansion, e.g., U.S. Countries	1	1	1	1	1
o Acquisition Initiatives	2	2	2	2	2
o Mergers with Other Computer Services Firms	3	3	3	3	3
o Partnerships with Other Organisations	4	4	4	4	4
o Agreements	5	5	5	5	5
o Divestiture	6	6	6	6	6

2. **What would you consider to be the three most important benefits of strategic partnership with other organisations?**

1. _____

2. _____

3. _____

3. I would now like to quickly run through a list of potential issues for services vendors, can you say in each case whether you consider each issue to be a serious problem, a problem, or not a problem?

	Serious Problem	Problem	Not a Problem	DK
o Staff Shortages	1	1	1	1
Any particular area(s)? _____				
o Increased competition from small vendors	2	2	2	2
Comment _____				
o Large company competitive threat - i.e., from internal DP department	3	3	3	3
Comment _____				
o Manufacturers' activity in Software and Services	4	4	4	4
Any comments _____				
o The communications environment in your country	5	5	5	5
Any comments _____				

PROCESSING SERVICES

1. You indicated that approximately _____% of your business is generated in the area of bureau (and/or network) services.

   a. Can you tell me in which of the following areas is your company involved?

   b. And approximatly what percent of your business each one represents?

	a.	b. (Percent)
RCS	1	_____
On-line Data Base	2	_____
Batch	3	_____
On-site Services	4	_____
FM	5	_____
Network Services (VANS)	6	_____
Other (please state)	7	_____
_____		_____
		100%

Comments: _____

_____

_____

2. Taking this part of the business as one entity (100%) what percentage of your revenues in this area are derived from the following major industry segments, approximately?

		Percent
Manufacturing	- Discrete	_____
	- Process	_____
Distribution	- Retail	_____
	- Wholesale	_____
Transportation		_____
Utilities		_____
Banking and Finance		_____
Insurance		_____
Government	- National	
	- Local	
Services		
Other (please define)		_____
_____	____	
		100%

3a. And in which major application areas do you provide services, (read out list) and

3b. What is the approximate percentage contribution of each area to your revenues?

	3a	3b (Percent)
Accounting	1	_____
Engineering and Scientific	2	_____
Industrial/Military Control Systems	3	_____
Production Control	4	_____
Banking and Finance	5	_____
Payroll/Personnel	6	_____
Planning and Analysis	7	_____
Office Automation	8	_____
Education and Training	9	_____
Marketing/Sales	10	_____
Other (please state) _____	11	_____
Nonspecific _____	12	_____
		100%

4. I would now like to run through a list of potential business development opportunity areas and ask you whether you are in this area, have high interest, or no interest?

	Already Active	High Interest	No Interest	D/K
VIDEOTEX Services	1	1	1	1
Facilities Management	2	2	2	2
Providing Communications Network Services (VANS)	3	3	3	3
On-line Data Base Services	4	4	4	4
Electronic Data Interchanges	5	5	5	5
Electronic Mail Services	6	6	6	6
On-site Hardware Services				
- Integration of PCs (Micro-Mainframe Links)	7	7	7	7
- Distributed Data Processing (Departmental Systems)	8	8	8	8
Disaster Recovery	9	9	9	9
Printing Services	10	10	10	10
Third-Party Maintenance	11	11	11	11
Software Product Sales	12	12	12	12
Professional Services	13	13	13	13
Any Other (please state)	14	14	14	14

Comments: _____

_____

5. For your company, what do you consider the three major factors that are most likely to lead to the generation of new business?

1. _____

2. _____

3. _____

Comments please: _____

_____

Prompts: Economic changes, technological factors, telecommunications convergence, etc.

6. And again for your company, what do you consider to be the three most serious threats to your business?

1. _____

2. _____

3. _____

Comments please: _____

_____

_____

SOFTWARE PRODUCTS

1. In the area of packaged software products you indicated that these account for some _____% of your business.

   a. In which particular areas is your business?

   and

   b. What percentage of the total does each one represent?

			a.	b. (Percent)
Mainframe	-	Systems Software	1	_____
	-	Applications	2	_____
Mini	-	Systems Software	3	_____
	-	Applications	4	_____
Micro (PC)	-	Systems	5	_____
	-	Applications	6	_____
Other (please state)			7	_____
_____				_____ 100%

Comments: _____

_____

ASK ONLY IF YES TO APPLICATIONS SOFTWARE

2. Taking this part of the business as one entity (100%), what percentage of your revenues in this area are derived from the following major industry segments, approximately?

			Percent
Manufacturing	-	Discrete	_____
	-	Process	_____
Distribution	-	Retail	_____
	-	Wholesale	_____
Transportation			_____
Utilities			_____
Banking and Finance			_____
Insurance			_____
Government	-	National	_____
	-	Local	_____
Services			_____
Other (please define) _____			_____
_____			100%

3a. And in which major application areas do you provide services (read out list) and

3b. What is the approximate percentage contribution of each area to your revenues?

	3a.	3b. (Percent)
Accounting	1	_____
Engineering and Scientific	2	_____
Industrial/Military Control Systems	3	_____
Production Control	4	_____
Banking/Finance	5	_____
Payroll/Personnel	6	_____
Planning and Analysis	7	_____
Office Automation	8	_____
Education and Training	9	_____
Marketing/Sales	10	_____
Other (please state) _____	11	_____
Nonspecfic _____	12	_____
		100%

4. I am now going to read out a list of product areas for packaged software products and ask you to tell me whether you are already active in this area, see it as a very attractive opportunity, as a possiblity, or as not a very attractive area for your organisation?

	Already Active	Very Attractive Opportunity	Possiblity	Not Attractive	DK
SYSTEMS SOFTWARE					
IBM Mainframe Systems S/W	1	1	1	1	1
IBM Systems S/W	2	2	2	2	2
Fourth Generation Languages DBMS/RDBMS	3	3	3	3	3
DEC System Software	4	4	4	4	4
Telecommunications Software (OSI, SNA)	5	5	5	5	5
UNIX/PICK	6	6	6	6	6
Artificial Intelligence/ Expert Systems	7	7	7	7	7
Programmer Productivity Aids	8	8	8	8	8
Departmental Software (Micro-Mini-Mainframe)	9	9	9	9	9
Any Other (please state) _____	10	10	10	10	10
Applications Packages					
- Banking/Finance	11	11	11	11	11
- Accounting	12	12	12	12	12
- Planning and Analysis	13	13	13	13	13
- Discrete Manufacturing	14	14	14	14	14
Any Other (please state) _____	15	15	15	15	15

Comments:

_____

_____

5. For your company, what do you consider the three major factors that are most likely to lead to the generation of new business?

1. _____

2. _____

3. _____

Comments please: _____

_____

Prompts: Economic changes, technological factors, telecommunications convergence, etc.

6. And again for your company, what do you consider to be the three most serious threats to your business?

1. _____

2. _____

3. _____

Comments please: _____

_____

7. I would now like you to give me your opinion about some service and support issues?

   a. What sort of hotline enquiry service do you provide?

   ---

   b. Do you support remote diagnostics for your products?

   _____ All _____ Some _____None

   c. Fault diagnostics data base?

   _____

   d. Do you charge for consultancy support?

   _____Yes _____No

   e. And if so, what proportion of your overall software revenues do these constitute?

8. Finally, in the area of software marketing what comments do you have on the following topics?

   a. The need and desirability for site licenses? (or what is your company's attitude to site licenses?)

   _____

   b. Bundling a number of products together to gain greater market penetration?

   _____

   c. Channels of distribution for your software products?

Direct Sales	1
Software Distributor	2
Equipment Manufacturer	3
Retailer	4
Other (please state)	5

_____

PROFESSIONAL SERVICES

1. You indicated that approximately _____% of your business is generated in the area of professional services.

   a. In which of the following major areas is your company involved?

   b. And what approximate percentage does each represent of your total professional services revenue?

	a.	b. (Percent)
Consultancy	1	_____
Bespoke (custom) Systems Development	2	_____
Training and Education	3	_____
Other (please state)	4	_____
		100%

Comments: _____

_____

2. **Taking this part of the business as one entity (100%), what percentage of your revenues in this area are derived from the following major industry segments, approximately?**

			Percent
Manufacturing	-	Discrete	_____
	-	Process	_____
Distribution	-	Retail	_____
	-	Wholesale	_____
Transportation			_____
Utilities			_____
Banking and Finance			_____
Insurance			
Government	-	National	_____
	-	Local	_____
Services			
Other (please define)			_____
_____			_____
			100%

3a. And in which major application areas do you provide services (read out list) and

3b. What is the approximate percentage contribution of each area to your revenues?

	3a.	3b. (Percent)
Accounting	1	_____
Engineering and Scientific	2	_____
Industrial/Military Control Systems	3	_____
Production Control	4	_____
Banking/Finance	5	_____
Payroll/Personnel	6	_____
Planning and Analysis	7	_____
Office Automation	8	_____
Education and Training	9	_____
Marketing/Sales	10	_____
Other (please state) _____	11	_____
Nonspecific _____	12	_____
		_____ 100%

4. I am now going to read out a list of potential areas of opportunity for professional services, can you in each case tell me whether you are already active in this area, see it as a very attractive opportunity, as a possiblity for development, or not an attractive option?

	Already Active	Very Attractive Opportunity	Possibility	Not Attractive	DK
Consultancy in:					
o Telecommunications	1	1	1	1	1
o Capacity Planning/ Performance Measurement	2	2	2	2	2
o System Implementation	3	3	3	3	3
o EDP Auditing	4	4	4	4	4
o Software Quality Assurance	5	5	5	5	5
o Security	6	6	6	6	6
o Software Product Support	7	7	7	7	7
System Development (in which areas?) _____	8	8	8	8	8
Subcontracting for System Development	9	9	9	9	9
Education and Training	10	10	10	10	10
Computer Integrated Manufacturing	11	11	11	11	11
Artificial Intelligence	12	12	12	12	12
Any Other Area (please state) _____	13	13	13	13	13

Comments: _____

_____

5. For your company, what do you consider the three major factors that are most likely to lead to the generation of new business?

1. _____

2. _____

3. _____

Comments please: _____

_____

Prompts: Economic changes, technological factors, telecommunications convergence, etc.

6. And again for your company, what do you consider to be the three most serious threats to your business?

1. _____

2. _____

3. _____

Comments please: _____

_____

_____

7. What do you consider is likely to be the most important factor in improving system development productivity over the next couple of years?

_____

_____

_____

INTEGRATED SYSTEMS

1. You indicated that approximately _____% of your business lies in the area of complete systems including hardware.

   a. In which areas are you active?

   b. And what approximate percentage does each one represent of your overall business?

	a.	b. (Percent)
Business Systems (please state particular area) _____	1	_____
CAD/CAM	2	_____
Other Engineering Scientific	3	_____
Planning and Analysis, e.g. Project Management	4	_____
Other (please state) _____	5	_____
Value-Added Reseller	6	_____
Value-Added Dealer	7	_____
Joint Marketing (Cooperative Marketing)	8	_____
Other (please state) _____	9	_____
		100%

Comments: _____

_____

2. **Taking this part of the business as one entity (100%), what percentage of your revenues in this area are derived from the following major industry segments, approximately?**

			Percent
Manufacturing	-	Discrete	_____
	-	Process	_____
Distribution	-	Retail	_____
	-	Wholesale	_____
Transportation			_____
Utilities			_____
Banking and Finance			_____
Insurance			_____
Government	-	National	_____
	-	Local	_____
Services			_____
Other (please define)			_____
			100%

3. And what are the major application areas for which you provide services, what is the approximate percentage contribution of each area to your revenues?

	3a.	3b. (Percent)
Accounting	1	_____
Engineering and Scientific	2	_____
Industrial/Military Control Systems	3	_____
Production Control	4	_____
Banking/Finance	5	_____
Payroll/Personnel	6	_____
Planning and Analysis	7	_____
Office Automation	8	_____
Education and Training	9	_____
Marketing/Sales	10	_____
Other (please state) _____	11	_____
Nonspecific _____	12	_____
		100%

4. What do you consider are the most attractive opportunities available in the market for complete systems?

_____

_____

_____

5. For your company, what do you consider the three major factors that are most likely to lead to the generation of new business?

1. _____

2. _____

3. _____

Comments please: _____

_____

Prompts: Economic changes, technological factors, telecommunications convergence, etc.

6. And again for your company, what do you consider to be the three most serious threats to your business?

1. _____

2. _____

3. _____

Comments please: _____

_____

_____

7a. What proportion of your revenue for complete systems is derived from? (READ OUT LIST)

7b. What do you anticipate these proportions to be in 2 years time?

		Now (Percent)	In 2 Years Time
i.	The Hardware System	_____	_____
ii.	The Software (Systems and Applications)	_____	_____
iii.	Professional Services	_____	_____
iv.	Maintenance		
	- Hardware	_____	_____
	- Software	_____	_____
v.	Other (please state)	_____	_____
	_____	_____	_____
		100%	100%

Comments: _____

_____

_____

CONCLUDING SECTION

1. a. What were your total company revenues for your most recent financial year?

_____ (local currency)

Year ended: _____Day _____Month _____Year

b. If some of your revenues are derived from activities other than computer services, please indicate what percent this represents of your total revenue?

_____%

c. If financial information is confidential, please provide an indication of your computer services revenue by checking the appropriate space.

French France (Millions)	Italian Lira (Billions)	£ Sterling (Millions)	Deutsche Marks (Millions)
___	___	___	___
___ Under 10	___ Under 2	___ Under 1	___ Under 3
___	___	___	___
___ 10 - 50	___ 2 - 10	___ 1 - 5	___ 3 - 15
___	___	___	___
___ 50 - 100	___ 10 - 20	___ 5 - 10	___ 15 - 30
___	___	___	___
___ 100 - 250	___ 20 - 50	___ 10 - 25	___ 30 - 75
___	___	___	___
___ Over 250	___ Over 50	___ Over 25	___ Over 75

THANK YOU.

APPENDIX D: USER QUESTIONNAIRE

APPENDIX D

USER QUESTIONNAIRE

QA May I just check on the total number of full time employees in your company, not just at this location.

Under 500	1
500-999	2
1,000+	3

QB What is the principal activity of your organisation?

Manufacturing - Discrete	1
Manufacturing - Process	2
Distribution - Retail	3
Distribution - Wholesale	4
Transportation	5
Utilities	6
Banking and Finance	7
Insurance	8
Government - National	9
Government - Local	0
Other _____	X

INTRODUCTION

Good morning, good afternoon, I am telephoning from INPUT, the international planning services company. We are conducting a survey about the major issues in the data processing industry. Your opinion would be very valuable. All information you give will of course be absolutely confidential.

QC What are the main types of data processing equipment that you have at your company (this establishment)?

PROBE WHETHER MAINFRAME/MINI ETC. AND FOR MODEL AND VENDOR

	MODEL	VENDOR
Mainframe		
Mini		
PCs		
Office Automation		
Other _____		

Q1 What do you consider to be the three most serious obstacles affecting your progress in providing an up-to-date, cost-effective computer service?

1. _____

_____

2. _____

_____

3. _____

_____

Other comments: _____

_____

_____

_____

Q2a I am going to read out a variety of problems concerning data processing which have been experienced by other companies. For each one, could you tell me whether it is currently a very serious problem, fairly serious, not very serious, or is it not a problem at all for your company?

READ OUT, ROTATE ORDER

	VERY SERIOUS	FAIRLY SERIOUS	NOT VERY SERIOUS	NO PROBLEM	DO NOT KNOW
Recruiting Staff	1	2	3	4	5
Training Staff	1	2	3	4	5
Lack of End-User Involvement	1	2	3	4	5
Coping with Technological Change (for the company)	1	2	3	4	5
Lack of management awareness	1	2	3	4	5
Data Processing Costs	1	2	3	4	5
Managing Growth and/or Changes to the Business	1	2	3	4	5
Having Inadequate Systems SW	1	2	3	4	5
Need to Improve Operations	1	2	3	4	5
Lack of Industry Communications Standards	1	2	3	4	5
Developing Communications Systems for the Company	1	2	3	4	5
Changes of Operating Systems	1	2	3	4	5
Large Applications Backlog	1	2	3	4	5

Q2b Are there any other major problems you are currently facing which we have not covered?

IF YES: What are they?

No, none 1

Don't know 2

Yes (Write in) 3

_____

_____

Q3 I would now like to ask you a few questions about applications software.

a. Please can you tell me whether you have purchased any software packages for each of these major applications areas?
Firstly ..... READ OUT LIST.

IF HAVE PURCHASED ASK:

b. Who was the supplier?

FOR EACH AREA WHERE SOFTWARE PACKAGE NOT USED:

c. All you planning to use a software package within the next 2 years for .....
(NAME OF AREA)

d. Are you planning to change to a custom-built system for any of these application areas? That is> (READ OUT FULL LIST AGAIN)

	Purchased	Supplier	Planning To Use	Planning To Change To Custom Built
Accounting & Finnace	1	_____	1	1
Payroll/Personnel	2	_____	2	2
Order Entry/Purchasing	3	_____	3	3
Production/Inventory Control	4	_____	4	4

e. Are there any other application areas which you have purchased or are planning to purchase software packages for? And any where you are planning to change to a customs built system?

Any other important areas (Please State)	5	_____	5	5
		_____		

Q4 Over the next two years which applications areas will have the highest development priority in your company (e.g., Computer Integrated Manufacturing, Order Entry .....)

1. _____

2. _____

3. _____

Q5a Do you use a Data Base Management Systems in you organisation?

Yes	1	Q5b
No	2	Q5c

b. IF YES

Which one do you use?

ASK ALL

c. Are you planning to use a Data Base Management Systems/Planning to change your current systems?

Yes	1	Q5d
No	2	Q5c

IF YES

d. Which one are you planning to use?

	Use	Plan to Use In Future
DB2	1	1
DL1	2	2
IMS	3	3
TOTAL	4	4
SUPRA	5	5
IDMS	6	6
ADABAS	7	7
RAMIS	8	8
ADR/DATACOM	9	9
ORACLE	0	0
MODEL 204	X	X
OTHER (Please State)	V	V

_____

IF USE OR PLANNING TO USE DATA BASE MANAGEMENT SYSTEM

Q6 How important is it for your company to develop integration between application areas and your DBMS system?

PROBE: Why is that?

_____

_____

_____

ASK ALL

Q7a Do you use, or are you planning to use any software products that can be broadly described as Fourth Generation Languages? e.g., (All, AS, IDEAL, MAPPER, FOCUS, NATURAL)

USE	PLANNING TO USE	NOT USING
1	2	3

b IF PLANNING TO USE - Which products are these?

_____

_____

_____

c IF USE Have you encountered any particular problems when using these products? What else?

_____

_____

_____

Q8 I would now like to get your opinion on a range of important topics in data processing organisations - firstly: (READ OUT TOPIC ON LIST, ASK A - C FOR EACH TOPIC BEFORE MOVING ON TO NEXT)

A Do you currently use .....

B Are you planning to use ..... within the next two years?

C Do you consider ..... to be unimportant for your company?

Useful

Needed

or Very Important for your Company

	USE	PLANNING TO USE	UNIM-PORTANT	USE	NEED
An Information Centre	1	1	1	1	1
A Development Centre	2	2	2	2	2
Departmental Software:					
PC Based	3	3	3	3	3
Mini Based	4	4	4	4	4
Ask Q's for Both Types					
UNIX-Based Systems	5	5	5	5	5
Micro-to-Mainframe Links	6	6	6	6	6
Local Area Networks	7	7	7	7	7
PICK Based Systems	8	8	8	8	8
SW Productivity Tools	9	9	9	9	9

Q9 Can you also please rate your general level of satisfaction with software products on a scale of 1 = dissatisfied to 10 = very satisfied. READ OUT AREAS: WRITE IN

Systems Software _____

Applications Software _____

PC Software _____

Any Comments: _____

_____

PROCESSING SERVICES

Q10a Is your organisation a user of any of the following types of computer services? READ OUT LIST BELOW

b FOR EACH ONE USED .....Please can you rate your general level of satisfaction with the services you receive on a scale of 1 = dissatisfied to 10 = very satisfied.

	a. USE	b. RATING
Bureau Services		
Batch	1	
Remote Computing	2	
On-Site Hardware Services	3	
On-Site Data Base Services	4	
Communications Network Services (VANS)	5	
Facilities Management	6	
Any others e.g.,		
Disaster Recovery Printing Servcies RATE OTHERS	7	

_____

_____

Q11 In general, what do you think are:

a The three most important benefits to your organisation of using outside computer servcies?

1. _____

2. _____

3. _____

b and the three most serious drawbacks?

1. _____

2. _____

3. _____

PLEASE NOTE ANY OTHER COMMENTS

_____

_____

_____

_____

PROFESSIONAL SERVICES

Q12 a Moving on to the area of professional services, may I ask which of the following types of professional computer services does your organisation use? READ OUT

b FOR EACH ONE USED Please can you tell me your general level of satisfaction with the services you recieve on a scale of 1 = dissatisfied to 10 = very satisfied.

	a. USE	b. RATING
Consultancy	1	
Education and Training	2	
Custom System Development	3	
Contract Staff	4	
Are there any other professional services you use? RATE OTHERS _____	5	

Q13 In the area of Consultancy services, in which areas do you consider that your company could most benefit?

1. _____

2. _____

3. _____

TURNKEY SYSTEMS

Q14 a Does your company use or is it planning to use any "so-called" standard turnkey systems - i.e., complete hardware/software systems for a particular application?

Yes - Use	1
Yes - Planning	2
No	3

IN YES

b In what application areas CODE BELOW. PROBE FOR WHETHER PLANNING OR USE

c FOR EACH ONE USED. What is your general level of satisfaction with the services you receive on a scale of 1 = dissatisfied to 10 = very satisfied.

	PLANNING	USE	RATING
Production Control	1	1	
Project Management	2	2	
Business System	3	3	
CAD/CAM	4	4	
Other (Please State)	5	5	
_____			
_____			

Q15 a Have you purchased any equipment/systems from third-party suppliers, e.g., Value-Added Resellers, OEMs, Computer Dealers?

b IF PURCHASED What is level of satisfaction with the services received form .....on a scale of 1 = dissatisfied to 10 = satisfied.

	USE	RATING
Value-Added Resellers	1	
OEMs	2	
Computer Dealer	3	

Q16 For your organisation, what do you consider to be the three most important concerns about the telecommunications environment within which you have to operate?

1. _____

2. _____

3. _____

Finally, I should like to cover some classification and budget details.

Q17 a Can you please give me some indication of your total data processing budget for 1986? (excluding building and facility costs)

b How does this break down proportionally between the following areas (READ OUT), are there any other important budget areas which we have not mentioned? (WRITE IN PERCENTAGES)

c What changes do you anticipate in your budget for 1987, both in total and for particular segments, approximately?

d How does your software expenditure breakdown approximately between:

Systems Software?
Application Packages for Mainframes
Mini Computer
PC Software

	18b 1986 % Breakdown or Amounts of $	18c 1987 % Change
Personnel	_____	_____%
Communications (i.e., computer-related HW and SW)	_____	_____%
All Other Hardware	_____	_____%
All Other Hardware (Including Maintenance)	_____	_____%
Professional Services (e.g., Contract Staff, Custom Development)	_____	_____%
Other Services (WRITE IN) _____	_____	_____%
TOTAL (Q18A)	£_____	£_____

Don't Know _____

Refused _____

SOFTWARE EXPENDITURE BREAKDOWN:

Systems Software	_____%
Application Packages for Mainframes	_____%
Mini Computer	_____%
PC Software	_____%

Q18 Does your company purchase outside computer services that are not under the control of your own data processing management?

Yes 1

No 2

Q19 a And what was your company's total approximate expenditure in 1985 on processing services?

Q19 b And on professional services?

Q19 c Or any other computer services? WRITE IN AMOUNT

	DON'T KNOW	REFUSED
a) Processing _____	X	Y
b) Professional _____	X	Y
c) Other _____	X	Y

Q20 How many full-time Data Processing staff are employed by your company?

WRITE IN _____

Q21 What was you company's annual turnover (revenue) in 1985?

WRITE IN £_____

THANK YOU VERY MUCH INDEED FOR YOUR HELP!!

COMPLETE CLASSIFICATION AND CLOSE

APPENDIX E: RELATED INPUT REPORTS

APPENDIX E: RELATED INPUT REPORTS

- Artificial Intelligence - European Market Opportunities, 1986.
- Facilities Management Opportunities in Western Europe, 1986.
- Decision Support Systems - European Market Opportunities, 1986.
- Electronic Data Interchange - European Market Opportunities, 1986.
- Network Services Directions, 1986 (U.S.).
- IBM Operating Strategies, 1986 (U.S.).
- Impact of CD ROM on Information Services, 1986 (U.S.).
- Distributed Processing Services in the New Telecomputing Environment, 1986 (U.S).

APPENDIX F: FORECAST RECONCILIATION, 1985-1986

APPENDIX F: FORECAST RECONCILIATION, 1985-1986

- INPUT forecasts that the total information services markets for the four major country markets of France, Italy, West Germany, and the United Kingdom were $13,200 million in 1985 and will be $18,480 million in 1986.

- Measured in terms of U.S. currency, this represents a growth rate of 39%. However, it should be noted that a significant proportion of this growth is accounted for by changes in rates of foreign exchange, specifically the depreciation of the U.S. dollar against Western European currencies between 1985 and 1986.

- INPUT's assumptions about U.S. dollar conversion rates used in calculating the aggregate forecast are shown in Exhibit III-1 of this report.

- It should be noted that INPUT's forecast of market growth measured in terms of local currency between 1985 and 1986 show growth rates of 17% for France, 27% for Italy, 21% for the United Kingdom, and 20% for West Germany.

APPENDIX G: ITALIAN MARKET FORECAST DEFINITION

APPENDIX G: ITALIAN MARKET FORECAST DEFINITION

- In view of the complex interrelated structure of Italian industry and commerce, distinctions between captive and noncaptive revenues of computer services firms are more difficult to justify than in the other major Western European country markets. Consequently, INPUT has included captive revenues when assessing total market size and preparing lists of top ten vendor rankings.

- Names of companies and groups of companies included in the top ten vendor ranking tables are mentioned in the same manner as they are promoted in the marketplace. For example, companies within the Finseil Group, Sogei and Italsiel are mentioned as the holding company--Finseil Group. Companies owned by Olivetti (i.e., Syntax, SST, OIE, Unit, Elea, Sixcom, SSS, PBS, and Tesis) and Montedison (Datamont and Sime) are mentioned as the individual subsidiary companies.