


ANALYSIS OF THE EUROPEAN MARKET

FOR INFORMATION SERVICES

AND TELECOMMUNICATIONS, 1985-1990

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**MAJOR WESTERN EUROPEAN MARKETS
FOR INFORMATION SERVICES
ANALYSIS AND FORECASTS, 1985-1990**

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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 to comprise four major sectors--processing 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 1990. 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 279 pages, including 106 exhibits.

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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.

A. SCOPE OF THE REPORT

- This report reviews and analyses the four major sectors which constitute INPUT's definition of the information services market.
 - Processing 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 1985 and presents a medium- and longer-term forecast through 1987 and 1990 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 markets of France, Italy, the United Kingdom, and West Germany. The term 'Western Europe' is used throughout 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 in the course of 1985:
 - 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, 100 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.

- Efforts were made to include as wide a cross section of information services vendors as possible with a bias toward 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 through the medium of a mail questionnaire in France, the United Kingdom, and West Germany. In Italy user research was carried out by means of a telephone survey. The questionnaire is included in Appendix D.
- Altogether, some 86 user questionnaires were returned out of a total mailing of 2,228, representing a return rate of 3.8%.
- 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 this report are organised as follows:
 - Chapter II is an Executive Summary providing an overview 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 strategic issues that are of concern to and are likely to affect the development of the information services business. Two major areas are addressed:
 - The economic background.
 - The telecommunications environment.
 - Chapter V discusses other issues and analyses those that are of importance to the information services market. These are described under the broad classification of vendor and user issues.

- Chapter VI to IX provide more detailed analyses of each of the four main sectors of the information services defined by INPUT, respectively:
 - . Processing services in Chapter VI.
 - . Software products in Chapter VII.
 - . Professional services in Chapter VIII.
 - . Integrated systems in Chapter IX.

- 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 SUMMARY



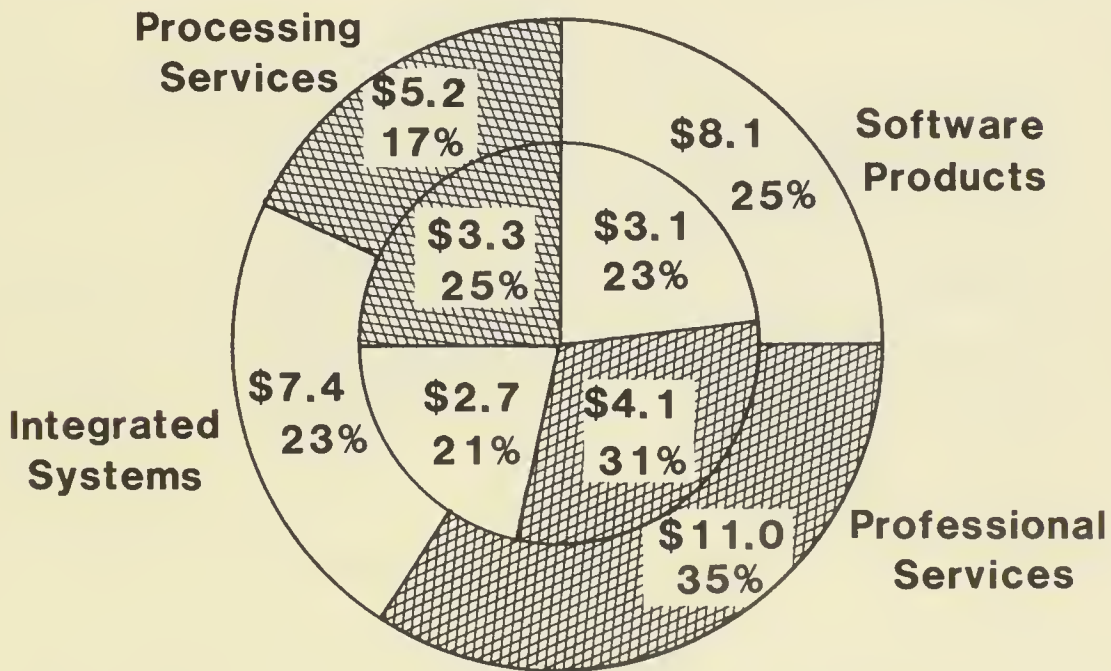
II EXECUTIVE SUMMARY

- This Executive Summary 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-10. On the left-hand page facing each exhibit is a script explaining its contents.

A. \$32 BILLION INFORMATION SERVICES MARKET BY 1990

- 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 \$13 billion in 1985.
- INPUT also estimates that this market will grow at an average annual growth rate (AAGR) of 19% to reach \$32 billion by 1990.
- The highest levels of growth will be in the integrated systems and professional services sectors--22% AAGR. Each will increase its absolute share of the market, largely at the expense of processing services.
- The software products sector is expected to grow at the slightly lower annual growth rate of 21% to represent a quarter of the market in 1990 (up from 23% in 1985).
- Processing services is expected to achieve only 10% annual average growth to 1990. Thus, this sector, representing 25% of the 1985 market, falls to a 17% share of the 1990 market.
- Each of these major industry sectors is discussed in more detail below.

**\$32B INFORMATION SERVICES MARKET BY 1990
(Western Europe)**

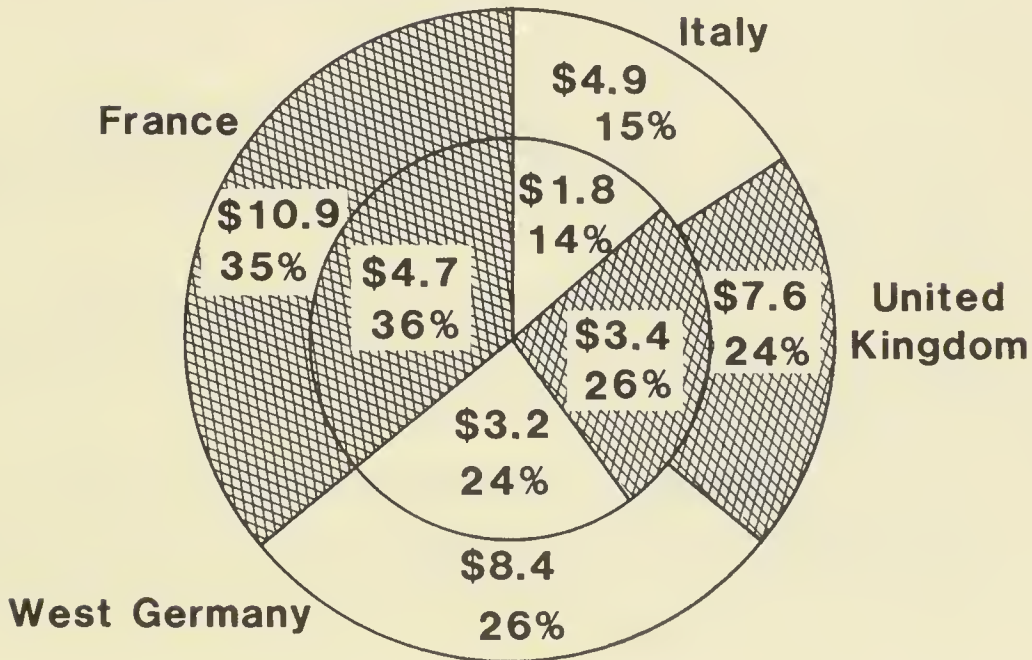


Total Market 1985 \$13.2 - 1990 \$31.7 (\$ Billions)

B. FRANCE IS LARGEST MARKET

- France continues to be the dominant country market for information services in Europe, accounting for 35% of the total market. INPUT forecasts that this proportion will be maintained through to 1990.
- The French market will grow at an annual average rate of 18% to reach \$11 billion in 1990.
- The highest rate of growth is likely to be in the Italian market where an AAGR of 22% is forecast. Despite this rate of growth, Italy remains the smallest of the four country markets at \$4.9 billion in 1990.
- A higher rate of growth (21% AAGR) in West Germany in comparison to that expected in the United Kingdom (17% AAGR) moves West Germany into the position of the second largest single-country market by 1990 at \$8.4 billion to the United Kingdom's \$7.6 billion.

FRANCE IS LARGEST MARKET

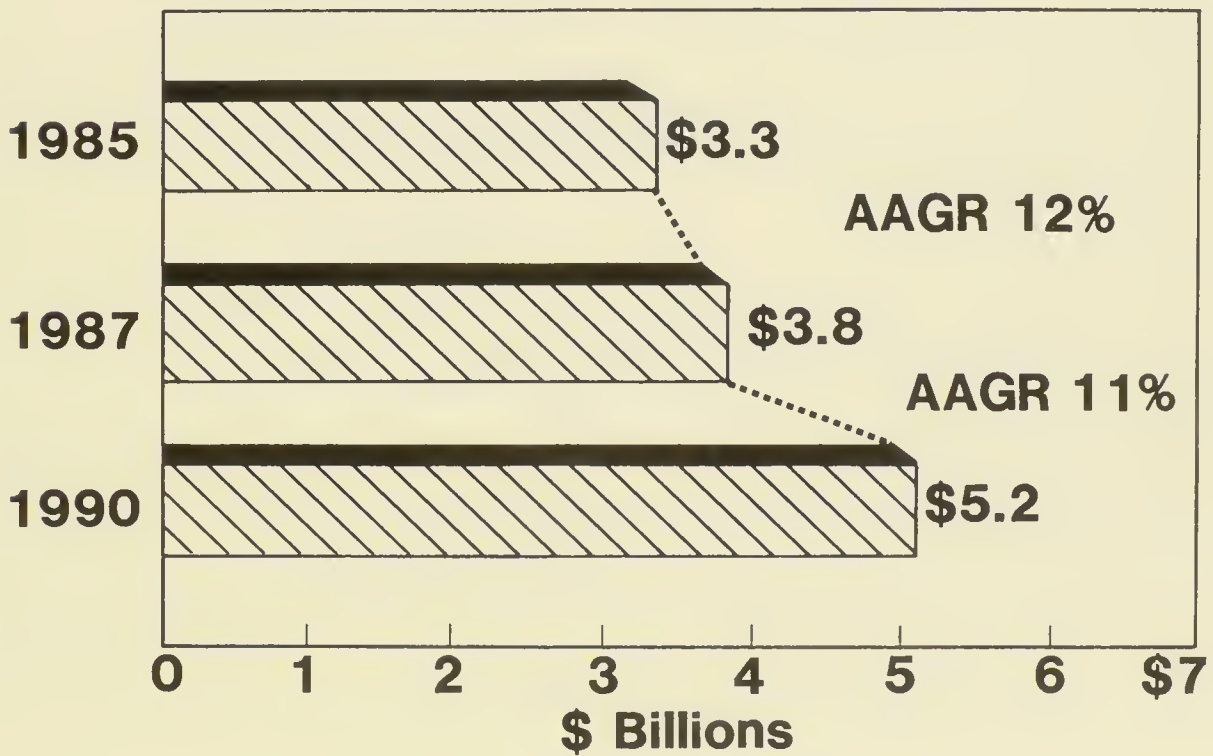


Total Market 1985 \$13.2 - 1990 \$31.7 (\$ Billions)

C. PROCESSING SERVICES REVENUE GROWTH

- INPUT forecasts that the processing services sector will achieve an AAGR of 10% to expand revenues from \$3.3 billion in 1985 to \$5.2 billion by 1990.
- The most significant driving force for growth during this five-year forecast period will be the convergence of computer and telecommunications technology.
- The development of communications network processing services, typically referred to as value-added network services (VANS), will provide a major new opportunity for services vendors.
- Processing facilities management and network facilities management could potentially be a major opportunity in Europe.
- More and more emphasis is being placed by vendors on the provision of more complex applications through the processing services delivery mode--applications that are more transaction-oriented rather than analytical, that are multiple rather than single-site, and that involve greater amounts of software.
- Processing services vendors must develop a total customer service that augments the basic delivery of processing power with consultancy expertise, software, and network systems.

**PROCESSING SERVICES REVENUE GROWTH
(Western Europe)**



D. REDEFINITION OF PROCESSING SERVICES

- The processing services sector is continuing to undergo a radical redefinition, primarily as a result of the:
 - Continuing cost/performance advances in minis and micros.
 - Convergence of computer and communications technologies.
- As higher levels of computing power can be more easily distributed throughout organisations, the traditional boundaries of processing services are becoming blurred.
- Increasing availability of computer/communications networks opens up completely new application areas.
- Consequently, processing services vendors are adjusting to these changed conditions with commercial partnerships and new services. Vendors must place increasing emphasis on providing solutions that are:
 - Comprehensive--that combine elements of distributed processing, network service, and applications software.
 - Flexible--that are customised to exact needs and are augmented with professional services support.
- Communications convergence is leading to the development of substantial new markets for value-added network services. This is a major factor leader to the entry of new competitors into the processing services markets; e.g., telecommunications suppliers and banks.

REDEFINITION OF PROCESSING SERVICES

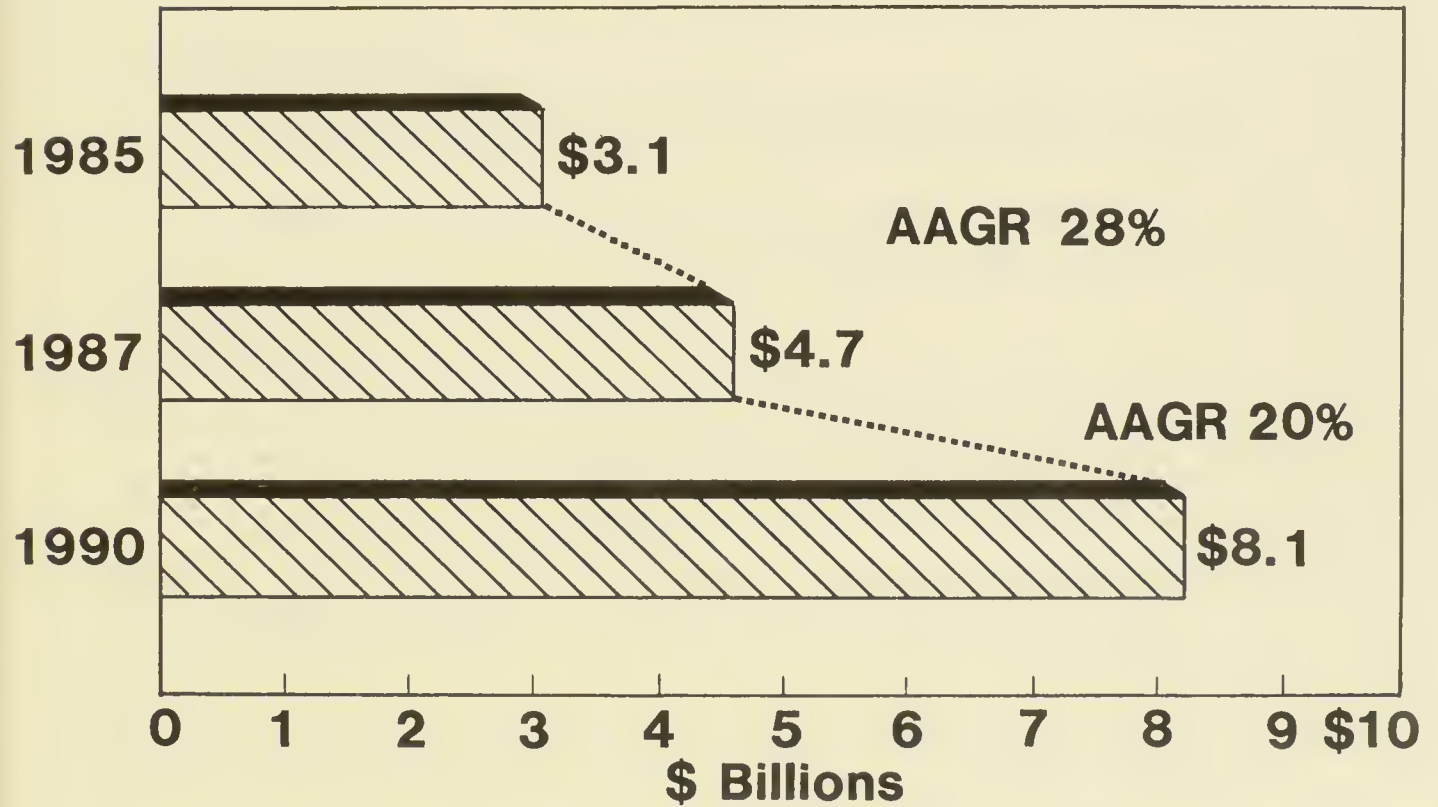
- **Minis/Micros**
 - **Comprehensive**
 - **Flexible**

 - **Communications Convergence**
 - **VANS**
 - **Competition**
-

E. SOFTWARE PRODUCTS REVENUE GROWTH

- INPUT forecasts that the recent rapid growth of the software products sector will decline during the next five years.
- The four country markets of France, Italy, the United Kingdom, and West Germany will reach \$4.7 billion in 1987, having grown from \$3.1 billion in 1985 at an AAGR of 28%.
- However, over the period 1987 to 1990, the AAGR of the market is expected to fall to 20% with the market size, exceeding \$8 billion in 1990.
- The myth of users' infinite capacity to absorb software products in the PC area with software as a consumable item has been exploded.
- Some resistance to the use of software applications packages is expected as fourth generation languages and other productivity aids swing the balance toward lower-cost, custom-built systems for large systems.
- Vendors are now facing a more realistic environment, but one which nevertheless promises excellent opportunities for good and well-supported products.

**SOFTWARE PRODUCTS REVENUE GROWTH
(Western Europe)**



F. KEY SOFTWARE VENDOR CHALLENGES

- A marked slowdown in the rate of growth in the software product markets is resulting in more testing conditions for software vendors.
- Software vendors are having to face up to a situation in which they must balance the conflicting requirements of:
 - Shortage of investment funds, but the need to invest heavily in new product development.
 - Shortages of skilled personnel, but the need to meet service and support requirements.
- Software vendors must place increasing emphasis on building up continuing revenue streams from service and support and product enhancement pricing mechanisms.
- Effort must be expended on developing comprehensive product portfolios, possibly through mergers and acquisitions.
- Key marketing challenges will be the establishment of a distinctive image amongst potential purchasers and the selection and manipulation of product distribution channels.
- Developing and retaining unique knowledge skills must also remain a long-term commitment.

KEY SOFTWARE VENDOR CHALLENGES

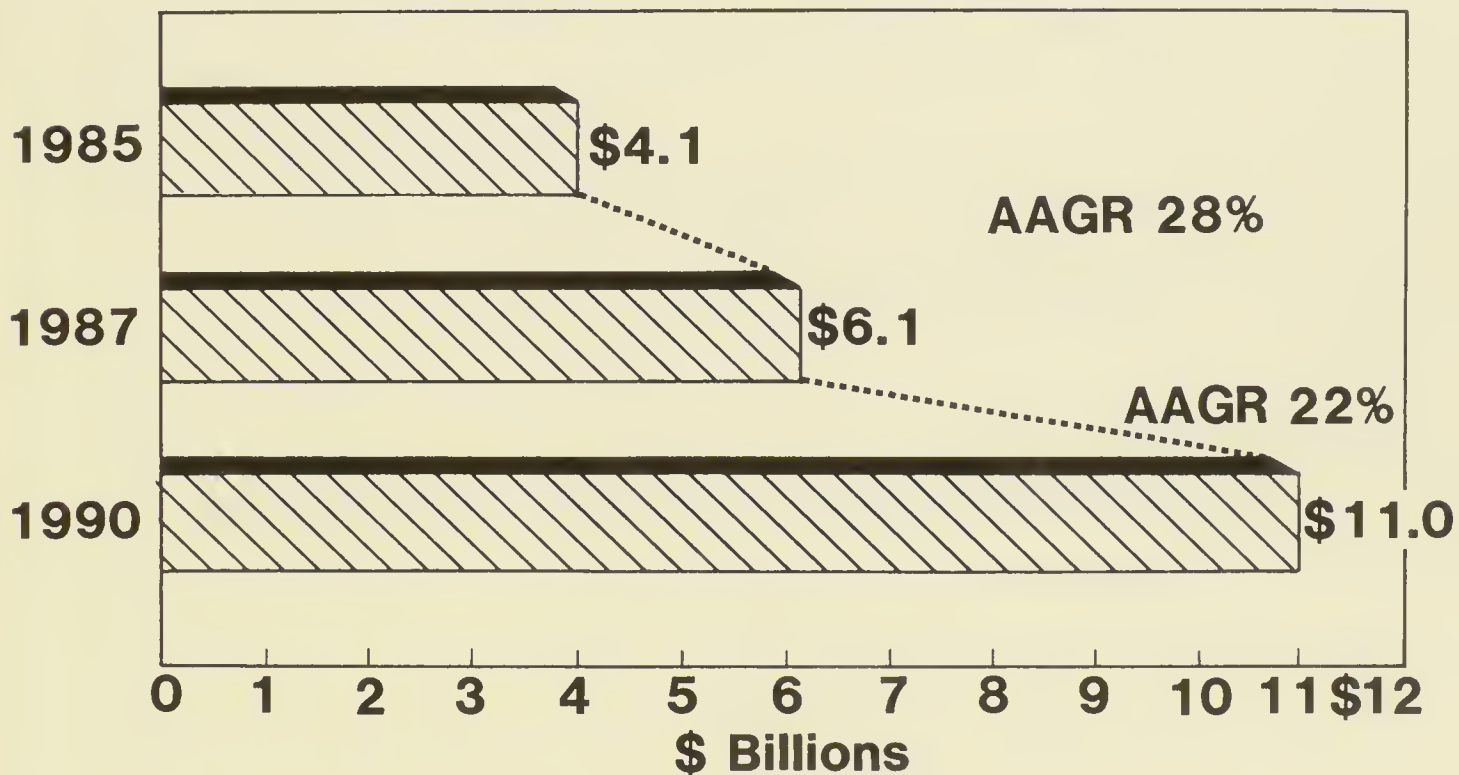
- **Balancing**
 - **Investment/New Product Development**
 - **Skills/Service and Support**

 - **Emphasizing**
 - **Continuous Revenue Streams**
 - **Product Portfolio**
 - **Marketing**
-

G. PROFESSIONAL SERVICES REVENUE GROWTH

- The growth rate for professional services is expected by INPUT to fall from around 28% (AAGR) between 1985 and 1987 to 22% between 1987 and 1990.
- This decline in growth rate can be attributed to a number of factors.
- On the supply side, constraints exist on the vendor's capability to maintain high growth rates in the medium term, particularly in the light of shortages of skilled manpower.
- On the demand side, the resistance amongst large European commercial organisations to the 'service solution' and the preference for the 'in-house' solution whenever possible continue. This factor is lessening but still influences growth of the sector.
- The increasing need for telecommunications network-based systems is a major driving force for the breakdown of this type of attitude.
- Despite this slowdown in the rate of growth, the professional services sector is expected to exceed \$6 billion in revenues by 1987, having grown from \$4 billion in 1985, and reach \$11 billion by 1990.

**PROFESSIONAL SERVICES REVENUE GROWTH
(Western Europe)**



H. PROFESSIONAL SERVICES DIRECTIONS

- The distinct boundaries that once separated the various sectors of the information industry are blurring as knowledge of the customers' system needs, rather than of a particular delivery mode, becomes the critical competitive issue.
- Consequently, professional services vendors are tending to develop and concentrate on areas of specialisation.
- This trend is opening up new opportunities for professional services companies which include systems integration, software product implementation services, and provision of software products.
- Increasing demand for large and complex systems, particularly with dependency on telecommunications networks, leads to the need for contractors prepared to take on overall responsibility for systems integration projects.
- More complex software applications and staff shortages lead to a need for more software product implementation services.
- The provision of software products based on system development contracts is already well established and is a natural complement to product implementation services.
- The development of business relationships with other services companies or equipment manufacturers will be an important factor for exploiting these new opportunities for many vendors.

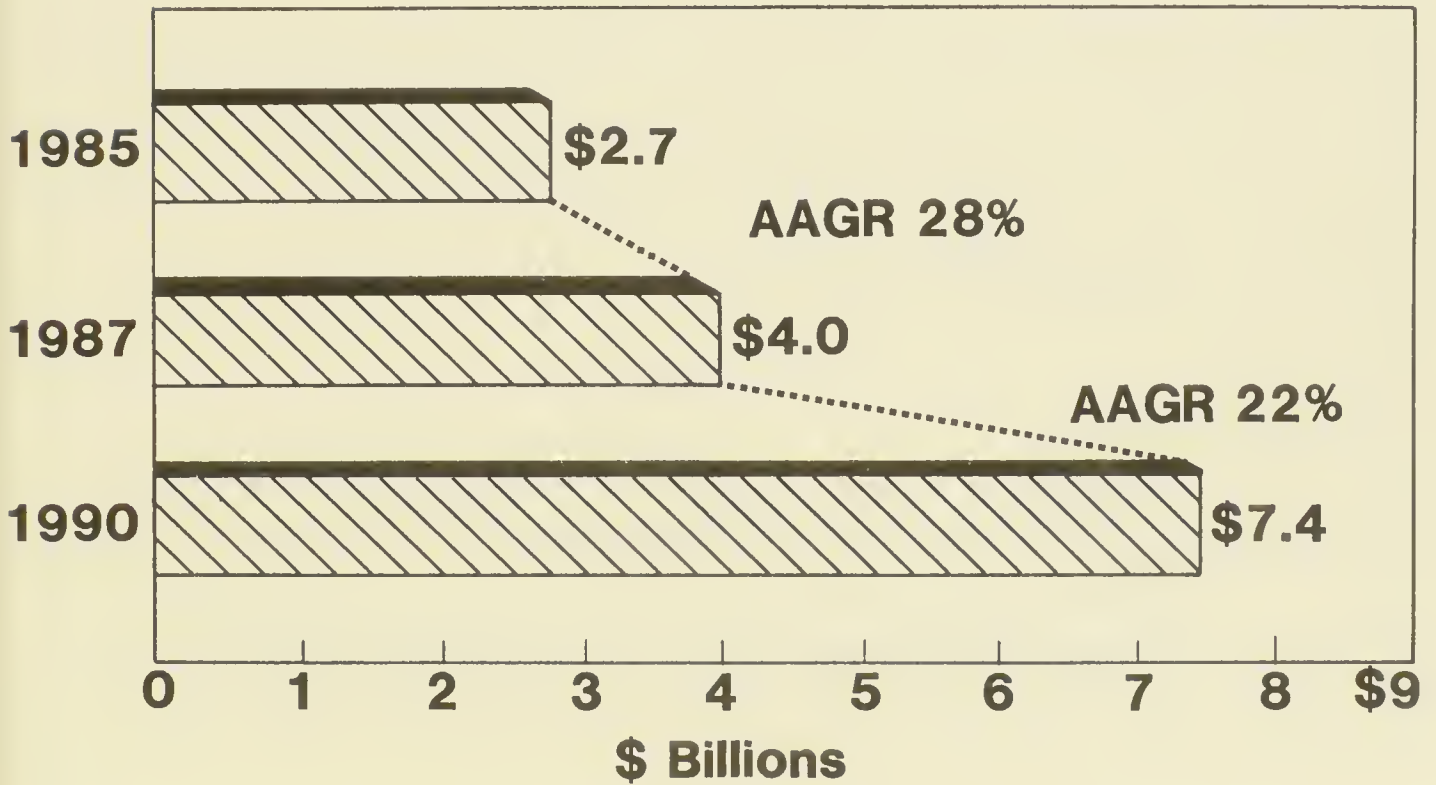
PROFESSIONAL SERVICES DIRECTIONS

- **Specialization**
- **Opportunities**
 - **Systems Integration**
 - **Software Product Implementation**
 - **Software Products**
- **Alliances/Joint Agreements**

I. INTEGRATED SYSTEMS REVENUE GROWTH

- The integrated systems market encompasses these 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 (28% AAGR) is being experienced in Europe. This is fueled by the wide availability of low-cost mini and personal computer systems and the needs of high-volume manufacturers to develop cost-effective distribution systems for their products.
- The increasing user need for more and more specialised applications systems and services is also a key driving force for this market.
- Over the five-year period to 1990, growth is expected to decline, largely as a result of increasing price pressure on hardware.
- INPUT forecasts that the market will reach \$7.4 billion in 1990, having reached \$4 billion by 1987 from its level of \$2.7 billion in 1985.

INTEGRATED SYSTEMS REVENUE GROWTH (Western Europe)



J. INTEGRATED SYSTEMS BUSINESS FACTORS

- Important driving forces for integrated systems growth are rapidly improving hardware system performance capabilities, the increasing specialised demands of users, and the complimentary need of equipment manufacturers to supply these markets.
- In order to operate successfully in this environment, vendors must study carefully the key business factors of:
 - Market segment selection.
 - Hardware and software system development.
 - Value-added service and support.
- The expansion of services outside the basic integrated system delivery mode (e.g., as processing services or software products) and the provision of professional services (e.g., customisation services) are important opportunities.
- The fall in equipment costs is presenting vendors with a strong challenge in system pricing. Strategies to cope with this challenge will include:
 - Offering more functionality in the software component and more installation support.
 - Developing into distributed systems with less self-contained 'integrated systems'.
- Vendors must therefore plan for changes in the types of added value that they offer as the balance between hardware, software, and professional services changes.

INTEGRATED SYSTEMS BUSINESS FACTORS

- **Driving Forces**
 - **Hardware Cost/Performance**
 - **Specialist User Needs**
 - **Manufacturer Distribution Channels**

 - **Services Expansion**
 - **More Functionality**
 - **System Distribution**

 - **Value-Added Components Change**
-

III MARKET ANALYSIS AND FORECAST

III MARKET ANALYSIS AND FORECAST

A. MARKET STRUCTURE

- The Western European information services market was researched during 1985, data from previous INPUT research was also considered, and the market was forecast for the five-year period 1985-1990. Market development for the 1984-1985 period was evaluated from face-to-face in-depth interviews with leading vendors in the information services business and supported by the collection of other public domain information.
- During 1985, INPUT has re-assessed its classification of the processing services sector to reflect the changing nature of this market, in particular the growing impact of computer and communications convergence and the emergence of value-added network services.
- Consequently, INPUT has redefined the processing services sector as comprising four modes:
 - Remote computing services (RCS).
 - Value-added network services (VANS).
 - Batch processing services.
 - Processing facilities management (FM).

- Software products were forecast:
 - By system and application packages.
 - By both independent suppliers and hardware vendors.

- Professional services were forecast for the following categories:
 - Consultancy.
 - Software development.
 - Education and training.
 - Contract 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 countries 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--5.3% per annum.
 - Italy--8.7% per annum.

- United Kingdom--5.9% per annum.
- West Germany--2.2% per annum.
- 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 3.2%.
- 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, 1985-1990

- INPUT forecasts that the Western European information services market will grow from \$13 billion in 1985 to nearly \$19 billion in 1987, representing an annual average growth rate (AAGR) of 19%.
- In the period up to 1990, INPUT forecasts growth continuing at around 20% AAGR to reach a market size just under \$32 billion by 1990.
- Exhibit III-2 shows the breakdown of these market size and growth projections for the four individual country markets studied in this report.

EXHIBIT III-4

COMPARISON OF INFORMATION SERVICES MARKETS
BY COUNTRY IN WESTERN EUROPE, 1984-1990

COUNTRY	MARKET FORECAST (\$ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
France	\$3,460	\$4,721	24%	\$6,600	18%	\$10,936
Italy	1,379	1,838	23	2,560	24	4,923
United Kingdom	2,518	3,397	25	4,699	17	7,586
West Germany	2,434	3,247	26	4,809	20	8,368
Total	\$9,791	\$13,203	24%	\$18,668	20%	\$31,813

EXHIBIT III-5

COMPARISON OF INFORMATION SERVICES MARKETS BY MARKET SECTOR
IN WESTERN EUROPE, 1984-1990

MARKET SECTOR	MARKET FORECAST (\$ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Processing Services	\$2,681	\$ 3,292	12%	\$ 3,801	11%	\$ 5,248
Software Products	2,250	3,140	28	4,670	20	8,093
Professional Services	2,912	4,062	28	6,142	22	11,033
Integrated Systems	1,948	2,709	28	4,055	22	7,439
Total	\$9,791	\$13,203	24%	\$18,668	19%	\$31,813

- INPUT estimates that France's share of the combined four major country markets will remain at around 35% throughout the five-year period to 1990.
- The French information services industry is relatively more developed than in other Western European countries with the top nine vendors all exceeding \$50 million in annual revenues during 1984.
- The largest French services company, as measured by total international revenues, remains CAP GEMINI SOGETI which has adopted an aggressive acquisition strategy, most recently taking over the consulting division of the U.S. services vendor CGA.
- This takeover effectively doubles CAP GEMINI SOGETI's U.S.-sourced revenues and takes U.S. revenues to a position where they generate approximately one-third of total company revenues.
- Exhibit III-6 shows the breakdown of the French information services market across the four main segments of the information services business.
- Growth in the processing services sector is expected to maintain an average annual rate of around 10% to 1987 and to then increase at an annual rate of 12% up to 1990.
- The development of value-added network services (VANS), in particular VIDEOTEX, will be the most significant driver of this growth.
- In the other three market segments of software products, professional services, and integrated systems a slight decline in the rate of growth is forecast for this five-year period. Annual growth of around 25% is expected to fall to around 22% to 23%.
- This relative decline can largely be attributed to the fact that the market is already well developed in France; however, some other factors of importance are:

EXHIBIT III-6

INFORMATION SERVICES MARKET FORECAST, 1984-1990
FRANCE

MARKET SECTOR	MARKET FORECAST (FF Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Processing Services	FF 9,007	FF10,064	10%	FF 11,899	12%	FF 16,505
Software Products	5,550	7,050	25	10,900	22	20,000
Professional Services	10,260	12,680	25	19,800	23	37,200
Integrated Systems	6,410	8,000	25	12,500	23	23,500
Total	FF 31,227	FF37,794	21%	FF 55,099	21%	FF 97,205

- The ability of French user organisations to absorb new information processing systems.
- Increasing shortages of professional staff.
- Difficulties in funding investment of new products, services, and vendors. The low availability of venture capital may be a significant factor here.
- There is still a tendency for French user organisations to be reluctant to use software packages, and much more emphasis has therefore been placed on custom-built solutions whether developed in-house or contracted out.
- The vendors in general view the development of applications products as a high-risk area because of these user attitudes and the high-investment, low-margin situation that prevails.
- The overall economic environment for France remains problematical in the light of the parliamentary elections which took place in March 1986. These open up the possibility of a right-wing national assembly and a Socialist president.
- Contentions in economic and political issues that could potentially have some impact on the information services industry are:
 - Economic liberalisation through the lifting of price and exchange controls.
 - Privatisation of industries previously nationalised by the Socialists.
 - The easing of restraints on redundancy terms for employees.

- Although France has had considerable success in reducing inflation, generally expected to be about 6% in 1986, GNP growth has slowed to an annual rate of around 2%.
- Vendors are in general fairly cautious in respect of the market prospects and continue to place emphasis on rationalisation and consolidation measures to ensure that their businesses are soundly based in areas that they know and understand well.

2. ITALIAN MARKET DEVELOPMENT

- The Italian information services market continues to show strong growth, albeit that it is the least developed of the major European country markets. Exhibit III-7 shows the expected development of the Italian market through to 1990.
- Growth is expected to continue at a high rate (up to 31% AAGR) over this period as a relative 'catching-up' process occurs in respect to the other European information services industries.
- The principal reasons for the delay in the development of the Italian market have included:
 - Low availability of information services to users.
 - The poor telecommunications infrastructure.
 - The lack of government support for the industry, both in terms of direct financial support and the optimisation of government contract placements.
 - A lack of direct investment in the information services industry by major industrial and commercial groups.

EXHIBIT III-7

INFORMATION SERVICES MARKET FORECAST, 1984-1990
ITALY

MARKET SECTOR	MARKET FORECAST (£ Billions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Processing Services	£ 743	£ 856	15%	£ 1,145	18%	£ 1,890
Software Products	627	820	29	1,350	28	2,817
Professional Services	600	842	35	1,460	35	3,638
Integrated Systems	549	734	26	1,100	41	3,054
Total	£ 2,519	£ 3,252	26%	£ 5,055	31%	£ 11,399

- A propensity for user organisations to use 'in-house' services rather than contract for an outside service.
- INPUT now considers that the influence of the above factors will decline in the face of newly emerging positive growth factors, such as:
 - A growth in interest in and the availability of investment funds from major groups, such as Fiat, Pirelli, Montedison, and Olivett; and large public groups, in particular in the telecommunications sector.
 - The entry of new vendors, both Italian and foreign-based (particularly from the U.S.).
 - Increasing commercial activity by predominantly 'captive revenue'-dominated vendors (for example, ENIDATA, SIME, FINSIEL, etc.) on the open market.
 - Considerable development of the telecommunications infrastructure as demonstrated by the Videotel and Itapac initiatives.
- There is also a greater acceptance of information services amongst users which strengthens demand for the new services becoming available.
- As can be seen from Exhibit III-7, the processing services sector is still the largest of the four sectors, but its dominance is being eroded by a contraction of services in batch processing and data entry. Processing services represented 26% of the total information services market in 1985 against 29% in 1984.
- However, as in Europe in general, the positive growth of new processing services such as on-line data bases and in particular the development of VANS will, it is expected, lead to growth that averages out at 17% per year to 1990.

- Growth in the software products sector is still rapid at around 29% per annum. This growth has been relatively more recent than in the other major country markets and can therefore be expected to be maintained for several more years before the inevitable levelling of demand occurs.
- The professional services sector continues to maintain a high rate of growth, in excess of 30% per annum, which will result in its accounting for approximately 32% of the total market by 1990, up from just under 26% in 1985.
- Demand for custom-built specialist systems rather than a reliance on standard application package solutions will be a major factor in this growth. The need for specialised consultancy and development work in areas like telecommunications and factory automation will also be an important factor.
- The integrated systems sector will continue to maintain a high level of growth in the forecast period to 1990. Principal driving forces for growth will be:
 - The availability of new low-cost systems, personal computers, and minicomputers that will extend the market into larger potential areas.
 - The development of new types of specialist systems, in particular industrial automation and communications.
 - The distribution needs of hardware vendors.
- These factors are expected to be particularly strong in Italy leading to accelerated growth in the period between 1987 and 1990.
- The Italian economy continues to make some progress, despite the overwhelming issue of the reduction of the vast public sector deficit.

- Real growth in GNP continued at around 2% in 1985 after growth of 2.6% in 1984. The inflation position has improved considerably. The expected 9% rate to be recorded for 1985 follows a long period of double-figure rates.
- Clearly these unsettled economic conditions do not help Italian information services vendors. However, the overall size of the information services industry in comparison to the whole economy, the strong user demand for information systems and services, and more aggressive marketing by vendors will ensure strong growth over the next five years.

3. UNITED KINGDOM MARKET DEVELOPMENT

- INPUT forecasts that in 1985 the United Kingdom market will reach nearly 2.4 billion pounds, having grown at over 20% from 1984. Further, INPUT forecasts that this market is likely to exceed 6 billion pounds in 1990.
- This forecast, illustrated in Exhibit III-8, shows growth for the four major constituent sectors over the 1985 to 1990 timeframe.
- Processing services are assessed as being the third largest sector in 1985, and this sector currently shows the lowest level of growth (6% from 1984 to 1985). This follows a period of stagnation in the earlier years of this decade.
- INPUT expects, however, that higher growth will be achieved in the years ahead, driven by increasing availability of and demand for network processing services, generally referred to as the VANS market.
- Other important factors expected to be driving growth in processing services are increased development of on-line data base systems and processing facilities management.
- The software market is forecast by INPUT to maintain a rate of growth of around 20% per annum up to 1990.

EXHIBIT III-8

INFORMATION SERVICES MARKET FORECAST, 1984-1990
UNITED KINGDOM

MARKET SECTOR	MARKET FORECAST (£ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Processing Services	£ 465	£ 493	8%	£ 587	14%	£ 874
Software Products	497	600	21	875	20	1,515
Professional Services	656	827	25	1,290	23	2,385
Integrated Systems	372	460	25	730	21	1,300
Total	£ 1,990	£ 2,380	22%	£ 3,482	20%	£ 6,074

- Professional services markets are expected to show the highest level of growth.
- INPUT forecasts that a growth rate of 23% per annum will be maintained over the five-year period to 1990. Software development and education and training are likely to show the highest growth potential.
- Driving this growth is the increasing dependence of organisations on data and information processing.
- Not only is basic data processing a vital part of the infrastructure for nearly all medium and large organisations, but managements have become increasingly aware of the competitive advantages of information processing.
- The integrated systems factor is forecast to grow at the second highest rate overall (21% AAGR) to reach 1.3 billion pounds by 1990.
- Growth in this sector will be generated by a number of factors, principally:
 - Strong demand for CAD/CAM and other factory automation systems.
 - Increased demand for specialised, industry-specific systems.
 - Increasing use of VAR (value-added reseller) channels by equipment suppliers as the solution to high selling costs and the desire to achieve high-volume sales.
- The information services industry in the United Kingdom is now facing up to a period of development in an increasingly complex and challenging environment. The principal driving forces of this are:

- Liberalisation of the telecommunications environment.
- A rationalisation of the electronics market amongst large vendors.
- Liberalisation of the City of London financial institutions.
- The privatisation of British Telecom and the creation of Mercury (a part of Cable and Wireless) as a competitor has given enormous impetus to the development of VANS.
- Thus, the convergence of computers and communications is having a deep impact on the nature of the processing services sector. This market is developing towards network processing, and as a result, new competitors are presenting a challenge to the existing vendors operating in this area.
- The CSA (Computer Services Association) has recently mounted a campaign to reorientate its members to this challenge and to gain wider acceptance for processing services amongst the buying public.
- The rationalisation of the electronics market has also been driven to some extent by convergence. The takeover of ICL by STC and the latest manifestation, GEC's bid for Plessey, are evidence of the need for economies of scale to build equipment manufacturers capable of competing in these new markets.
- Liberalisation of the 'City of London', culminating in the 'big bang' of Autumn 1986, is particularly significant for the information services industry.
- Not only are the financial institutions very large buyers of information services, they are also potentially competitors.
- The U.K. market is clearly offering many new opportunities for information services vendors, but the competitive environment is increasingly challenging.

- Vendors will need to place increasing emphasis on such considerations as:
 - Careful marketing planning.
 - Market segmentation.
 - Joint agreements and partnerships.
- The overall economic situation in the United Kingdom is dominated by the general decline of the manufacturing industry and the concurrent high unemployment. The structural changes that have led to this growth have occurred against a backdrop of very slow overall economic growth.
- In the 1970s, GDP grew in real terms by little more than 12%. In the five years since 1979 it has grown by barely 3%.
- The most interesting conclusion from a sectoral analysis of the U.K. economy is that the increase in output of services in the decade to 1984 was equivalent to about 80% or more of the total increase in GDP.
- Moreover, the expansion of financial services alone accounted for nearly half the total increase in output. Energy, principally North Sea oil and gas, was the other main engine of growth in the decade to 1984.
- The counterpoint to the expansion of North Sea oil and services was the contraction of manufacturing and construction.
- The economic evidence suggests that despite the change of government in 1979, when the Conservative party was returned to power with Mrs. Thatcher as Prime Minister, the most important industrial trends of the 1980s--the expansion of oil, the decline of manufacturing, and the growth of financial services--were firmly established in the second half of the 1970s.

4. WEST GERMAN MARKET DEVELOPMENT

- West Germany represents the paradox of having the largest computer equipment marketplace of all countries in Western Europe but a relatively undeveloped information services market.
- This phenomena has been most prevalent in the processing services sector, where the use of outside services is generally viewed as a second-best solution and in-house development is always preferred if economically possible.
- The development of the information services market in West Germany is shown in Exhibit III-9. Overall growth of around 20% per annum is forecast by INPUT for the five-year period to 1990.
- The processing services sector is expected to show stronger growth in this period in line with the trends towards more communications network-based services.
- One of the important developments in this area has been the realisation of Bildschirmtext (Btx), the Deutsche Bunderpost's videotex system.
- West Germany now prides itself on having the third largest terminal base in European videotex, which INPUT has estimated as reaching 40,000 units by the end of 1985.
- The service bureau industry expects this number to continue rising steadily and the general view is that the Bunderpost's decision to allow third-party systems and services to link to the network is the guarantee of long-term success for Btx.
- INPUT is predicting annual average growth of 26% per year for videotex processing services within an overall VANS market which, from a very low overall base, should grow in excess of 100% per year to 1990. This prediction

EXHIBIT III-9

INFORMATION SERVICES MARKET FORECAST, 1984-1990
WEST GERMANY

MARKET SECTOR	MARKET FORECAST (DM Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Processing Services	DM 2,025	DM 2,235	9%	DM 2,619	13%	DM 3,752
Software Products	1,950	2,460	25	3,850	21	6,800
Professional Services	1,812	2,150	22	3,300	22	5,700
Integrated Systems	1,370	1,670	24	2,600	21	4,600
Total	DM 7,157	DM 8,515	20%	DM 12,369	19%	DM 20,852

assumes some level of further liberalisation moves by the Bunderpost are likely during this period.

- In the software products sector, growth is expected to decline as a result of the widespread phenomenon of market saturation. The dominance of IBM standardisation, with Siemens, the major local equipment supplier, being IBM compatible, creates a considerable market for IBM systems software products.
- An important area of growth in the West German market will be the integrated systems sector, not only because of equipment manufacturers' need to develop system house distribution networks to achieve volume sales, but also because of a greater level of demand in Germany for complete solutions.
- CAD/CAM and industrial automation are thus important development areas for integrated systems. Process control and material control systems offer particular potential.
- The demand for complete solutions will also drive strong growth in the professional services sector, but a potential inhibitor is the shortage of skilled data processing professional staff. Office automation and communications have been singled out as areas of particular concern in this regard.
- As in the United Kingdom, the major economic problem facing the West German federal government is unemployment, which has now risen to some 8.4% of the workforce.
- Although the government is planning various tax-cutting measures as an aid to the reduction of unemployment, it is generally considered that they will be neutralized by further reductions in the federal government deficit.
- Further tax cuts are unlikely, despite foreign pressure, since the West German economy is growing at an acceptable 2.5% to 3.0% per annum in real terms. West Germany maintains a very strong surplus on its external trade balance.

- An interesting footnote to the development of the information services industry in West Germany is the increased levels of job mobility of managerial and technical data processing staff, in line with the shortages mentioned above.
- A number of the vendors interviewed referred to the 'brain drain' away from the heavily industrialized north to the southern countryside of Bavaria.

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 1984.
 - 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, the top 10 vendors in each of the four main sectors of the information services industry.

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 both computer hardware and 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.

THE TOP TWENTY INFORMATION SERVICES VENDORS IN
WESTERN EUROPE IN 1984

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (\$ Millions)
1	IBM-INS	1.38%	\$135
2	SG2	1.35	133
3	CISI	1.22	120
4	SCICON	1.13	111
5+	THORN EMI IT	1.02	100
5+	CAP GEMINI SOGETI	1.02	100
7	DATEV	1.00	98
8	GSI	0.91	89
9	REUTERS	0.88	86
10	CCMC	0.82	80
11	SLIGOS	0.78	77
12	GEISCO	0.75	74
13	COMPUTERVISION	0.73	72
14	TELESYSTEMES	0.67	66
15	SEMA-METRA	0.62	61
16	EDS	0.60	59
17	SYSTIME	0.56	55
18	SESA	0.55	54
19+	STERIA	0.45	44
19+	HOSKYNS	0.45	44
	OTHERS	83.11	\$8,133
TOTAL MARKET		100.00%	\$9,791

EXHIBIT III-11

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 INFORMATION SERVICES
 FRANCE

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (FF Millions)
1	SG2	3.84%	FF 1.200
2	CISI	3.00	940
3	CAP GEMINI SOGETI	2.46	769
4	GSI	2.43	760
5	CCMC	2.30	718
6	SLIGOS	2.22	693
7	TELESYSTEMSES	1.92	600
8	SEMA-METRA	1.76	550
9	SESA	1.57	490
10	STERIA	1.28	400
	OTHERS	77.26	24,127
TOTAL MARKET		100.00%	FF 31,247

EXHIBIT III-12

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 INFORMATION SERVICES
 ITALY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	FINSIEL	10.60%	£ 267,000
2	ENIDATA	4.29	108,200
3	DATA MANAGEMENT GROUP	2.20	55,400
4	SYNTAX	1.59	40,200
5	DATAMONT	1.59	40,100
6	CNI (CONSORZIO)	1.43	36,000
7	GEIS	1.37	34,600
8	SOPIN	1.02	25,800
9	SIME	0.91	22,900
10	GE-DA GROUP	0.89	22,600
	OTHERS	74.11	1,866,200
TOTAL MARKET		100.00%	£ 3,419,000

EXHIBIT III-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 INFORMATION SERVICES
 UNITED KINGDOM

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	THORN EMI IT	3.98%	£ 76
2	SYSTIME	2.09	40
3	EDS	1.99	38
4+	HOSKYNS	1.83	35
4+	REUTERS	1.83	35
6	LOGICA	1.57	30
7	CENTRE-FILE	1.52	29
8	CAP	1.51	29
9	SCICON	1.46	28
10	IBM-INS	1.41	27
	OTHERS	80.81	1,543
TOTAL MARKET	OTHERS	100.00%	£ 1,910

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
INFORMATION SERVICES
WEST GERMANY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (DM Millions)
1	DATEV	4.33%	DM 310
2	IBM-INS	2.33	160
3	TAYLORIX	2.02	145
4+	SCS	1.39	100
4+	COMPUTERVISION	1.39	100
6+	ADV ORGA	0.85	61
6+	GEI	0.85	61
8	REUTERS	0.84	60
9+	MBP	0.78	56
9+	KIENBAUM	0.78	56
	OTHERS	84.54	6,048
TOTAL MARKET		100.00%	DM 7,157

EXHIBIT III-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROCESSING SERVICES

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (\$ Millions)
1	IBM-INS	5.03%	\$135
2	DATEV	3.65	98
3	CISI	3.35	90
4	REUTERS	3.21	86
5	GSI	3.06	82
6	GEISCO	2.65	71
7	CCMC	2.35	63
8	SG2	2.05	55
9	SLIGOS	1.56	42
10	DATASOLVE (THORN EMI IT)	1.42	38
	OTHERS	71.67	1,921
TOTAL MARKET		100.00%	\$2,631

EXHIBIT III-16

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
SOFTWARE PRODUCTS
(Independent Vendors)

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (\$ Millions)
1	THORN EMI IT	2.22%	\$20
2+	SG2	2.00	18
2+	COMPUTER ASSOCIATES	2.00	18
2+	SOFTWARE AG	2.00	18
5+	CINCOM	1.89	17
5+	MBP	1.89	17
7	SCICON	1.78	16
8	ADV ORGA	1.55	14
9+	SEMA	1.44	13
9+	CGI	1.44	13
	OTHERS	81.79	735
TOTAL MARKET		100%	\$899

EXHIBIT III-17

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROFESSIONAL SERVICES

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (\$ Millions)
1	CAP GEMINI SOGETI	2.64%	\$77
2	FINSIEL	2.40	70
3	SCICON	2.09	61
4	EDS	2.02	59
5	SG2	1.99	58
6	SEMA	1.37	40
7	LOGICA	1.16	34
8+	THORN EMI IT	1.03	30
8+	CISI	1.03	30
10	SYSECA	0.96	28
	OTHERS	83.31	\$2,425
TOTAL MARKET		100.00%	\$2,912

EXHIBIT III-18

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
INTEGRATED SYSTEMS

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (\$ Millions)
1	COMPUTERVISION	3.69%	\$72
2	SYSTEME	2.82	55
3	INTERGRAPH	2.05	40
4	CALMA	1.23	24
5	APPLICON	1.18	23
6+	RACAL REDAC	1.13	22
6+	SESA	1.13	22
8+	SLIGOS	0.97	19
8+	MBS	0.97	19
10	METIER	0.92	18
	OTHERS	83.91	1,634
TOTAL MARKET		100.00%	\$1,948

EXHIBIT III-19

COMPARISON OF U.S. AND WESTERN EUROPEAN
INFORMATION SERVICES MARKET DEVELOPMENT, 1984-1990

MARKET SECTOR		MARKET FORECAST (\$ Billions)			
		1984	1985	1984-1990 AAGR	1990
Processing Services	U.S.	\$15.2	\$17.3	16%	\$36.6
	W.E.	\$ 2.7	\$ 3.3	12%	\$ 5.2
Software Products	U.S.	11.1	13.3	25	41.2
	W.E.	2.2	3.1	24	8.1
Professional Services	U.S.	8.8	10.5	20	26.3
	W.E.	2.9	4.1	22	11.0
Integrated Systems	U.S.	6.4	7.4	19	17.4
	W.E.	1.9	2.7	23	7.4
Total	U.S.	\$41.5	\$48.5	20%	\$121.5
	W.E.	\$ 9.7	\$13.2	20%	\$31.7

IV STRATEGIC ISSUES

IV STRATEGIC ISSUES

A. 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.
- As INPUT reported last year, 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 0.58% of the Gross Domestic Product (GDP). In contrast, in the United States the information services business represents 1.25% of GDP.

EXHIBIT IV-1

COMPARATIVE ECONOMIC STATISTICS, 1984

	FRANCE	ITALY	UNITED KINGDOM	WEST GERMANY	TOTAL	U.S.
Cross Domestic Product (\$ Billions)	\$444	\$297	\$382	\$573	\$1,696	\$3,311
Current Level of GDP Growth (Percent)	+1.0%	+1.3%	+3.3%	+3.4%	-	+2.7%
Size of Information Services Business	3.46	1.38	2.52	2.43	9.79	4.15
Percent of GDP	0.78%	0.46%	0.66%	0.42%	0.58%	1.25%
Total Working Population (Millions)	23.2	22.8	26.6	26.9	99.5	113.5
Total Employed in Service Industries (Millions)	12.3	10.9	15.2	13.0	51.4	71.6
Percent Service Employees of Total Working Population	53%	48%	57%	48%	52%	13%
Current Inflation Rate (Percent)	+5.3%	+8.7%	+5.9%	+2.2%	-	+3.2%

- 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.

B. TELECOMMUNICATIONS ENVIRONMENT

I. FRANCE

- The PTT authority for communications, the Direction Generale des Telecommunications (DGT), is the monopoly provider of all telecommunications facilities in France. The DGT has gained some achievements in the last few years, notably:
 - Early installation of digital telephone exchanges.
 - The successful development of a consumer-oriented videotex service.
 - The development of the TRANSPAC X.25 network.
 - An aggressive position towards new communications methods with the launch of the Telecom I satellite.
- One of the key trends amongst the world's national communications authorities has of course been deregulation or liberalisation of some form. France shows apparently no signs of going down that route as links between the DGT and the government are very strong; for example, the DGT helps fund general industrial investment in the electronics industry in France.

- It is considered very unlikely that even any change in the French government's ruling political party would lead to deregulation in the medium term. Jacques Dondoux, head of the DGT, has been publicly quoted as favouring anti-deregulation initiatives.
- Recently, the French telecommunications industry has been beset by some reverses; for example, in the international sales of equipment and by the well-publicised problems of TRANSPAC during the summer of 1985.
- In this latter respect the French industry can really be seen as a victim of its own success.
- The strong initiatives in such areas as electronic banking, the smart card, and Minitel, particularly the latter, have placed considerable demands on the TRANSPAC network, sufficient for it to be closed down temporarily. One commentator was caused to remark '(this problem) was a sign, not of failure, but of an unprecedented success and a quantum leap in this nation's inter-connectivity'.
- The TRANSPAC network, based on the X.25 CCITT recommendation for packet switching, has grown at approximately 50% per annum since its inception in 1978 and now has approximately 24,000 dedicated ports and is claimed to transmit about 300 billion characters a month.
- Since the beginning of 1985, X.25 (X.32) synchronous dial-up telephone lines at 2,400 and 4,800 bauds have been possible in addition to the dial-up telephone access at 300 and 1,200 baud already available.
- Moves towards the development of an ISDN within France are somewhat fragmented. Three services have been announced by the DGT which represent moves towards the evolution of an ISDN. These are:

- TRANSFIX.
 - TRANSDYN.
 - TRANSCOM.
- TRANSFIX is a system of leased digital circuits at medium and high speed (48 Kbits/second to 2 Mbits/second).
 - TRANSDYN offers nonpermanent digital circuits from 2,400 bits/second to 2 Mbits/second which can be established by switching on demand in point-to-point or broadcasting mode.
 - TRANSCOM is a dial-up service which operates at 64 Kbits/second and was anticipated to be available by the end of 1985.
 - Moves towards ISDN are expected to include a pilot network to be installed by the end of 1986 and widespread availability of digital transmission integrating voice and data at 144 Kbits/second by the end of the decade.
 - Currently, it is claimed that 50% of transit switching centres, 50% of transmission trunks, and 45% of user equipment is based on digital technology.
 - In respect of international telecommunication standards, the DGT are committed to a policy of compliance except in respect of videotex where none exist. The standards being adopted include:
 - X.25.
 - X.21 and V.35.
 - CCITT No. 7 standard and S-interface.

- ISO 7-layer protocol recommendations.
- CCITT Teletex recommendations.
- X.400 protocol for interconnection between private messaging systems.

2. ITALY

- Within the worldwide environment of rapid change in telecommunications, Italy is responding only slowly. Although changes are beginning to happen, the Italian communications environment is a long way behind the rest of Europe.
- For example, some comparative statistics show:
 - There are 30% fewer telephones per head in Italy than in West Germany.
 - Almost all exchanges are electromechanical.
 - There are only half the number of telex subscribers as in France and one-third the number as in the U.K.
- Telecommunications development has been hampered by political instability, a slow realisation of the need for change, and the division of responsibility for its operation amongst five different organisations:
 - The state-owned company ASST (State Company for Telephone Services) which presides over all the other organisations and is itself responsible for national and European traffic.
 - SIP which belongs to the state holding company STET, handles the majority of all telephone calls, and is the only interface with the public in the field of telephones. It has to share its revenues with other organisations and has no responsibility for telex.

- Italcable, another part of STET, which runs telephone, telegraphic, and telex lines with all countries outside Europe.
 - A third company that belongs to STET, Telespazio, which has responsibility for satellite communications.
 - A central headquarters for the administration of Post and Telecommunications, the Direzione Centrale Servizi Telegrafici (PTT), which runs the national, non-European, and continental telegrams services.
- The result of new developments in telecommunications has been to create a situation which has been described as 'competition amongst the managers'.
 - However, this situation has resulted in the signing of a new agreement in 1984 which has revised the relationship between SIP and the PTT Ministry. Under the new agreement:
 - SIP was given responsibility for all switching (not just telephones) and the ability to sell as well as lease telecommunications equipment. In particular, SIP will operate and market Itapac, the packet switched network now scheduled for completion sometime in 1986.
 - ASST retained the operational responsibility for telecommunications transmission between the major switching centers.
 - The PTT retained control of the TELEX network and has the right to establish electronic mail systems.
 - European communications will be handled by the PTT whilst all other overseas connections will be the responsibility of Italcable.

- Further definition and clarification of the Italian telecommunications market is awaited in respect of the manifestation of SIP's policies and changes in the relevant legislation.
- It is anticipated that a General Secretariat of the PTT Ministry will be responsible for defining the control policies for both the postal and telecommunications services.
- For telecommunications it is anticipated that the situation will become rationalised as:
 - A body for national telecommunications, SIP.
 - A body for international telecommunications, Italcable.
 - An organisation that would be in charge of satellite communications.
- Further, it is expected that this new environment will encourage:
 - Further development of the existing liberalised market for terminal equipment.
 - Progressive liberalisation of the market for value-added services.
- The environment for value-added network services development in Italy will depend very much on the way in which these new developments evolve.
- The regrouping of telecommunications resources and the availability of Itapac and a pilot service ISDN in 1989 should provide the basic infrastructure upon which these new services can be based.

3. THE UNITED KINGDOM

- The U.K. telecommunications marketplace represents a unique situation in Western Europe in respect of the development of value-added network services.
- This policy of liberalisation and deregulation which culminated in the successful stock market flotation of shares in British Telecom at the end of 1984 had its beginnings in the British Telecommunications Act of 1981, announced in July of that year.
- These changes have created three organisations that are licensed for basic conveyance:
 - British Telecom.
 - Mercury (a subsidiary of Cable and Wireless).
 - The City of Kingston-upon-Hull.
- More importantly for the development of value-added network services, the July 1981 announcement represented the first stage in liberalisation in allowing the provision of value-added services not already provided by BT.
- In October 1982, a procedure known as the VANS general license was announced, where it was required that vendors wishing to offer VAN services should register with the DTI and provide details about their proposed services. As of July 1985, some 646 services were registered; an analysis of these is shown as Exhibit IV-2.
- However, it must be pointed out that very few of these registered services are in serious operation at this time. The number of active services has been estimated to be between 20 and 30.

ANALYSIS OF VANS LICENSES IN UNITED KINGDOM

REGISTRATIONS UNDER THE VANS GENERAL LICENCE AS OF 31 JULY 1985

COMPANIES: 151

SERVICES: (Some companies provide more than one service.)

● Automatic ticket reservation and issuing;	12
● Conference calls;	10
● Customers' data bases;	49
● Deferred transmission;	48
● Long-term archiving;	26
● Mailbox;	64
● Multi-address routing;	47
● Protocol conversion between incompatible computers and terminals;	66
● Secure delivery services;	21
● Speed and code conversion between incompatible terminals;	41
● Store and retrieve message systems;	} 86
● Telephone answering using voice retrieval systems;	
● Telesoftware storage and retrieval;	21
● Text editing;	27
● User management packages, e.g., accounting, statistics, etc.;	43
● Viewdata;	45
● Word processor/facsimile interfacing	40
	646

Source: Department of Trade and Industry.

- During 1985, the U.K. government put forward further proposals for the future licensing of value-added and data services. These were set out in a consultative document, the purpose of which was to elicit comments from all interested parties.
- Comments were to be received by a deadline of the 31 July 1985 with the aim of being able to announce new licensing arrangements by early Autumn. In fact, the announcement was finally made on the 30 December 1985, just as this report was going to print.
- The most significant elements of the 30th December 1985 announcement can be stated as:
 - The opening up of 'basic conveyance' services, with the exception of voice and telex, to fair and open competition.
 - The acceptance of the principle of a single class license for all except telecommunications operators.
- This announcement confirms the trend toward the opening up of these markets to more equitable competition and the reduction of distinctions between communications operators and other services vendors targetting these markets.
- The U.K. telecommunications environment, particularly in comparison with that of other European countries, clearly now presents an attractive opportunity for vendors to establish these new services.

4. WEST GERMANY

- A key characteristic of the West German telecommunications environment is the strongly defended monopoly position of the PTT, the Deutsche Bundespost (DBP).

- The DBP has, however, come under increasing criticism in recent years, both in respect of the service it offers and its policies with regard to the use of telecommunications equipment.
- In particular, controversy has arisen over the DBP's policies on cable television and videotex (Bildschirmtext) and its bureaucratic approach and high tariff structure. Criticism has been expressed by both the users and the equipment suppliers.
- Whether as a direct response to these criticisms or not, the federal government has put in motion the establishment of a committee to review the changing telecommunications environment and how this might affect the running of the DBP. This committee is to be drawn from representative segments of German political, scientific, and business society.
- It is considered unlikely that any kind of liberalisation along the lines of the U.K. experience is to be contemplated.
- One of the key areas where West Germany is leading in terms of telecommunications infrastructure is that of digital transmission. The DBP plans to complete the changeover from analogue to digital switching by the year 2020.
- The first stage in this broad long-range plan is the development of an initial Integrated Services Digital Network (ISDN) which is planned to be operational by 1988. This system will handle telephone, telex, and data transmission.
- The second stage will be the development of an integrated broadband system capable of handling video transmission (teleconferencing, etc.) which is planned to be operational by 1992.
- In respect of the development of other potential value-added network services, the regulatory position does not allow private organisations to

establish communications networks or to offer other services in competition to the Bundespost.

- The view of the DBP is that increasing convergence of computer technology into the new and planned communications facilities will reintegrate 'additional' or 'enhanced' services from the remote terminals or attached processors into the central digital switching system run by the DBP. These enhanced features are such items as protocol conversion, information storage, and some processing.
- Consequently, it is most likely that the availability of value-added network services in West Germany will be very largely determined by the Bundespost.
- Examples of VANS currently available in West Germany are:
 - Bildschirmtext (Btx), the Bundespost Videotex Service.
 - DATEX-P, the packet switched network.
 - Telebox, a new message store and retrieval system currently under development.
- Although, as stated above, the monopoly position of the DBP does not allow the offering of private systems at the moment, a number of closed user groups are licensed to establish their own special networks based on lines leased from the DBP.
- These networks are restricted for internal use (i.e., for private networks) or for use within closed membership groups.
- Some examples of these networks are:
 - DATEV, a processing services communications network.
 - START, a network connecting travel agencies.

- DIMDI, a medical database information system.
- MAKATEL, a retail point-of-sale network.
- INPUT considers that the continuation of tight monopoly control is more likely to hinder the development of value-added services to end users than to encourage them.
- Although there are considerable pressures for change within the West German PTT environment, there are also powerful forces defending the status quo.

V INFORMATION SERVICES MARKET ISSUES

V INFORMATION SERVICES MARKET ISSUES

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

A. ANALYSIS OF VENDOR ISSUES

I. THE CHANGING COMPETITION

- 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.
- Some vendors have expressed the fear that the information services business might become dominated by a limited number of large vendors backed by 'deep-pocket' corporations; e.g., GM and McDonnell Douglas. One vendor, for example, commented, 'We see a big threat from U.S.-based companies'.
- However, as the vendor ranking tables shown in Chapter III indicate, the information services markets are still fragmented, with no vendor being able to establish a dominant position in any one market.

- The diverse and specialised nature of end-user needs continues to provide many opportunities for vendors who understand the customer's service needs.
- Some vendor comments on the level of competition to be found amongst Western Europe's major markets are shown in Exhibit V-1. These comments reveal the competitive nature of the information services market, but also underline the optimism of the many vendors who have been able to identify the growing areas of opportunity.
- Information services markets can be expected to diverge between the needs for low-cost utility services (for example, VANS networks) and the specialised application niches. The larger companies will be likely to be most successful in the former area. Smaller vendors would be wise to specialise.
- Levels of competition in the market also have their impact in respect of acquisition, merger, or partnership activity. INPUT questioned vendors on whether they were actively seeking acquisitions, mergers, or partnership arrangements. This distribution of responses is shown below.

	<u>Yes</u>	<u>Possible</u>	<u>No</u>
Acquisitions	30%	40%	30%
Mergers	6%	34%	60%
Partnerships	34%	40%	26%

- In comparison with last year's analysis, this distribution of responses indicates a marked lowering of interest in all three of these activities, perhaps indicating that much of the planned changes of this type have either been accomplished or abandoned.
- Some vendor comments on the need or other issues of joint arrangements are shown in Exhibit V-2.

EXHIBIT V-1

VENDOR COMMENTS ON THE COMPETITIVE ENVIRONMENT

- It is a highly competitive environment, from small micros through to the large manufacturers. (France)
- Very strong competition, heightened by many small firms entering at the mini and micro end, particularly in the provinces. (France)
- Competition is not a problem at the moment as the market is growing faster than the vendors. (Italy)
- Much competition in the field of software development; prices and quality are going down. (Italy)
- We are experiencing new competition in the area of CAD/CAM. (France)
- Competition is increasing; it is getting tougher as well in terms of buying decisions. (U.K.)
- Competition is much the same; there are many new companies, but many others are getting out of the market. (Italy)
- We see lots of opportunities and now particular threats. (U.K.)

EXHIBIT V-2

VENDOR COMMENTS ON ACQUISITIONS, MERGERS, AND PARTNERSHIPS

- It is very difficult to find the right partner at the right price.
- Partnerships with other companies are important both in development of products and in marketing, where they must compliment, not compete.
- We need agreements in order to commercialise our products through third parties and to acquire software for our professional and processing services.
- Acquisitions are a very good way of getting personnel who are specialised in an area not covered by the company at present.
- We have an acquisition policy in order to maintain growth and to expand our expertise and capabilities in new areas.
- We feel that a majority holding is preferable in a partnership.
- We have agreements with other software houses which provide us with the software we need.
- More acquisitions will benefit us - this was one of the reasons for going public. It is then possible to get the required market penetration.
- We look to make agreements with other vendors in order to bring a number of different strengths together. On one's own, one cannot succeed.

2. INDUSTRY-SPECIFIC MARKETING

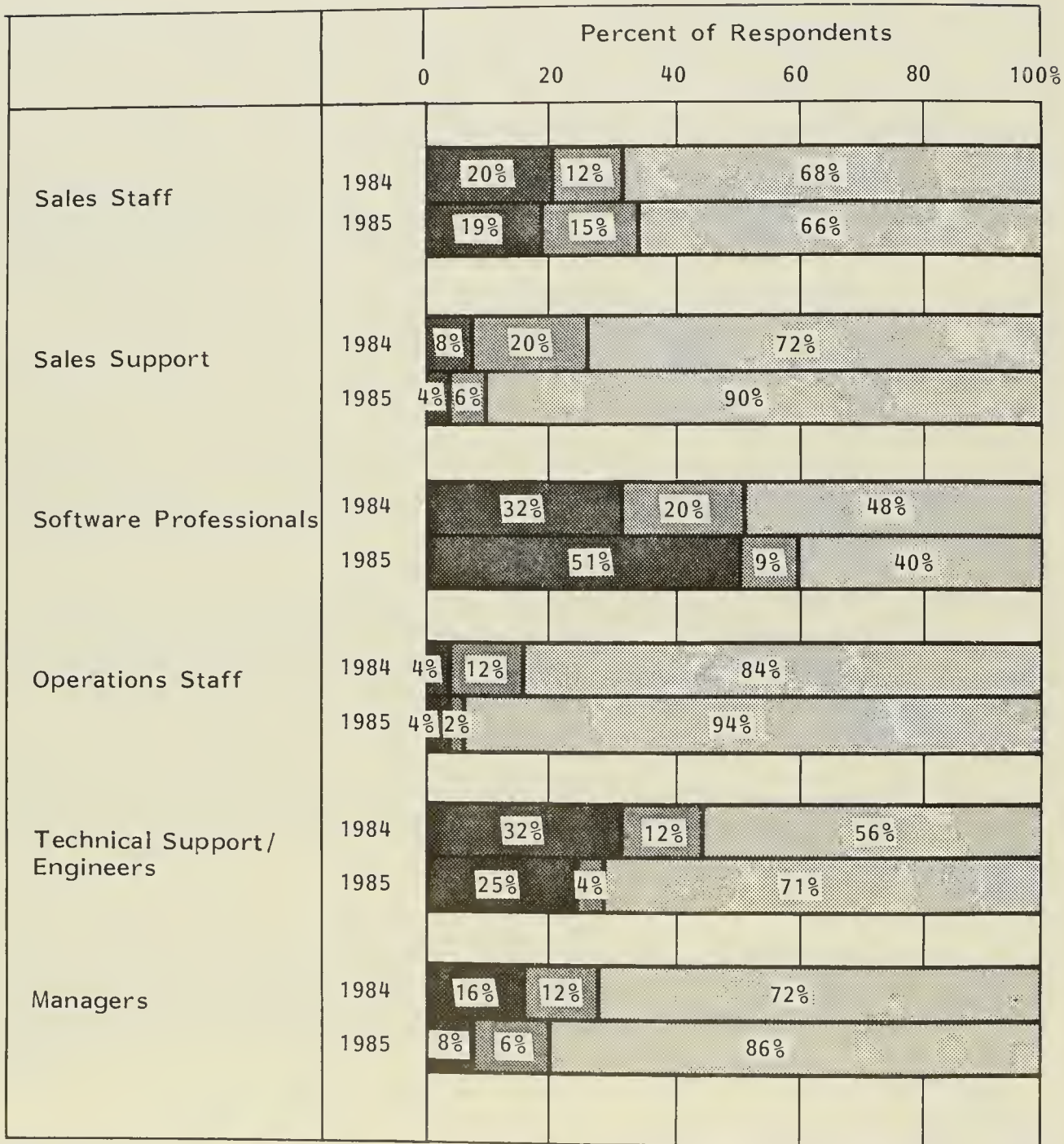
- An important product marketing decision for many information services vendors is the choice between cross-industry applications and industry-specific applications.
- INPUT's 1984 vendor poll indicated that around two-thirds of all vendors has no bias between these two approaches, but also indicated a trend towards more emphasis on industry-specific applications in the future.
- Vendor response on this issue in 1985 showed a more fragmented profile of approach with a considerable proportion (around 40%) placing strong emphasis on a cross-industry approach. Again, the general trend in the future is a move towards more industry specialisation.

3. STAFF SHORTAGES

- As INPUT reported last year in its annual survey, 'staff shortage' is considered more of a potential rather than a current problem by most information services vendors in Western Europe.
- Exhibit V-3 shows the distribution of vendors' perceptions of the impact of staff shortages on their business in the major categories of staff employed. This exhibit shows both the 1984 and 1985 survey results on this issue.
- The two areas of staff shortages that stand out as being most critical in their business impact are those of software professionals and technical support and engineers.
- In most categories, the rating of high and medium impact on the business has remained roughly the same or fallen slightly. The exception to this is the category of software professionals, where half the sample rated staff shortage as having a high impact.

EXHIBIT V-3

IMPACT OF STAFF SHORTAGES



High Impact
 Medium Impact
 Low Impact

- The problems of staff shortages were relatively homogeneous across the country markets except for Italy. In the Italian market there were generally few problems as reported by the vendors interviewed, with the exception of software professionals.
- Shortage of quality recruits rather than shortage of people per se was a continuing problem reported by vendors, summed up by the comment, 'Good staff are always hard to find'.
- Particular areas of expertise shortage singled out for special mention were:
 - Telecommunications and networks.
 - Applications specialists, particularly CAD/CAM.
 - Generalists, staff who combine an overall understanding of business as well as technical computer skills.
 - Marketing competence.

B. ANALYSIS OF USER ISSUES

- As part of INPUT's SSPS programme research, a questionnaire (see Appendix D) was mailed to users to assess levels of use of data processing systems and services. The purpose of this survey was to highlight changes and trends amongst the user population.
- The major areas covered were:
 - Users' data processing objectives and their relative priorities.

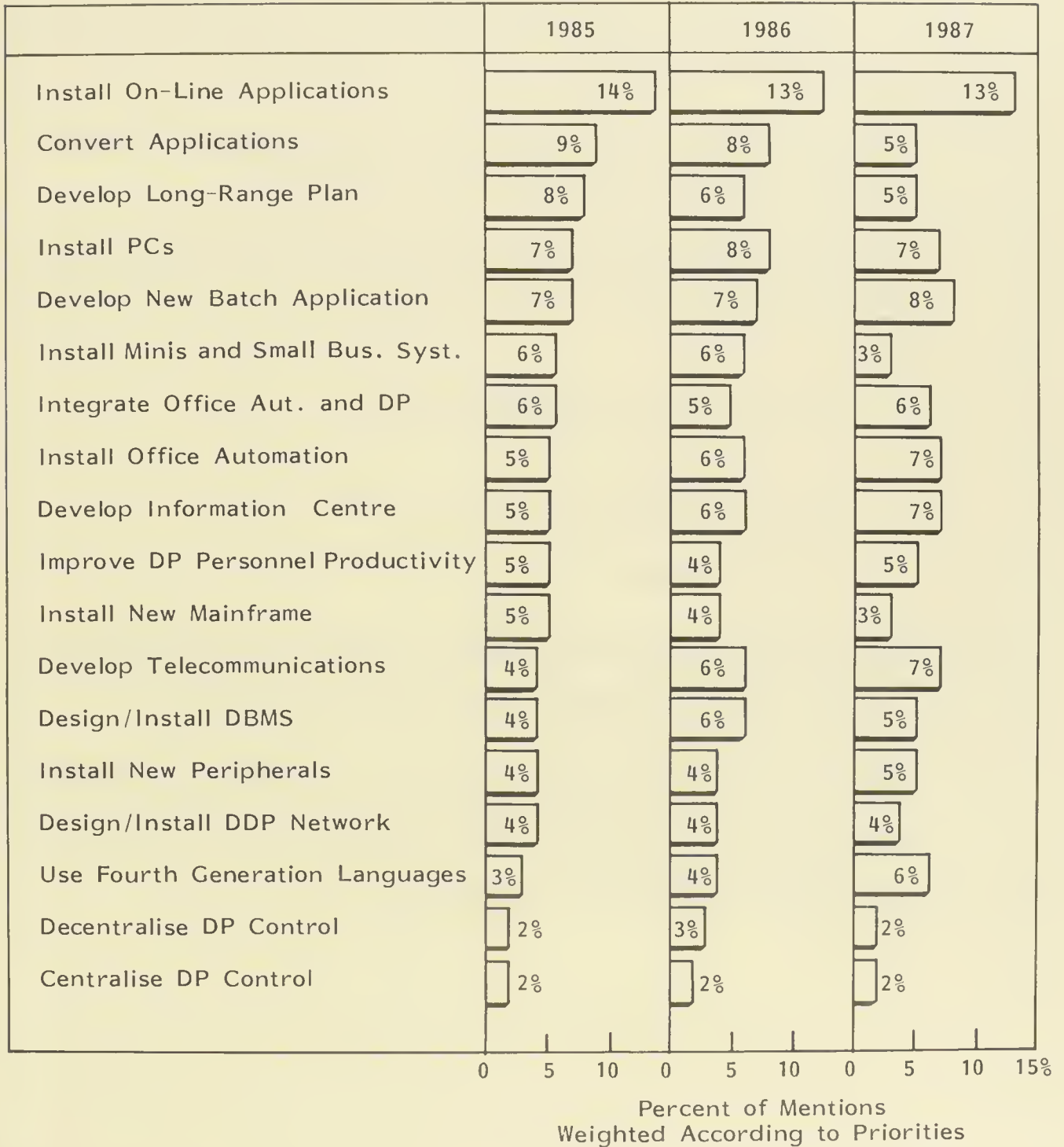
- The problems faced by DP managers during the past year, ranked according to the priority of the issue.
- Existing DP applications ranked in order of importance.
- Proposed areas for new applications development ranked in order of importance.
- Proposed modes of operation for new applications development--central versus remote sites.
- User satisfaction with information services.
- Users' budget trends for 1986.
- Communications issues.

I. DATA PROCESSING OBJECTIVES

- The analysis of the users' data processing objectives and priorities reveals potential buying decisions and thus sales opportunities for vendors.
- Exhibit V-4 shows the primary objectives of data processing management for 1985 and for the next two years.
- The installation of on-line applications will continue to be the prime objective of DP managers throughout 1986 and 1987.
- The conversion of applications is ranked second.
- The development of a long-range DP plan is now ranked third, up from seventh place in 1984. This, together with a slower budget growth rate of 1.4% for

EXHIBIT V-4

DATA PROCESSING MANAGEMENT PLANS
RELATIVE PRIORITY OF OBJECTIVES



1985-1986 highlights the contraction of demand for EDP equipment noted by vendors during 1985.

- Two areas have dropped significantly in priority from last year's returns:
 - Information centres, ranked second last year, now takes ninth place.
 - The design and installation of DDP networks has fallen from fourth to fifteenth place this year.
- Fourth generation languages go down from eleventh to fifteenth rank, but increasing importance is attached to these for 1986 and 1987.
- Objectives which increased in the priority ranking confirm the general trend--buyers perceive the highest value in new equipment which can be integrated with existing systems:
 - Personal computers with mainframes.
 - Minicomputers with PCs.
 - Office automation with DP.
- New batch applications rank highly for users wishing to expand subcontracted DP rather than incur the costs of taking on more in-house staff.
- The improvement of DP personnel productivity is ranked tenth--below possible purchases and above postponed purchases. This is surprising in the light of the following problems encountered by DP managers, but reflects scepticism over the capability to achieve results in this area.

2. DP PROBLEM AREAS

- Exhibit V-5 provides a ranking of the problems perceived by DP managers as most significant. A similar weighting to that used for rating DP plans was applied.
- The problems cited by DP managers fall into two categories:
 - Man-management problems are collectively most important--63%.
 - Procedural and equipment problems together take second place--37%.
- Even though improvements in DP personnel productivity ranked tenth amongst objectives, the following are all perceived to be serious problems:
 - Personnel recruitment.
 - Lack of management understanding.
 - Excessive applications development time.
 - Personnel training.
- Procedural and equipment problems which occupy the lower half of the table exclusively have all eased during 1985, although problems caused by inadequate systems software have risen from eleventh to seventh rank.

3. EXISTING AND PLANNED DP DEVELOPMENT

- Exhibit V-6 shows a comparison of user respondents' existing and planned application developments.

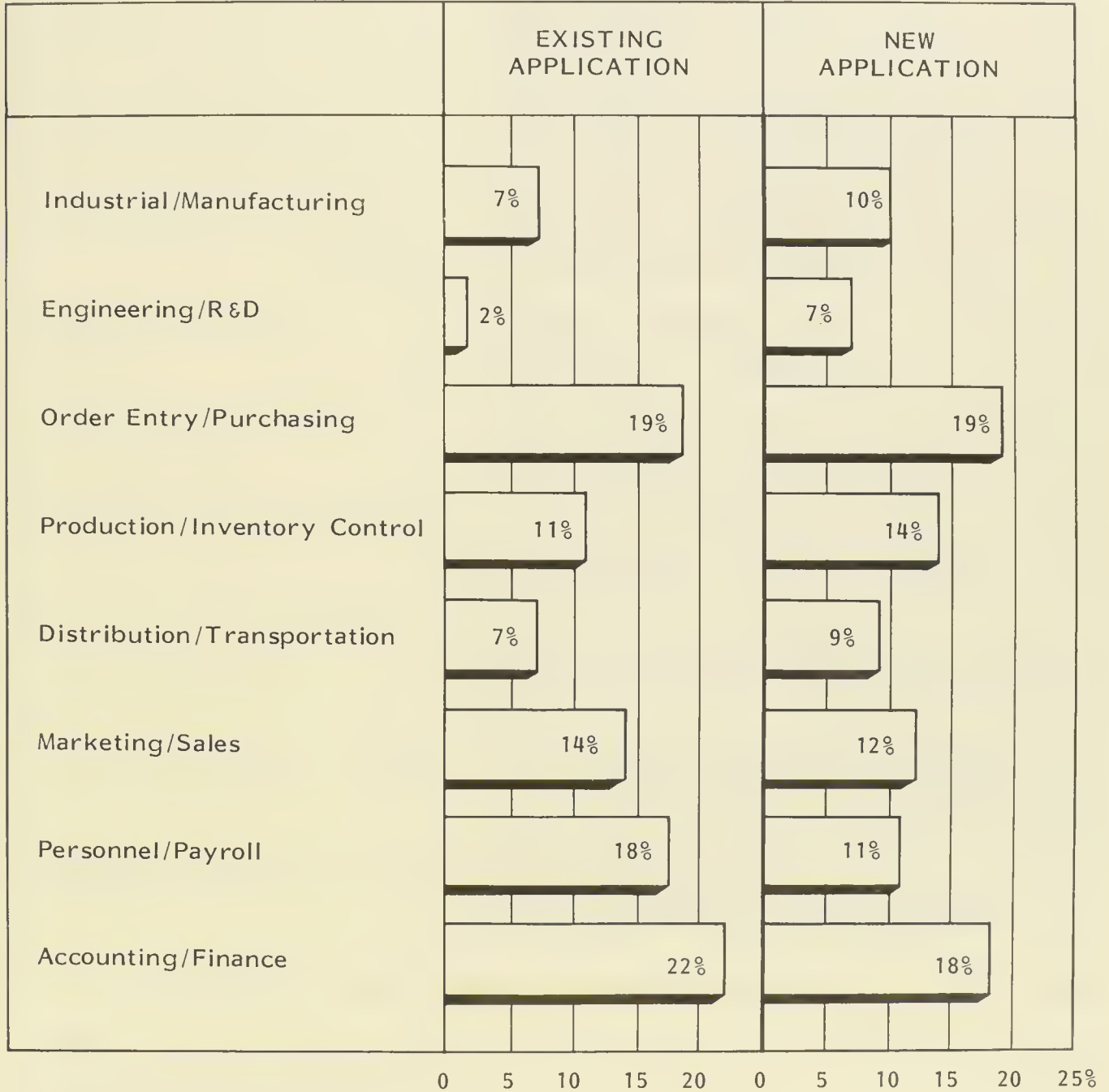
EXHIBIT V-5

RANKING OF MOST SIGNIFICANT PROBLEMS FOR DATA PROCESSING MANAGEMENT

	PERCENT OF MENTIONS IN EACH PRIORITY					
	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	All Priorities
Excessive Applications Backlog	17%	15%	13%	8%	6%	12%
Personnel Recruiting	17	11	8	6	6	11
Lack of Management Understanding	16	3	9	7	8	9
Excessive Applications Development Time	15	24	14	4	6	14
Lack of User Involvement	9	8	7	10	12	9
Personnel Training	6	5	7	19	10	8
Inadequate Systems Software	6	5	3	13	8	6
Need to Improve Operations	5	6	9	13	9	8
Need to Improve Data Communications	5	5	13	4	9	7
Inadequate D.P. Funding	3	5	4	6	11	6
Hardware Maintenance Unsatisfactory	1	0	2	0	6	2
Need Better Planning Control	0	13	11	10	9	8
Total	100%	100%	100%	100%	100%	100%

EXHIBIT V-6

COMPARISON OF RESPONDENTS' EXISTING APPLICATION AREAS WITH
PLANNED NEW DEVELOPMENTS



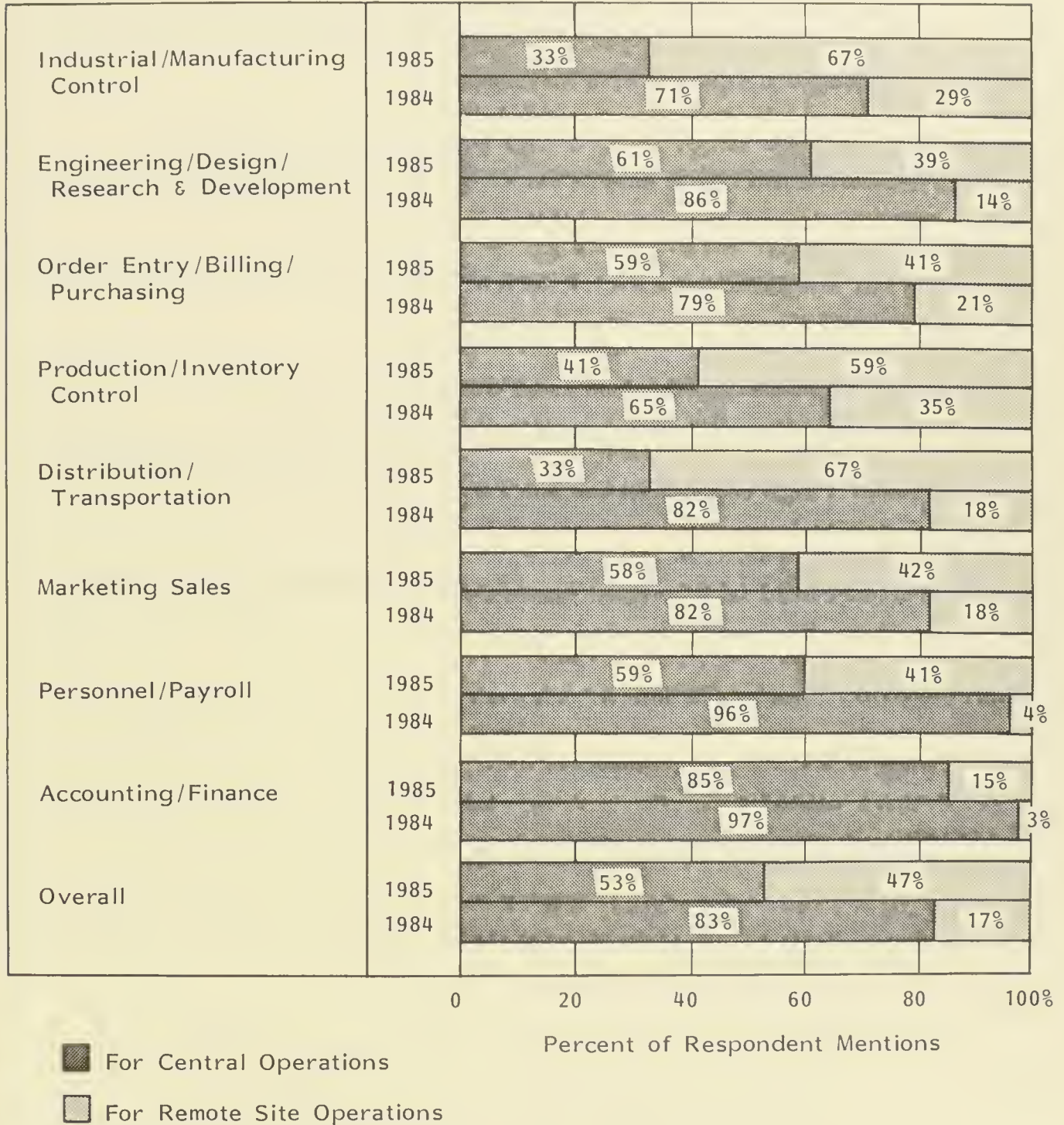
- Accounting and finance applications are the most strongly favoured application, achieving 22% of weighted mentions for existing applications and 18% for new applications.
- Order entry, billing, and purchasing applications take second place this year with a rating of 19% for both existing and new applications.
- Research and development and engineering applications are rated lowly at 2% but show at 7% for new applications.
- Respondents reiterated their primary intentions as being the development of:
 - Order entry, billing, and purchasing applications.
 - Accounting and financial applications.

4. CENTRAL VERSUS REMOTE SITE

- An analysis of planned modes of operation for application areas, whether run centrally or remotely, are shown in Exhibit V-7.
- In 1984, 83% of sites for users' application developments were central, 17% remote.
- This year, analysis of the location of new applications developments indicated that 53% were in central sites, 47% in remote sites.
- This shift in emphasis away from central sites is confirmed by the analysis of changes in DP management objectives:
 - Postponement of major financial expenditures on mainframes.

EXHIBIT V-7

PRIMARY MODES OF OPERATION FOR NEW DEVELOPMENTS -
CENTRAL VERSUS REMOTE SITES



- Users perceive the greatest utility in new hardware which can be used in conjunction with existing equipment. The keyword in this context is integration.
- INPUT therefore recommends that vendors of accounting and finance applications reexamine the area of remote site operations which has grown from 3% to 15% of respondents.
- For new order entry billing and purchasing applications, remote site use has grown from 21% to 41% of respondents.
- For user personnel and payroll applications, it has grown from 4% to 41% of respondents.
- INPUT therefore recommends that vendors of order entry, billing, and purchasing applications and personnel and payroll applications reexamine their vertical market niches and client profiles to determine shifts in the underlying pattern of clients' buying criteria.
- Other applications indicating a shift toward remote sites as the location for new developments are:
 - Marketing and sales applications.
 - Production and inventory control applications.

5. USER SATISFACTION

- Exhibit V-8 shows the results of the survey of user satisfaction levels with information services.
- Overall satisfaction with information services rated 3.4—identical to 1984.

EXHIBIT V-8

USER SATISFACTION WITH INFORMATION SERVICES

CATEGORY	Number of Mentions	SERVICE RATING				
		1	2	3	4	5
All Information Services	563			3.4		
RCS-Interactive	29			3.3		
RCS-Remote Batch	18			3.2		
Batch	33			3.7		
Facilities Management	26			3.2		
Total Processing Services	106			3.4		
Integrated Systems	32			3.0		
Hardware Maintenance	81				4.2	
Systems Software	87			3.8		
Applications Software	83			3.2		
Total Software Products	283			3.6		
Consultancy	56			3.1		
Custom Software	51			3.4		
Education and Training	67			3.2		
Total Professional Services	174			3.2		

- Satisfaction with processing services has fallen slightly from 3.6 in 1984 to 3.4 this year.
- All areas of processing services showed a decrease in user satisfaction compared with 1984, the largest decline being noted in batch processing, down from 4.1 to 3.7.
- Software products user satisfaction remained about the same at 3.7 compared to 3.6 in 1984.
- Of all the services, hardware maintenance again gave the greatest satisfaction, the rating being 4.2 compared to last year's 4.0.
- Professional services were once again rated the lowest of the three sectors with a rating of 3.2 (3.3 in 1984).

6. BUDGETS

- Exhibit V-9 shows the analysis of the 1985 budget data by major categories of expenditures. Allocations or expenditures for accommodation of data processing activities were excluded.
- Overall, respondents' budgets are expected to increase by 1.4% in 1986--a marked slowdown when compared with the increase of 12% noted this time last year.
- Budget areas showing the greatest gains are:
 - Terminals, +15.4%.
 - Integrated systems, +17.6%.
 - Office automation equipment, +10.8%.
 - Software, +10.1%

EXHIBIT V-9

RESPONDENTS' DATA PROCESSING BUDGET CATEGORIES

BUDGET CATEGORY	1985		1986		ANTI-CIPATED CHANGE 1985-1986
	\$ Millions	Percent	\$ Millions	Percent	
Personnel	\$140.7	38.5%	\$144.1	39.0%	+2.4%
Mainframe Processors	45.6	12.5	46.3	12.5	+1.6
Peripherals	32.0	9.0	33.5	9.0	+4.7
Minicomputers	11.3	3.0	8.6	2.5	-23.9
Personal Computers	6.6	2.0	7.2	2.0	+9.1
Terminals	22.0	6.0	25.4	7.0	+15.4
Office Automation Equipment	6.5	1.5	7.2	2.0	+10.8
Communications H/W and S/W	16.9	4.5	17.4	4.5	+2.9
Software	14.9	4.0	16.4	4.5	+10.1
Integrated Systems	1.7	0.5	2.0	0.5	+17.6
Vendor Maintenance	25.4	7.0	23.2	6.0	-8.7
Professional Services	7.8	2.0	6.8	2.0	-12.8
Processing Services	19.3	5.5	18.3	5.0	-5.2
Supplies and Other	14.5	4.0	13.9	3.5	-4.1
Total	\$365.2	100.0%	\$370.3	100.0%	+1.4%

- Budget areas showing the greatest decreases are:
 - Minicomputers, -23.9%.
 - Professional services, -12.8%.
 - Vendor maintenance, -8.7%.
- The decline indicated in professional services should be treated with caution. INPUT's interpretation is that this refers primarily to contract programming staff where DP management will tend to see the possibility of cost savings. In reality, these frequently do not materialise.

7. COMMUNICATIONS ISSUES

- Users were asked to rate the importance of telecommunications to their EDP systems and future plans, with the following responses:
 - Extremely important, 31%.
 - Very important, 39%.
 - Of some importance, 11%.
 - Not very important, 10%.
 - Not at all important, 9%.
- The key issues in terms of the development and use of telecommunications were:
 - Telecommunications links with other organisations; for example, subsidiaries, suppliers of materials, components or services, and distribution agents in separate geographic locations.

- The cost of telecommunications.
- Data transmission speeds.
- Data security.
- Compatibility between different systems and improvements in processing capabilities were also considered as important issues by vendors.
- Users were invited to comment on the national PTT and the telecommunications environment with respect to their individual needs.
- Where opinions were expressed without qualification, there was an even distribution of comments ranging from 'very bad' to 'very good'.
- Qualified statements were numerous. Most of these were variations of 'good, but too expensive'.
- Other qualifications noted were:
 - '...transmission speeds are too slow'.
 - '...better communications are needed between the PTT and the customers'.
 - '...worrying on the level of security'.
 - '...standardised connections should be agreed by hardware manufacturers'.
- Users were asked about their current use of electronic mail and what their plans were for the period to 1990.

- Sixteen percent of respondents currently use electronic mail, but one-third of these described current use as a pilot or test study.
- Forty-two percent of respondents indicated that they would be using electronic mail by 1990.
- The patterns of expansion described by respondents were of two types:
 - Expansion to all departments within a given location.
 - Expansion to departments of a similar function in several different locations; particularly foreign offices or subsidiaries.
- The most frequently quoted reason for not using electronic mail in the future was cost.
- However, one respondent admitted that it might be necessary to introduce electronic mail simply to keep pace with competitors.
- Users were asked to indicate whether they currently used Electronic Data Exchange (EDI).
- Thirteen percent of respondents indicated that they were already using EDI.
- An additional 25% of respondents said that they intended to introduce EDI in the future, as follows:
 - During 1986--13%.
 - During 1987--9%.
 - During 1988--3%.

- For a more detailed analysis of these VANS issues, see INPUT's report, Value Added Network Services - European Market Opportunities.

VI PROCESSING SERVICES

VI PROCESSING SERVICES

A. INTRODUCTION

- The processing 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 services vendors in Europe are classifying their business in new ways. In particular, the growing impact of computer and communications convergence is leading to the rapid emergence of value-added network services.
- Consequently, INPUT has redefined the processing services sector as comprising four modes:
 - Remote computing services (RCS).
 - Value-added network services (VANS).
 - Batch processing services.
 - 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.
- INPUT's research indicates that, contrary to this belief, there is enormous potential in this area. Growth prospects in processing services are, however, being largely driven by new developments.
- The development of the on-line database services business, primarily for financial data, has been one important factor.
- The most significant driving force over the next few years will be computer/communications convergence. This will have a profound effect on the processing services markets of the future.
- Processing facilities management also has the potential to become a much more significant market than it has hitherto been in Europe. The development of this market will be dependent to a large extent on the attitudes of users toward the 'service solution'. The provision of 'services' can far outweigh the 'processing' element in this type of service and thus is likely to become a 'professional service' in the future.
- A significant trend in processing services has been the entry of new competitors onto the market. For example, Reuters sells on-line financial data. This trend will continue, spurred by the attractions of the emerging opportunity for value-added network services.
- Already such organisations as communications vendors and banks, as well as completely new 'start-up' companies, are taking up positions to enter these new markets.

B. MARKET DEVELOPMENT, 1985-1990

- The processing services sector achieved an overall market size of \$2.7 billion in 1984 and is expected to reach \$3.3 billion in 1985.
- INPUT forecasts that this market will grow at an annual average growth rate of around 10% to reach \$5.2 billion in 1990.
- Exhibits VI-1 through VI-5 provide summary tables of the forecast growth for processing 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 1984 and 1985, a medium-term forecast for 1987 and a longer-term forecast through to 1990. In each case, the processing services market is analysed by its four principal components.

C. USER ATTITUDES AND TRENDS

- The sample included 106 user comments on their level of satisfaction with processing services.
- Overall, the satisfaction level recorded was 3.4 which was the average for all information services, as shown on the comparative chart shown as Exhibit V-8.
- Exhibit VI-6 shows the distribution of levels of satisfaction recorded for the various major categories of processing services. The exception is VANS, where no data has yet been obtained as only limited services are available to date.

EXHIBIT VI-1

PROCESSING SERVICES MARKET FORECAST, 1984-1990
WESTERN EUROPE

SUBSECTOR	MARKET FORECAST (\$ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Remote Computing Services	\$1,367	\$1,681	13%	\$1,988	11%	\$2,716
Value-Added Network Services	23	104	122	254	50	854
Batch Processing	1,084	1,252	5	1,255	-	1,245
Facilities Management	207	255	14	304	13	433
Total	\$2,681	\$3,290	12%	\$3,801	11%	\$5,248

EXHIBIT VI-2

PROCESSING SERVICES MARKET FORECAST, 1984-1990
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Remote Computing Services	FF 4,532	FF 4,940	9%	FF 5,950	11%	FF 8,100
Value-Added Network Services	-	474	-	999	38	2,605
Batch Processing	3,760	3,870	2	4,000	2	4,300
Facilities Management	715	780	10	950	16	1,500
Total	FF 9,007	FF 10,064	10%	FF 11,899	12%	FF 16,505

EXHIBIT VI-3

PROCESSING SERVICES MARKET FORECAST, 1984-1990
ITALY

SUBSECTOR	MARKET FORECAST (£ Billions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Remote Computing Services	£ 280	£ 330	19%	£ 470	24%	£ 890
Value-Added Network Services	-	1.5	-	25	100	199
Batch Processing	313	350	10	420	2	450
Facilities Management	150	175	15	230	14	351
Total	£ 743	£ 856	15%	£ 1,145	18%	£ 1,890

EXHIBIT VI-4

PROCESSING SERVICES MARKET FORECAST, 1984-1990
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Remote Computing Services	£317	£331	5%	£364	27%	£445
Value-Added Network Services	18	29	62	77	48	249
Batch Processing	110	106	-	100	-	100
Facilities Management	20	27	18	46	20	80
Total	£465	£493	8%	£587	14%	£874

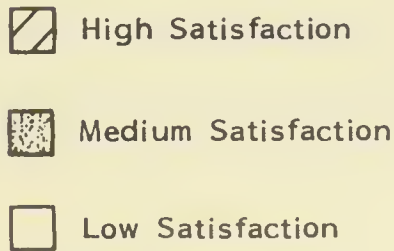
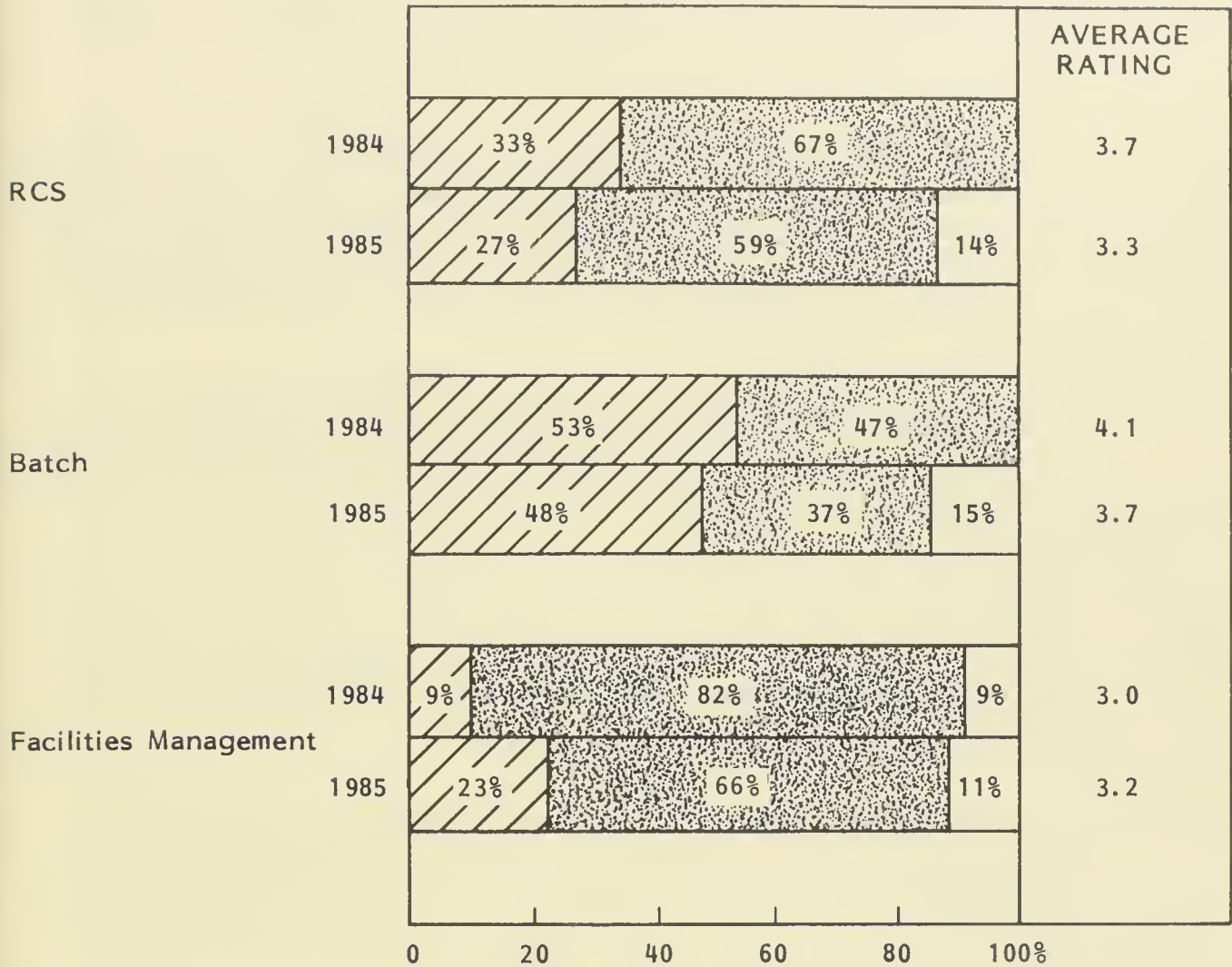
EXHIBIT VI-5

PROCESSING SERVICES MARKET FORECAST, 1984-1990
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Remote Computing Services	DM 915	DM 1,060	15%	DM 1,400	15%	DM 2,150
Value-Added Network Services	-	10	-	44	107	407
Batch Processing	1,050	1,100	2%	1,100	-	1,100
Facilities Management	60	65	8	75	8	95
Total	DM 2,025	DM 2,235	9%	DM 2,619	13%	DM 3,752

EXHIBIT VI-6

LEVELS OF USER SATISFACTION WITH PROCESSING SERVICES



- Exhibit VI-6 also shows a comparison with levels of user satisfaction recorded in INPUT's 1984 survey.
- Whilst there is no dramatic difference between the satisfaction profiles recorded for 1984 and 1985, there is an indication of:
 - Some decline in levels of satisfaction for RCS and batch services. Both these categories recorded a minority of users expressing low satisfaction in 1985 whereas none were recorded in 1984. This decline is in accord with the overall rating for processing services which went from 3.6 to 3.4 (see Exhibit V-8).
 - An increase in the level of satisfaction for facilities management, with users expressing a level of high satisfaction increasing from 9% in 1984 to 23% in 1985.
- Processing services vendors must give consideration to the overall level of service that they are providing. User criticism has been expressed in respect of an unwillingness on the part of some vendors to be flexible with regard to the development of new systems.
- This will imply the need to take a more aggressive stance on developing new business rather than simply bidding on the basis of 'spare capacity' on existing installations.
- For some time now there has been a clear trend away from the business of pure 'computer services'. Increasingly important is the need to provide a solution to a customer's systems problem. This solution will involve a combination of elements:
 - Computer.
 - Software.

- Network.
 - Service.
 - People.
 - Knowledge.
- Vendors that grasp this challenge fully will not be accused by users of being too costly and lacking in flexibility, two of the most frequently voiced complaints.
 - Users will in general willingly pay a 'value-related' price for a service that meets their needs and provides a solution to their systems problem.
 - The increased satisfaction in the facilities management sector can be attributed in part to the service orientation of vendors like EDS and Hoskyns.

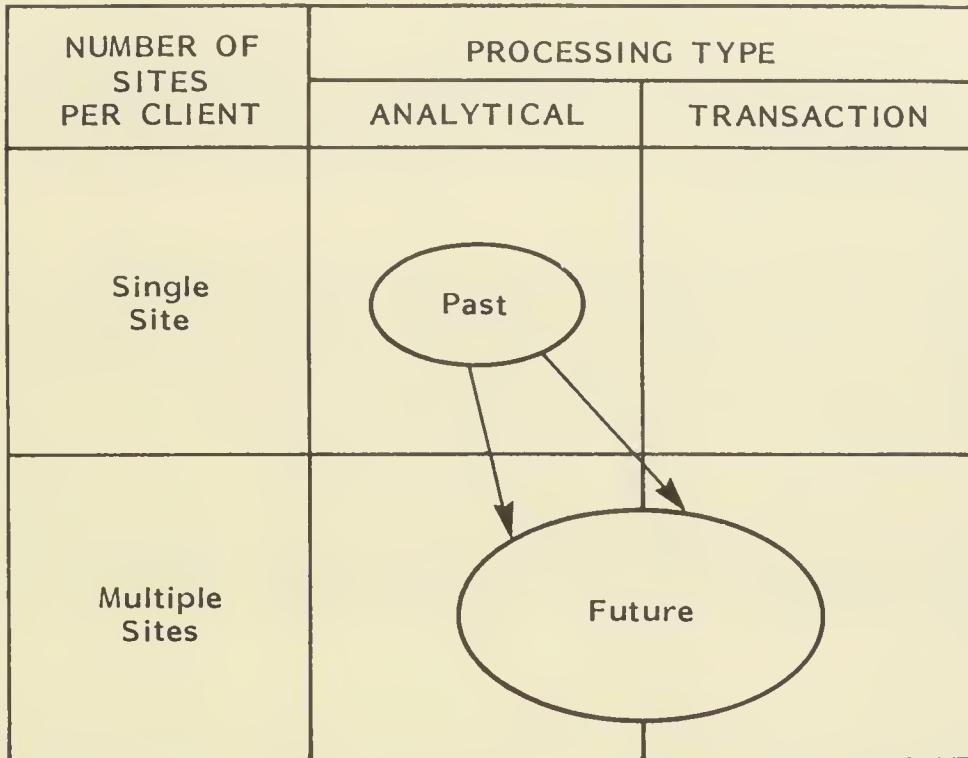
D. VENDOR ISSUES

I. MARKET ENVIRONMENT

- Two major forces are affecting the market environment for processing services--the continuing impact of low-cost minis and microcomputers and the impending opportunities in value-added network services.
- The availability of 'in-house' processing on affordable minis and micros as an alternative to a processing service was expressed as a major concern by many vendors, particularly in the Italian and West German markets.

- This is a trend that has been of significance over the past five years. Vendors have responded by placing much more emphasis on the use of micros as part of a services solution. This was referred to by one vendor as:
 - 'A redefinition of what is processed at the central site and what is processed at the micro level--it is necessary to offer a more global service'.
- The offering of more comprehensive services was a theme picked up by many other vendors. It is a recognition that the service vendor is in a position to become much more involved with the users' applications than either a pure hardware or pure software supplier.
- An attitude of flexibility to the needs of users is a key element to achieving success. It is a recognition that user needs and demands are changing and that new solutions can be provided using the minis and micros that originally were perceived as a threat to the business.
- Thus, a trend is observable towards multi-user and higher-value transaction systems, as illustrated in Exhibit VI-7.
- The second major change affecting the market environment for processing services is that of computer/communications convergence and the resulting opportunities for value-added network services.
- The development of the VANS market for information services vendors is very dependent upon the PTT environment that exists in each country. Of particular interest is the opportunity in the U.K. created as a result of the government policy of liberalisation of the telecommunications environment.
- The French market also appears to offer a substantial opportunity, particularly for videotex systems.

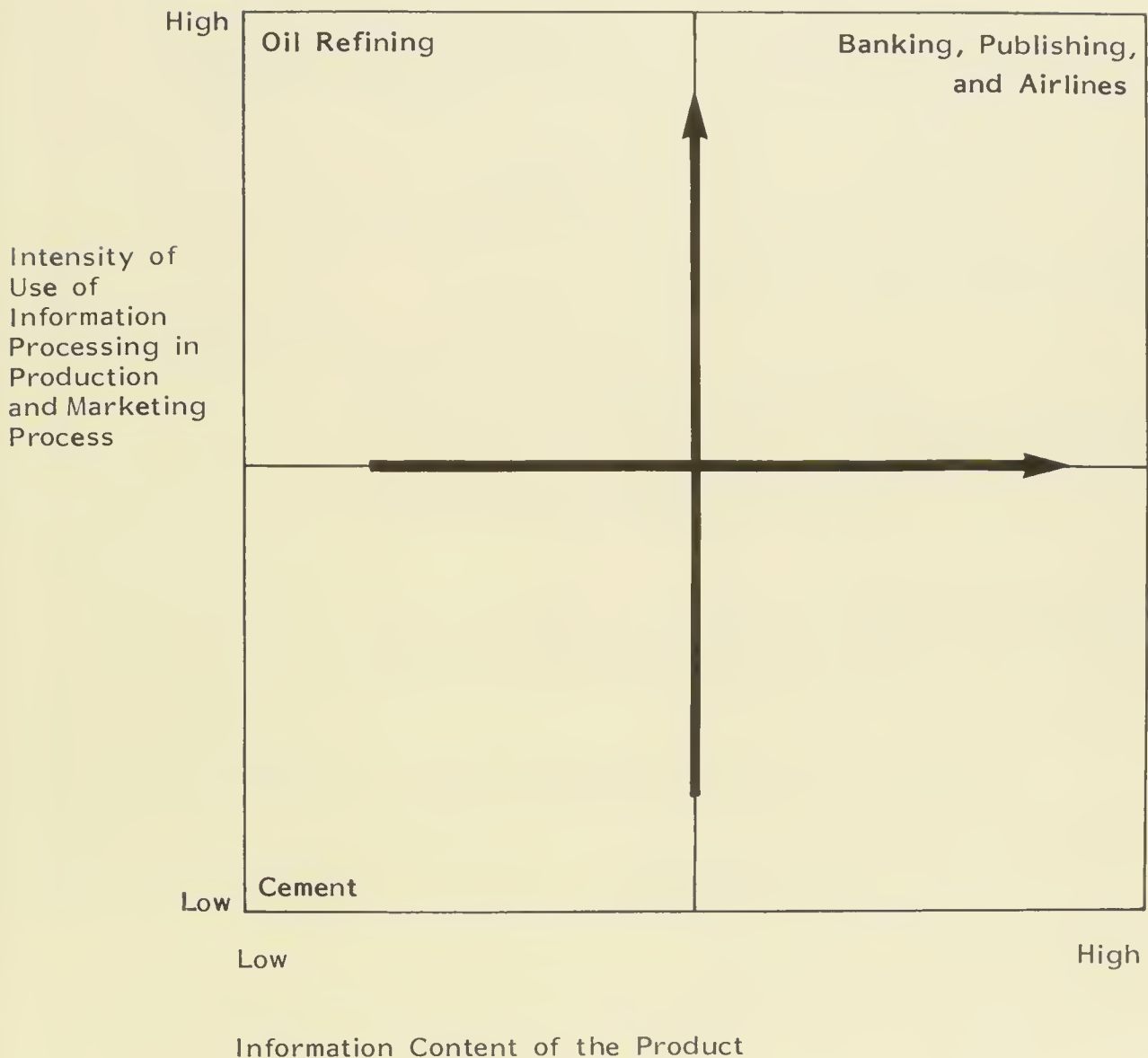
CHANGING RCS MARKET FOCUS



- The position in both West Germany and Italy is less clear, in the former primarily because of the strongly defended position of the Deutsche Bundespost, in the latter as a response to a poorly developed basic communications infrastructure.
- Nearly all the Italian vendors interviewed cited poor quality, highly-priced telecommunications as a major obstacle to the development of new services. One Italian vendor commented:
 - 'There is considerable uncertainty over telecommunications services and their quality. It is therefore impossible to understand what to do in the long term'.
- Vendors should be sensitive to the increased user requirements for improved security and reliability as more and more systems become dependent on on-line operation and communications links. This will be particularly true of systems concerned with electronic funds transfer (EFT).
- Existing processing services vendors should also be conscious of the arrival of new competitors into either their existing markets or areas of targeted future growth.
- In addition to the major equipment manufacturers and communications organisations such as British Telecom there is also a continual threat from other commercial organisations seeking to leverage their in-house investment in computer systems.
- Exhibit VI-8 is a graphic aid to identifying those industries from where this threat is most likely to come. The information intensity matrix plots the intensity of use of information technology in the production of a product against the level of information content in the product itself.

EXHIBIT VI-8

INFORMATION INTENSITY MATRIX



Source: "How Information Gives You Competitive Advantage"
Michael E. Porter and Victor E. Millar,
HBR, July - August 1985

- Clearly those industries such as banking and the airline industry that can be positioned in the top right-hand segment are those most likely to have developed the sophisticated computer systems that provide the opportunity for leverage on the open market.

2. BUSINESS DEVELOPMENT

a. General

- Growth in the various subsectors of the processing services market will continue to be uneven, the extremes being represented by very high expected growth for VANS and an overall stagnant market for batch processing services.
- Areas of opportunity for future business development that were particularly emphasised by vendors were:
 - The integration of personal computers (micro-mainframe links) into a processing services offering (10 mentions).
 - Videotex (9 mentions).
 - VANS (8 mentions).
 - Provision of on-site services (4 mentions).
- A number of other areas of possible potential for the development of processing services that were mentioned by vendors included:
 - Facilities management.
 - On-line database.

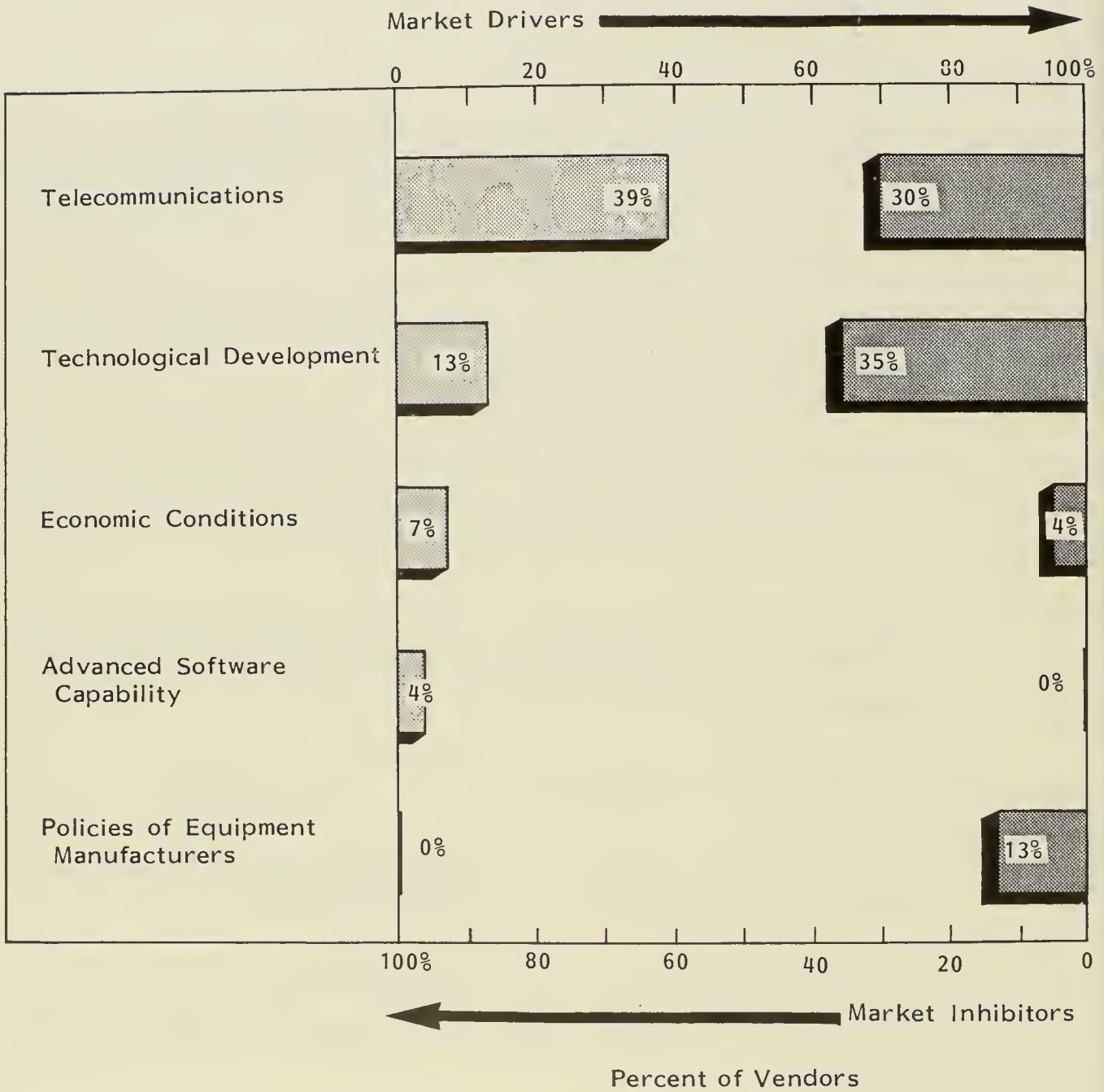
- Disaster recovery services.
 - Laser printing.
 - Office services including electronic mail.
- The emphasis on communications network processing as a major business development factor was underlined by the vendors' views of external or technological factors driving or inhibiting the market.
 - A considerable proportion (39%) specified communications developments and PTT policies as market drivers. However, a number of vendors, almost entirely Italian and West German, saw the inadequacy of the telecommunications infrastructure as an inhibitor.
 - The distribution of vendor opinion on the forces shaping the processing services market is shown in Exhibit VI-9.
 - It can be seen from this chart that technological developments, primarily the availability of low-cost minis and micros, are perceived as having had the most depressing effect on processing services markets.
 - However, at the same time, some vendors also see strong market growth possibilities in harnessing PCs to formulate new types of distributed processing services.

b. VANS

- As has already been mentioned, this is perhaps the key strategic development in the processing services sector over the next five years.
- A detailed assessment of the market potential in this area is provided by INPUT's 1985 report Value Added Network Services - European Market Opportunities.

EXHIBIT VI-9

PROCESSING SERVICES MARKET DRIVERS AND INHIBITORS
VENDORS' VIEWPOINTS



- Since the term VANS has been used loosely in many instances, INPUT has been particularly concerned to carefully define its use in the formulation of market assessments and forecasts.
- Exhibit VI-10 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.
- This market is currently undeveloped and immature and very few services are active. The exception to this, however, is videotex, which particularly in France has already achieved a significant market position.
- Videotex has also been the subject of a detailed market assessment by INPUT in 1985, the results of which are available in the report European Videotex Market Opportunities.

3. MARKETING ISSUES

- A number of marketing issues that are of concern to processing services vendors are reviewed below. These include:
 - Size of customers classified by number of employees.
 - New approaches to selling processing services.
 - Marketing strategies and initiatives.
 - Pricing.
- Exhibit VI-11 shows a profile of the customer base for processing services companies by number of employees for 1985 compared to vendor expectations for 1987.

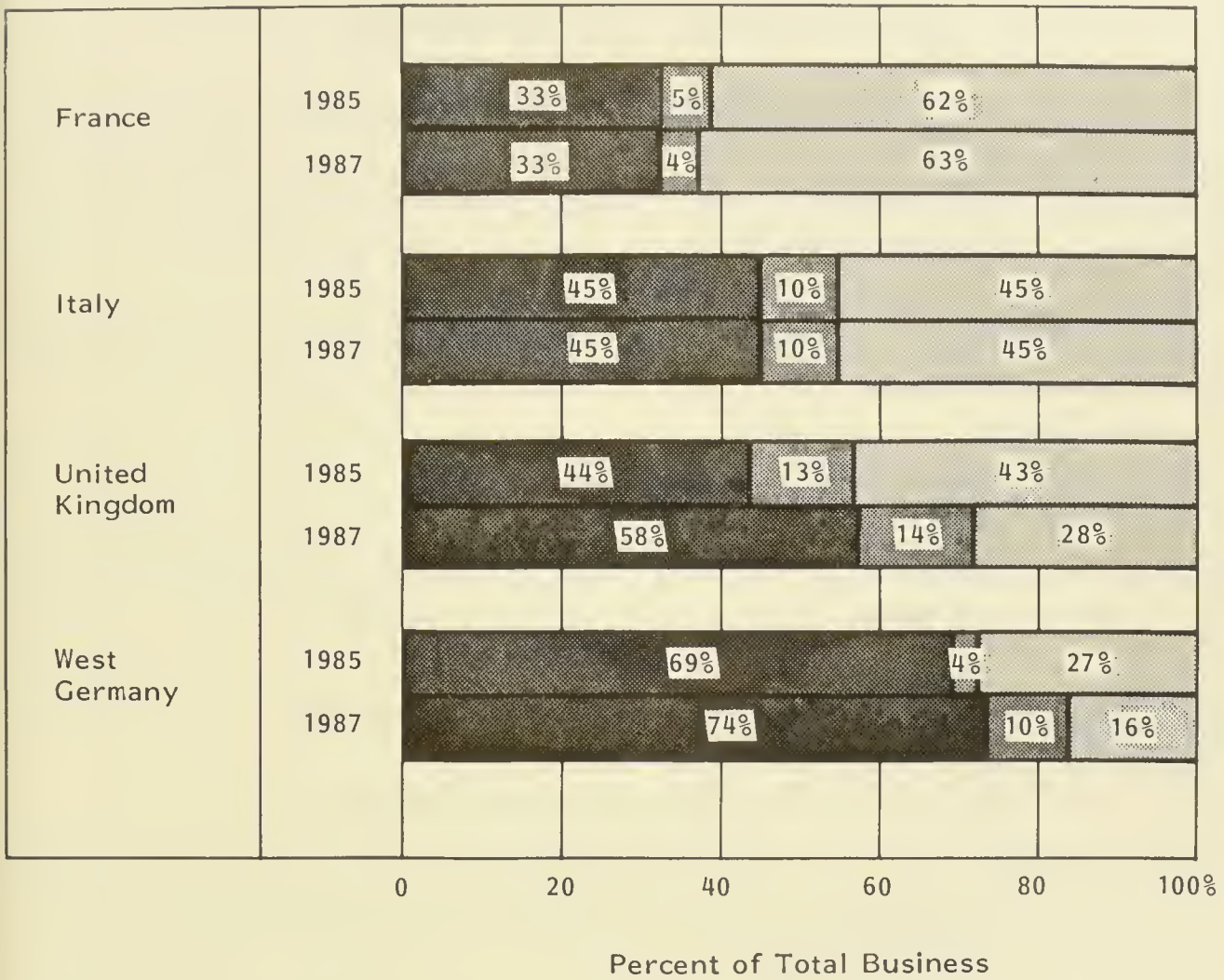
VANS MARKET STRUCTURE IN EUROPE

BEARER SERVICES											
Networks	PTT-Operated	Vendor-Operated	Closed User Group	Private							
	<table border="1"> <tbody> <tr> <td rowspan="7">Services</td> <td>Videotex</td> </tr> <tr> <td>Electronic Mail</td> </tr> <tr> <td>EDI</td> </tr> <tr> <td>EFT</td> </tr> <tr> <td>Insurance and Other (Financial)</td> </tr> <tr> <td>Remote Computing Services Including On-Line Database</td> </tr> <tr> <td>Voice- and Image-Related Services</td> </tr> </tbody> </table>				Services	Videotex	Electronic Mail	EDI	EFT	Insurance and Other (Financial)	Remote Computing Services Including On-Line Database
Services	Videotex										
	Electronic Mail										
	EDI										
	EFT										
	Insurance and Other (Financial)										
	Remote Computing Services Including On-Line Database										
	Voice- and Image-Related Services										

———— Boundary of INPUT's European VANS Market Definition

EXHIBIT VI-11

PROFILE OF PROCESSING SERVICES BUSINESS BY NUMBER OF EMPLOYEES



- Percent of Business with Under 250 Employees
- Percent of Business with between 250 and 500 Employees.
- Percent of Business with over 500 Employees.

- Very few vendors that were interviewed were able to give any details of moves toward introducing any new methods to sell processing services. The majority saw no change in their current practices, although few vendors saw the need to change; as one commented, 'We'll probably look at this in the future'.
- Areas of interest in new selling approaches mentioned were limited to:
 - Selling machine resources to a 'third-party' services provider.
 - Using agents where some strong element of software existed as part of the overall service.
- In respect of marketing strategies and initiatives, there was a much clearer awareness of the need to adjust to changed market conditions.
- Marketing initiatives cited by vendors included:
 - Improving profitability through reorganisation into smaller structures that would encourage more personal motivation.
 - Improving the overall product and service quality.
 - Building up a concentration of technical expertise.
 - Identifying and focusing on specific areas either by industry or cross-industry specialisation.
 - Diversification into related activities such as software and systems house business.

- Using mass marketing techniques; e.g., seminars with more prospect qualification.
- In total, just over 60% of all processing services vendors interviewed were able to identify a clear marketing initiative that was active or planned.

E. COMPETITIVE ANALYSIS

- Exhibits VI-12 through VI-15 show the rankings of the leading processing 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 1984.

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROCESSING SERVICES
FRANCE

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (FF Millions)
1	CISI	7.44%	FF 670
2	GSI	7.32	660
3	CCMC	6.37	572
4	SG2	5.55	500
5	SLIGOS	4.22	380
6	TELESYSTEMES	3.51	316
7	IBM-INS	3.11	280
8	GFI	2.32	209
9	SPI	2.11	190
10	REUTERS	1.44	130
	OTHERS	56.61	5.098
TOTAL MARKET		100.00%	FF 9,007

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROCESSING SERVICES
ITALY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	ENDATA	7.92%	£58,900
2	IBM-INS	3.90	29,000
3	GEIS	3.86	28,700
4	SIME	2.65	19,700
5	COPELD	2.58	19,200
6	CIN (CONSORZIO)	2.55	19,000
7	DATAMONT	2.53	18,800
8	SIPE OPTIMATION	1.99	14,800
9	DATA MANAGEMENT GROUP	1.85	13,800
10	LOMBARDIA INFORMATION	1.36	10,100
	OTHERS	68.81	511,000
TOTAL MARKET		100.00%	£743,000

EXHIBIT VI-14

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROCESSING SERVICES
UNITED KINGDOM

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	REUTERS	7.52%	£ 35
2	DATASOLVE (THORN EMI IT)	6.45	30
3	IBM-INS	5.80	27
4	GEISCO	4.73	22
5	CENTRE-FILE	4.30	20
6	DATASTREAM	3.65	17
7	CMG	3.01	14
8	COMSHARE	2.79	13
9+	SIA	2.58	12
9+	HOSKYNS	2.58	12
	OTHERS	56.59	263
TOTAL MARKET		100.00%	£ 465

EXHIBIT VI-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 PROCESSING SERVICES
 WEST GERMANY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (DM Millions)
1	DATEV	14.32%	DM 290
2	IBM-INS	7.90	160
3	TAYLORIX	3.75	76
4	REUTERS	2.96	60
5	GEISCO	2.47	50
6	VEREINIGTE RZ.	2.22	45
7+	AC-SERVICE	1.18	24
7+	DVO	1.18	24
9	REIN-MAIN RZ.	1.03	21
10	FIDUCIA	0.98	20
	OTHERS	62.01	1,255
TOTAL MARKET		100.00%	DM 2,025

VII SOFTWARE PRODUCTS

VII SOFTWARE PRODUCTS

A. INTRODUCTION

- During 1985 the rapid growth of the software market has slowed, and consequently a reassessment of this sector's future prospects has become necessary.
- The U.S. market has been seriously affected by the so-called 'shakeout' syndrome as well-established software companies (for example, MSA, ADR, and Cullinet) have encountered difficulties.
- This 'shakeout' has not occurred in Europe in such a dramatic form, but there is no question that growth has slowed and that software vendors have become much more cautious in their approach to the market.
- As INPUT stated in its 1984 report, vendors must be careful in their selection of software markets if profitable business is to be generated.
- In the recent past, very high growth rates in the software market, particularly for PCs, have resulted in vendors believing that almost any software product would sell.
- This myth, along with those that decreed the almost infinite capacity of users for purchasing new software products and saw the application package promoted as the ultimate panacea, have very definitely been put to rest.

- Today the software industry is facing up to a new more realistic world in which a premium will be placed on the software vendors' skills in balancing a number of different factors, the principal ones being:
 - Product research and development.
 - Marketing (particularly pricing and contractual arrangements).
 - Service and support.
- Exhibit VII-1 provides a schematic representation of INPUT's classification of the software products market showing the definitions used for systems and applications software.

B. MARKET DEVELOPMENT, 1984-1989

- Following a period of very rapid growth in software product markets throughout Europe, a marked slowdown is now forecast by INPUT for the period up to 1990.
- Thus, whilst growth has been running at a rate in excess of 30% per annum, it is now expected to fall to around 20% per annum over the next five years.
- On this basis it is forecast that the Western European software market, assessed at \$3.1 billion in 1985, will exceed \$8 billion by 1990.
- Exhibits VII-2 through VII-6 are summary tables of forecast growth for the software products markets in Western Europe and the four individual country markets.

SOFTWARE PRODUCTS MARKET STRUCTURE

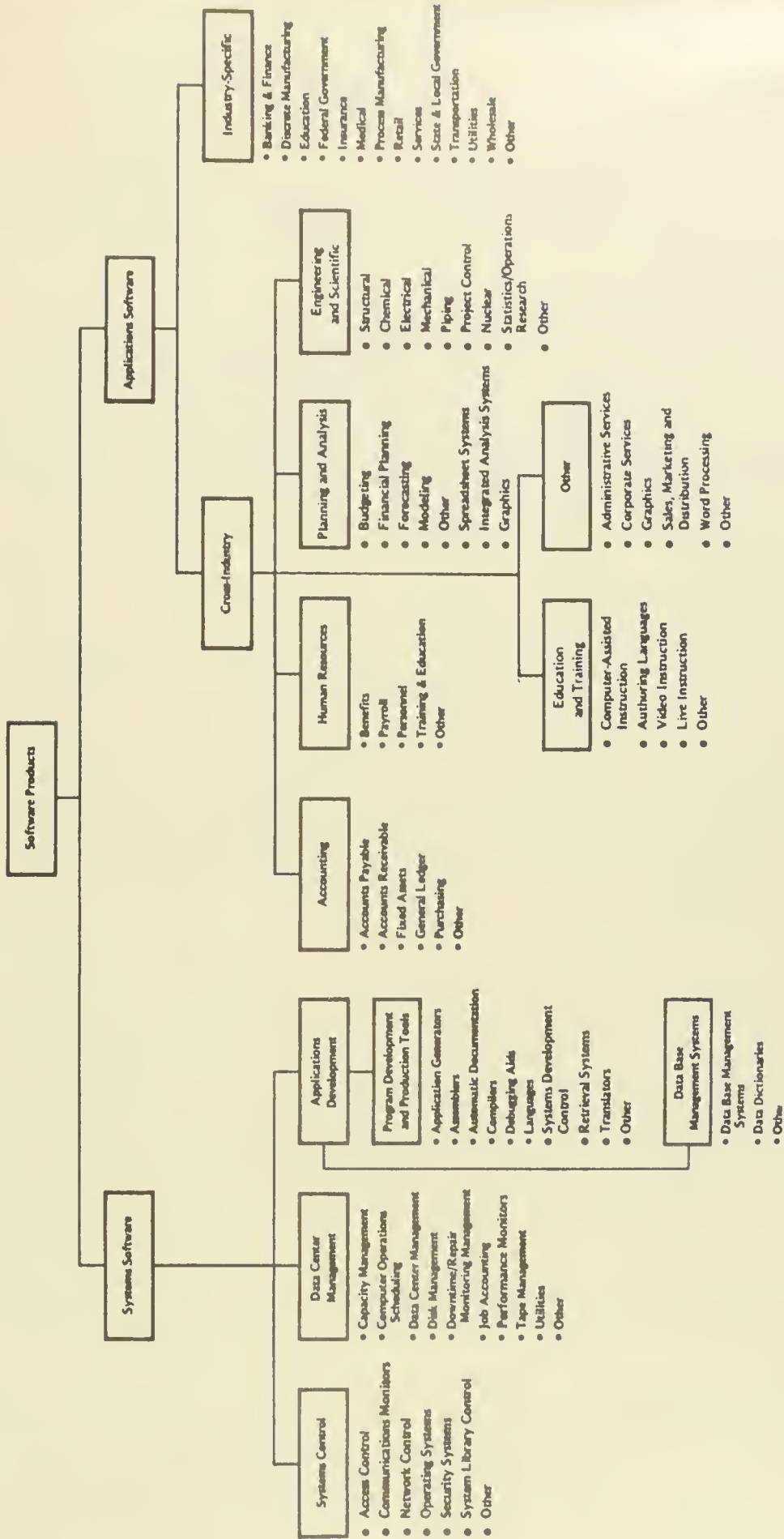


EXHIBIT VII-2

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1990
WESTERN EUROPE

SUBSECTOR	MARKET FORECAST (\$ Millions)					
	1984	1985	1987-1990 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
<u>Hardware Manufacturers</u>						
Systems	\$1,125	\$1,558	27%	\$2,288	20%	\$3,914
Applications	226	316	25	445	18	724
Subtotal	\$1,351	\$1,874	25%	\$2,733	17%	\$4,638
<u>Independents</u>						
Systems	\$277	\$ 401	33%	\$ 651	24%	\$1,241
Applications	622	865	27	1,286	20	2,214
Subtotal	\$899	\$1,266	30%	\$1,937	21%	\$3,455
<u>Total Market</u>						
Systems	\$1,402	\$1,959	28%	\$2,939	20%	\$5,155
Applications	848	1,181	27	1,731	19	2,938
Total	\$2,250	\$3,140	28%	\$4,670	20%	\$8,093

EXHIBIT VII-3

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1990
FRANCE

SUBSECTOR	MARKET FORECAST (FF Millions)					
	1984	1985	1987-1990 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
<u>Hardware Manufacturers</u>						
Systems	FF 2,700	FF 3,350	24%	FF 5,100	23%	FF 9,500
Applications	460	550	20	800	17%	1,300
Subtotal	FF 3,160	FF 3,900	23%	FF 5,900	22%	FF 10,800
<u>Independents</u>						
Systems	FF 840	FF 1,150	31%	FF 1,900	26%	FF 3,800
Applications	1,550	2,000	26	3,100	20	5,400
Subtotal	FF 2,390	FF 3,150	28%	FF 5,000	22%	FF 9,200
<u>Total Market</u>						
Systems	FF 3,540	FF 4,500	25%	FF 7,000	24%	FF 13,300
Applications	2,010	2,550	25	3,900	20	6,700
Total	FF 5,510	FF 7,050	25%	FF 10,900	22%	FF 20,000

EXHIBIT VII-4

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1990
ITALY

SUBSECTOR	MARKET FORECAST (£ Billions)					
	1984	1985	1987-1990 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
<u>Hardware Manufacturers</u>						
Systems	£ 317	£ 420	30%	£ 700	27%	£ 1,440
Applications	80	120	36	200	23	370
Subtotal	£ 397	£ 540	31%	£ 900	26%	£ 1,810
<u>Independents</u>						
Systems	£ 100	£ 120	26%	£ 200	34%	£ 480
Applications	130	160	24%	250	28	1,527
Subtotal	£ 230	£ 280	25%	£ 450	31%	£ 1,007
<u>Total Market</u>						
Systems	£ 417	£ 540	29%	£ 900	29%	£ 1,920
Applications	210	280	29	450	26	897
Total	£ 627	£ 820	29%	£ 1,350	28%	£ 2,817

EXHIBIT VII-5

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1990
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1984	1985	1987-1990 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
<u>Hardware Manufacturers</u>						
Systems	£231	£280	22%	£420	21%	£750
Applications	52	60	15	80	16	125
Subtotal	£283	£340	17%	£500	21%	£875
<u>Independents</u>						
Systems	£48	£60	25%	£95	24%	£180
Applications	166	200	19	280	18	460
Subtotal	£214	£260	19%	£375	20%	£640
<u>Total Market</u>						
Systems	£279	£340	23%	£515	22%	£930
Applications	218	260	18	360	18	585
Total	£497	£600	21%	£875	20%	£1,515

EXHIBIT VII-6

SOFTWARE PRODUCTS MARKET FORECAST, 1984-1990
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1984	1985	1987-1990 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
<u>Hardware Manufacturers</u>						
Systems	DM 1,060	DM 1,300	22%	DM 1,940	189%	DM 3,200
Applications	190	240	24	360	22	650
Subtotal	DM 1,250	DM 1,540	DM 23%	DM 2,300	19%	DM 3,850
<u>Independents</u>						
Systems	DM 200	DM 270	36%	DM 500	24%	DM 950
Applications	500	650	28	1,050	24	2,000
Subtotal	DM 700	DM 920	30%	DM 1,550	24%	DM 2,950
<u>Total Market</u>						
Systems	DM 1,260	DM 1,570	25%	DM 2,440	19%	DM 4,150
Applications	690	890	27	1,410	23	2,650
Total	DM 1,950	DM 2,460	25%	DM 3,850	21%	DM 6,800

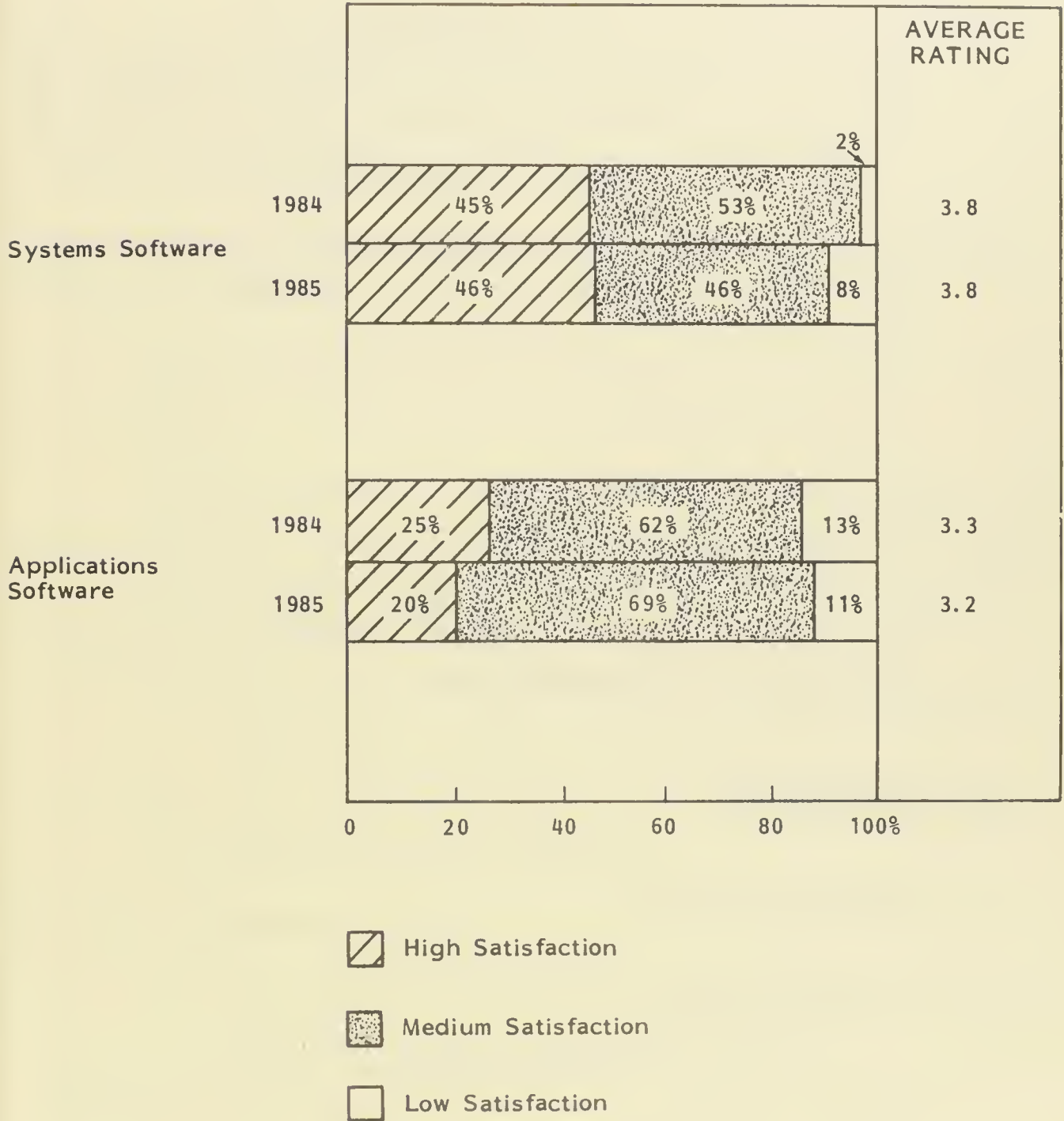
- Equipment manufacturers will continue to pay increasing attention to software products in order to support their hardware sales and maintain their market or expand their market position.
- Manufacturers' sales of software will continue to be predominantly of systems rather than applications products.
- Although manufacturers have paid considerable attention to the applications software area, they have failed to achieve a dominant position.
- As end-user markets continue to fragment into more and more specialised segments, the greater will be the manufacturers' need for the value-added reseller (VAR) mechanism and the more these specialised applications software requirements will be met by the independents.
- Manufacturers will primarily retain their focus on the mass market and use the VAR mechanism to help achieve that objective.
- The implication of this is that independent software firms can benefit from this opportunity to meet user demand for application packages. However, the increasing specialisation of user needs, such as the trend away from providing a production control package to providing one specifically oriented to a particular type of manufacturing, contains a potential threat to growth.
- That threat is custom-built software, probably developed on the basis of standard applications building blocks and supported by implementation consultancy.
- It can be expected that, as a general rule, this approach will tend to occur for larger system developments.

C. USER ATTITUDES AND TRENDS

- The levels of user satisfaction with software products from INPUT's 1985 survey are shown in Exhibit VII-7. (Note also Exhibit V-8 above.)
- The 1985 response again shows that, as in 1984, satisfaction with systems software is significantly higher than with applications software.
- This underlines a tendency on the part of some users to move away from applications packages whenever practical or economically justifiable. This is clearly more often the case at the higher end of the market.
- An indication of software product opportunity areas can be gained from examining data processing managements' plans for new development. Exhibit V-4 shows the relative priority given by DP management to their new development objectives.
- The following areas are of note:
 - The installation of on-line application remains the highest priority for most DP managers, and the development of telecommunications has assumed higher priority as well.
 - Development of information centres has declined as a priority from being clear second highest to ninth position, although it is likely to have more emphasis in the future.
 - The installation of distributed data processing networks is another area that has declined significantly in importance from fourth to fifteenth position.

EXHIBIT VII-7

LEVELS OF USER SATISFACTION WITH SOFTWARE PRODUCTS



- Other areas which show up as lower priority items in the 1985 survey (compared to 1984) are the design and installation of DBMS systems and the use of fourth generation languages (FGLs). However, fourth generation language systems are likely to become more important over the next couple of years.
- The relatively low rating of fourth generation languages would appear at first sight to be at odds with the ranking of 'excessive applications backlog' as the most frequently mentioned priority problem. It must be concluded that currently most FGL products are not considered adequate to meet this task.
- Exhibit V-6 in Chapter V shows a comparison of the development priorities for existing applications and new developments. Areas of highest planned activity are:
 - Accounting/finance.
 - Order entry/purchasing.
 - Personnel/payroll.
- Industrial/manufacturing control and production/inventory control were areas where a decline in emphasis was indicated.

D. VENDOR ISSUES

I. BUSINESS DEVELOPMENT

a. Key Challenges

- As the expected rate of growth for software products slows, vendors are being faced with a number of business development challenges. Key challenges identified by vendors were:

- High levels of competitive activity, particularly in the applications software market.
 - The level of investment required to develop software products and to bring them to the market.
 - Shortages of skilled staff.
 - Marketing issues, particularly pricing.
 - The need to improve the quality and maintainability of software products.
- Marketing issues and services and support are discussed in Sections 2 and 3 below.
 - The high growth rate of the software industry has led to large numbers of participants. As the rate of growth contracts, vendors with weak products and poor market positions and those unable to cross-subsidise their sales by other activities are squeezed out, thus results the 'shakeout' phenomenon.
 - The implications of this increased competition for vendors are the needs for:
 - 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 or increased support services revenues.

- These aims will, in general, be much more readily achieved at the upper end of the market; i.e., with mainframe level systems. At the other extreme, the personal computer level, the business will remain 'cut-throat' for some time. Vendors will need to make a large financial investment to stay in these markets and be successful in the long term.

- The level of investment required for the software market has become a major concern for European vendors. Some typical vendor comments on this issue were:
 - 'A major concern is the investment level necessary in comparison to the size of the market'.

 - 'The investment needed for a new software product is very expensive'.

- The fragmented nature of the European market in comparison to that of the United States is a major drawback. Given the levels of investment required to develop and market a product, often underestimated initially, a sufficiently large market is needed to generate the required level of sales so costs can be more widely spread.

- It is therefore not surprising that the U.S. is seen by European vendors as such an attractive opportunity despite the many failures that have occurred.

- Increasing shortages of skilled staff was also identified by a number of vendors as a potential inhibitor to the development of their business. Some vendor comments were:
 - 'The main problem is to find qualified personnel who understand not only the software problems, but the applications problems as well'.

 - 'It is very hard to get the good people we need--software technicians and sales personnel'.

- 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 increased interest in software products by equipment manufacturers could represent a potential threat to independent vendors.
- However, few vendors saw this as a major problem in 1985. The majority view was that the manufacturers represented an important market opportunity.
- Certainly in 1985 we have seen ICL make considerable efforts to develop better relationships with the independents and thereby enrich the software portfolio available for its equipment. This strategy has of course been a major objective for personal computer makers.

b. New Areas

- Software vendors were questioned on what areas were considered to offer the best market opportunities over the next couple of years. An analysis of their responses is shown in Exhibit VII-8.
- Applications software was the area most frequently mentioned, with nearly one-half of all respondents seeing this as an opportunity.
- Not all vendors were prepared to reveal the specific areas of applications software that they were targeting. However, amongst those that did, the dominant interest was in factory automation process and CAD.
- Also mentioned was the search for specific industry or cross-industry niches within which to specialise.

EXHIBIT VII-8

MOST POPULAR OPPORTUNITY AREAS FOR
NEW SOFTWARE PRODUCTS

TYPE OF SOFTWARE	PERCENT OF RESPONDENTS*
Applications	47%
Systems Software	27
Fourth Generation Language (FGLs)	27
Personal Computer Software	24
Artificial Intelligence and Expert Systems	22
Decision Support Systems	13
Software Productivity Aids	13
Communications Software	11
UNIX/PICK	11
Other	4

* Multiple Choices.

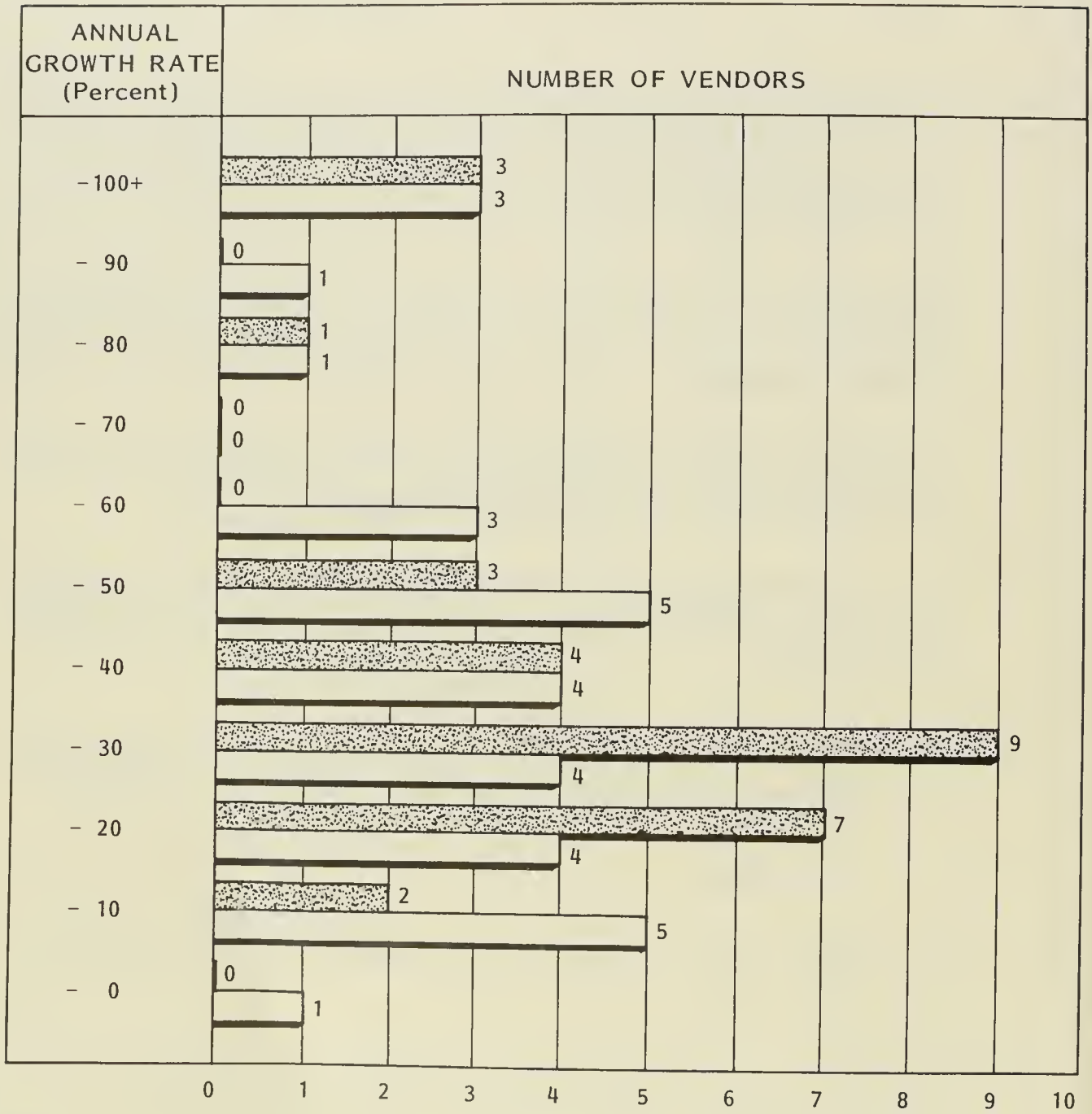
- Vendors must concentrate their area of focus in applications software since the market is oversubscribed, particularly at the PC end. Genuine user benefits and unique features are important factors in assessing the viability of products. Successful applications packages are tending to become more and more specialised.
- Other areas of interest mentioned by a significant proportion of vendors (between one-fifth and one-quarter) were systems software, fourth generation languages, personal computer software, and the area of artificial intelligence and expert systems.
- Systems software continues to be an important opportunity, particularly in respect of the trend to integrate more systems software functions into applications packages.
- Fourth generation languages and micro-mainframe software opportunities are two areas in which INPUT has carried out research during 1985.
- Other important areas like decision support systems, software productivity aids, and communications software were of interest to only just over 10% of the respondents.
- Interestingly, despite the frequency of mention by computer journals, only 11% of the vendors interviewed experienced any interest in UNIX or PICK.



c. Growth Rates

- The software products market has been characterised by very high growth rates in recent years.
- Exhibit VII-9 shows the comparative distribution of growth rates currently being achieved by the vendors interviewed along with those obtained from last year's survey.

EXHIBIT VII-9

DISTRIBUTION OF INDEPENDENT SOFTWARE PRODUCT VENDORS' GROWTH RATES



 1985 Survey
 1984 Survey

- Whilst it can be seen that high revenue growth rates are still being achieved, there is an observable drift downward in the rate of growth for most vendors.
- Whereas in 1984, the median point was around 30-40%, in 1985 it has fallen to 20-30%.

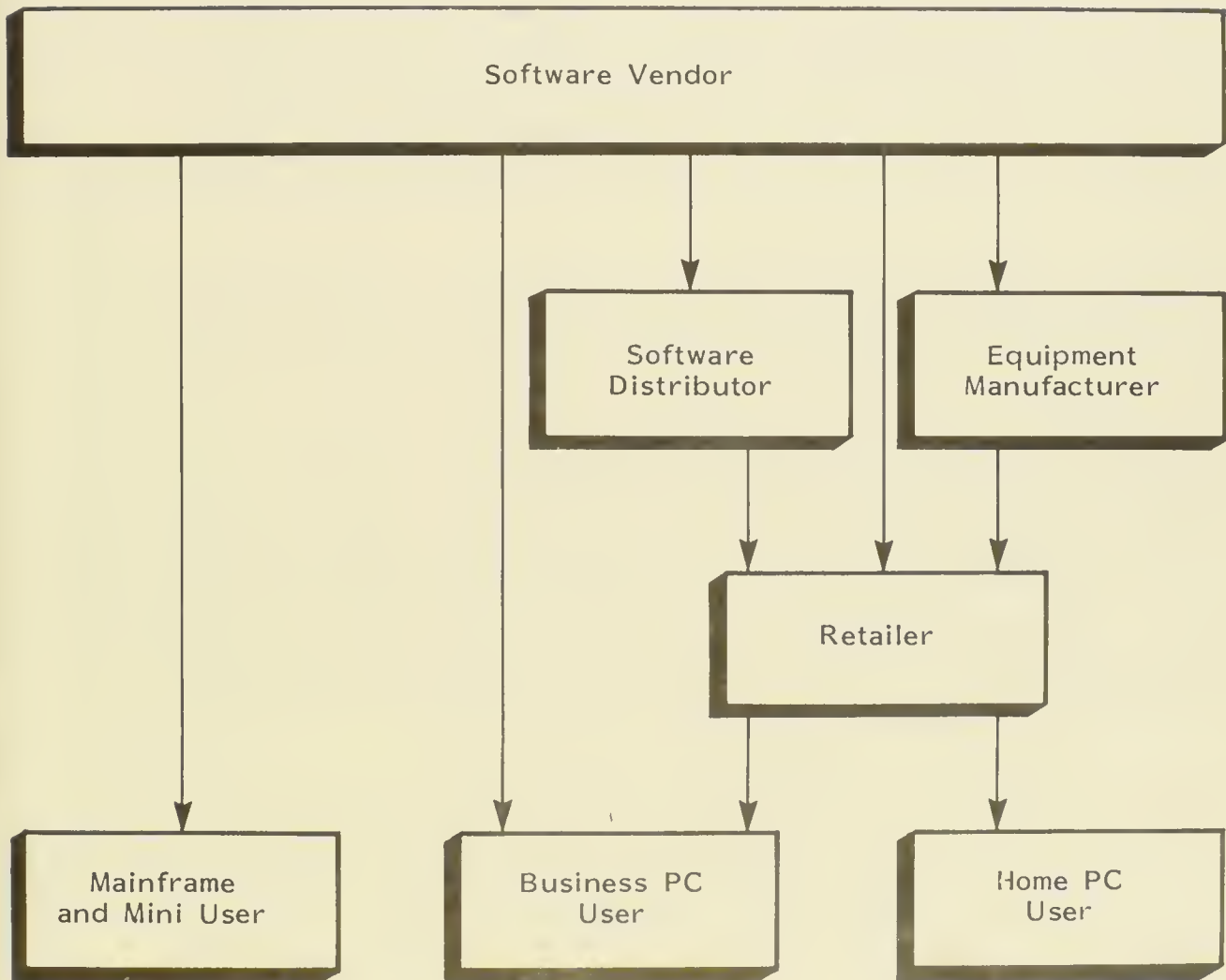
2. MARKETING

- Despite the slowing of growth and increased levels of competition, few software vendors have adopted innovative marketing methods.
- As was reported during 1984, some software vendors have been most progressive in the use of marketing methods such as complex distribution channels and advertising, but there is little evidence that these approaches are being adopted to any great extent by the vast majority of vendors.
- To some extent, this results from the fact that the 'shakeout' has yet to seriously affect most vendors. There have been some instances of problems, for example, MICRO-FOCUS, but the majority of vendors have continued to experience acceptable growth rates.
- In particular, Italian vendors commented that they saw no sign of a 'shakeout' in their market as yet.
- Particular trends commented upon that affected the marketing approach of software vendors included:
 - 'Increasing need to be distinctive'.
 - 'Marketing expenses continuing to grow'.
 - 'Increasing U.S. vendor market penetration'.

- Vendors most at risk to a market shakeout were considered to be those:
 - That placed total reliance on software products for their revenues.
 - That were lacking in the necessary technical expertise and support.
 - That were relatively new entrants into the market and had not become established.
 - That were underinvested.
- In terms of marketing methods and techniques, the majority of vendors were tending to place more emphasis on prospect generation techniques such as mail shots and seminars but still saw the field sales force as vital.
- Exhibit VII-10 summarises the principal distribution channels through which software vendors must seek to sell 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 will probably need to be backed up by advertising expenditure.
- One example of the successful use of this approach is by Macro 4, the U.K.-based IBM DOS systems software vendor that has marketed products entirely by direct mail and the offer of a free 30-day trial period.
- This kind of approach is dependent upon the product benefits being readily self-evident.
- There are a number of factors which software vendors must balance in the selection of the appropriate distribution channel. These will include:

EXHIBIT VII-10

SOFTWARE PRODUCT DISTRIBUTION CHANNELS



- The characteristics of the product.
 - Market population of target machine or models.
 - Type of target machine or model.
 - Vendor position in the marketplace, established or new entry.
- A key area in marketing is pricing, particularly in today's fast changing market environment. Vendor comments indicated that pricing was a key consideration and that it was an area of management concern.
 - 'We will withdraw from the market if we cannot maintain our margins'.
 - 'We are adopting a strategy of moving towards higher ticket items on larger machines'.
 - 'We are emphasising service to justify our prices'.
 - Many vendors reported using market-related factors such as competitors prices, and markups on a cost basis for software product pricing. However, there were also those vendors who were adopting value-based pricing albeit on an experimental level. One vendor, for example, commented:
 - 'High pricing conveys a high-quality image'.
 - Vendors were also concerned about such factors as multiple discounts, site licenses, and chargeable maintenance fees tied into software revision levels.
 - Bundling of software prices is also an issue for vendor consideration given the trend toward a greater level of integration of systems and applications software.

- Exhibit VII-11 shows a summary of the perceived advantages for software bundling from both the vendor's and the user's perspective.
- Vendors must be cautious in their approach to such areas since dramatic changes in pricing may indicate a false message to users. Vendor reputation is often a key factor and pricing policy should support not diminish this aspect.
- 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 appropriate 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.
- Nearly all vendors utilise phone-in centres as the basis for customer support. However, relying on people to provide information and training is an inexact way of answering customer questions.
- Few vendors were using remote fault diagnosis techniques. Clearly, there is a problem of the size of the installed base. One smaller vendor commented:
 - 'One needs a large-scale operation to justify remote diagnosis'.
- However, those vendors operating on a worldwide scale were utilising such methods as a database of standard error correction procedures and a database of user details; e.g., configuration data.

EXHIBIT VII-11

SOFTWARE BUNDLING:
ADVANTAGES AND DISADVANTAGES

VENDOR'S PERSPECTIVE

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none">● Helps Sell Product Family● Eliminates Confusing Options● Customer Will Buy More● Helps Boost Sales of Weak Products When Bundled With Strong Ones	<ul style="list-style-type: none">● Puts Long-Term Pressure on Profit Margins Due to Bundling Discounts● May Slow Down Sales Cycle Due to Magnitude of Dollar Commitment

USER'S PERSPECTIVE

ADVANTAGES	DISADVANTAGES
<ul style="list-style-type: none">● Appeals to User's Desire for a Total Integrated Solution● Simplifies Buying● Provides Better Prices	<ul style="list-style-type: none">● Don't Want to Pay for What Is Not Used● May Not Get The Best Product for Each Component

- Exhibit VII-12 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 VII-13 shows the factors involved and the need to have most of these determinants close to the high end of the scale.
- Although it might 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 would help vendor support operations in:
 - Smoothing time-of-day/week peaks.
 - Ranking problems.
 - Documentation.
 - Assigning problems to the correct specialist.
- The perceived benefits would include:
 - Much faster response to known problems, especially if the expert system interface were used.

REMOTE SUPPORT OF THE FUTURE

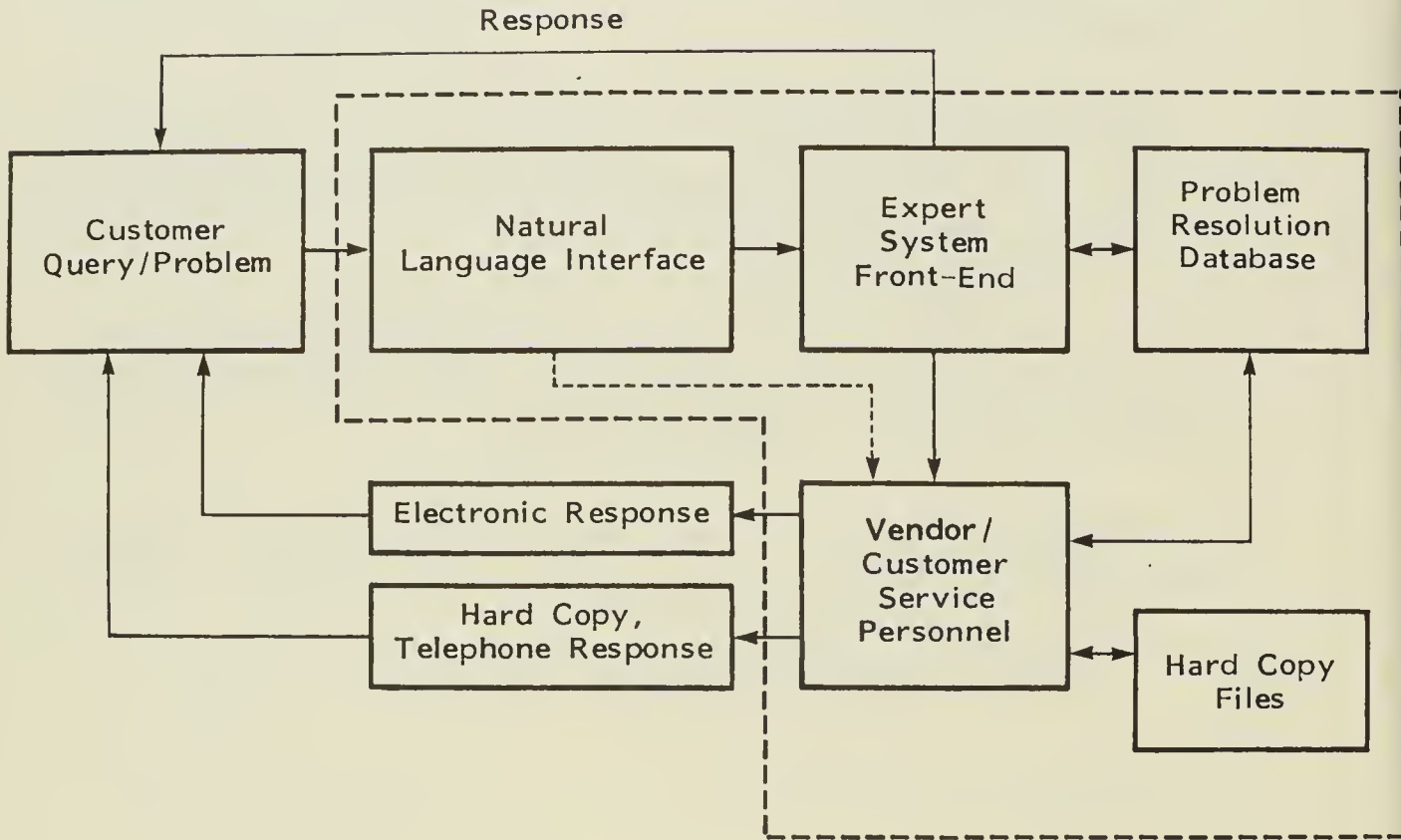
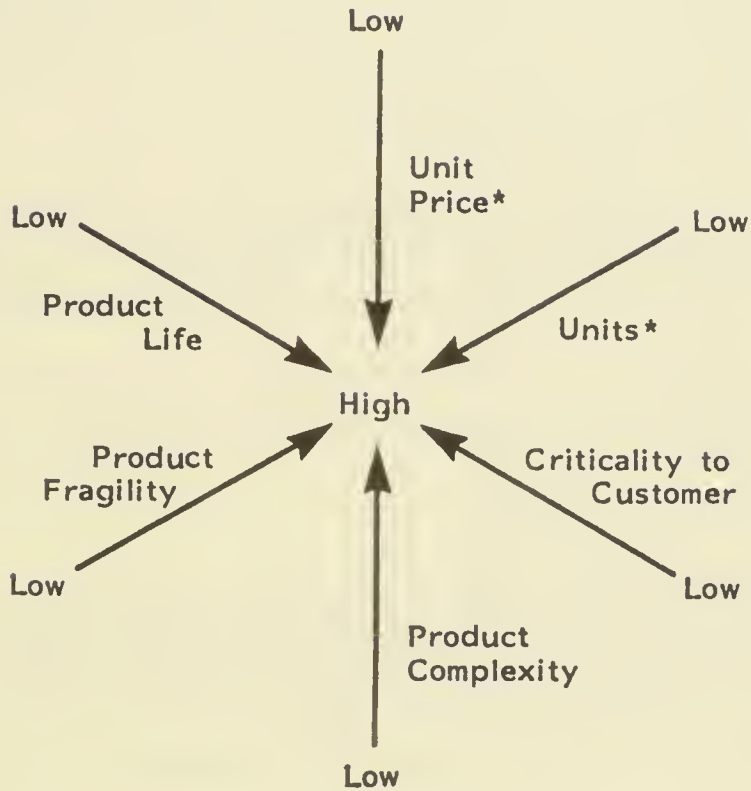


EXHIBIT VII-13

REMOTE SUPPORT SYSTEM: INVESTMENT DETERMINANTS



* Critical

- Much less vendor involvement in problems/queries which turn out to be in customer documentation already.
- These two benefits, taken together, could then allow support organisations to focus on the major operating system problems.

4. UNIX AND PICK

- One of the issues much discussed in the computer press is that of UNIX, its possible position as a competitor to IBM operating system domination, and its relative position vis a vis PICK.
- UNIX is of particular interest to European information services vendors because of developments like the X/Open group, a consortium of the main European-based manufacturers to set certain UNIX standards.

a. UNIX

(i) Background

- Developed by Bell Labs, UNIX comes in many versions and variations, such as Microsoft's XENIX. Considering all of its implementations, UNIX is the leading multi-user system (MUS) operating system. UNIX is viewed by many observers as an alternative to IBM's dominance of information systems technology.
- AT&T's policy of inexpensive (\$150) university licensing has led to a degree of system familiarity. INPUT user surveys have not revealed strong interest to date.

(ii) UNIX Will Share the Standard Label

- In spite of its development history and AT&T's reported expenditure of \$3.5 million on awareness advertising in the U.S. over the past year, the general lack of UNIX familiarity is clear.
- This does not necessarily mean that UNIX will fail, only that as a 'standard' operating system UNIX will probably have to share that label. For it to gain significant market share, vendors will need to continue their awareness campaigns and continue UNIX improvements to overcome shortcomings reported below.

(iii) UNIX Advantages and Disadvantages

- Two UNIX terms need to be defined to aid understanding of the operating system.
 - The 'kernel' controls hardware resources and basic file management. It can be optimised to match CPU sophistication and can manage multiple devices.
 - A 'shell' surrounds the kernel and acts as an interpreter between operating system and user with menus or help screens. A shell interprets keyed commands to execute programs.
- UNIX has some very positive characteristics:
 - UNIX incorporates over 200 utilities for word processing, editing, and other functions for software development.
 - Since it transfers easily from one computer to another, it is vendor-independent. This means users can upgrade to more powerful machines and use existing software.

- If used on micros, minis, and mainframes, only one user interface needs to be learned.
 - In a UNIX network, server functions can be handled in the background while applications run in the foreground.
 - AT&T provides training and support to hardware and software vendors that license the UNIX operating system.
- However, there are a number of disadvantages to UNIX.
 - Although it can technically support many more, in its original form UNIX works best with three to five users running COBOL or BASIC applications. UNIX System V, used on multiprocessor hardware, overcomes this limitation.
 - There are 25 commercial versions of UNIX and an equal number of UNIX clones, with manufacturers adding extensions to enhance business application usefulness. These versions are often incompatible, causing user confusion and hampering software development.
 - Because it was designed for software development and scientific applications, the user interface is considered 'unfriendly'. Missing are important business functions (e.g., file locking). Newer versions of UNIX address this problem. Shells can be adapted to special needs, but this is not unique to UNIX. Shells may also reduce system efficiency.
 - Record and file locking features which prevent multiple revisions of an open file are poor. Expert programmers can break into the most well-protected UNIX files, a serious security problem. Newer versions of UNIX (e.g., XENIX) address this problem.

- UNIX requires at least 1.5 M-bytes of disk storage, often cramping other needs.
- UNIX applications are written in C language which produces less efficient code than assembly language.
- Scientific UNIX applications are available, but business applications are difficult to locate since there is no clear distribution path. There are approximately 600 scientific and business packages available.
- UNIX software has often been adapted from minicomputer versions and tends to be less functional and more costly than other software.
- The UNIX MUS kernel does not inherently offer 'realtime' capabilities without major modifications. This causes some UNIX features to be omitted and processing to be slowed.
 - Realtime is when a system responds to changes within a specified short time, compared to batch or time-shared jobs.
 - UNIX is difficult to use for transactions or for voice and image digitization because of this limitation.
 - AT&T is offering realtime versions for mini and mainframe computers which will eventually benefit MUSs. This also means even more UNIX variations.
- Documentation is very technical. System specialists are needed for software maintenance.

- Many of these problems are being addressed.
 - System V is emerging as the one UNIX standard. AT&T and Microsoft (developer of XENIX) have entered a joint development agreement to make XENIX, based on System III, more compatible with System V. The new version is called XENIX V.
 - The use interface is being improved with shells.
 - More powerful chips can accommodate UNIX's memory demands. AT&T, as well as other manufacturers, is working to encode the operating system on a single chip.
 - Realtime languages and kernels for MUS will eventually become available.
 - Several companies have developed 'bridge products' to alleviate the software availability problem with DOS and UNIX applications running concurrently in configurations linking a UNIX MUS with a DOS micro.
- The benefits and limits of UNIX are shown in Exhibit VII-14.

(iv) IBM and UNIX

- Since the 1970s, IBM has been offering VM/IX, a UNIX mainframe product intended for engineering, scientific, and research environments, to gauge demand for mainframe UNIX.
- More recently, the company implemented several versions of UNIX: CPIX for telecommunications, IX/370 derived from Version VII, IX/370 derived from System III, Xenix from Microsoft, and VM/IX. These are in addition to Time Sharing Option (TSO), an early mainframe UNIX-like operating system.

EXHIBIT VII-14

UNIX OPERATING SYSTEM

ADVANTAGES	DISADVANTAGES	FUTURE DEVELOPMENTS	VENDORS SUPPORTING
<p>Vendor Independent: Portable</p> <p>Over 200 Utilities</p> <p>Supports Customization</p> <p>AT&T Plus Growing IBM Support</p> <p>One User Interface for all Computers</p> <p>Computer Science Graduate Familiarity</p>	<p>50 Versions and Clones Hamper Compatibility</p> <p>Requires Shells to Ease Use</p> <p>Poor Record/File Locking</p> <p>High Storage Requirements</p> <p>Limited, Costly Software</p> <p>Limited Realtime Capabilities</p> <p>Technical Documentation</p>	<p>UNIX V and XENIX V as Standards</p> <p>New Chips Meet Storage Needs</p> <p>Realtime Kernals</p> <p>Bridges to Other OS Software</p>	<p>AT&T, ALTOS, IBM, Fortune, Morrow, ONYX, Plexus</p>

- UNIX V will be available for the IBM Sierra mainframe, replacing VM/IX. IBM's PC-UNIX version (PC/XT) is based on System III whereas AT&T is now backing System V. Xenix will be available for the PC/AT, but files created under PC/IX and Xenix are not compatible.
- IBM's UNIX strategy is unclear. It may represent ambivalence toward the UNIX marketplace, a response to user interest, or an attempt to 'hedge its bets' with UNIX.
- IBM has established a small task force for long-range planning and marketing support of the company's UNIX implementations:
 - This may signal intent to ultimately control development of the operating system and a prelude to System V availability on new micros competing with AT&T products.
 - However, a more conservative view sees the task force formed in response to anticipated competition from Amdahl's UNIX mainframes. AT&T has entered an agreement with Amdahl for UNIX System V support.
- IBM is understandably reluctant to support AT&T's product, but equally reluctant to pass up what may prove a promising area.

(v) Analysis

- Some MUS vendors are offering UNIX due to the users' perhaps inflated image of the operating system. There is a desire to give the customer what he wants.
- However, AT&T's continuing efforts behind UNIX and the support of other computer vendors (notably IBM and the X/Open group) means the operating system must be considered by users and vendors at least as an option on multi-user, multitasking, networked machines.

b. PICK

- Originally developed to provide an extremely user-friendly interface and recently improved, PICK is a viable alternative to UNIX.
- It is supported by approximately 17 MUS and minicomputer vendors, including Altos, Honeywell, and Prime, and on the IBM Series/1, 4300 series, and the PC. It can share files created under PC-DOS.
- PICK's advantages are:
 - It integrates a powerful relational data base management system supporting applications where locating and moving data is important.
 - It has print spooling, text formatting, and development tools for multi-user applications.
 - PICK has an English-like query language. It is easier to program in PICK than UNIX. The RPL (Realtime Processor Language) is similar to BASIC.
 - While not considered suitable for scientific applications, it is suitable for business users with little computer experience.
 - UNIX is complex, with various versions and over 400 modules available around the kernel. PICK is simpler and much more portable between machines.
 - PICK originated over a decade ago, is well developed, and has a small but growing following.

- PICK's disadvantages are:
 - The operating system is not strongly supported by industry leaders, although it has been transferred to several 68000-based computers and some vendors offer both UNIX and PICK operating systems.
 - Experienced PICK users and developers are rare and there is little literature about the system.
 - The programming language (PICK Basic) uses one or two characters instead of words. Reading code is difficult, a problem in servicing software.
 - PICK lacks floating-point arithmetic functions.
 - There is limited available software (approximately 620 packages).
- However, a new version called PICK Open Architecture will work to overcome some of these limitations.
 - The enhancements are designed to permit future hardware and communications developments to be easily incorporated into PICK software while maintaining compatibility with earlier versions.
 - PICK Open Architecture features unlimited record size.
 - Users will be able to execute system commands from within applications.
 - A C-language compiler will allow UNIX applications to be recompiled to run under PICK.

- Open Systems Architecture will ease the ability to run multiple operating systems such as UNIX and VM on the same machine.
- A group of PICK licensees working with vendor PICK Systems is developing a more aggressive marketing strategy and standards to insure compatibility between present and future variations of PICK.
- Future planned PICK enhancements will enable it to run on the IBM PC/AT.

E. COMPETITIVE ANALYSIS

- Exhibits VII-15 through VII-18 rank the leading suppliers of software products by market share of all software product user expenditures in 1984 for each of the four individual country markets.

EXHIBIT VII-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 SOFTWARE PRODUCTS
 FRANCE
 (Independent Vendors)

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (FF Millions)
1	SG2	5.85%	FF 140
2	SEMA	5.02	120
3	CGI	4.85	116
4	SESA	3.76	90
5	STERIA	3.34	80
6	SAGES	2.93	70
7	SLIGOS	2.88	69
8	ANSWARE	2.51	60
9	UNILOG	2.30	55
10	CAP GEMINI SOGETI	2.26	54
	OTHERS	64.30	1,536
TOTAL MARKET		100.00%	FF 2,390

EXHIBIT VII-16

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
SOFTWARE PRODUCTS
ITALY
(Independent Vendors)

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	DATA MANAGEMENT GROUP	6.69%	£15,400
2	SYNTAX	6.61	15,200
3	COMPUTER ASSOCIATES	4.80	11,000
4	ENIDATA	3.39	7,800
5	O. GROUP	2.74	6,300
6+	SOPIN	2.21	5,100
6+	CNI (CONSORZIO)	2.21	5,100
6+	SELESTA GROUP	2.21	5,100
9	ENGINEERING	2.13	4,900
10	INAZPAGHE	2.08	4,800
	OTHER	64.93	149,300
TOTAL MARKET		100.00%	£230,000

EXHIBIT VII-17

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 SOFTWARE PRODUCTS
 UNITED KINGDOM
 (Independent Vendors)

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	THORN EMI IT	5.60%	£ 12
2	MICRO FOCUS	3.74	8
3	SCICON	3.27	7
4+	MCCORMACK & DODGE	2.80	6
4+	PETERBOROUGH	2.80	6
6+	PPL	2.33	5
6+	MSA	2.33	5
8+	CAP	1.87	4
8+	CINCOM	1.87	4
8+	HOSKYNS	1.87	4
	OTHERS	71.52	153
TOTAL MARKET		100.00%	£ 214

EXHIBIT VII-18

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 SOFTWARE PRODUCTS
 WEST GERMANY
 (Independent Vendors)

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (DM Millions)
1	MBP	7.28%	DM 51
2	SOFTWARE AG	6.43	45
3	SAP	5.28	37
4	ADV ORGA	5.00	35
5	GEI	4.43	31
6	SOFTLAB	3.28	23
7	CINCOM	2.85	20
8	SCS	2.28	16
9	TAYLORIX	2.14	15
10	COMPUTER ASSOCIATES	1.71	12
	OTHER	59.52	415
TOTAL MARKET		100.00%	DM 700

VIII PROFESSIONAL SERVICES

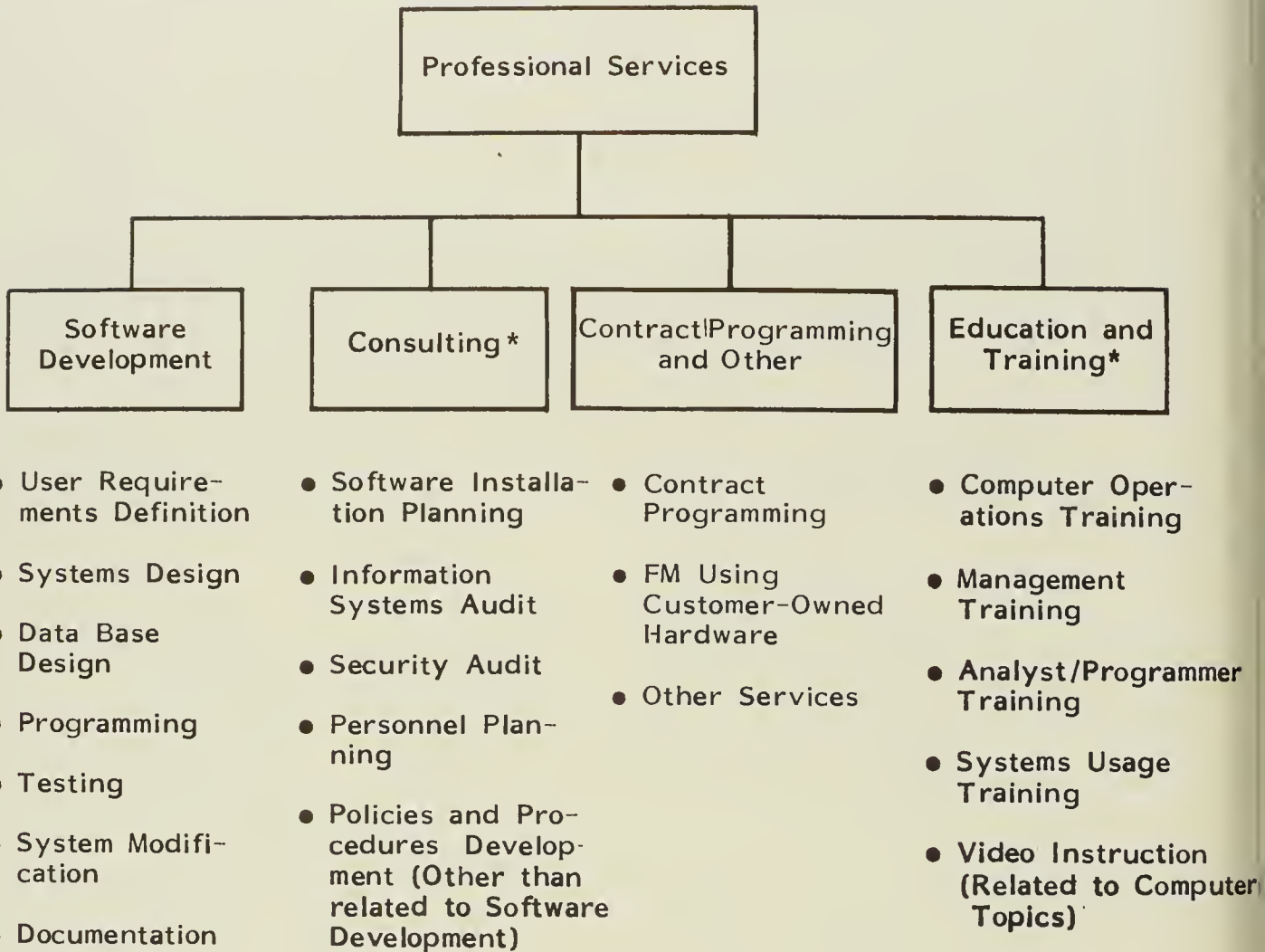
VIII PROFESSIONAL SERVICES

A. INTRODUCTION

- In 1984, the professional services sector contributed very nearly 30% of the Western European Information Services market and became the largest sector. In 1983, it was the second largest sector to processing services.
- 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 VIII-1 gives a schematic representation of INPUT's classification of the professional services market structure.
- The growth rate in this market is expected to decline in the five-year forecast period from an annual average of 28% up to 1987, to 22% between 1987 and 1990.

EXHIBIT VIII-1

PROFESSIONAL SERVICES MARKET STRUCTURE



* All related to computer systems, topics or issues

- The major driving force for growth will be the increasing complexity of system development, particularly the increasing convergence of computers and communications networks.

B. MARKET DEVELOPMENT, 1985-1990

- Exhibits VIII-2 through VIII-6 provide summary tables of the forecast professional services market growth between 1985 and 1990 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 34% per annum.
- The Italian market will be largely driven by the needs of medium and large companies to get up-to-date, on-line, network-based systems up and running in an environment of rapid improvement in the telecommunications infrastructure.
- The highest sustained rate of growth is expected in the education and training sector, the lowest in consultancy. Consultancy will be the most 'people-restricted' sector.

C. USER ATTITUDES AND TRENDS

- Exhibit VIII-7 shows the user survey results for satisfaction with professional services for both 1984 and 1985.

EXHIBIT VIII-2

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1990
WESTERN EUROPE

SUBSECTOR	MARKET FORECAST (\$ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Consultancy	\$ 325	\$ 421	19%	\$ 553	14%	\$ 822
Software Development	1,882	2,671	30	4,157	23	7,679
Contract Programming and Other	391	530	25	767	18	1,275
Education and Training	314	440	28	665	24	1,257
Sector Total	\$2,912	\$4,062	28%	\$6,142	22%	\$11,033

EXHIBIT VIII-3

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1990
FRANCE

SUBSECTOR	MARKET FORECAST (FFMillions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Consultancy	FF 880	1,030	17%	FF 1,400	16%	FF 2,200
Software Development	7,300	9,050	26	14,500	24	28,000
Contract Programming and Other	1,380	1,700	21	2,500	19	4,250
Education and Training	700	900	25	1,400	25	2,750
Sector Total	FF10,260	12,680	25%	FF19,800	23%	FF37,200

EXHIBIT VIII-4

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1990
ITALY

SUBSECTOR	MARKET FORECAST (£ Billions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Consultancy	£ 75	£ 96	26%	£ 150	26%	£ 300
Software Development	360	524	36	910	38	2,398
Contract Programming and Other	120	160	33	280	32	640
Education and Training	45	62	39	120	36	300
Sector Total	£ 600	£ 842	35%	£ 1,460	35%	£ 3,638

EXHIBIT VIII-5

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1990
UNITED KINGDOM

SUBSECTOR	MARKET FORECAST (£ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Consultancy	£ 89	£100	12%	£ 125	14%	£ 185
Software Development	424	550	28	900	24	1,700
Contract Programming and Other	66	80	20	115	20	200
Education and Training	77	97	25	150	26	300
Sector Total	£656	£827	25%	£1,290	23%	£2,385

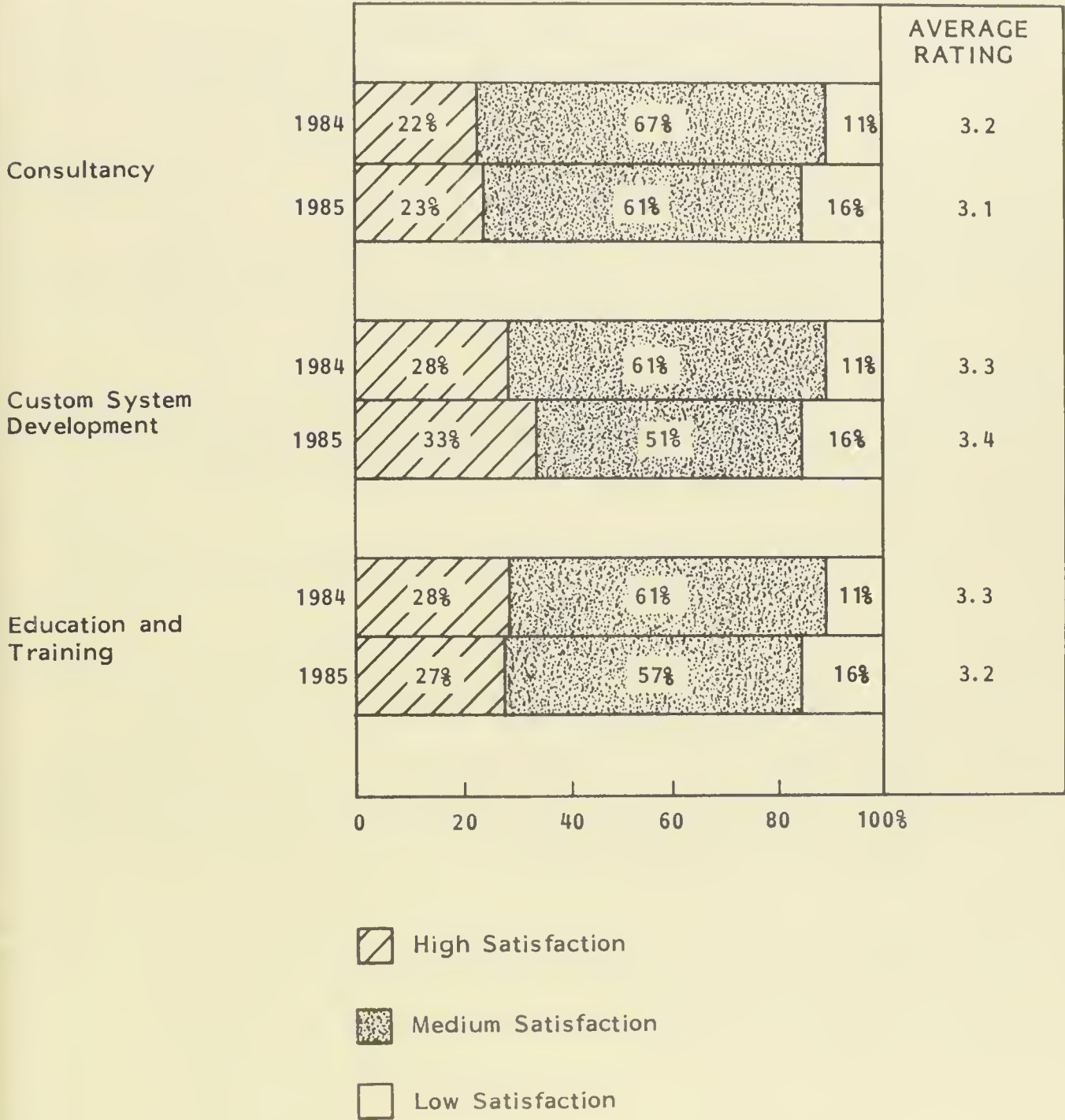
EXHIBIT VIII-6

PROFESSIONAL SERVICES MARKET FORECAST, 1984-1990
WEST GERMANY

SUBSECTOR	MARKET FORECAST (DM Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
Consultancy	DM 215	DM 250	20%	DM 360	14%	DM 530
Software Development	1,000	1,200	26	1,900	21	3,400
Contract Programming and Other	260	300	21	440	15	670
Education and Training	337	400	22	600	22	1,100
Sector Total	DM1,812	DM2,150	22%	DM3,300	22%	DM5,700

EXHIBIT VIII-7

LEVELS OF USER SATISFACTION WITH PROFESSIONAL SERVICES



- This profile indicates a moderate level of satisfaction for 1984 and 1985. Only in the category of custom system development did the proportion of respondents recording high satisfaction reach one-third.
- Consultancy is the sector with the lowest rating with only just over one-fifth of respondents rating a degree of high satisfaction with the services received.
- These relatively low satisfaction ratings were reflected in some of the critical comments made by users:
 - 'The quality of outside services is extremely variable though consistently expensive. We try to avoid them'.
 - 'I dislike being reliant upon outside services firms since they are beyond my direct control. It is not only difficult but also time-consuming to differentiate between good and bad suppliers of services'.
 - 'Project and man-management techniques appear to be lacking in most services companies'.
 - 'If the cost of programming services continues to rise, we may establish our own programming capability within the next two years'.
- Other typical comments were that 'using outside consultants had never met with much success' and comments to the effect that they preferred to keep the expertise they required in-house.

D. VENDOR ISSUES

I. BUSINESS DEVELOPMENT

- The continuing development of information technology and the increasing pressure on organisations to use it opens up new opportunities for professional services organisations.
- However, these opportunities are to be exploited in an environment which is increasingly competitive and in which many new problems and challenges need to be faced. Exhibit VIII-8 lists some of the business challenges most frequently mentioned by vendors.
- A key concern of many professional services vendors was the exploitation of new technology. As one vendor commented, 'we have to take up a position in new areas and we have to do it now or we will miss the opportunity'.
- Areas of particular interest mentioned by vendors were:
 - Artificial intelligence and expert systems.
 - Computer integrated manufacturing (CIM). Many vendors remain sceptical as to the real capability of developing such systems, but see opportunities to provide consultancy services directed at this area.
 - Computer/telecommunications convergence.
- 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.

PROFESSIONAL SERVICES BUSINESS CHALLENGES

- The need to exploit and make use of newly emerging technologies.
- Difficulties in recruiting the required professional staff.
- Improving software development productivity.
- Meeting high levels of competition.
- Increasing profitability.
- Building relationships with other vendors, in particular equipment manufacturers.
- The need to adopt a more specialised approach.

- Another important concern for vendors was the increasingly competitive environment within which they operate. Amongst strategies being adopted to strengthen the company's marketing image were:
 - Using consultancy services as a market development tool to open up business opportunities in custom system development.
 - Improving the professional image of the company. One vendor spoke of using higher quality salespeople able to see projects through to implementation as a support to this objective.
- Increasing specialisation is another strategy aimed at improving a company's professional image.
- Historically, the majority of professional services vendors have remained free of either industry or project specialisation.
- The proliferation of increasingly complex technologies and the consequent demands that these make on systems implementors are causing vendors to reassess their position on this issue.
- Other important business challenges mentioned; i.e., software development productivity, profitability, and new business relationships, are discussed in the sections below.

2. CONSULTANCY TRENDS

- Trends in consultancy services are determined both by market demand and new technological developments where knowledge and experience are likely to be limited.
- Consultancy assignments on the development of communications systems and communications use are important examples of both the above-mentioned

factors at work. Another example is the provision of expert systems consultancy.

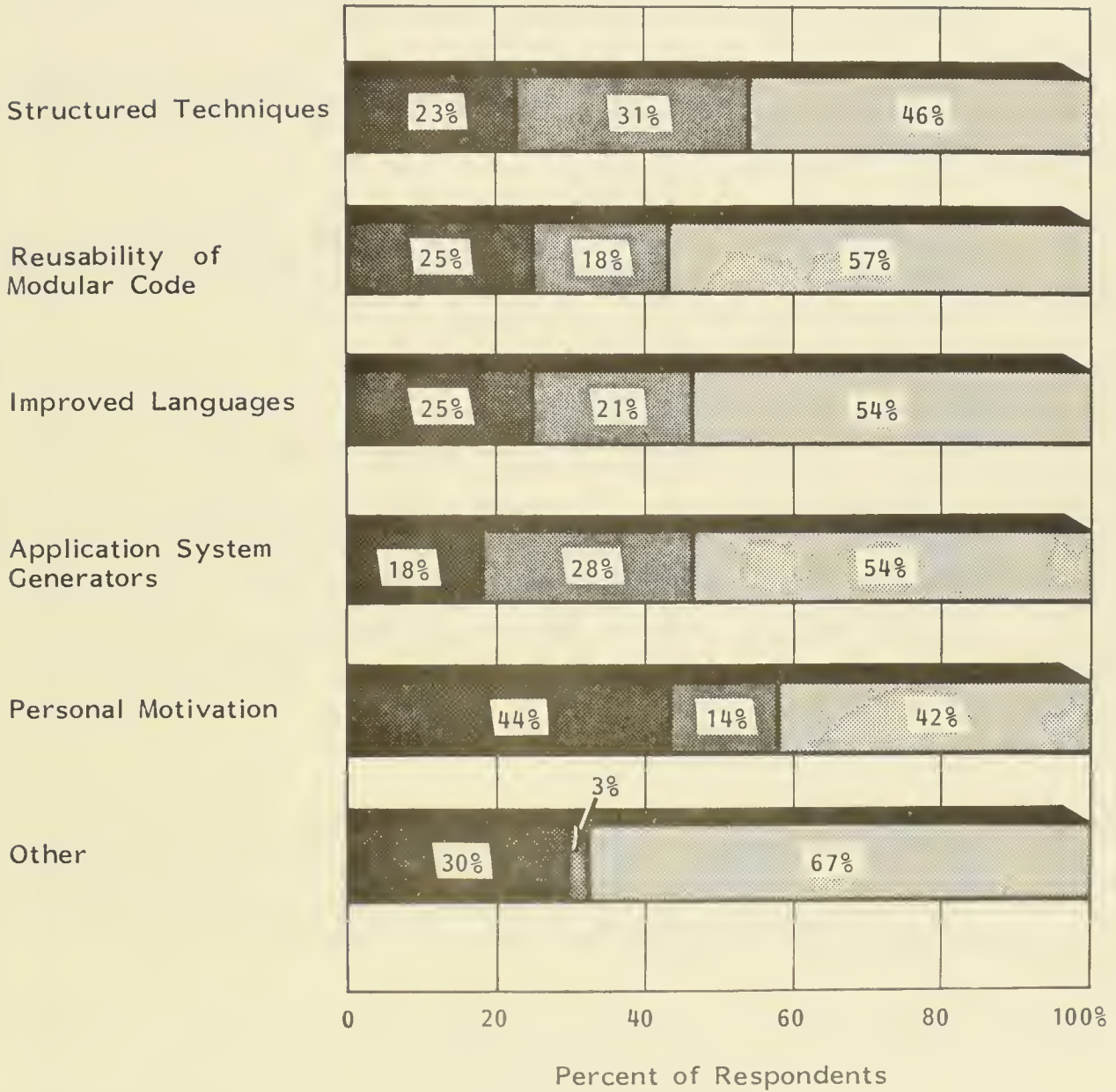
- In addition to communications consultancy, the most frequently mentioned areas of consultancy activity were the provision of equipment selection services, feasibility studies, and systems planning services.
- The general trend amongst professional services vendors towards vertical market specialisation was also observable in regard to consultancy. Several vendors commented on this; for example, one was specialising in the aerospace industry.
- Other areas mentioned by vendors included:
 - Performance measurement and capacity planning.
 - EDP auditing.
 - Software quality assurance.
 - Supporting software packages.
 - Security issues and disaster recovery.

3. PRODUCTIVITY APPROACHES

- Exhibit VIII-9 illustrates the profile of the usage of productivity techniques amongst the professional services vendors interviewed.
- As has been the case in previous research, personal motivation stood out as the most significant contributor to productivity in the opinion of vendors.

EXHIBIT VIII-9

USAGE OF PRODUCTIVITY APPROACHES



- High Usage
- Medium Usage
- Low or No Usage

- The search for increased productivity is a key concern for professional services vendors, as has already been observed. The pattern of responses shown in Exhibit VIII-9 indicates that many of the promised solutions have yet to be used comprehensively by most vendors.
- The conclusion drawn is that whilst in certain situations dramatic productivity improvements have been gained, the general picture is one in which most methodologies or 'productivity products' have failed to deliver their promise.
- This situation is of course also reflected in the experience of user organisations where a similar situation has emerged.
- Nevertheless, it may also be true that managers responsible for system development have over reacted to this situation and have in fact been too cautious in their approach to new methods.
- The category 'Other' in Exhibit VIII-9 included mentions of software productivity tools, fourth generation languages, and project management methods.
- INPUT recommends that vendors pay increasing attention to this area and make efforts to utilise appropriate tools and methodologies to their maximum impact. These efforts will be repaid in terms of improving customer service and increased profitability.

4. PROGRAMMING LANGUAGES

- Vendors were questioned on their use of different programming languages for the development of software. The usage profile for vendors in 1985 and a comparison to last year's survey results are shown in Exhibit VIII-10.
- The comparison with 1984 shows a decrease in emphasis on assembler languages. Use is now limited to the necessity in some situations to achieve performance targets; for example, in the development of systems software.

EXHIBIT VIII-10

USAGE OF PROGRAMMING LANGUAGES

LANGUAGE CATEGORY	MEAN PERCENTAGE USE	
	1984	1985
Assembler	8%	4%
Traditional High-Level Languages (e.g., COBOL, FORTRAN)	56	47
Newer High-Level Languages (e.g., PL1, PASCAL, ADA, MODULA-2)	16	26
Nonprocedural, Fourth Generation Languages and Other	20	23
Total	100%	100%

- A significant increase in the use of the newer, higher-level languages was measured largely at the expense of the traditional languages like Cobol and Fortran.
- In most cases professional services vendors feel that it is important to offer the capability to develop systems in whatever language the client needs.
- It is also interesting to note that several professional services vendors reported using fourth generation languages exclusively for system development.
- This approach was not widespread. Most vendors reported limited use of fourth generation languages; one vendor commenting, 'We use it only for prototyping'.

5. PROFITABILITY ISSUES

- Vendors were questioned on their estimate of the contribution to profitability of elements such as software productivity techniques and staff calibre.
- Exhibit VIII-11 shows a tabulation of vendors' estimates for the year 1985 and a comparison with last year's results.
- This profitability contribution profile underlines the points made earlier in respect of productivity approaches, namely that:
 - High emphasis is placed by vendors on staff quality and personal motivation.
 - A relatively low emphasis is placed on software productivity techniques.

EXHIBIT VIII-11

IMPORTANCE OF FACTORS THAT CONTRIBUTE TO PROFITABILITY

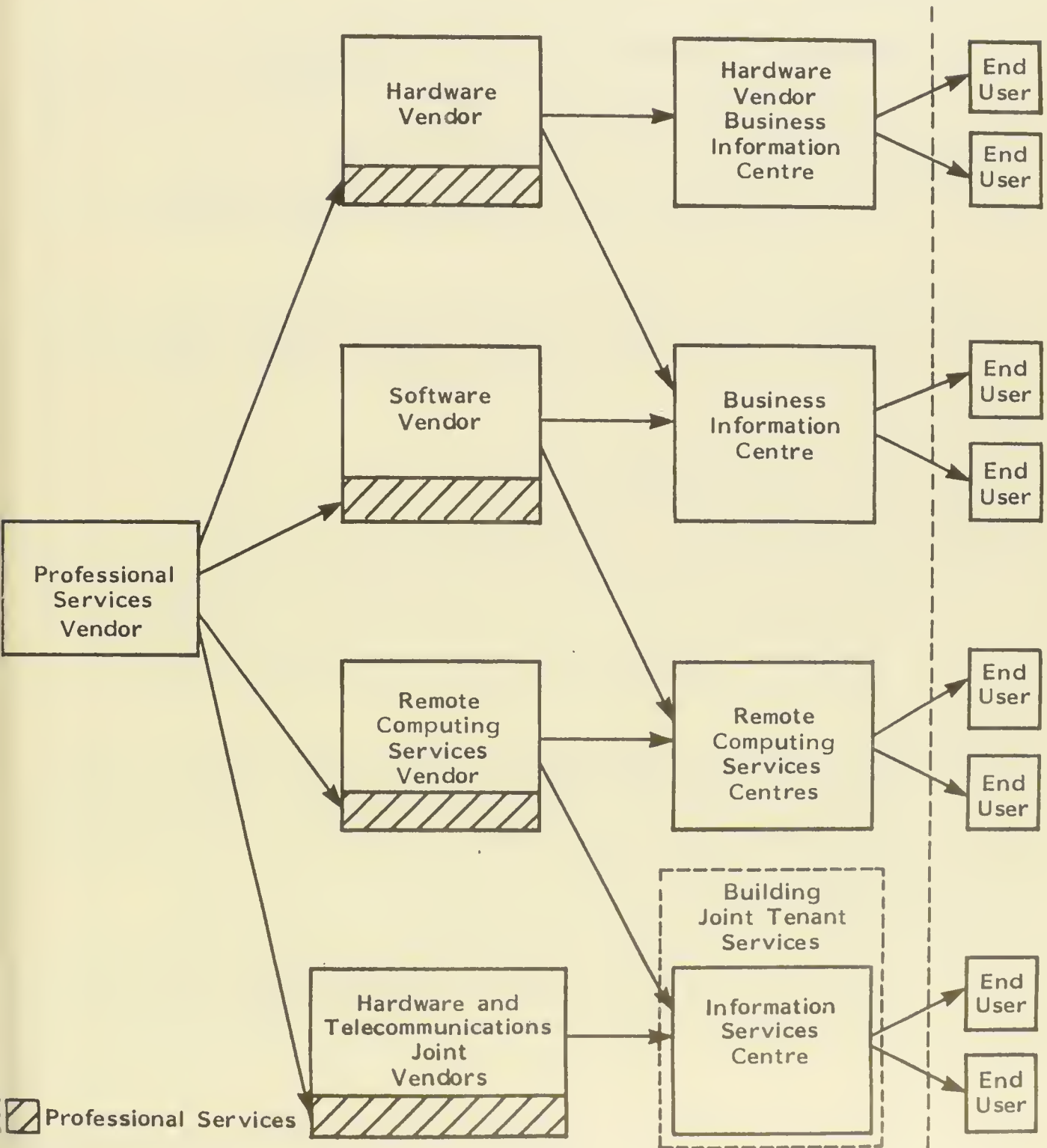
FACTOR	CONTRIBUTION (Percent)	
	1984	1985
Software Productivity Techniques	22%	14%
Project Management Methods	30	28
Staff Calibre	48	54
Other	-	4
Total	100%	100%

- Other factors mentioned by vendors that can contribute to profitability included:
 - Quality control.
 - Contract negotiation techniques.
 - Ability to maintain a high fee rate.
 - Emphasis on limiting groups within the organisation structure to a maximum of 50 people.

6. NEW SERVICES AND DISTRIBUTION CHANNELS

- The distinct boundaries that once separated the various sectors of the information services industry are blurring. In the future it will become more and more difficult to separate the market sectors of processing services, software products, professional services, and integrated systems.
- This changing market structure is happening because the key strategic factor for vendors is becoming their knowledge of the customer's 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.
- Exhibit VIII-12 is a graphic which illustrates the numerous avenues of opportunity available to professional services vendors. These include:
 - Systems integration.
 - Software product implementation services.
 - Providing software products.

EMERGING PROFESSIONAL SERVICES DISTRIBUTION CHANNELS



- Systems integration and software product implementation services are both discussed in more detail below.
- An important aspect for professional services vendors developing new distribution channels will be that of developing relationships with other organizations.
- Developing a relationship with an equipment manufacturer may be a key need for some vendors. Another alternative is a relationship with other services companies. One vendor commented on this issue:
 - 'We see a development towards more business being generated by alliances with other vendors'.
- This may be particularly important in the area of systems integration (discussed below) where very large projects may need a considerable sub-contract element.

a. Systems Integration

- Systems integration is potentially one of the great professional services opportunities of the future. The role of systems integrator first emerged in contracting for the United States federal government as a direct response to problems with fragmented procurements and an increasingly complex systems environment.
- The systems integration function that had been used successfully with military weapons systems began to appear several years ago in non-weapons systems. Project VIABLE (performed by EDS for the Department of the Army) was a logistics management contract of this type.
- The role is gradually being transferred to the commercial environment in the U.S. where it is being stimulated by companies like EDS and manufacturers like IBM in the information systems area.

- EDS's impact on the European environment was recognised by one vendor who said:
 - 'EDS is coming into the market, legitimising facilities management, and promoting big systems integration contracts. Whilst this poses a potential threat it is also potentially a great opportunity for sub-contracting'.
- With the proliferation of different types and sizes of equipment and increasingly complicated software tasks, there is a growing void between the vendors and the buyers.
- External organisations, particularly professional services companies, have a major opportunity since it is unlikely that internal information systems departments can continue to fill this gap.
- This emerging opportunity is perhaps greatest in the area of telecommunications systems. It is in this area that internal information systems organisations most obviously lack the necessary skills and experience. It is also the area where management is most willing to accept that they are unable to meet the technical demands.

b. Software Product Implementation Services

- One of the major factors inhibiting growth of the software product market (and thus the hardware market as well) is the implementation problem.
- New applications software systems are not simple, standalone, batch-oriented applications that function primarily on the information system department central computers. Considerable effort and skill is required to implement these new applications effectively in the new distributed processing environment.

- This task requires professional services in the form of implementation services. Many product vendors will prefer to work with professional services organisations to provide their services rather than provide them themselves.
- Furthermore, even if they do decide to pursue this opportunity, the requirements for implementation and support will probably oustrip their internal capabilities and they will thus be forced to work with third parties.
- It is interesting to note that in the U.S. market, INPUT has forecast that the market for implementation services related to software products will grow at over 30% per year, a faster rate than product sales themselves.

E. COMPETITIVE ANALYSIS

- Exhibits VIII-13 through VIII-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 the calendar year 1984.

EXHIBIT VIII-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 PROFESSIONAL SERVICES
 FRANCE

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (FF Millions)
1	CAP GEMINI SOGETI	5.44%	FF 560
2	SG2	5.15	530
3	SEMA	3.50	360
4	CISI	2.62	270
5	SYSECA	2.43	250
6+	ANSWARE	1.94	200
6+	SESA	1.94	200
8	STERIA	1.65	170
9	GFI	1.48	152
10	SOPRA	1.46	150
	OTHER	72.39	7,438
TOTAL MARKET		100.00%	FF 10,280

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROFESSIONAL SERVICES
ITALY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	FINSIEL	21.50%	£129,000
2	ENDATA	4.20	25,200
3	SYNTAX	4.16	25,000
4	DATA MANAGEMENT GROUP	2.95	17,700
5	SOPIN	1.93	11,600
6	SOFTWARE SYSTEMI (SSS)	1.66	10,000
7	DATAMONT	1.40	8,400
8	O GROUP	1.28	7,700
9	LOMBARDIA INFORM	0.83	5,000
10	SELESTA GROUP	0.76	4,600
	OTHERS	59.38	355,800
TOTAL MARKET		100.00%	£600,000

EXHIBIT VIII-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 PROFESSIONAL SERVICES
 UNITED KINGDOM

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	EDS	5.79%	£ 38
2	LOGICA	4.11	27
3	THORN EMI IT	3.66	24
4	CAP	3.05	20
5	SYSTEMS DESIGNERS	2.74	18
6	DATALOGIC	2.44	16
7	SCICON	1.98	13
8+	ATKINS	1.52	10
8+	BIS	1.52	10
10	F-INTERNATIONAL	1.22	8
	OTHERS	71.97	472
TOTAL MARKET		100.00%	£ 656

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
PROFESSIONAL SERVICES
WEST GERMANY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (DM Millions)
1	SCS	4.63%	DM 84
2	KIENBAUM	2.76	50
3	EDS	1.76	32
4	TAYLORIX	1.65	30
5	GMO	1.49	27
6+	IKOSS	1.38	25
6+	SOFTLAB	1.38	25
8	EDV PLOENZKE	1.16	21
9	PDV	0.94	17
10	DVO	0.88	16
	OTHERS	81.97	1,485
TOTAL MARKET		100.00%	DM 1,812

IX INTEGRATED SYSTEMS

IX 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, foreign exchange banking systems.
- 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 reassess 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.
- Consequently, the integrated systems sector has developed into a complex distribution system encompassing a variety of products from complex CAD/CAM systems on the one hand to straightforward sales of personal computers for business on the other.

B. MARKET DEVELOPMENT, 1985-1990

- Exhibits IX-1 through IX-5 show the forecast growth and market size for the integrated systems sector for Western Europe and the four major country markets between 1984 and 1990.

C. USER ATTITUDES

- Just over 30% of the user respondents provided data on satisfaction levels for integrated systems.

EXHIBIT IX-1

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1990
WESTERN EUROPE

	MARKET FORECAST (\$ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
System Hardware	\$1,119	\$1,524	25%	\$2,189	21%	\$3,868
Software and Other Charges	829	1,185	31	1,866	24	3,571
Subtotal	\$2,709	\$2,678	28%	\$4,055	22%	\$7,439

EXHIBIT IX-2

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1990
FRANCE

	MARKET FORECAST (FF Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
System Hardware	FF3,730	FF4,600	23%	FF6,900	21%	FF12,200
Software and Other Charges	2,680	3,400	28	5,600	26	11,300
Subtotal	FF6,410	FF8,000	25%	FF12,500	23%	FF23,500

EXHIBIT IX-3

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1990
ITALY

	MARKET FORECAST (£ Billions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
System Hardware	£ 324	£ 432	23%	£ 600	40%	£ 1,630
Software and Other Charges	225	302	30	500	42	1,424
Subtotal	£ 549	£ 734	26%	£ 1,100	41%	£ 3,054

EXHIBIT IX-4

INTEGRATED SYSTEMS MARKET FORECAST, 1984-1990
UNITED KINGDOM

	MARKET FORECAST (£ Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
System Hardware	£ 205	£240	23%	£ 380	20%	£ 660
Software and Other Charges	167	220	28	350	22	640
Subtotal	£ 372	£460	25%	£ 730	21%	£1,300

EXHIBIT IX-5

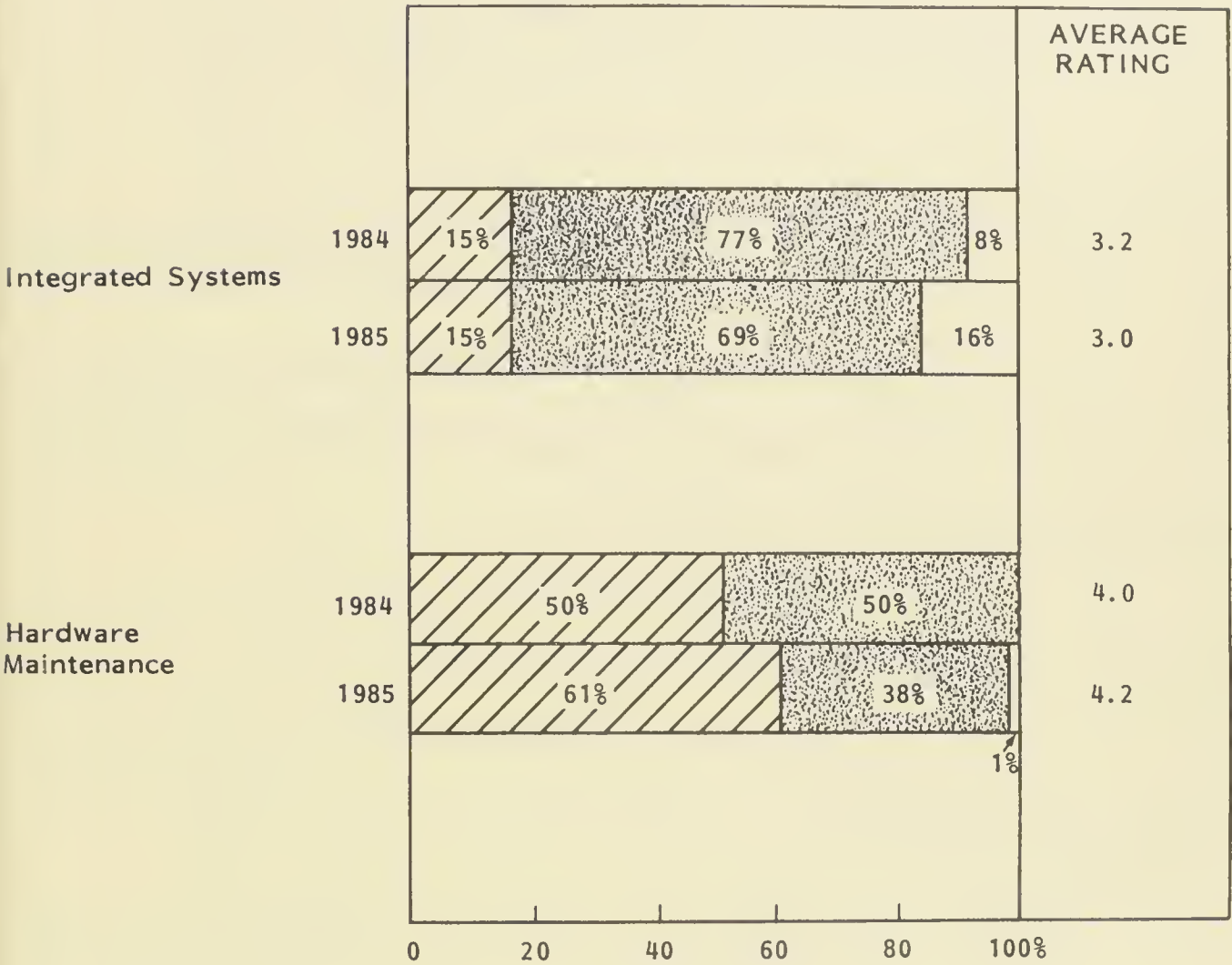
INTEGRATED SYSTEMS MARKET FORECAST, 1984-1990
WEST GERMANY




	MARKET FORECAST (DM Millions)					
	1984	1985	1984-1987 AAGR (Percent)	1987	1987-1990 AAGR (Percent)	1990
System Hardware	DM 795	DM 950	21%	DM1,400	20%	DM2,400
Software and Other Charges	575	720	28	1,200	24	2,200
Subtotal	DM 1,370	DM1,670	24%	DM2,600	21%	DM 4,600

- The comparative levels are shown in Exhibit IX-6 for both integrated systems and hardware maintenance.
- For a more detailed analysis of levels of satisfaction with hardware maintenance, see INPUT's report European Field Services Program 1985 Annual Report.
- The average rating for satisfaction with integrated systems (3.0) was the lowest for all information services categories. The proportion of users expressing high satisfaction (15%) again was the lowest rating for all categories.
- These ratings are in stark contrast to those for pure hardware maintenance where the highest level of satisfaction was recorded for all information services categories.
- Nevertheless, despite the relatively low rating recorded for integrated systems in both 1984 and 1985, it still represented a considerable improvement over previous satisfaction levels measured by INPUT.
- Integrated systems represents one of the most difficult areas for services vendors since it combines a number of different elements--hardware, software, and services--in one package.
- Users are also expecting a close 'fit' of the offered product to their needs, and this will be the 'marketing' offer from the vendor. Consequently, there is considerable scope for disappointment.

EXHIBIT IX-6

LEVELS OF USER SATISFACTION WITH INTEGRATED SYSTEMS



-  High Satisfaction
-  Medium Satisfaction
-  Low Satisfaction

D. VENDOR ISSUES

I. BUSINESS DEVELOPMENT

- As can be seen from the market dimension data given in Section B above, the integrated systems sector is showing strong growth.
- 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.
 - 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, corporate systems.
 - The increasing specialisation of user needs and the attraction of a complete solution that targets these market segments.
 - The needs of equipment manufacturers to seek volume outlets that are met through the extensive distribution networks of integrated system vendors.
- Increasing market specialisation 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 market niches 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 the other major hardware suppliers, will continue to support the VAR/VAD concept. They recognise the limitations of their own in-house sales force to deliver the sales volume that can only be found amongst a wide collection of speciality markets.
- Key business development factors for integrated system vendors can be summarised as:
 - Selection of viable specialist (or niche) markets.
 - Development of the appropriate specialised software and/or hardware.
 - Capability to provide the necessary value-added service factors; e.g., implementation consultancy and hotline support.
- Exhibit IX-7 lists some of the major areas of specialisation mentioned by vendors interviewed in this survey.
- Discrete manufacturing probably represents the largest market opportunity as there exists strong competitive pressure on manufacturers to increase productivity. CAD/CAM and possibly CIM applications are tools which can enhance competitiveness.
- Banking and finance also offer attractive opportunities, particularly in the U.K. where deregulation in the City of London is opening up a wide range of new potential financial markets and services.
- Retail and wholesale distribution systems are also expected to show strong growth as automated integrated system solutions are implemented to enhance competitiveness.

SOME INTEGRATED SYSTEMS SPECIALIST MARKETS

- Discrete Manufacturing
 - General Accounting
 - Mechanical CAD
 - Electronics CAD
 - Analysis/CAE
 - Manufacturing Information/Control
 - Numerical Control, Shop Floor Data Collection, Robotics

- Banking and Finance
 - Securities Market Trading

- Insurance

- Retail and Wholesale Distribution
 - Mailing, Sales Tracking, Forecasting, Etc.
 - Telephone Ordering Support Systems
 - Sales and Marketing Support Systems
 - Order Entry and POS
 - Distribution Applications

EXHIBIT IX-7 (Cont.)

SOME INTEGRATED SYSTEMS SPECIALIST MARKETS

- General Cross-Industry Business Applications
- Specific Industry Business Applications
- Corporate Management Support, Project Planning, Property Management
- Networking of Minis and Micros
- In-House Printing and Publishing

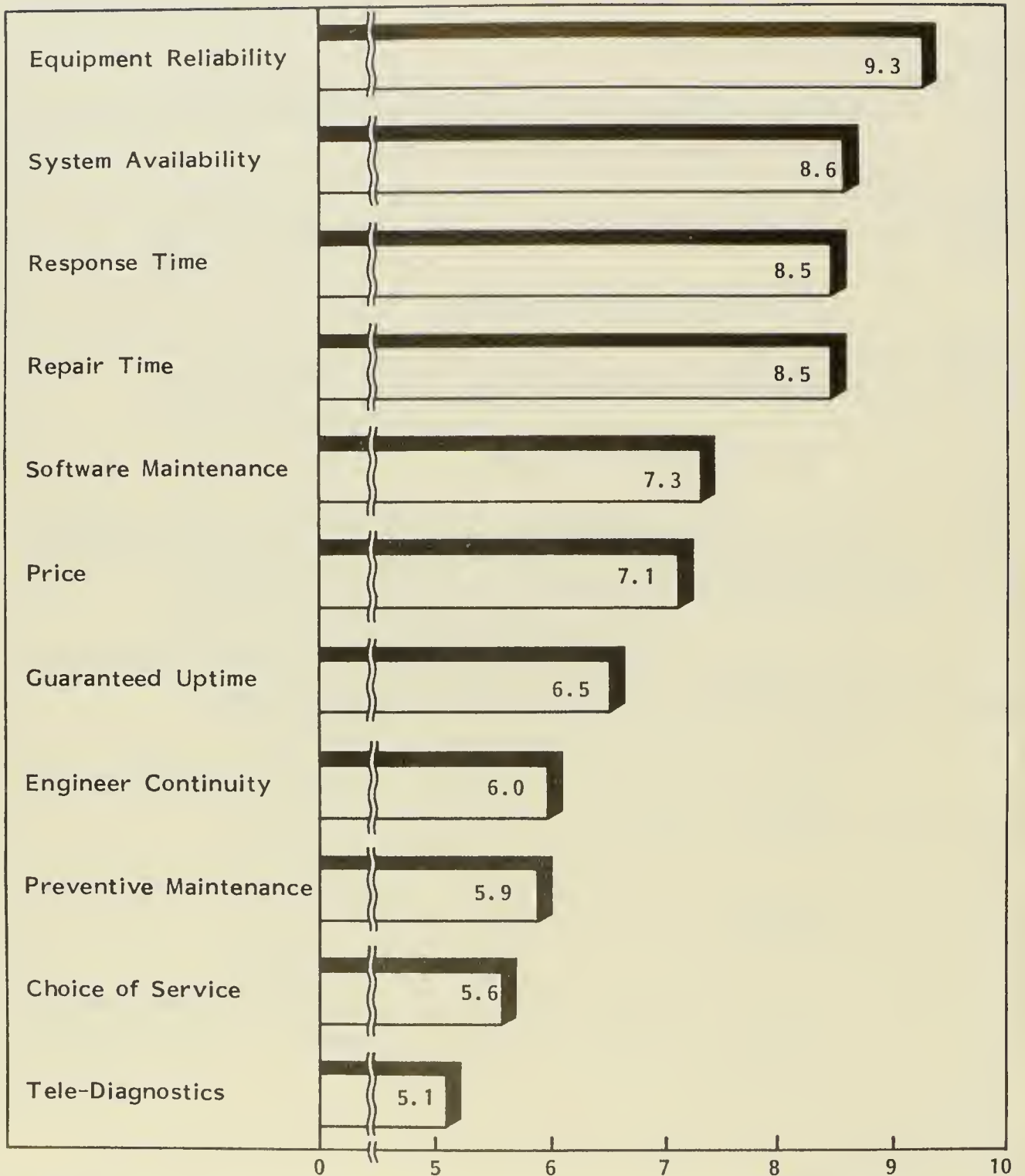
- Business development opportunities for integrated system vendors also exist in respect of the expansion of services to the customer beyond the traditional boundaries.
- The opportunity exists for vendors to enhance their competitive edge by offering complementary services and implementing innovative hardware/software support services policies.
- Complementary services involve the provision of other information services delivery modes such as processing services, professional services, and software products.
- 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.
- Service and support are discussed in Section 2 below.
- 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.
 - Adapting to changes in policy toward value-added resellers by equipment manufacturers.
 - Meeting financial problems; for example, obtaining financing and meeting profitability goals.

2. SERVICE AND SUPPORT

- Innovative support and service strategies are important because they address key areas of customer concern, namely hardware maintenance and software support.
- As Exhibit IX-8 shows, the most important elements of service as researched for INPUT's European field service survey were:
 - Reliable equipment.
 - High levels of system availability.
 - Quick response and repair time.
 - Software maintenance support.
- Exhibit IX-9 shows a breakdown of the source of the most common complaints users have about service analysed from data in the same survey.
- A more aggressive approach toward support and service would assist in reducing complaints in those areas that are really unnecessary:
 - Poor support staff, either in terms of the quality of the personnel or inadequate training.
 - Administrative problems such as telephone response and customer invoicing.
 - Attitude toward the user's problem, especially understanding the business implications of system downtime in the application environment.

EXHIBIT IX-8

USER NEEDS

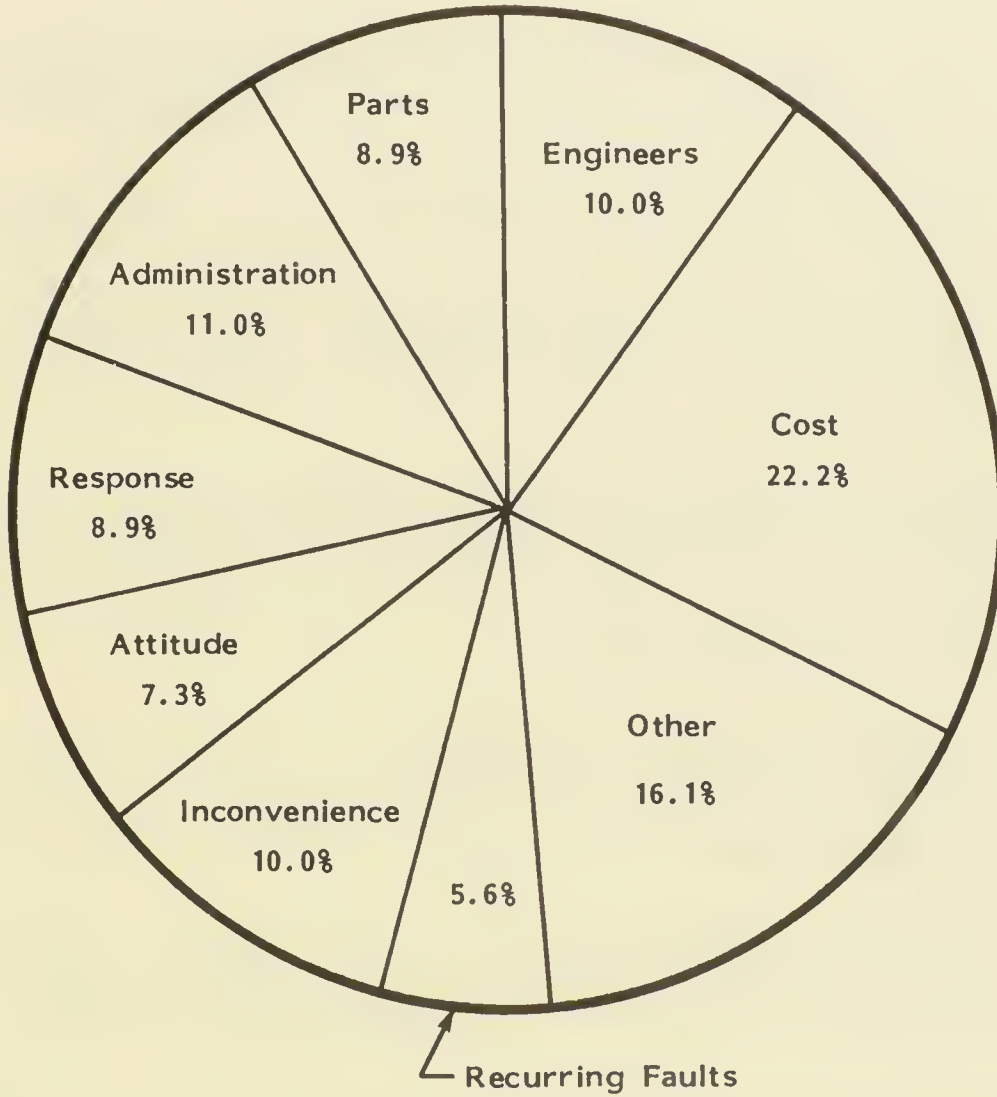


Rating: 1 = Unimportant, 10 = Vitally Important

Source: INPUT User Survey

EXHIBIT IX-9

COMPLAINTS ABOUT SERVICE



Source: INPUT User Survey

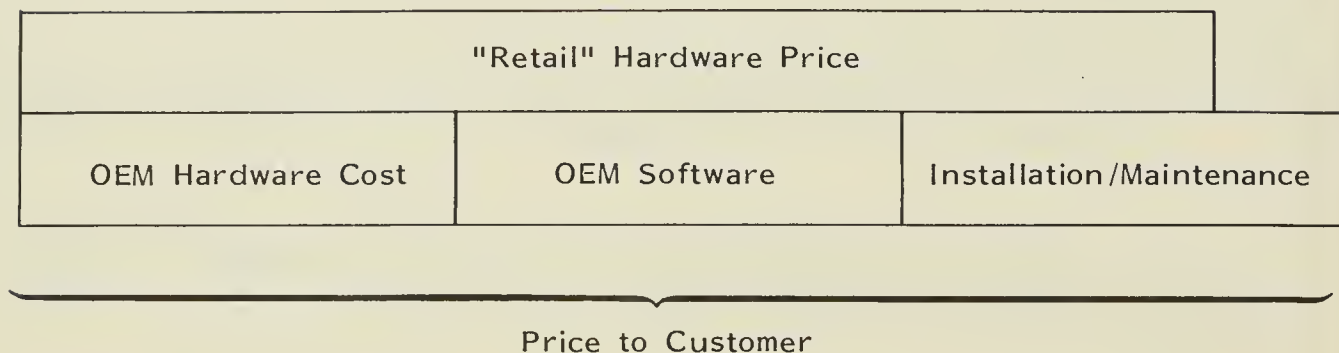
- Eliminating these complaints would considerably improve overall service quality.
- INPUT's research indicates that hardware and software post-sale service and support is a major opportunity, particularly as competition intensifies in the integrated systems marketplace.
- INPUT suggest vendors investigate new ways to provide a higher quality of hardware and software support service in a more cost-effective manner.
- Areas to be considered 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 VII concerning service and support issues for software products.)
- Higher levels of customer service develop higher customer satisfaction and, consequently, lead to additional sales. Customer service designed specifically to increase service quality and customer satisfaction can have significant positive effects on revenues.
- 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 contrast, is an action that a competitor can follow almost immediately, negating the market advantage sought by the initiator.
- It will generally take time to implement product quality improvements because resources and ingenuity will be required to develop additional services and inherent improvements.

3. PRICING CONSIDERATIONS

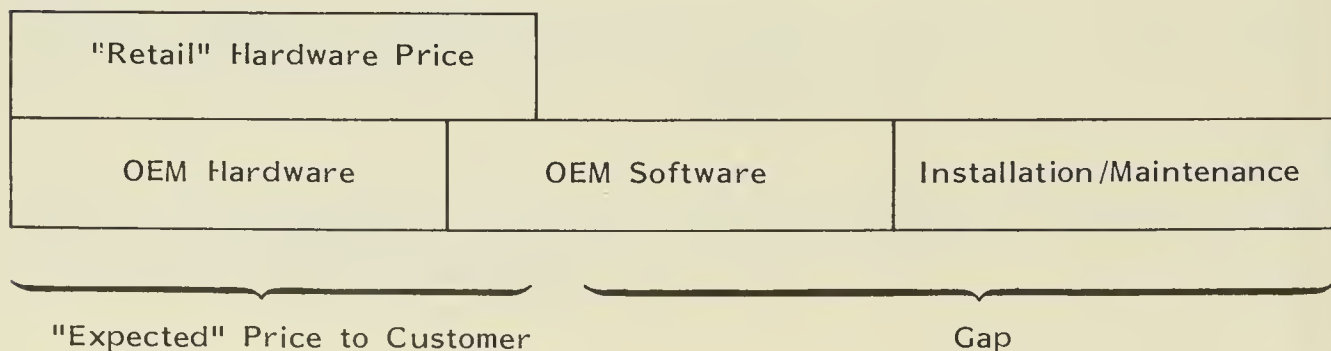
- As minicomputers have become more and more powerful, the availability of low-cost hardware is presenting a pricing dilemma for integrated systems vendors.
- Mini-based integrated systems have typically been priced modestly above the hardware manufacturers' fully configured list hardware price (see Exhibit IX-10). This was due to the large discount given on OEM equipment and the fact that, at least in the past, mini manufacturers had little interest in direct sales.
- The microcomputer-based hardware situation is much more difficult for the integrated system vendor in two respects:
 - Microcomputer prices are, of course, much lower than mini prices, both on a price/performance basis and even more so on a 'box versus box' basis.
 - There is much less of a discount available for OEMs.
 - There is an absolute floor on prices due to materials, distribution, etc.
 - End-user prices themselves are really 'retail' prices with little manufacturer control possible and much commodity and/or loss-leader discounting.
 - Manufacturers (i.e., IBM) have active discount programs to large corporate customers. A large-quantity corporate discount can equal or surpass a small-quantity OEM discount.

INTEGRATED SYSTEMS PRICING RELATIONSHIPS

Minicomputer Based Products



Microcomputer-Based Products

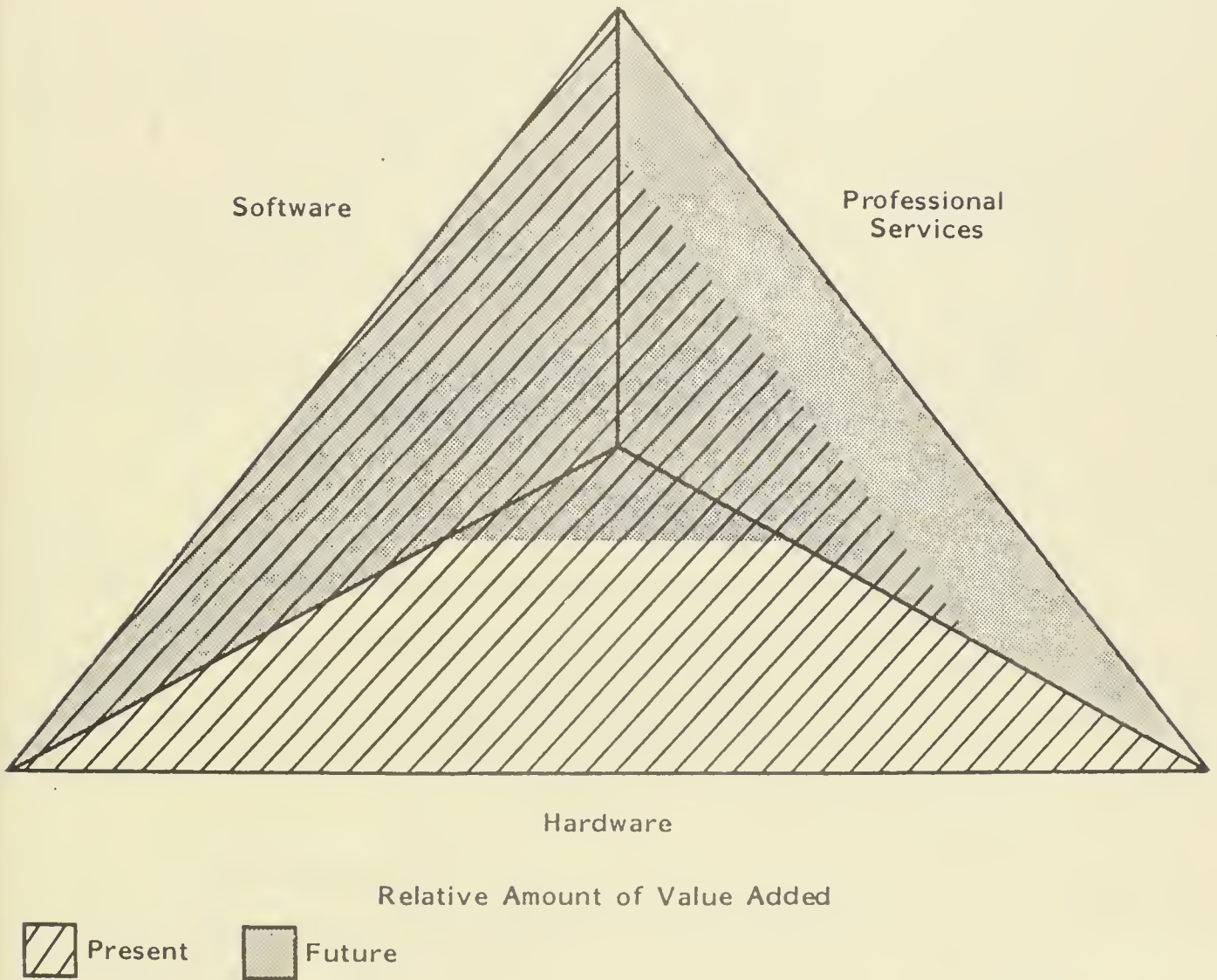


- Another aspect is that software and installation costs for micro-based systems are not intrinsically lower than those for mini-based systems:
 - This causes the 'pricing gap' shown in Exhibit IX-10.
 - The pricing gap is underlined by the software vendors who sell vertical-market microcomputer software in the high hundreds or low thousands of dollars.
 - Many of these products come nowhere near to doing their intended job due to quality and design failings.
 - A few, though, do perform reasonably because they have been priced and marketed for relatively high-volume, low-support markets.
- This 'pricing gap' problem will have to be addressed by integrated system vendors through much more flexible system functionality offerings and by entrance into the distributed systems area.
- Some examples of these approaches are contained in INPUT's 1985 report Micro-Mainframe Links: European Market Opportunitites.
- Offering much more flexible functionality with the system will imply a much greater percentage of the overall price being represented by the software and installation components.
- Distribution of systems functionality will face integrated systems vendors with the challenge of:
 - Greatly reduced added value from hardware selection and integration.
 - A much less self-contained 'integrated system'.

- A more complex customer interface both inside and outside the company.
- The result of this would be a change in the types of value-added offered by an integrated systems vendor:
 - The professional service component will increase and the hardware component decrease, relatively speaking.
 - Exhibit IX-11 illustrates these trends graphically.
- Software will continue to be the driving force in the new environment. The professional services component will change considerably from its (much smaller) current constituents; i.e:
 - Systems analysis and design (for interfaces).
 - Communications design (for mainframe links).
 - Software modification.
- The following professional service components will prevent the integrated systems sector from becoming just software.
 - It is the familiarity and acceptance of the professional service component that can potentially give integrated systems vendors an advantage over the packaged software vendors who are certain to be targeting this market.
 - Providing professional services has always made the software vendors uncomfortable. They view the people involved as representing a loss of resources from their core business of developing and supporting

EXHIBIT IX-11

RELATIVE PROPORTION OF VALUE ADDED IN INTEGRATED SYSTEMS COMPONENTS
PRESENT AND FUTURE (SCHEMATIC)



software. Consequently, in a self-fulfilling prophecy, customer support staff are often not top-quality.

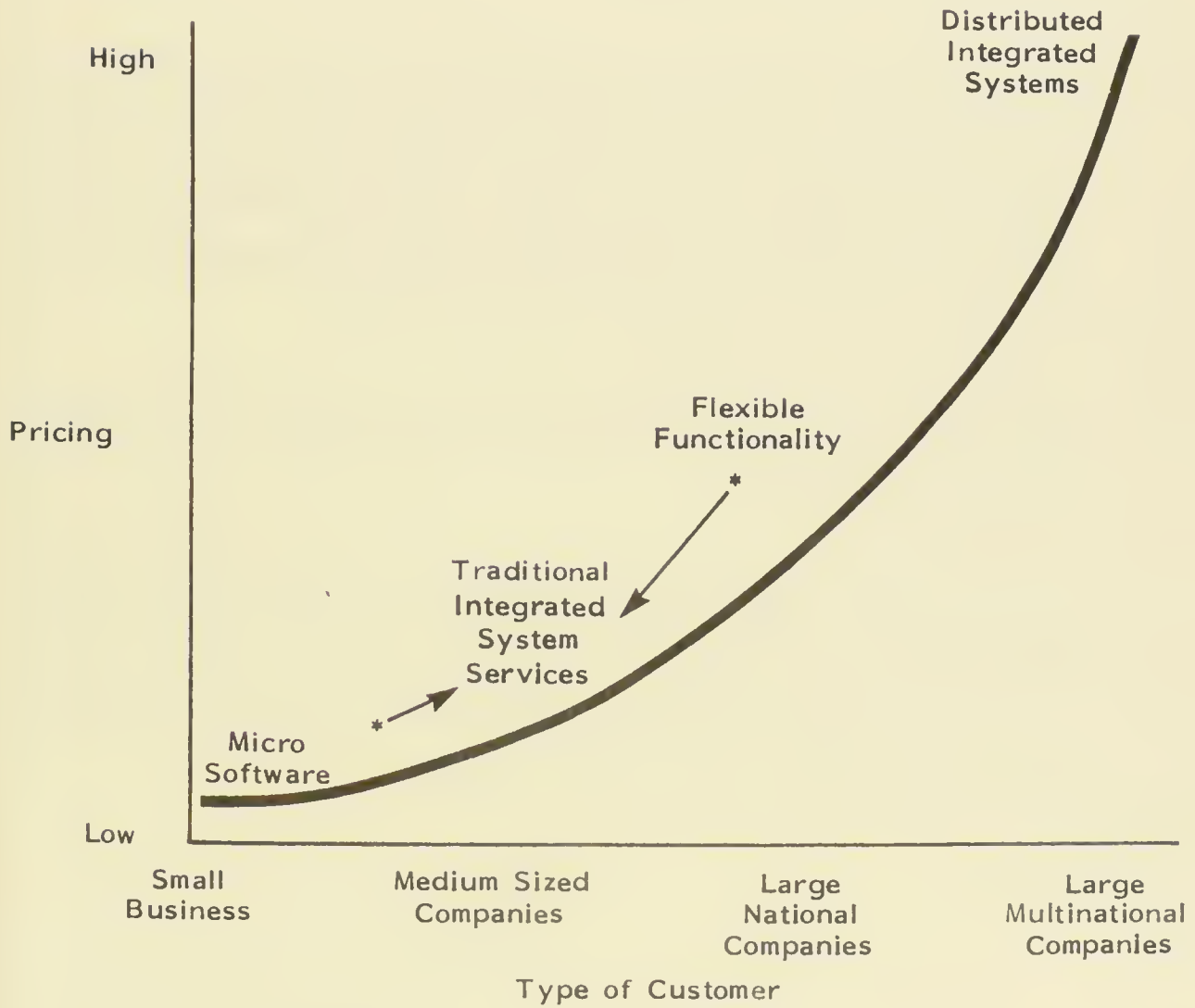
- Software vendors also object to customers modifying their software. This is also a somewhat circular, but strongly held, position.
 - . Virtually all mainframe software has been designed with very limited modification in mind. The concept of 'snap-in' modules is still foreign to most vendors.
 - . There is no conceptual framework for making major modifications. Consequently those that are made are often done badly, reinforcing opinion that this is a bad alternative.
 - . To make matters worse, major modifications reduce interest in obtaining standard vendor software maintenance.
- Exhibit IX-12 summarises in schematic form the relationship, on a pricing basis, of these evolving types of integrated systems products.

4. COMPUTER HARDWARE VENDORS

- The past four years have seen significant change in the way that companies like Wang, Data General, IBM, Apple, and other hardware vendors are distributing computer hardware products, software products, and services. Hardware vendors are responding to market demand to provide solutions, particularly to vertical markets, as contrasted to general functional data processing systems.
- Hardware vendors are increasingly going outside their organisations to establish relationships with other companies including software, professional services, systems, communications, and other vendors to assist in delivering (and increasingly to directly deliver) hardware and software products.

EXHIBIT IX-12

INTEGRATED SYSTEMS PRODUCT AND PRICING APPROACHES



* Pressure Point

- No vendor has altered distribution channels in the past three years more than IBM. Establishment of the marketing assistance program (MAP), the complementary marketing organization (CMO), the value-added remarketer (VAR), and the value-added integrator (VAI) are but a few of the ways IBM is establishing cooperative relationships to deliver its products and provide specific solutions to users.
- Some aspect of software-related professional services is involved in almost all of the value-added delivery of hardware vendor products. INPUT believes that partnering with hardware vendors is a significant strategy for professional services corporate planners.
- IBM estimates that more than half of industry hardware revenues flow from end users through value-added distribution channels. The company projects that by 1989 almost two-thirds will flow through these channels. It is evident that the major market strategy for hardware vendors is establishing relationships with other vendors, including software product and professional services vendors who offer software-related professional services.
- User demand for vertical-market solutions is increasingly being met by hardware vendor strategies of partnering through licensing and cooperative ventures with other vendors.
- As the hardware and software cost components for computer-based solutions shift toward the software side, hardware vendors can leverage software product vendor and professional services vendor expertise in vertical markets to reduce marketing, distribution, implementation, extension, and support costs and to increase revenues and profit margins.

E. COMPETITIVE ANALYSIS

- Exhibits IX-13 through IX-16 show the ranking 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 the calendar year 1984.

EXHIBIT IX-13

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 INTEGRATED SYSTEMS
 FRANCE

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (FF Millions)
1	SESA	3.12%	FF 200
2	SLIGOS	2.70	173
3	COMPUTERVISION	1.87	120
4	INTERGRAPH	1.56	100
5	CGI	1.35	87
6+	TELESYSTEMSES	1.24	80
6+	STERIA	1.24	80
6+	SEMA-METRA	1.24	80
9	CALMA	0.93	60
10	APPLICAON	0.70	45
	OTHERS	84.05	5,385
TOTAL MARKET		100.00%	FF 6,400

EXHIBIT IX-14

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
INTEGRATED SYSTEMS
ITALY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	SICIT	3.28%	£ 18,000
2	DATAMAT	1.75	9,600
3	SOPIN	1.40	7,700
4	DATAMONT	1.31	7,200
5	CNI (CONSORZIO)	1.13	6,200
6	DATA MANAGEMENT GROUP	1.07	5,900
7	GE-DA	0.69	3,800
8	GEIS	0.62	3,400
9	ENDATA	0.45	2,500
10	SELESTA	0.25	1,400
	OTHERS	88.05	483,000
TOTAL MARKET		100.00%	£ 549,000

EXHIBIT IX-15

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 INTEGRATED SYSTEMS
 UNITED KINGDOM

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (£ Millions)
1	SYSTIME	10.75%	£ 40
2	COMPUTERVISION	5.37	20
3+	MBS	4.03	15
3+	RACAL-REDAC	4.03	15
5	HOSKYNS	3.49	13
6+	INTERGRAPH	2.69	10
6+	ARBAT	2.69	10
6+	THORN EMI IT	2.69	10
9	METIER	2.15	8
10	APPLICON	1.61	6
	OTHERS	60.50	225
TOTAL MARKET		100.00%	£ 372

EXHIBIT IX-16

TOP VENDOR RANKINGS AND MARKET SHARES, 1984
 INTEGRATED SYSTEMS
 WEST GERMANY

RANK	VENDOR	MARKET SHARE PERCENT (Rounded)	ESTIMATED REVENUES (DM Millions)
1	COMPUTERVISION	7.30%	DM 100
2	INTERGRAPH	3.65	50
3	CALMA	2.55	35
4	APPLICON	2.19	30
5	GEI	1.75	24
6	TAYLORIX	1.68	23
7	METIER	1.31	18
8	MCDONNELL DOUGLAS INFORMATION SYSTEMS GROUP	1.09	15
9	ADV ORGA	0.95	13
10	IKOSS	0.80	11
	OTHERS	76.73	1,051
TOTAL MARKET		100.00%	DM 1,370

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

- INFORMATION SERVICES - The provision of:
 - Data processing functions using vendor computers (processing services).
 - The provision of database 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) - Characterized 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 resource requirements.
 - DATABASE - Characterized by the retrieval and processing of information from a vendor-provided database. The database may be owned by the vendor or a third party.

payroll, and personnel applications fall into this category. Function-specific database services where the vendor supplies the database 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 database 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 database services, where the vendor supplies the database 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, database 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 organizations 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 system to perform basic functions. 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, database

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 vendor; 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 specialized 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.

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 services.
 - Software products.
 - Professional services.
 - Integrated systems.
- In total, 10 vendor organisations were interviewed, many of them on an in-depth, face-to-face basis.
- The profile of organisation type is shown in Exhibit B-1.

EXHIBIT B-1

PROFILE OF VENDOR INTERVIEWS

	PROCESSING SERVICES	SOFTWARE PRODUCTS	PROFES- SIONAL SERVICES	INTEGRATED SYSTEMS	TOTAL NUMBER OF COMPANIES
France	10	10	9	8	17
Italy	4	10	3	2	30
United Kingdom	9	12	12	5	26
West Germany	10	10	6	6	27
Totals	33	42	30	21	100

B. USERS

- The user respondent sample analysis by country is given below:

-	France	26
-	Italy	25
-	United Kingdom	35
-	West Germany	<u>25</u>
	Total	111

APPENDIX C: VENDOR QUESTIONNAIRE

EUROPEAN INFORMATION SERVICES INDUSTRY

VENDOR QUESTIONNAIRE

COMPANY INFORMATION

INPUT

1. COMPANY BACKGROUND DATA

Company Name: _____

Address: _____

Telephone No: _____

Number of Employees: _____ Financial Year End _____
Day Mth

Ownership: Public Private Subsidiary

If a subsidiary:

Parent Company Name: _____

Address: _____

Telephone No: _____

If your company has any subsidiaries please list here with principal business activity.

2. PRINCIPAL BUSINESS ACTIVITY

Please describe the principal business of your firm: _____

Please provide an analysis of your overall business by application or industry specialisation (as appropriate) in the table below.

	Processing	Software Products	Professional Services	Integrated System

3. TYPE OF COMPUTER SERVICES OFFERED

Please indicate what percent of your revenue comes from the following activities and check the appropriate boxes.

o PROCESSING SERVICES _____ %

Batch Interactive Remote Batch

On-line Data Base Facilities Management

User Site Hardware Services (PC)

User Site Hardware Services (Non-PC)

o SOFTWARE PRODUCTS _____ %

Application Software System Software

o PROFESSIONAL SERVICES _____ %

Software Development Consulting Contract Staff

Education/Training

o INTEGRATED SYSTEMS _____ %

General Business Industry Specific CAD/CAM

o OTHER (Please Define) _____ %
100%

4. INDUSTRIES SERVED

Please indicate what percent of your revenue is derived from the following major industry segments:

- | | |
|--|--|
| o MANUFACTURING _____% | o DISTRIBUTION _____% |
| <input type="checkbox"/> Discrete <input type="checkbox"/> Process | <input type="checkbox"/> Retail <input type="checkbox"/> Wholesale |
| o TRANSPORTATION _____% | |
| o UTILITIES _____% | o GOVERNMENT _____% |
| o BANKING AND FINANCE _____% | <input type="checkbox"/> National |
| | <input type="checkbox"/> Local |
| o INSURANCE _____% | o SERVICES _____% |
| <input type="checkbox"/> Life/Health | |
| <input type="checkbox"/> Agents/Brokers | o OTHER (Please define) _____% |

 _____ 100%

5. APPLICATION SPECIALISATION

Please indicate what percentage of your revenue comes from the following application areas.

- | | |
|-----------------------------------|--|
| Accounting _____% | Education & Training _____% |
| Engineering and Scientific _____% | Financial _____% |
| Payroll/Personnel _____% | Production Control _____% |
| Planning and Analysis _____% | Marketing/Sales _____% |
| Office Automation _____% | Industrial/Military Control Systems _____% |
| Other (Please Define) _____% | |

 _____ 100%

6. GEOGRAPHIC MARKETS

Please indicate what percent of your information services revenue comes from:

France	_____ %
Italy	_____ %
United Kingdom	_____ %
West Germany	_____ %
Other European	_____ %
United States	_____ %
Other International	_____ %
	<u>100%</u>

7. COMPUTER HARDWARE

Please list the major computers installed in your organisation: (do not include peripherals & terminals)

Quantity	Manufacturer	Model	Operating System
1.			
2.			
3.			
4.			

8. FINANCIAL INFORMATION

Please provide your total company revenues (including subsidiary operations, if any) for your most recent financial year end:

Day Month
_____ (Local Currency)

What growth rate did you achieve between your most recent financial year and the previous year? _____ %

If some of your revenues are derived from non-information service activities, please indicate what percent this represents of your total revenue _____ %

If financial information is confidential, please provide an indication of your computer services revenue by checking the appropriate box.

<u>French Francs</u> (Millions)	<u>Italian Lira</u> (Billion)	<u>£ Sterling</u> (Million)	<u>Deutsche Marks</u> (Million)
<input type="checkbox"/> Under 10	<input type="checkbox"/> Under 2	<input type="checkbox"/> Under 1	<input type="checkbox"/> Under 3
<input type="checkbox"/> 10 - 50	<input type="checkbox"/> 2 - 10	<input type="checkbox"/> 1 - 5	<input type="checkbox"/> 3 - 15
<input type="checkbox"/> 50 - 100	<input type="checkbox"/> 10 - 20	<input type="checkbox"/> 5 - 10	<input type="checkbox"/> 15 - 30
<input type="checkbox"/> 100 - 250	<input type="checkbox"/> 20 - 50	<input type="checkbox"/> 10 - 25	<input type="checkbox"/> 30 - 75
<input type="checkbox"/> Over 250	<input type="checkbox"/> Over 50	<input type="checkbox"/> Over 25	<input type="checkbox"/> Over 75

9. May we have copies of any marketing literature, brochures, company reports etc that you have available?

THANK YOU

EUROPEAN INFORMATION SERVICES INDUSTRY
VENDOR QUESTIONNAIRE

COMMON ISSUES

INPUT

1. How do you view the competitive environment? Are you facing new competitors - who do you see as your most serious competition?

2. How do you differentiate yourself from your competitors? For example, through your marketing and development strategies?

3. In order to expand your business and compete effectively, do you see a need for acquisitions/mergers/partnerships or even divestiture?

4. Are you planning geographic expansion?

5. Are you placing more or less emphasis on industry specialisation (vertical applications) as opposed to horizontal (or cross-industry) applications?

XI IS

Percentage split:

Now

--	--

2 years time

--	--

Comments:

6. Are staff shortages obstacles to your growth? If so please rate the impact to your organisation.

- Sales
- Sales support
- Software professionals
- Operations staff
- Tech. Support/Engineers
- Managerial
- Other (please specify)

	High	Medium	Low

7. How do you view the telecommunications environment in respect of the convergence of communications and computers and the resultant opportunities for services business?

PROMPTS: PTT regulations, Network Services

THANK YOU

EUROPEAN INFORMATION SERVICES INDUSTRY
VENDOR QUESTIONNAIRE

PROCESSING SERVICES

INPUT

1. What do you consider to be the major challenges/problems facing the processing services business?

2. What areas do you see as offering opportunities for business development in the processing services sector (or outside it)? And why?

PROMPTS

VANS (EDI)
On-line Data Base
VIDEOTEK
PC's & other on-site hardware
Office Automation

Multiple delivery modes for S/W
Facilities Management
USHS - Non PC
USHS - PC (PC-RCS)
TPM
Disaster Recovery

3. How do you classify your major products/services, what proportion of the business are they? What would you expect these proportions to be in two years time?

	1985	1987
1. _____	_____ %	_____ %
2. _____	_____ %	_____ %
3. _____	_____ %	_____ %
4. _____	_____ %	_____ %
5. _____	_____ %	_____ %
6. _____	_____ %	_____ %

PROMPTS

Interactive, Remote Batch, Batch, On-line Data Base, etc

4. What proportion of your business is with small as opposed to large establishments?

<u>Number of Employees</u>	1985	1987
Under 250		
250-500		
Over 500		

Comments:

5. In your opinion are there any particular external/technological factors that are acting as drivers or inhibitors on the market?

6. Are you adopting any changes in the way that you price processing services? (For Batch/RCS, etc)

7. Are you seeking to market your products/services in new ways (eg through 3rd parties) now or in the future?

8. From what sources do you obtain software to build into your products and services?

9. Are there any particular strategies/marketing initiatives that you are adopting to meet changing market conditions? (eg improve profitability)

THANK YOU

EUROPEAN INFORMATION SERVICES INDUSTRY
VENDOR QUESTIONNAIRE

SOFTWARE PRODUCTS

INPUT

1. What would you describe as the most important challenges/problems that you are encountering in the software products market?

2. Is increased competition from manufacturers a problem; if so, how do you see this developing and how will you counter it?

3. What areas for software products do you think offer the best market opportunities over the next couple of years?

PROMPTS

- Applications S/W _____
- Systems S/W _____
- UNIX/PICK _____
- AI _____
- Decision Support _____
- IBM Environment _____
- FGLS _____
- Software Productivity Aids _____
- Personal Computers _____
- Other _____

4. The software products markets are very competitive and much is heard about the 'shake out'. What marketing methods are you adopting to cope with this environment?

5. The software industry has grown rapidly. What growth rates have you been experiencing - what do you think it will be in 2 years time (1987)?

_____	1985	_____ %

_____	1987	_____ %

6. How has this affected your organisation, what effect has it had on profitability?

7. What approach do you take towards software product pricing?

8. What kind of service and support methods do you use (or are planning to use): e.g., phone in support centres, other methods of remote diagnosis, etc.?

9. Are you adopting any particular approaches towards making software products more reliable or giving them better performance?

10. In general, over how many sales do you expect to recover software development costs?

THANK YOU

EUROPEAN INFORMATION SERVICES INDUSTRY
VENDOR QUESTIONNAIRE

PROFESSIONAL SERVICES

INPUT

1. How do you classify your main professional services activities and what proportions of your overall business do they represent? Do you anticipate any changes in the next two years?

	1985	1987
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %

PROMPTS

Consultancy, Software Development, Contract Programming, Education and Training

2. What in your opinion are the major challenges/problems facing vendors of professional services?

3. What productivity aids/methods do you employ: (please note the importance to your organisation).

- Structured techniques, e.g., M.Jackson
- Reusability of modular code
- Improved languages
- Application system generators
- Personal motivation
- Other (please specify)

High	Medium	Low

4. What factors contribute to your profitability?

- Software productivity techniques
- Project management methods
- Calibre of your staff
- Other (please specify)

Cont. %

100%

Comments:

5. What approximate percentages of your software is developed using the following languages:

- Assembler _____ %
 - Traditional high-level - COBOL, FORTRAN, BASIC, AGOL 60 PRG _____ %
 - Newer high-level eg - PL1, CORAL 66, RTL2, PASCAL, APL, ADA, MODULA-2 _____ %
 - Non-procedural, e.g., Query languages, non-host DBMS _____ %
 - Fourth generation languages _____ %
 - Other (please specify) _____ %
- _____ 100%

6. Are there any particular trends that you are noticing in the area of consultancy (i.e., new opportunities)?

PROMPTS

Equipment selection services, Performance measurement, Communications, Scientific

THANK YOU

EUROPEAN INFORMATION SERVICES INDUSTRY
VENDOR QUESTIONNAIRE

INTEGRATED SYSTEMS

(Sometimes called Turnkey Systems)

INPUT

1. What do you consider to be the major challenges/problems facing the integrated systems business?

2. How would you classify your products, and what proportion of your integrated systems business do they constitute now and in 2 years time? Please state type of H/W that product is based on.

	<u>1985</u>	<u>1987</u>
CAD/CAM		
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
Small Business Systems (Please state application)		
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
Other (Please define)		
_____	_____ %	_____ %
_____	_____ %	_____ %
_____	_____ %	_____ %
	<u>100%</u>	<u>100%</u>

3. What proportion of your revenues (approximately) derives from:

	<u>1985</u>	<u>1987</u>
Hardware	_____	_____
Hardware maintenance	_____	_____
Software	_____	_____
Software maintenance	_____	_____
Training and support	_____	_____
	<u>100%</u>	<u>100%</u>

Comments:

4. How would you describe your overall approach to product development?
ie modifying hardware, software etc.

5. Do you have your own hardware/engineering facilities? If so what
services do they provide?

6. What are the basic forms of business relationship that you have with H/W suppliers and/or services vendors? (Please give details including level and degree of investment required etc.)

7. Do you offer warranty on your systems; if so, for what period and is this different for hardware and software?

THANK YOU

APPENDIX D: USER QUESTIONNAIRE

USER QUESTIONNAIRE

(Please use local currency where applicable)

Completed by: _____ Date: _____

Position/Title: _____

Name of Company: _____

Address _____

GENERAL INFORMATION

1. Primary business _____

2. Total number of employees _____

3. Number of DP employees _____

4. Annual Revenue _____ or

Other scale of measurement _____

Please return to:

Peter Lines
INPUT LTD
41 Dover Street
LONDON W1X 3RB

OBJECTIVES AND PRIORITIES

5. What are your primary objectives and priorities for the next three years? (Please rank the top ten in order of importance: 1 through 10, 1 being most important, 2 second, etc, for each of the three years.)

<u>CATEGORY</u>	<u>PRIORITY RANKING</u>		
	<u>1985</u>	<u>1986</u>	<u>1987</u>
Convert application	_____	_____	_____
Develop new batch application	_____	_____	_____
Install on-line applications	_____	_____	_____
Design/Install DBMS	_____	_____	_____
Design/install DDP network	_____	_____	_____
Install new mainframe	_____	_____	_____
Install minicomputers/small business systems	_____	_____	_____
Install personal computers	_____	_____	_____
Install new peripherals	_____	_____	_____
Install office automation	_____	_____	_____
Use fourth generation languages	_____	_____	_____
Develop Information Centre	_____	_____	_____
Centralise DP Control	_____	_____	_____
Decentralise DP Control	_____	_____	_____
Develop long-range DP plan	_____	_____	_____
Improve DP personnel productivity	_____	_____	_____
Integrate office automation with DP	_____	_____	_____
Develop Telecommunications network	_____	_____	_____
Other (please specify and indicate priority)	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Comments:	_____	_____	_____
_____	_____	_____	_____

DP PROBLEMS

6. What are the most significant DP problems you face in 1985 (Please rank the top ten in order of priority: 1 through 10, 1 being most urgent, 2 second etc.)

<u>CATEGORY</u>	<u>PRIORITY RANKING</u> <u>1985</u>
Personnel recruiting	_____
Personnel training	_____
Lack of general management understanding	_____
Lack of user involvement in system/ application development	_____
Inadequate systems software	_____
Need for improvement in operations	_____
Need for better planning control	_____
Excessive applications development time	_____
Excessive applications backlog	_____
Inadequate DP funding (budgets)	_____
Need to improve data communications facilities	_____
Unsatisfactory hardware maintenance	_____
Other (please specify and indicate priority)	_____
_____	_____
_____	_____
_____	_____
Comments: _____	

DP APPLICATIONS

7. What new applications will you be developing (or purchasing) during 1985? What is their mode of operation and relative importance in your total development effort? (Please rank new applications in order of importance: 1 through 10, 1 being most important, 2 second, etc.)

	New Development		Primary Mode of Operations (tick one)		Please Indicate Whether Outside Purchase
	Priority Ranking	Existing Application	Central Site	Remote Site	
Industrial/ Manufacturing	_____	_____	_____	_____	_____
Engineering/ R&D	_____	_____	_____	_____	_____
Order entry/ purchasing	_____	_____	_____	_____	_____
Production/ inventory control	_____	_____	_____	_____	_____
Distribution/ transportation	_____	_____	_____	_____	_____
Marketing/ sales	_____	_____	_____	_____	_____
Personnel/ payroll	_____	_____	_____	_____	_____
Accounting/ finance	_____	_____	_____	_____	_____
Other (please specify)	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

DP BUDGET

8. Please categorise how your 1985 DP budget will be spent. Please indicate how much you expect specific categories to increase or decrease in 1986.

<u>BUDGET CATEGORIES</u>	<u>1985 Total Budget</u>	<u>Anticipated Percentage Change in 1986</u>	
	<u>Amount (Local Currency)</u>	<u>Increase</u>	<u>Decrease</u>
Personnel (including recruitment, training etc)	_____	_____	_____
Mainframe processors	_____	_____	_____
Peripherals	_____	_____	_____
Minicomputers	_____	_____	_____
Personal computers	_____	_____	_____
Terminals	_____	_____	_____
Office Automation equipment	_____	_____	_____
Communications hardware and software	_____	_____	_____
Software (purchase or lease)	_____	_____	_____
Integrated Systems (Turnkey Systems)	_____	_____	_____
Vendor maintenance services (hardware or software)	_____	_____	_____
Professional services (Consultancy, software development etc.)	_____	_____	_____
Processing services (outside)	_____	_____	_____
Supplies and other	_____	_____	_____

9. What would you consider to be the major factors affecting any changes in the size of the DP Budget?

OUTSIDE COMPUTER SERVICES AND SOFTWARE EXPENDITURES

10. Does your company purchase outside computer services that are not under the control of the DP organisation?

Yes _____ No _____

11. If yes, what were the approximate annual expenditures for these services in 1984?

12. What percent increase or decrease do you expect between:

1984-1985 _____ % 1985-1986 _____ %

13. Who purchases these outside services?

Finance _____ % Operation/manufacturing _____ %

Corporate _____ % Marketing/sales _____ %

Personnel _____ % Other (please specify)

R & D engineering _____ % _____ %

SATISFACTION WITH SERVICES AND SOFTWARE SUPPLIERS;
AND FUTURE USE

14. Please indicate your level of satisfaction (High, Medium, Low) with different types of service/software, and also give the likely increase/decrease in usage over the next two years.

<u>SERVICE/SYSTEM</u>	<u>SATISFACTION (tick one)</u>				<u>PROJECTED CHANGE 1985-1987</u>	
	<u>Don't Use</u>	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Growth (Percent)</u>	<u>Growth (Percent)</u>
Bureau -						
RCS - Interactive	_____	_____	_____	_____	_____%	_____%
RCS - Remote batch	_____	_____	_____	_____	_____%	_____%
Batch	_____	_____	_____	_____	_____%	_____%
Facilities management	_____	_____	_____	_____	_____%	_____%
Turnkey/Integrated systems	_____	_____	_____	_____	_____%	_____%
Hardware maintenance	_____	_____	_____	_____	_____%	_____%
System software products	_____	_____	_____	_____	_____%	_____%
Application software products	_____	_____	_____	_____	_____%	_____%
Professional Services:						
Consultancy	_____	_____	_____	_____	_____%	_____%
Tailored software development	_____	_____	_____	_____	_____%	_____%
Education and training	_____	_____	_____	_____	_____%	_____%

15. Have you any general comments or particular concerns over the use of outside services?

TELECOMMUNICATIONS

16. How important are telecommunications to you EDP systems and future plans ?

17. What are the key issues for your organisation in terms of the development and use of telecommunications?

18. Do you have any views on the telecommunications environment (i.e. the PTT) in respect of your information systems needs?

19. What is the current use made of 'electronic mail services' for your organisation, and how do you see this developing by 1990?

20. Does your organisation anticipate using Electronic Data Interchange (EDI) services; if so, when would you think this might commence and with what approximate volume of documents?

NEW AREAS OF DEVELOPMENT

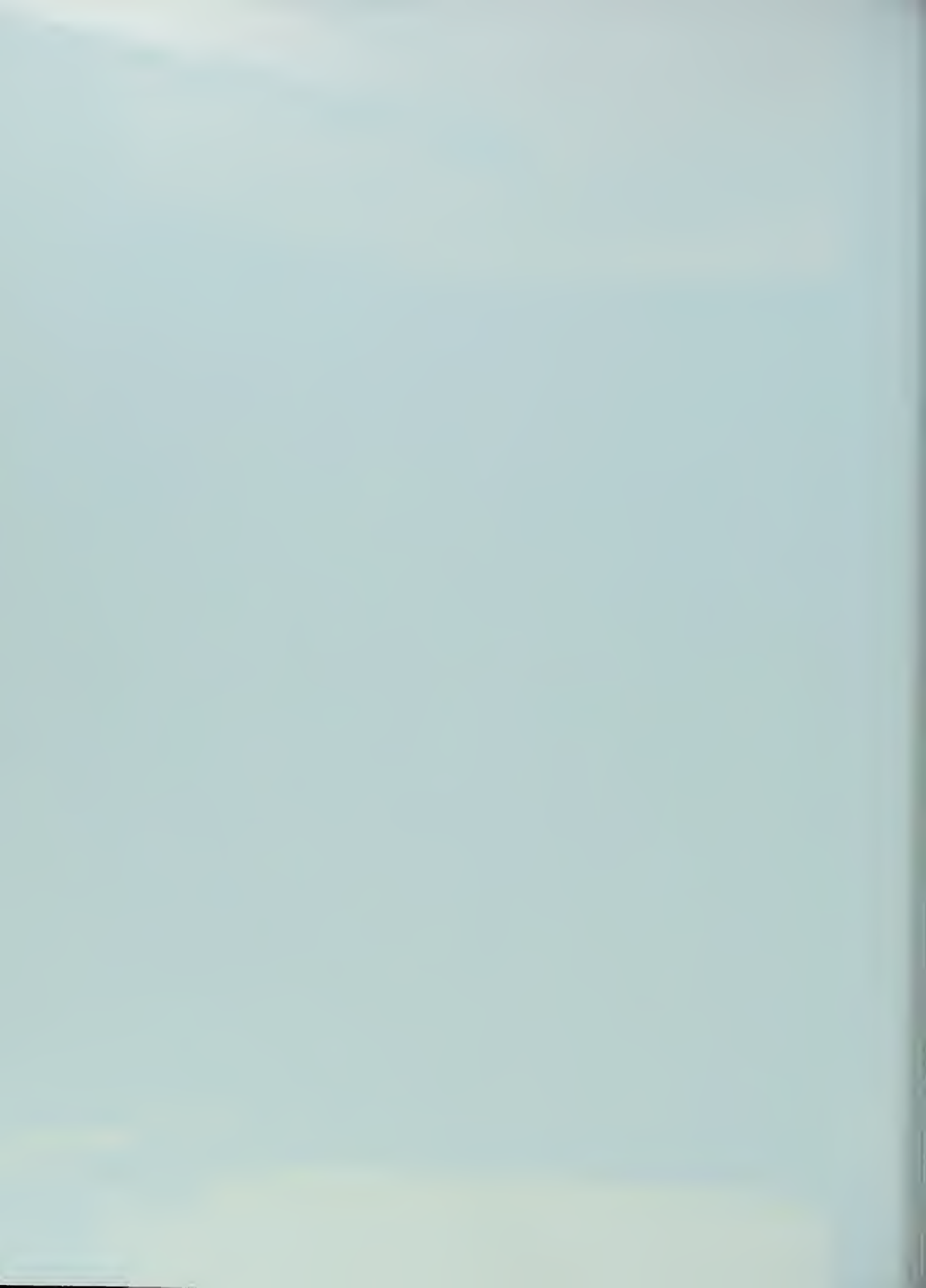
21. Please indicate your level of interest in the following areas of development.

	High	Medium	Low
Use of applications packages	_____	_____	_____
S/W Productivity	_____	_____	_____
Facilities Management	_____	_____	_____
Networks	_____	_____	_____
Office Automation	_____	_____	_____
VIDEOTEK	_____	_____	_____
Use of Value Added Networks	_____	_____	_____
Electronic Data Interchange	_____	_____	_____
Expert Systems	_____	_____	_____
FGL's	_____	_____	_____
Decision Support Systems	_____	_____	_____
Other (please define):	_____		
Comments:	_____		

22. Are there any other key issues not mentioned above, in the development of data processing for your organisation?

THANK YOU

APPENDIX E: RELATED INPUT REPORTS



APPENDIX E: RELATED INPUT REPORTS

- European Videotex Market Opportunities, 1985.
- Value-Added Network Services--European Market Opportunities, 1985.
- Micro-Mainframe Links--European Market Opportunities, 1985.
- European Opportunities for Integrated DBMS-Applications Software, 1985.
- Service Versus Systems for Small Organisations in Europe, 1985.
- European Trends and Opportunities in Fourth Generation Languages, 1985.

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs.

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Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

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