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INPUT

VALUE ADDED NETWORK SERVICES
EUROPEAN MARKET OPPORTUNITIES

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ABSTRACT

The continuing convergence of computer and communications technologies is creating challenging new service opportunities to European information services vendors. The highly regulated PTT environments of most European countries and the partially deregulated U.S. environment present a number of challenges to vendors wishing to exploit these rapidly developing new markets.

This report examines the emerging new markets for VANS, looking in particular at networks, electronic mail, electronic data interchange, and electronic funds transfer. Videotex, another important VANS market, is incorporated in the overall market sizes and forecasts but is dealt with in detail in a separate report entitled European Videotex Market Opportunities.

Examples of existing and emerging developments are given, the PTT environments for each of the four countries studied (France, Italy, the United Kingdom, and West Germany) are described, and both user and vendor issues are discussed. Market forecasts for the period 1985 to 1990 are included.

This report contains 149 pages, including 37 exhibits.

VALUE ADDED NETWORK SERVICES
EUROPEAN MARKET OPPORTUNITIES

CONTENTS

EXHIBITS

1 INTRODUCTION

I INTRODUCTION

A. SCOPE OF THE REPORT

- 'Value added networks' (VANs) and 'value added network services' (VANS) have become increasingly important developments for the information technology world and particularly for the information services industry.

- Services companies, PTTs, equipment suppliers, and, not least, governments are concerned about the opportunities in these potentially strategically important markets and their impetus to economic growth.

- INPUT's particular objective in conducting this research programme and preparing this report has been to:

  - Establish an overall view of the market for VANs and associated services in an attempt to provide an ordered approach for information services vendors to assess it potential.

  - Identify the key strategic issues (whether technological, regulatory, or user demand) that are likely to affect its development.

  - Address the product and marketing issues that must be considered by the vendors of VANS.

- The report covers the country markets of France, Italy, the United Kingdom, and West Germany. The term Western Europe is used throughout the report to imply these four individual country markets as a group.

- Although videotex is considered as part of the overall VANS market, its importance in Europe was considered justification for a separate report. This has been produced as a companion volume to this report entitled European Videotex Market Opportunities.

- Value added network services are developing fast in the U.S. market. In consequence, U.S. experience is relevant and of interest to both existing and potential services vendors in Western Europe. A number of INPUT's U.S. reports on subjects related to this area are, therefore, listed in Appendix D.

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

- INPUT expresses its thanks to all those individuals and companies that participated in the research programme upon which this report is based.

B. METHODOLOGY

- Field research for this report was obtained from an interview programme that was conducted during the period of August through October 1985.

- Altogether, some 48 in-depth interviews were conducted, the majority being face-to-face discussions. These were made in the four Western European countries of France, Italy, the United Kingdom, and West Germany.

- These interviews were conducted amongst network services vendors, the PTTs, users, and common interest groups.

- The questionnaire used as the basis of these interviews is included as Appendix C.

- A second level of user research was also conducted on a wider basis in France, the U.K., and West Germany by mail questionnaire as part of INPUT's annual user survey. There were 86 respondents to this survey.

- An analysis of the research sample is included as Appendix B.

- INPUT's continuing research programmes on the information services markets of both Western Europe and the U.S. were also important contributors to the analysis of this market.

- For convenience of comparison between markets, local currencies have been converted to U.S. dollars. U.S. dollar conversion rate assumptions over the five-year period 1985 to 1990 are given in Exhibit III-2. These conversion rate assumptions should not be interpreted as forecasts of exchange rates.

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

C. REPORT STRUCTURE

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

  - Chapter II is an Executive Summary providing an overview of the contents of the entire report.

  - Chapter III describes INPUT's definition of the VANS market structure including INPUT's assessments of market size and expected growth.

- Chapter IV provides a perspective on the value added network services market in Western Europe through the provision of outline descriptions of vendors active in this market and their services.

- Chapter V describes the telecommunications environment in each of the four major country markets studied.

- Chapter VI analyses and discusses the strategic trends and market influences that are shaping the newly developing markets for value added network services.

- Chapter VII describes potential areas of opportunity that fall within the areas covered by INPUT's definition of the VANS market.

- Chapter VIII discusses some characteristics of users or potential users of value added network services as defined from INPUT's research programme.

- Chapter IX provides INPUT's conclusions and recommendations for information services vendors participating or planning to participate in the VANS market.

- The Appendices contain a list of definitions of terms, an analysis of the research sample, the vendor survey questionnaire, and a list of related reports.

II EXECUTIVE SUMMARY

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- 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 script, to facilitate group communication.
- The key points of the entire report are summarised in Exhibits II-1 through II-6. On the left-hand page facing each exhibit is a script explaining its contents.

A. VALUE ADDED NETWORK SERVICES—THE NEW OPPORTUNITY

- The convergence of computers and communications is opening up a fantastic new world of opportunity.

- Just as at an earlier stage of convergence (during the 1970s) 'time sharing' opened up a new area of services previously beyond the reach of most users, this continuing convergence is again driving the development of new services hitherto unavailable.

- In the time-sharing era 'communications' brought the power of prohibitively expensive computers to a wide audience. This time, the driving force is the network capability to collect data and to connect people and organisations over a widespread geographic area.

- Thus, whereas previously the focus of attention was the computer and its processing capability, it has now turned to the communications capability of networks and the new types of services that this makes possible.

- The focus is now on such features as:

  - Wide area connectivity.

  - Connection of 'communities' of users.

  - Speed of operation, ease of use, and cost reduction.

INPUT®

VALUE ADDED NETWORK SERVICES
THE NEW OPPORTUNITY

- Convergence
  - Computers/Communications
- The Focus has Changed
  - From the Need to Compute
  - To the Need to Communicate

B. VANS--THE EUROPEAN PERSPECTIVE

- Within Europe the regulatory environment of the PTTs clouds the issue of the development of the VANS market.

- The convergence of the computer and communications industries is bringing together a highly competitive commercial industry and highly regulated public utilities. Consequently, the VANS markets are developing at the fringe of regulation.

- The undefined nature of this new environment is illustrated by:

  - The difficulty experienced in the U.K. in attempting to define guidelines for VANS.

  - The confusion amongst European services companies as to the nature of these markets, to what extent they use the PTTs' monopoly, and whether they can be entered at all.

- Information services vendors must consider joint ventures or obtain PTT approval for their new services. Vendors must develop relationships with the PTT authorities in order to develop new opportunities as they become available.

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VANS - THE EUROPEAN PERSPECTIVE

- Regulatory Environment
- Joint Ventures
- PTT Approval

C. VANS—A $1.2 BILLION OPPORTUNITY

- INPUT forecasts that the VANS market for the combined four country markets of France, Italy, the United Kingdom, and West Germany could potentially grow at a rate in excess of 60% per annum to reach $1.2 billion by 1990.

- However, INPUT stresses that many uncertainties are associated with this forecast, particularly:

  - The development of the PTT regulatory environment and consequent vendor willingness to develop services.

  - User attitudes and acceptance of VANS.

- The forecast has therefore been presented in the form of a low (pessimistic), mid-point, and high (optimistic) evaluation.

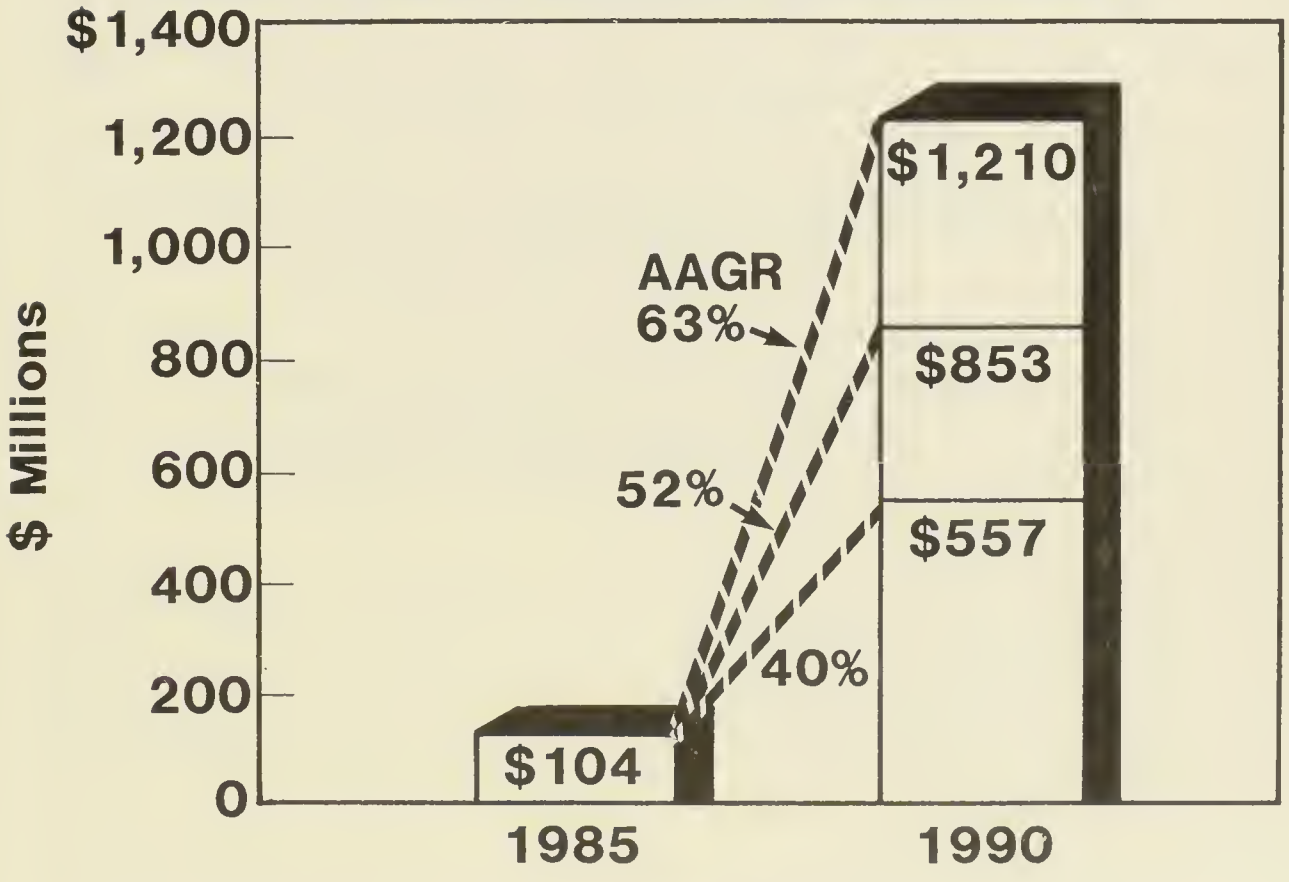
- It is considered that even with many negative influences, the European VANS market will grow at 40% per annum to exceed $500 million by 1990.

- France and the United Kingdom will be the most significant markets, achieving $400 million (33% market share) and $412 million (34% market share) respectively of the $1.2 billion forecast on the optimistic scenario.

- The Italian market will show the highest level of growth at around 200% per annum to 1990, but will only at most account for around 10% of the overall market.

- The West German market shows the greatest difference between the optimistic and pessimistic scenarios, a 22% market share for the optimistic forecast at an annual growth rate of 132% compared to only a 10% market share and a growth rate of 70% for the pessimistic forecast.

VANS - A $1.2 BILLION OPPORTUNITY



D. STRATEGIC DIRECTIONS FOR VANS

- Throughout Western Europe, the PTTs will be key participants in the emerging markets for VANS.

- British Telecom has already made strategic partnerships with a number of potential VANS operators in areas such as credit card authorisation and EDI. The French PTT has entered into a joint company with CSC to create the INTERPAC network. The Italian market has seen the creation of SEVA as a joint venture between the PTT and other major organisations to offer credit card authorisation and other financial services.

- Thus, not only are the PTTs assured of a leading role by virtue of their monopoly position (or dominant market position in the case of British Telecom) in the area of network operation, they are also seeking to enter the market for specific services through partnership arrangements.

- The area of network operation is also characterised by the presence of powerful independent network vendors, such as McDonnell Douglas' TYMNET, GEISCO, and IBM. These vendors are working hard to establish a strategic position in a market where the costs of entry will become increasingly large for new entrants.

- Specific services offerings will be the key to market development. Users will buy specific applications solutions in this undeveloped market where there is little understanding or perceived need for generic solutions.

- The sales justification of a specific service will be the business benefits that it supplies. These will represent the value added that will be the source of revenue to the service vendor.

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STRATEGIC DIRECTIONS FOR VANS

- PTTs Key Participants
- Powerful Network Operators Establishing Position
- Markets Will Be Driven by Specific Services

E. USER CONSIDERATIONS

- The cost of using telecommunications networks was the most frequently mentioned consideration of users. Vendors should be careful not to misinterpret this. Emphasis on cost is a reaction to the general misunderstanding of potential benefits that could be made available through the use of value added network services.

- One of the major factors likely to drive the growth of VANS markets will be growing user awareness of the complexity of building and operating networks. Users expressed an awareness of the importance of such factors as reliability and ease of use, but many have yet to seriously face the problems of delivering fully functioning network systems.

- A key driving force for VANS use will be the needs of industry communities to communicate amongst their members. As this trend becomes increasingly marked as a result of the development of electronic data interchange (EDI) systems, greater user acceptance of independent VANS vendors will occur.

- Vendors must pay increasing attention to customising their services by developing a greater understanding of user needs. Overall performance of the network, reliability, and security will all be important user considerations.

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USER CONSIDERATIONS

- Cost
- Complexity
- 'Community' Needs

F. MARKET OPPORTUNITIES

- The markets for VANS are extensive and potentially vast.

- Opportunities for the provision of networks must be viewed in the context of the PTT environment and the considerable capital investment that will be increasingly required to establish a viable market position.

- Specific services will be the key strategy for most information services vendors entering the VANS market.

- The videotex market is currently the most important VANS market and will continue to offer significant opportunities, particularly in France. Italian and West German markets will also be significant due to their current undeveloped status.

- Major areas of new opportunity will occur in:

  - Electronic Data Interchange (EDI), where growth well in excess of 100% per annum is forecast.

  - Electronic Funds Transfer (EFT), as increasing use is made of 'cashless' shopping and as banks and other organisations extend the use of financial services.

  - Insurance systems, where again growth in excess of 100% per annum is anticipated.

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MARKET OPPORTUNITIES

- Networks
- Videotex
- EDI
- EFT
- Insurance

III MARKET SIZE AND GROWTH

III MARKET SIZE AND GROWTH

A. MARKET DEFINITION

- Since the expression 'Value Added Network Services' has been used loosely in many instances, INPUT has been particularly concerned to define its meaning in this report as exactly as possible.

- A major concern in the development of the definition has also been to make it as useful as possible. Therefore, INPUT has excluded some existing services, e.g., on-line data base, which could be included and has placed the emphasis on newly emerging services like electronic data interchange (EDI).

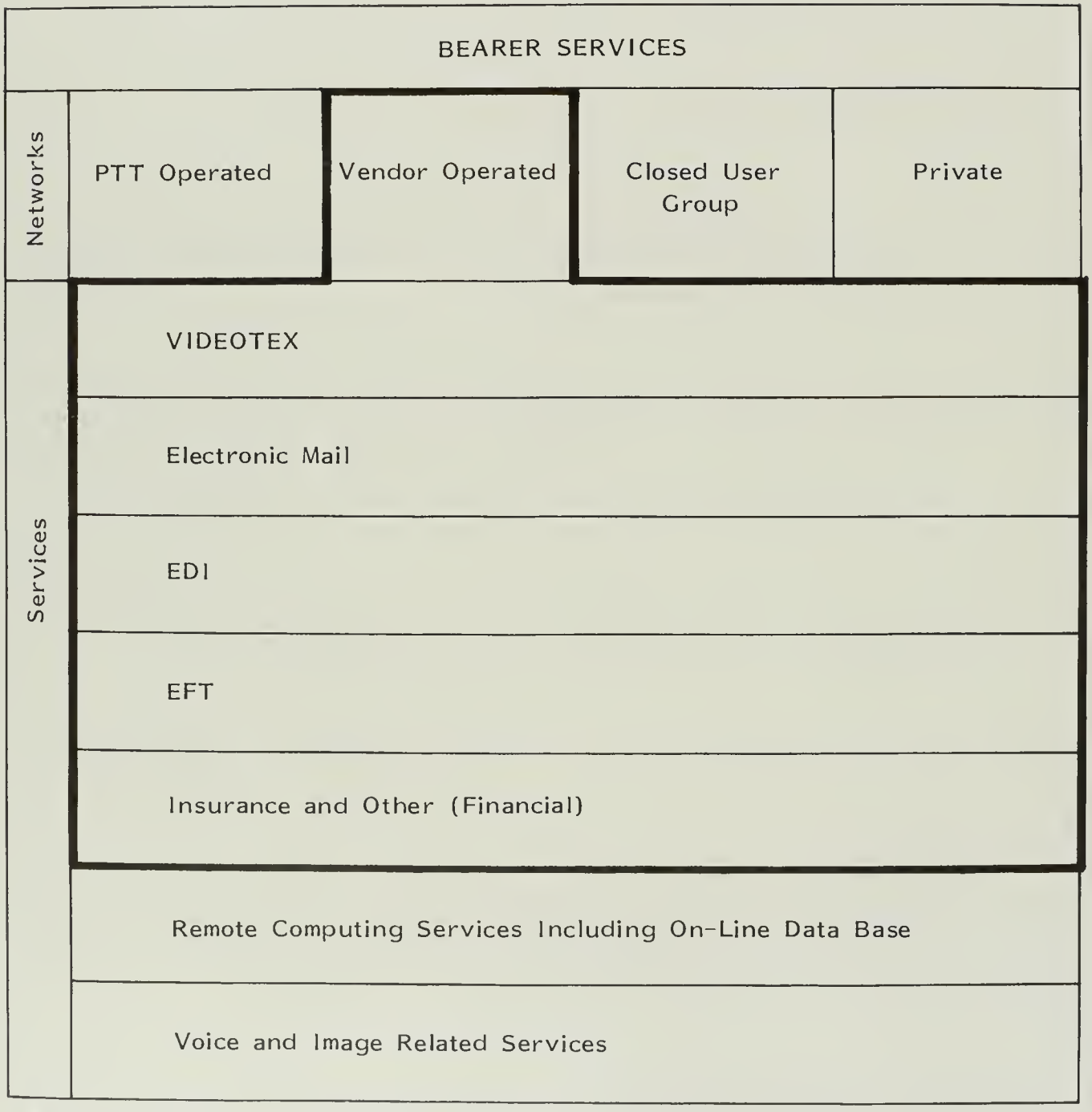
- Exhibit III-1 provides a representation of the structure of the VANS market, as defined by INPUT, in Western Europe. The VANS market is considered as the sum of those subsegments surrounded by the thick black line.

- Major difficulties encountered in sizing and forecasting this market included the lack of accepted definitions in the industry and the overlapping nature of the various subsegments.

- INPUT has attempted in its definition of the VANS market to identify readily recognisable market segments, albeit recognising that some degree of overlap may exist between them. Allowances have been made for this.

EXHIBIT III-1

VANS MARKET STRUCTURE IN EUROPE



- The potential for growth in this area is vast, and the overall state of the market is immature. The market size estimates and forecasts have therefore been formulated on both an optimistic and pessimistic basis.

- At the most basic level, all networks and transmission services must use a basic carrier service (or bearer service) for bit transmission. These services are provided by the PTTs or, in the U.K., British Telecom, Mercury, or the City of Hull. It is these bearer services that support the development of value added network services.

- Value added networks (i.e., the network services) are constructed upon the bearer service infrastructure from various transmission components and incorporating various processing capabilities.

- Outline descriptions of each component of the VANS market, as defined by INPUT, and some adjacent markets not included in the definition but relevant to an overall understanding of the market are included below.

I. NETWORK SERVICES

- In the early days of network development, the computer processing and communications functions could be clearly separated. Today, as a result of technological development, communications equipment such as switching equipment, PABXs, multiplexing equipment, etc. has come to rely increasingly on computer processing techniques.

- Consequently, the capability of offering enhanced services over and above basic bit transmission has emerged. This technology development has largely outpaced the regulatory authority's ability to define or control the new services that can be offered.

- This has resulted in considerable public debate with regard to the approaches to be taken to this phenomenon, and is currently being approached in many

different ways by European countries. The telecommunications environments in each of the four countries studied are described in Chapter V.

- Capabilities provided on networks which are generally considered to elevate it to VANS status are:

  - Deferred transmission.
  - Multi-address routing.
  - Protocol conversion.
  - Secure delivery service.
  - Speed and code conversion.

- The broad area of network services can be defined as consisting of:

  - Private networks.
  - Closed user group networks.
  - Enhanced service networks supplied by the PTT.
  - Independent vendors' network services.

a. Private Networks

- Although excluded from INPUT's VANS market definition, these networks are of interest since they can be used as the basis for generating non-captive VANS revenues when licensed to do so.

- For example, the DATEC network originally set up by the Debenhams department stores group in the U.K. (recently acquired by the Habitat/Burton consortium) and used as the basis for external sales of videotex and other services.

- The earliest commercial examples of private networks came in the airline industry with its very high need for real-time seat reservation systems.

- Subsequently, as computer costs have fallen and communications technology has become more accessible and widespread, more and more organisations have built communications networks to support their data processing systems.

- In some cases, the development of these networks have been contracted out wholly or in part to third parties, often professional services vendors.

- An example of such a network would be that recently contracted for by the Unilever Group with EDS.

b. Closed User Group Networks

- These networks have been set up by particular communities of users to meet mutually agreed upon communications needs.

- Since these services are not generally marketed outside the user group but are simply made available on a subscription basis to members, revenues are not included in the overall market size.

- Two important examples of this type of network are:

  - SITA, the airline seat reservation system that interlinks individual airlines for joint ticketing arrangements.

- SWIFT, a system for the interchange of financial transactions between banks.

c. PTT Services

- Enhanced services networks are provided by the respective PTTs in each European country.

- At this stage of development and prior to the advent of digital networks (ISDNs), examples of these networks are, for videotex, Prestel in the U.K. or, for packet switching services, TRANSPAC in France.

- Revenues from these services have not been included in INPUT's definition since they do not represent an available competitive market for information services companies.

- Principal services in each of the four major country markets studied are:

  - France - TRANSPAC.

  - Italy - ITAPAC and VIDEOTEL.

  - U.K. - PSS/Multistream/Prestel.

  - West Germany - DATEX-P/Bildschismtext (Btx).

d. Independent Vendor Networks

- Despite the highly regulated nature of the Western European telecommunications environment, a number of independent vendors operate networks primarily in association with service bureau work.

- These vendors operate under special license agreement with the PTTs and do not necessarily offer VAN services within INPUT's strict market definition.

- However, most are capable of doing so and are mostly planning to exploit the competitive advantage of already having a network in place upon which to offer enhanced services.

- Some of these services represent the European operations of U.S. networks such as TYMNET and TELENET.

- Many established processing services companies such as CISI also operate networks.

- Increasingly, it can be observed that vendors with networks in place are seeking to leverage these investments by moving into the area of value added services.

- For example, McDonnell Douglas (the parent of Tymshare) has recently set up a joint company, Edinet Ltd., with British Telecom.

- Other examples are ISTEL with its Videotex and Edict Services and GEISCO with Motornet.

- Some vendors, for example ICL and IBM, are in the process of specifically building networks in Europe upon which to base value added services.

- Revenues from these networks are included in INPUT's VANS market definition, as depicted in Exhibit III-1.

2. SPECIFIC SERVICES

- The second major component of INPUT's VANS definition are those services that are based upon a network service.

- As stated already, INPUT has attempted to formulate a definition which excludes, at this level, established markets like interactive processing services and on-line data base services.

- Services included within the definition are:

  - Videotex services.

  - Electronic mail.

  - EDI.

  - EFT and audit/cheque guarantee services.

  - Insurance.

- Additionally, allowance has been made for certain other data services, and these are described in subsection f. below.

a. Videotex

- This area has been one of importance for some time in the European market, largely as a result of the initiatives by British Telecom in developing Prestel and recently by the DGT in France with Teletel and the Minitel terminal.

- More recently, the Deutsche Bundespost has launched Bildschismtext (Btx), and the Italian PTT authorities are preparing for the introduction of the VIDEOTEL service.

- A wide variety of services have been developed for videotex delivery, with an original emphasis on home use. Much more emphasis is now being placed on commercial systems as vendors seek to exploit the business advantages of a simple 'easy-to-use' systems interface.

- Videotex is dealt with comprehensively in the companion volume to this report, European Videotex Market Opportunities.

b. Electronic Mail

- Like videotex this is an area of high interest and, as a result, many vendors have brought services to the market.

- The PTTs provide these services, e.g., British Telecom's Telecom Gold, as do independent vendors, for example GEISCO with QUICK-COM and ISTEL with COMET.

- Some electronic mail services are provided through videotex systems such as MISSIVE and S.TEL in France. Where this is the case, end-user revenues are counted within the videotex market sector.

c. Electronic Data Interchange

- Electronic Data Interchange (EDI) is the area of application that addresses the requirements of companies needing to communicate large quantities of documentation, for example, invoices, delivery notes, and shipping advice documents, by electronic transmission.

- First put forward by the Transportation Data Coordinating Committee (TDCC) some 17 years ago, it is now assuming considerable importance in the U.S.

- These moves are being closely followed in Europe where some significant developments have been made by major vendors.

- EDI fundamentally is about communities of users and, therefore, requires considerable cooperation over standards and data formats.

- Industry associations are thus of considerable significance and are one of the main driving forces behind these developments in Europe, for example:

  - The Article Number Association (ANA) in contracting ICL Network Services to build a network to support their TRADACOMS standards for the retail trade, as described more fully in Chapter IV.

  - ODETTE, the Organisation for Data Exchange through Teletransmission in Europe, set up under the auspices of the various national automobile manufacturer trade associations.

- A key issue for EDI is the concept of a 'clearinghouse'. If every member of the community participating in EDI transmits with absolute compliance to the established standards, then this limits the processing, and thus consequently the potential value added that can be generated on the network.

- INPUT believes that this 'ideal' situation is unlikely to pertain in general and that consequently considerable processing revenues will be generated by vendors who will act as the interface between the different levels of versions of 'standards' that will exist.

- Data standards will be complex and will need to be updated over time, thus imposing a heavy amendment burden on participants.

- In practise not all will be willing or able to keep up to date. Even the allowance of overlapping levels for set periods of time is unlikely to provide a complete solution to this problem.

- Additionally, the clearinghouse can provide many other value added services, such as:

- The resolution of technical standards between different types of equipment and transmission protocols.

- The resolution of time differences arising from the different operational schedules that will occur amongst different organisations.

- Already, ISTEL with their EDICT product, the joint McDonnell Douglas-British Telecom company Edinet Ltd., and GEISCO with Motornet have declared their interest in this new market opportunity.

d. Electronic Funds Transfer

- A very significant opportunity for VANS will be for networks and services concerned with providing electronic funds transfer (EFT).

- This area can be considered as consisting of two broad areas--retail and non-retail.

- In the non-retail sector, a number of private and closed user group networks exist, for example SWIFT and CHAPS.

- EFT services are also becoming increasingly linked with corporate cash management systems which have been an important processing services market for some time, with vendors like GEISCO and ADP being active in this field.

- There is some indication that the larger banks are moving towards in-house systems. For example, the National Westminster Bank has recently announced that it is going to offer its own corporate cash management system using National Data Corporation's NETS software on Tandem hardware.

- There thus appears to be a tendency for larger banks to develop their own in-house systems and reduce their reliance on networks like GEISCO's or the banks' own cooperative network SWIFT.

- Nevertheless, opportunities will exist to meet the needs of smaller banks, building societies, etc., as a result of financial deregulation and the need for correspondent bank services.

- A potentially larger opportunity for electronic funds transfer is going to develop, albeit slowly at first, in the retail sector. This area includes a number of separate but related service developments, such as:

  - Automated Teller Machines (ATM).

  - Point of sale services.

    . Credit card authorisation.

    . Cheque guarantee.

    . Direct debit.

  - Home banking.

- Home banking is another example of a videotex-based application. Development has been minimal in Europe, except in France where it is being strongly promoted by the large number of Minitel installations.

e. Insurance

- With increasing competitiveness and the need for insurance companies to communicate with large numbers of intermediary brokers, the trend towards the increased use of networks by insurance companies is inevitable.

- For example, services have been set up in the U.K. by both IBM and British Telecom following the IVANS precedent in the U.S.

- British Telecom launched a system, Mediat, in pilot form in the first half of 1985 with 9 insurance companies and 100 brokers.

- Based upon BT's Packet Switchstream network, brokers using this service will be able to gain immediate quotes on insurance business as well as conduct other transactions such as price and policy queries directly with the central computers of the insurance companies.

f. Other Value Added Data Services

- In addition to the services identified above, it is expected that many other new applications will emerge. A common theme will be the need to exploit network communications between many users and the capabilities of the enhanced services that can be provided on them.

- One area that has already been developed is in the pharmaceutical industry to meet the need to collect data on the performance of new drugs.

- It is also expected that manufacturing organisations will place increasing emphasis on the teletransmission of CAD/CAM data.

- It is likely that by 1990 there will be seen the beginnings of transportation networks (some videotex applications already exist) that extend automation beyond the heavily computerised airline industry.

g. Other Services

- In addition to the 'data' services described above, there is also a developing market for other value added services, for example:

  - Voice related.

  - Image related.

- Examples of such services are:
  - Teleconferencing.
  - Voice store and forward (voice mail box).
  - Facsimile interfacing.
  - Call logging and reporting.
  - Telephone marketing.
  - Physical security services.
- These types of services have not been included within INPUT's definition of the VANS market.

B. MARKET FORECAST

1. FORECAST DEFINITION

- The market assessment and forecast growth that follow were developed from an assessment of current and projected activities within the market definition described above.
- The forecast covers the period 1985 to 1990 and assesses end-user expenditures. 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%.
- Italy - 8.7%.
- United Kingdom - 5.9%.
- West Germany - 2.2%.

- 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-2 sets out the assumed conversion rates used in preparing this 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.

2. FACTORS INFLUENCING SIZE AND GROWTH

- There are a vast range of factors, economic, technical, and institutional, that will affect the development of the VANS market.
- However, two overriding influences will be:
  - The PTT regulatory environment.
  - User attitudes to, and acceptance of, value added network services.

EXHIBIT III-2

U.S. DOLLAR CONVERSION RATE ASSUMPTIONS

CURRENCY	ASSUMED U.S. DOLLAR CONVERSION RATE					
	1985	1986	1987	1988	1989	1990
French Francs	8.00	8.17	8.34	8.51	8.69	8.88
Italian Lira	1,770	1,867	1,970	2,078	2,193	2,313
Pounds Sterling	0.70	0.72	0.74	0.76	0.78	0.80
Deutsche Marks	2.62	2.59	2.57	2.54	2.52	2.49

- The degree to which the PTT environment allows and fosters the development of value added services will be an absolutely vital factor.

- The United Kingdom clearly offers the most open environment in this respect, and West Germany the most restricted. The telecommunications environment for each of the four countries studied is described in Chapter V.

- The market forecasts developed by INPUT assume some degree of 'liberalisation' on the part of the PTT monopolies in encouraging joint ventures or independent vendors to exploit these new opportunities.

- Whilst the PTT environment is the dominant influence on the supply side of the equation, the response of users to VANS will determine the other side.

- VANS markets are, at the time of this writing, largely undeveloped and embryonic in nature, the exception to this being the videotex market. In consequence, a degree of uncertainty must therefore be placed upon the assumed rate at which users will employ these new services.

- Use of these new services will demand adjustment on the part of users in respect to human organisation and working methods. These are complex issues, and the usage of services dependent on such change will rarely develop with the speed or to the plan predicted for them.

- For example, the use of EDI, whilst offering considerable cost reduction benefits to a company, also presents a considerable management challenge in terms of its internal implementation.

- In these situations, the presence of some other important factor, for example, the pressing need to reduce costs or the need to absorb rapid expansion, is usually necessary to stimulate use.

- In assessing these factors, INPUT considers it important to stress the tentative nature of the forecasts developed for these markets through to 1990. In consequence, they have been presented in the form of a low (pessimistic), mid-point, and high (optimistic) forecast for each of the components of INPUT's VANS market definition.

- This approach is considered to represent the most meaningful representation of INPUT's market assessments, given the uncertainty that exists with regard to the major factors that will determine the markets' size and growth.

3. MARKET FORECAST

- INPUT forecasts that the market for VANS in the four major country markets of Western Europe will grow from around $100 million in 1985 to potentially $1.2 billion by 1990.

- This market forecast represents an estimated annual average growth of 63% during the five-year period to 1990. This growth rate represents the optimistic scenario. The pessimistic scenario predicts annual average growth of 40% to reach a market size greater than $500 million by 1990. The median position predicts a market of over $800 million by 1990, reached at an average annual growth rate of 52%.

- These forecasts and those for each of the four country markets (shown in U.S. dollars) are summarised in Exhibit III-3.

- The two most important markets are expected to be the United Kingdom and France. France will show the lowest annual average growth (in the range 30-50%) due to its existing large videotex market. In contrast, the least developed market, Italy, is likely to experience explosive growth (in the range of 170-230% per annum) from a virtually nonexistent market presence in 1985.

EXHIBIT III-3

COMPARISON OF VALUE ADDED NETWORK SERVICES
MARKETS BY COUNTRY, 1985-1990

MARKET SUBSECTOR*		$ MILLIONS						AAGR 1985-1990
		1985	1986	1987	1988	1989	1990	
France	L		$ 80	$108	$139	$183	$236	32%
	M	$ 59	86	119	163	237	293	38
	H		93	130	187	291	406	47
Italy	L		3	9	19	29	46	173
	M	0.3	4	12	26	46	86	210
	H		6	14	34	66	125	234
United Kingdom	L		56	79	113	157	218	40
	M	41	66	104	163	221	311	50
	H		77	135	215	291	412	59
West Germany	L		6	10	18	33	57	70
	M	4	9	17	40	79	163	110
	H		12	24	61	128	267	132
Total	L		$145	$206	$289	$402	$557	40%
	M	$104	165	252	392	583	853	52
	H		188	303	497	776	1,210	63

* L = Low, M = Mid-Point, H = High Estimate

- Exhibit III-4 provides an analysis of the total market for the four countries studied, showing the constituent seven market sectors defined in Section A.

- The highest rate of growth is expected in the market for EDI services where, dependent upon the initial size of the market to be realised in 1986, growth could exceed 200% per annum.

- The lowest rate of growth, around 20%, is anticipated in the already established market for videotex services.

- Care should be exercised when comparing rates of growth amongst the various market sectors as the very small size of many markets manifests itself in high expected growth rates. Absolute market sizes should always be taken into account.

- Exhibits III-5 through III-8 show market forecasts for each of the four major country markets studied, respectively France, Italy, the United Kingdom, and West Germany.

- Videotex is the single most significant sector in the French market, which is the most developed videotex market in Europe. In 1985, it accounts for very nearly 80% of the estimated VANS market.

- Electronic Funds Transfer (EFT) is already developing as an important market in France. With continued development of the 'smart-card' and other initiatives, significant opportunities are available to service vendors in this area.

- INPUT expects the DGT to continue to foster the market for VANS in France through joint agreements and 'liberalisation' of its monopoly position.

- In the U.K., this trend is even more marked as a result of the breaking of the British Telecom monopoly and specific government initiatives to create a more open environment for the development of VANS.

EXHIBIT III-4

MARKET FORECAST FOR VALUE ADDED NETWORK SERVICES IN WESTERN EUROPE, 1985-1990

MARKET SUBSECTOR*		$ MILLIONS						AAGR 1985-1990
		1985	1986	1987	1988	1989	1990	
Enhanced Network Services	L	-	$12	$20	$29	$39	$52	42%
	M	$9	14	22	33	47	71	51
	H	-	16	26	37	55	92	59
Videotex	-	64	87	106	124	152	178	23
Electronic Mail	L	-	24	36	57	78	102	48
	M	14	28	46	68	90	128	55
	H	-	35	55	79	104	154	61
EDI	L	-	1	7	17	40	85	203
	M	-	3	10	26	62	134	158
	H	-	6	15	40	88	183	135
EFT	L	-	21	28	35	47	61	34
	M	14	30	51	99	153	193	69
	H	-	37	74	158	261	385	94
Insurance	L	-	3	6	13	26	49	117
	M	1	5	10	22	45	88	144
	H	-	7	17	31	67	128	163
Other Data Services	L	-	3	7	14	21	30	97
	M	1	4	10	20	34	60	126
	H	-	6	14	28	49	90	146
Total	L	-	$145	$210	$289	$403	$557	40%
	M	$103	165	255	392	583	852	53%
	H	-	188	307	497	776	1,210	64%

* L = Low, M = Mid-Point, H = High Estimate

EXHIBIT III-5

MARKET FORECAST FOR VALUE ADDED NETWORK SERVICES
IN FRANCE, 1985-1990

MARKET SUBSECTOR*		FF MILLIONS						AAGR 1985-1990
		1985	1986	1987	1988	1989	1990	
Enhanced Network Services	L		FF30	FF55	FF80	FF110	FF150	58%
	M	FF15	35	60	88	135	225	72
	H	-	40	65	95	160	300	82
Videotex	-	376	500	640	790	1,000	1,210	26%
Electronic Mail	L	-	20	60	90	120	160	121
	M	3	30	70	105	140	230	138
	H	-	40	80	120	160	300	151
EDI	L	-	6	16	45	100	230	148
	M	-	13	28	70	165	265	112
	H	-	20	40	100	230	300	96
EFT	L	-	100	125	150	200	250	25
	M	80	110	155	250	450	375	36
	H	-	120	180	350	700	1,000	66
Insurance	L	-	2	6	18	40	60	134
	M	-	10	23	50	110	180	105
	H	-	20	40	80	180	300	97
Other Data Services	L	-	2	5	11	22	40	111
	M	-	10	23	35	60	120	86
	H	-	20	40	60	100	200	78
Total	L	-	FF650	FF907	FF1,184	FF1,592	FF2,100	34%
	M	FF474	708	999	1,388	2,060	2,605	40%
	H	-	760	1,085	1,595	2,530	3,610	50%

* L = Low, M = Mid-Point, H = High Estimate

EXHIBIT III-6

MARKET FORECAST FOR VALUE ADDED NETWORK SERVICES IN ITALY, 1985-1990

MARKET SUBSECTOR*		Lit MILLIONS						AAGR 1985-1990
		1985	1986	1987	1988	1989	1990	
Enhanced Network Services	L	-	-	Lit 3	Lit 8	Lit 15	Lit 25	103%
	M	-	Lit 0.5	3.5	10	20	35	189
	H	-	1	4	12	25	50	166
Videotex	-	Lit 0.6	1	3	6	8	10	75
Electronic Mail	L	-	2	5	10	14	20	78
	M	-	2.5	5.5	11	17	35	93
	H	-	3	6	12	20	50	102
EDI	L	-	0.2	1	3	9	22	223
	M	-	0.6	1.5	5	16	36	178
	H	-	1	2	8	25	50	165
EFT	L	-	3	6	9	12	16	52
	M	-	3.5	7	15	25	40	84
	H	-	4	8	20	40	60	97
Insurance	L	-	-	1	2	4	8	100
	M	-	0.5	2	5	10	25	166
	H	-	1	3	8	28	40	151
Other Data Services	L	-	-	0.5	2	3	6	129
	M	-	0.5	2	3	6	18	145
	H	-	1	3	5	10	30	134
Total	L	-	Lit 6.2	Lit 19.5	Lit 40	Lit 65	Lit 107	182%
	M	Lit 0.6	9.1	24.5	55	102	199	219%
	H	-	12	27	71	146	290	244%

* L = Low, M = Mid-Point, H = High Estimate

EXHIBIT III-7

MARKET FORECAST FOR VALUE ADDED NETWORK SERVICES IN THE UNITED KINGDOM, 1985-1990

MARKET SUBSECTOR*		£ MILLIONS						AAGR 1985-1990
		1985	1986	1987	1988	1989	1990	
Enhanced Network Services	L	-	£ 6	£ 9	£12	£16	£20	32%
	M	£5	7	10	14	18	25	38
	H		8	12	16	20	30	43
Videotex	-	9	10	13	15	17	20	17
Electronic Mail	L	-	15	20	30	40	50	38
	M	10	17	25	35	45	55	40
	H		20	30	40	50	60	43
EDI	L	-	0.5	3	7	15	30	178
	M	-	1	4	10	22	50	166
	H	-	2	6	15	30	70	143
EFT	L	-	5	7	9	12	15	38
	M	3	9	18	35	45	55	79
	H		12	30	60	80	100	101
Insurance	L	-	2	3	6	12	25	90
	M	1	2	3	7	13	27	93
	H	-	2	4	8	15	30	97
Other Data Services	L	-	2	4	7	11	15	72
	M	1	2	4	8	13	17	76
	H	-	2	5	10	15	20	82
Total	L	-	£40.5	£59	£86	£123	£175	43%
	M	£29	48	77	124	173	249	54%
	H	-	56	100	164	227	330	63%

* L = Low, M = Mid-Point, H = High Estimate

EXHIBIT III-8

MARKET FORECAST FOR VALUE ADDED NETWORK SERVICES
IN WEST GERMANY, 1985-1990

		DM MILLIONS						AAGR 1985-1990
		1985	1986	1987	1988	1989	1990	
Enhanced Network Services	L							
	M							
	H							
Videotex	-	DM10	DM14	DM18	DM23	DM28	DM32	26%
Electronic Mail	L			2	5	15	30	146
	M	-	1	3	10	22	45	159
	H		2	5	15	30	60	134
EDI	L		-	2	4	12	30	146
	M	-	1	3	8	20	65	183
	H		2	4	12	30	100	166
EFT	L		1	2	5	10	20	111
	M	-	5	10	40	80	160	138
	H		10	20	70	150	300	134
Insurance	L		1	2	6	12	20	111
	M	-	2	7	13	30	60	134
	H		4	12	20	50	100	123
Other Data Services	L		0.5	2	4	8	12	121
	M	-	1	3	10	20	45	159
	H		1.5	4	15	35	75	166
Total	L	-	DM16.5	DM28	DM47	DM85	DM144	70%
	M	DM10	24	44	104	200	407	110
	H		33.5	63	155	323	667	132

* L = Low, M = Mid-Point, H = High Estimate

- As a result, a number of services vendors are already offering VANS, making the U.K. the second largest market for these services in 1985, despite the much smaller size of the U.K. videotex market.

- In contrast to France, electronic mail is the largest VANS market sector in the U.K. in 1985.

- However, it is anticipated that by 1990 the areas of Electronics Funds Transfer (EFT) and Electronic Data Interchange (EDI) will be the most significant sectors.

- The positon of London as a major financial centre, especially following the deregulation of 'the City' in 1986, and the concentration of multinational organisations in the U.K. will be important factors contributing to the growth of these sectors.

- In contrast to France and the United Kingdom, both Italy and West Germany are currently not significant VANS markets at all. This is a reflection of the telecommunications environment in general and the undeveloped nature of their videotex markets in particular.

- Both these country markets are expected to grow at a fast rate from a very small current base, in the expectation that considerable de facto liberalisation of the telecommunications environment takes place.

- There is considerable evidence of moves in this direction in Italy. The position is less clear in West Germany, where the role of the Deutsche Bundespost in the future telecommunications environment is the subject of government committees and much political debate.

IV SOME CURRENT VENDORS AND SERVICES

IV SOME CURRENT VENDORS AND SERVICES

- This chapter provides a perspective on the value added network services market in Western Europe by describing some vendors and their services.

- In the case of EDI, two industry associations and their work on developing data standards are described.

A. ISTEL

- Istel started life in 1979 as BL Systems Ltd., engaged in the provision of computing, communications, and systems services primarily for the BL Group.

- Renamed Istel in January 1984, the company offers a wide range of information services through three major business groups:

  - The Information Systems Group.

  - The Network Services Group.

  - The Operations Research Group.

- The Network Services Group offers a number of value added network services over its own communications network, INFOTRAC. These services include:

- A videotex service called VIEWSHARE.

- COMET, an electronic mail service.

- EDICT, a clearing house for electronic data interchange services.

- The INFOTRAC network offers over 50 strategically located access points in the U.K. which, it is claimed, offers local rate telephone call service to 98% of all U.K. business.

- The network includes nearly 200 miles of microwave radio paths and currently handles over 50,000 connections per day.

- COMET, the electronic mail service, is available both under license to provide a client with an in-house system or as a bureau service based on INFOTRAC.

- The EDI service, EDICT, was announced in June 1985 as a 'central clearing-house' for inter-business transfer of data.

B. INTERPAC

- INTERPAC is a new organisation founded on July 15, 1985, as a joint development of the DGT (French PTT) and Computer Sciences Corporation. Its shareholdings are apportioned as follows:

  - TRANSPAC - 60%.

  - France Cables et Radio - 20%.

  - Computer Sciences Corporation - 20%.

- The stated objective of the new organisation is to provide an interconnection service facility between the TRANSPAC network, France's nationwide packet switched network, and CSC's international network INFONET.

- INTERPAC thus provides the TRANSPAC user with access to the worldwide resources and connectivity of, the INFONET system. This is shown diagrammatically in Exhibit IV-1.

- Additionally, INTERPAC provides direct access to INFONET, without access via TRANSPAC, to terminals and computers transmitting via leased lines or telephone dial-up and telex.

- INFONET provides a wide variety of device and protocol handlers and features facilities for routing, flow control, and network control.

- Additionally, INFONET features a separate network centre to provide independent network control and monitoring from its three main Switcher Centres.

- The INTERPAC technology provides an X.25 gateway between TRANSPAC and INFONET that is completely transparent to the user. It conducts the necessary address translation in order for messages to reach their final destination.

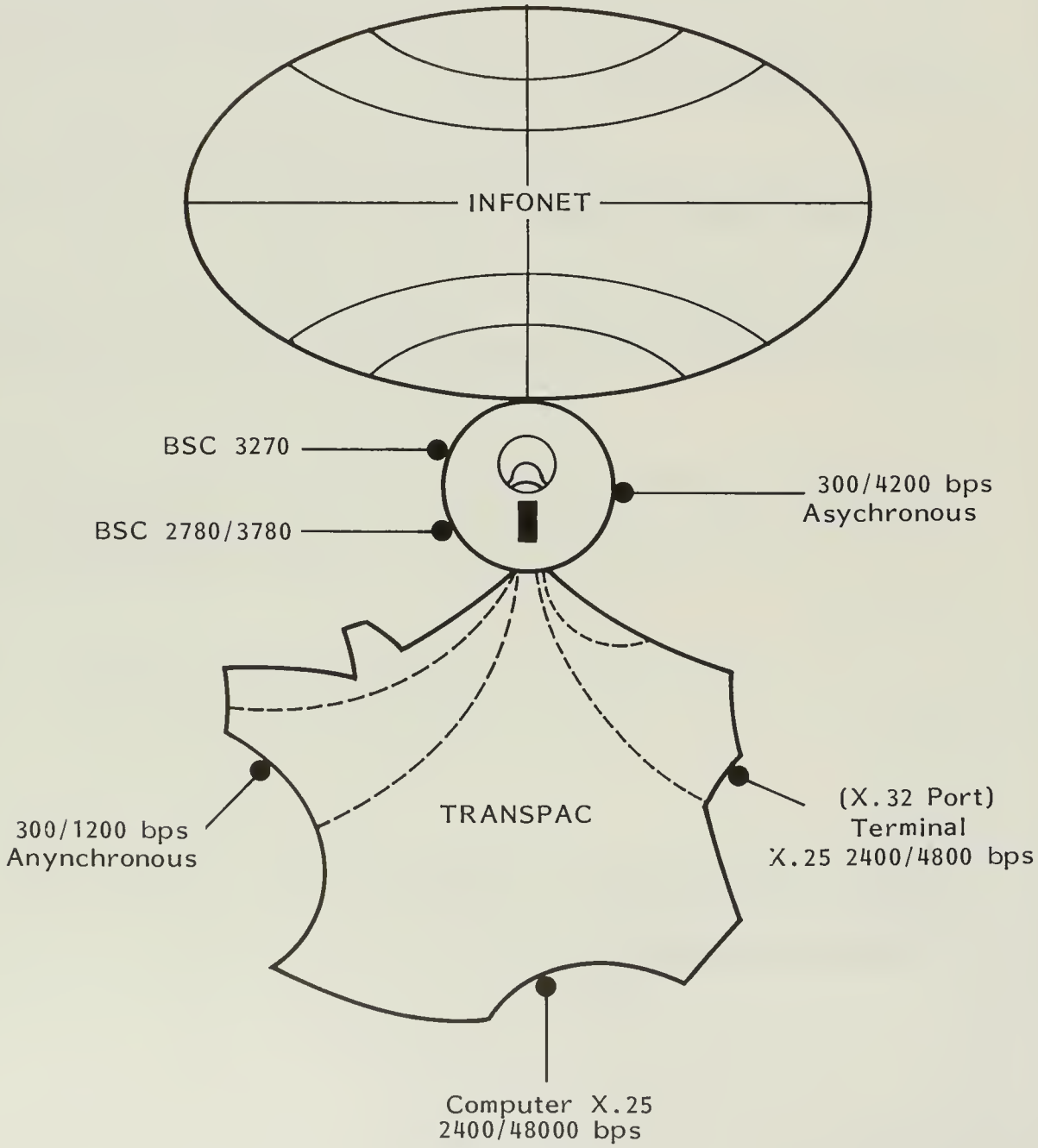
C. DATEC

- DATEC is the trading name of Debenhams Applied Technology Ltd., a subsidiary of the department store group, taken over during 1985 by the Habitat/Burton Consortium.

EXHIBIT IV-1

INTERPAC NETWORK

(Relationship to INFONET and TRANSPAC)



- Its origins are to be found within the Debenhams Management Services Department, but today DATEC, as well as serving the internal data processing needs of Debenhams, operates as an information services vendor. A key focus of its activities is the DATEC network.

- The DATEC network configuration, as of July 1985, is shown in Exhibit IV-2. It is claimed to provide local rate access for 95% of the population of the U.K., as shown schematically in Exhibit IV-3.

- This network, based on INFOTRON equipment, uses statistical multiplexing technology and leased circuits incorporating Kilostream links from the main concentrator points at London, Manchester, Bedford, Harrogate, Taunton, and Stirling.

- The current network has about 60 nodes, providing in excess of 700 ports for leased line or dial-in connection to the system.

- The system offers a 'transparent' interface to users. When the user connects to the system, the message 'Which Service?' is displayed. Input of the appropriate 'identifier' routes the user automatically to the service provider's host.

- Some of the applications currently run on the DATEC network are:

  - ENVOY, a videotex electronic mail system.

  - Credit checking services.

  - Sales performance data.

- New applications that are being planned include:

  - Videotex services for the automobile trade, such as:

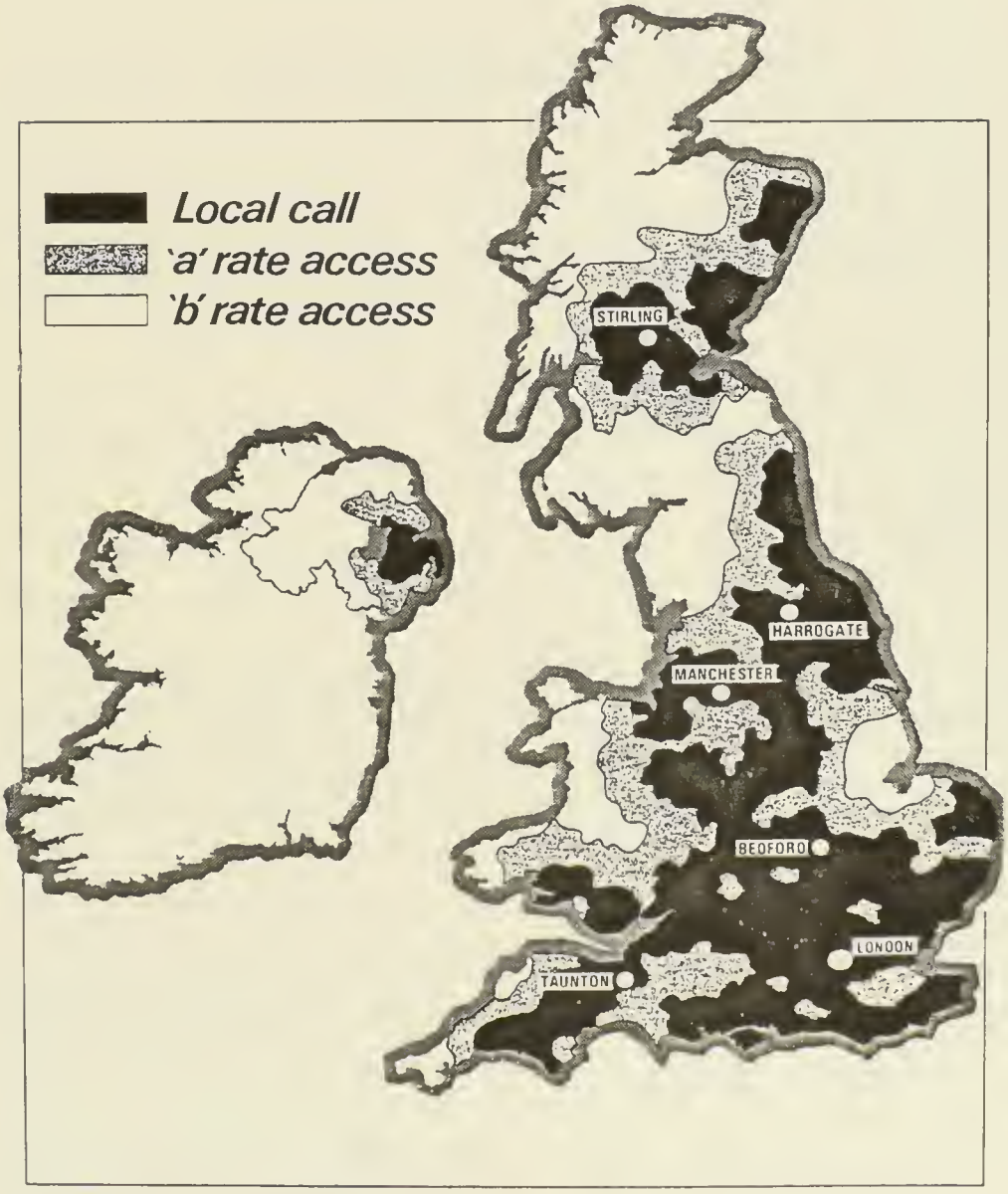
EXHIBIT IV-2

THE DATEC NETWORK
July 1985

datec
Bedford House
Park Street, Taunton
Somerset TA1 4DB
Telephone: 0823 57041
Telex: 46150 DATEC G

EXHIBIT IV-3

DATEC NETWORK



Local and 'a' rate access

- . Car location.
- . On-line ordering.
- . Hire purchase.
- . Insurance.
- . 'Glass's Guide' on-line (used car prices).

- Stock broking.
- Financial services.
- Network facilities for service bureau.

D. ODETTE

- ODETTE stands for the Organisation for Data Exchange through Teletransmission in Europe. It was formed in response to increasing interest in the use of electronic data interchange in the motor industry in the U.K. The four major manufacturers approached the SMMT, the trade association, to form a committee in the summer of 1983.

- The purpose of the committee was to investigate and, as a result, recommend procedures for the transmission of commercial information directly between the computers of both suppliers and manufacturers within the industry.

- The German automotive trade association, the VDA, had been working on the concept for some time and had developed a procedure which was operating in Germany.

- They were approached by the SMMT committee and as a result it was agreed in principle to discuss EDI developments on a European basis, and both the French and Italian major manufacturers were approached.

- The setting up of a European committee with representation from all countries with a motor industry soon followed.

- These efforts resulted in the formation of ODETTE with a Memorandum of Understanding issued on January 1, 1985.

- ODETTE has set up nine separate working groups to meet the basic aim of the organisation, which is to define the standards which will permit the communication between manufacturers' and suppliers' computers.

- The ODETTE organisation has made it quite clear that at the moment it does not intend to design and install specific software.

- It is currently being left to the individual country organisations to select system implementations of the ODETTE standards.

- In the U.K., the SMMT's ODETTE group has favoured a 'clearinghouse' approach, and currently both ISTEL with their EDICT service and GEISCO with Motornet are actively pursuing this business opportunity.

- In France, the Groupement pour L'Amelioration des Liaisons dans l'industrie Automobile (GALIA) is evaluating the use of a clearinghouse and the direct transfer of data between companies using TRANSPAC.

- The nine working parties set up by ODETTE have each been assigned a specific area of study as follows:

- Group 1 - Data Elements, to identify the data elements required, element sizes, and element terminology, and to compile directories.

- Group 2 - Formats, to identify the elements defined by Group 1 for a particular transaction, to assess the status of each element, and to structure the elements into a message format for transmission consistent with the syntax rules defined by Group 3.

- Group 3 - Syntax, to provide the syntax rules to Group 2 (Formats) for the development of formats and to interface with Group 4 (Communications) to ensure adequate information availability for successful message transmission. It is the intention that the base level of syntax will be supported by all communications devices down to the level of telex.

- Group 4 - Teletransmission Methods, to provide recommendations on the methods to be employed for the physical transmission of information. The telecommunications mode chosen is the file transfer between computers. This type of data exchange will be used in the case of direct links between the two partners' computers, as well as in the case of data exchanges through a clearing centre.

- Group 5 - Trials, to demonstrate that all formats developed by Groups 1 and 2, based on international standards and using syntax rules recommended for internal use which are not language, industry, or hardware captive, can be transmitted between trading partners in different countries.

- Group 6 - Legal, to identify cross-border transmission problems related with paperless transmission of messages such as defined in other groups and to propose solutions either by adapting form and/or content of messages so that they comply with national regulations or by suggesting necessary steps to place them at the level of national/inter-

national administrations in order to ask for some adaptation of the existing legislation.

- Group 7 - Codes , to study the work of Group 1 relating to coding requirements, to investigate the availability of suitable international codes to fulfill these requirements, and to make recommendations either as to the acceptability of available codes or the desirability of developing new coding structures.

- Group 8 - Product and Transportation Identification, initially limited to automatic identification of product and transport packages used in the external procedures between manufacturing companies and suppliers and in the distribution of goods. Automatic identification of objects in the internal material flow process of a company or corporation is thus not included in the scope.

- Group 9 - Software Syntax, to investigate and make recommendations on syntax software and, where necessary, undertake contractual negotiation.

E. THE ARTICLE NUMBER ASSOCIATION

- Article numbering is the allocation of a unique identifying number to every individual product for sale. In the U.K., this system is administered by the Article Number Association (ANA) which has established a system compatible with other systems in Europe, Japan, Australia, New Zealand, and South Africa.

- Article numbering, as well as offering benefits to a company internally, can also offer potential benefits in communications between firms.

- Consequently, in 1980 a working party was established by the ANA to examine establishing standards for an electronic format for product codes. This initiative resulted in the publication of TRADACOMS: Standards for Electronic Data Exchange.

- Electronic message structures were based on the syntax rules developed by a U.K. government organisation, the Simplification of International Trade Procedures Board (SITPRO).

- These syntax rules, known as GTDI, are internationally established (under the auspices of the United Nations) and are used in a variety of other applications.

- The establishment of these standards, fully published by 1982, allowed for the exchange of credit notes, invoices, etc., between participating organisations. They were quickly accepted by many companies. Today, some 150 firms in the U.K. are using them, and in the case of Woolworths and Boots for greater than 80% of all their transactions.

- It naturally followed from this development that computer-to-computer communications between companies could be developed, particularly through telecommunications, and the ANA set out to study this early in 1983.

- This work led to the endorsement by the ANA of a national service called TRADANET based on a network being provided by ICL Network Services and which is currently on trial use by about 10 or 12 companies.

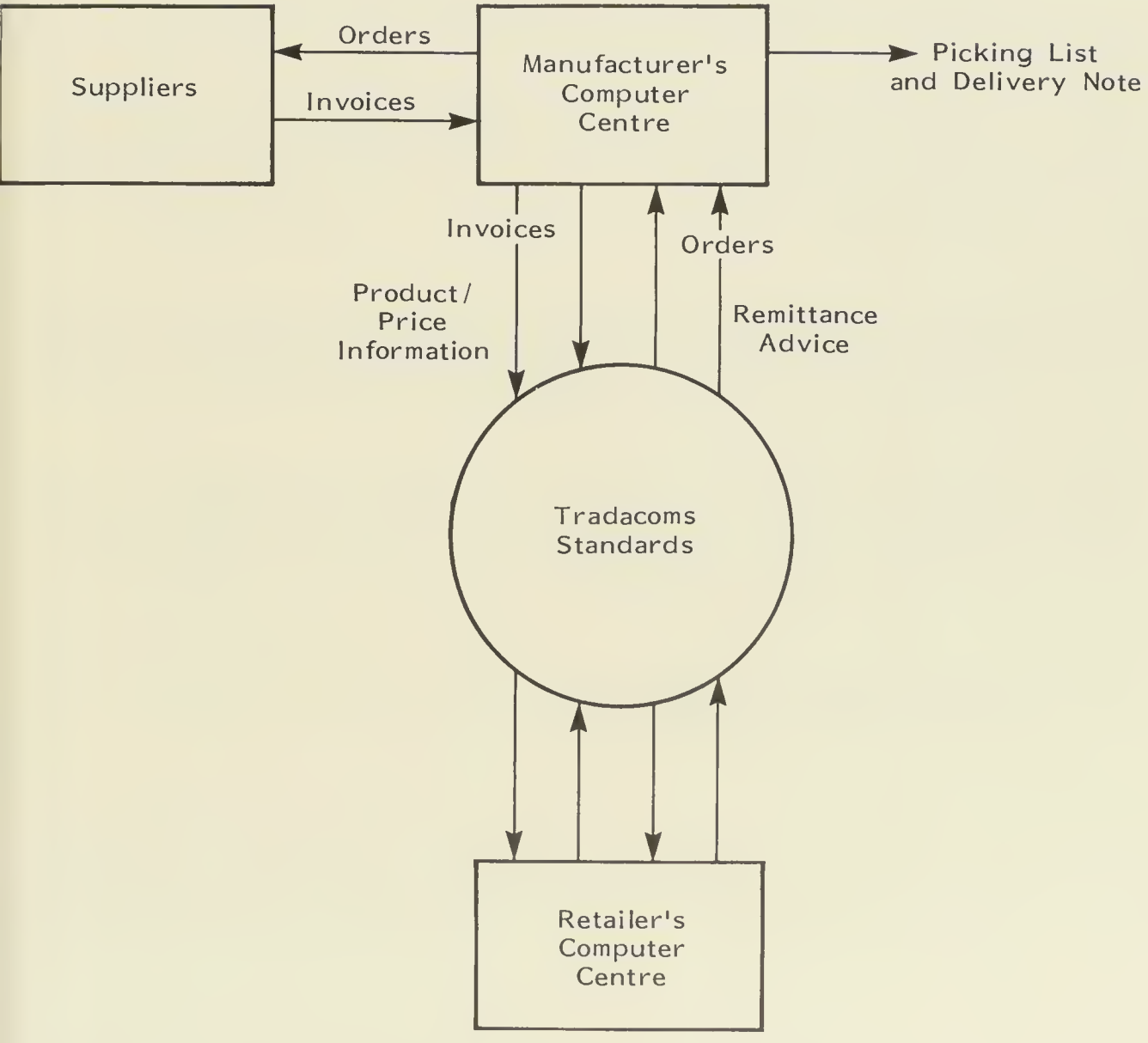
- Exhibit IV-4 shows an illustration of some of the many business transactions that can take place over the TRADANET network.

- The charging system being adopted for TRADANET can be summarised as:

  - A one-off joining fee of 2,500 pounds.

EXHIBIT IV-4

POTENTIAL TRADACOMS STANDARDS NETWORK



- A volume charge averaging 2p per 1,000 chs.

- The 'sender' of the data is billed.

- TRADANET acts as an electronic clearinghouse for its participants. Senders connect their computers to their local TRADANET 'node' (the network operates 24 hours a day) and transmit their batch of documents, which are placed into a 'post box' allocated to the sender.

- TRADANET is then responsible for transmitting that data to the appropriate locations or 'mailboxes' from which recipients can themselves call up the data via the network, at a time convenient to themselves, to receive it in their own computer centre.

- Whilst it is naturally the larger organisations that are likely to be the front runners in this development, the ANA is anxious that in the future the system should become available to smaller companies.

- For this to happen, it is envisaged that software packages will have to be developed to improve the user interface and, in addition, it may be necessary to review the pricing structure.

F. CRESTA COMMUNICATIONS LTD.

- Cresta Communications Ltd., a company in which British Telecom recently took a 20% stake for 900,000 pounds, operates a value added network service under the name TELETRAN. It is currently operating in the Greater London area.

- TELETRAN offers an on-line credit card checking service through the means of a special terminal connected to a dedicated communications network. Details of the network have not been made known for security reasons.

- TELETRAN overcomes the problem of having to store details of delinquent or lost cards in the terminal and the constant need to update such lists.

- The TELETRAN on-line system obviates constant time-consuming dialing and provides an 'instant' service to the customer.

- The sales assistant simply slides the card through the specially designed TELETRAN terminal. The card details are transmitted to TELETRAN's central DEC VAX computer where the number is checked against the up-to-date card files provided by the card companies. Assuming a valid card number, the invoice is then printed out immediately on the terminal for the customer to sign.

- The retail client can also be provided with a management control system consisting of VDU and report printer, thus enabling management to monitor the sales performance of its outlets.

- In addition, TELETRAN has an electronic mail facility which can be used to transmit to the retail sales point important messages; for example, a warning of forged money known to be circulating.

- A further possibility of the system is the inclusion of a security system, for example, pressing a couple of keys in the event of a hold-up.

V TELECOMMUNICATIONS ENVIRONMENT

V TELECOMMUNICATIONS ENVIRONMENT

- Clearly, the development of VANS is going to be very dependent upon the environment for telecommunications in any particular country market.

- Much focus and attention has been paid to this area in the U.K. because of 'liberalisation'. In other countries where a PTT monopoly exists, different environments exist.

- This chapter describes the telecommunications environment in each country with regard to attitudes and views on value added network services.

A. 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 notable 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 the French government, even with any change in the 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, of most relevance to the area of VANS, 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 interconnectivity'.

- 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 has been possible, in addition to the dial-up telephone access at 300 and 1,200 baud already available.

- The recent founding of INTERPAC, a joint company of the DGT and CSC that provides linkage between TRANSPAC and CSC's INFONET network, has already been described in Chapter IV.

- 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 non-permanent 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 is 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.

- As is evidenced by the success of videotex in France, the emphasis has tended to be on the consumer rather than the business user.

- As far as the development of new value added services are concerned, it is not clear at this undeveloped stage of the market how far the DGT will want to focus on the professional user or will enter into agreements with other organisations to develop the appropriate services.

- Thus in this new area, whilst the PTT has to date maintained its policy for the transmission of data, there exists no clearly defined policy for the kinds of services envisaged for the future.

B. ITALY

- Within the worldwide environment of rapid change in telecommunications, Italy is only responding slowly. Although changes are beginning to happen, the Italian communications environment is left a long way behind the rest of Europe.

- For example, some comparative statistics show:

  - That there are 30% fewer telephones per head in Italy than in West Germany.

  - That almost all exchanges are electromechanical.

  - That there are only half the number of telex subscribers than in France and one-third the number than 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 which are:

  - 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 telegramme 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 nework 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 nework 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.

- In December 1985, an announcement was made concerning the establishment of a new data services company, SEVA. The company is to be owned by:

  - Olivetti, 42%.

  - STET, 20%.

  - ENI, 20%.

- American Express, 10%.

- Visa, 3%.

- Diners Club, 3%.

- Sixcom (a software company), 2%.

- As its ownership would indicate, the purpose of the company is to offer value added network services for credit card checking services and related functions.

- Another joint venture in the VANS marketplace is that of TELEVAS, jointly owned by STET (51%) and Montedison (49%), to provide services connected with the distribution of goods for supermarkets and other stores.

- The implication of these recent developments is a determined attempt to participate in these newly emerging markets for value added network services.

- The regrouping of telecommunications resources, the availability of ITAPAC, and a pilot service ISDN in 1989 should provide the basic infrastructure upon which these new services can be based.

C. THE UNITED KINGDOM

- The United Kingdom telecommunications marketplace represents a unique situation in Western Europe in respect of the development of value added network services.

- The 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 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 final stage in liberalisation in allowing the provision of value added services not already provided by BT.

- An initial transitional phase was entered into in which vendors were invited to apply to BT for a license. In fact, only six applications were received in the period between October 1981 and the end of March 1982.

- This transitional phase ended in April 1982 when the entire market for value added network services (including those then being supplied solely by BT) was opened up to private competition.

- At this time, the DTI (Department of Trade and Industry) was given responsibility for licensing VANS operators.

- 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.

- This change encouraged many more vendors to register. As of July 1985, some 646 services were registered, and an analysis of these is shown as Exhibit V-1.

- However, it must be pointed out that very few of these registered services are in serious operation at this point in time. The number of active services has been estimated to be between 20 and 30.

- 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 July 31, 1985, with the aim of being able to announce new licensing arrangements by early autumn. In fact, the announcement was finally made on December 30, 1985, just as this report was going to print.

- Difficulties in arriving at a consensus on licensing arrangements can be attributed to a number of causes:

  - The attempt to define an artificial boundary between 'basic conveyance' and 'enhanced' services.

  - The attempt to introduce two classes of services, VANS and MDNS (Managed Data Network Services), and the resulting complexity.

  - The introduction of conditions within the proposed VANS or MDNS license requiring operators to provide OSI standard facilities.

- Considerable criticism of the U.K. government's proposals has been voiced by vendors, and much of this has been reported in the press.

EXHIBIT V-1

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.

- The most significant elements of the 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 aiming at 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.

D. 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 communication network.

  - START, a network connecting travel agencies.

  - DIMDI, a medical data base 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. Vendors contemplating entering this market will need to monitor events closely, particularly any changes resulting from the review committee's deliberations.

VI MARKET DEVELOPMENT

VI MARKET DEVELOPMENT

- This chapter analyses and discusses the strategic trends and market influences that are shaping the markets for value added network services.

- Vendors were asked to rate various factors for their degree of importance in influencing the development (or potential development) of VANS.

- A scale of 1 (most important) to 5 (least important) was applied, and the following profile resulted:

  - PTT regulatory environment - 1.5.
  - Industry associations - 2.2.
  - Market demand - 2.6.
  - Standards - 3.2.
  - Technology - 3.4.

- This assessment of priorities is useful in providing a framework for examining the factors which are likely to have the most influence on the development of VANS markets.

- Technology was clearly identified in nearly all cases as the least significant factor. Although new levels of enhanced communications facilities could not be offered without the increasing convergence of computer and telecommunications technologies, most vendors and potential vendors felt that the available technology far exceeded the current capabilities of the market to utilise it.

- Typical vendors comments were:

  - 'Technology is not a constraint'.

  - 'The technology has been available for some time'.

- Technological development is a necessary but not sufficient condition for the development of these markets. The following sections discuss the other major dvelopment factors identified by vendors.

A. VENDOR ATTITUDES TOWARDS THE PTT ENVIRONMENT

- As already described in Chapter V, there are significant differences between the PTT environments in the different country markets and the state of development of the telecommunications infrastructure.

- Consequently, there are differences between vendor attitudes in these countries, most significantly of those in the U.K. in comparison to the other three major country markets.

1. THE UNITED KINGDOM

- The key difference between the U.K. and France, Italy, and West Germany in respect to the development of VANS is, of course, liberalisation. The implica-

tions of this policy for the U.K. telecommunications market have already been discussed.

- The attitudes of U.K. vendors are strongly influenced both by the new competitive approach of British Telecom and the current uncertainty that pertains to the establishment of a new VANS licensing procedure.

- Government policy in respect to the latter was seen by most vendors as absolutely critical to their ability to compete effectively in the market for VANS.

- The major difficulty of licensing VANS, as already pointed out in Chapter V, seems to be the problem in coming up with a workable definition of something that is inherently difficult to define.

- Essentially, it is an 'artificial' problem--the attempt to prohibit simple resale of bit transport prior to the abandoning of restrictions in 1989.

- One vendor commented that the regulatory environment was absolutely key to their continuation in the market. If the government were to allow a situation to develop in which it was considered unfavourable to operate against BT, then they would have to pull out.

- Some further comments by vendors on the U.K. telecommunications environment are shown in Exhibit VI-1.

- Vendors viewed the opening up of the market to competition as a very positive step but clearly had reservations about the lack of clarity in the current artificial situation up to 1989 and over potential cross-subsidisation of services by BT from a dominant market position.

- The other aspect of the new 'liberalised' environment that concerned vendors was the aggressive marketing moves that BT is beginning to make into the new areas of value added services.

EXHIBIT VI-1

VENDOR COMMENTS ON THE
UNITED KINGDOM TELECOMMUNICATIONS ENVIRONMENT

- 'BT is majoring on being the carrier but is trying to get into higher value added services'.
- 'BT is a critical competitor'.
- 'BT has a 10 year horizon to offer a more sophisticated level of service, but is not an immediate threat'.
- 'We are concerned that BT, Mercury, and other big operators are the only ones likely to make a profit'.
- 'BT will always have the edge over competitive services because of its wider spread and coverage'.
- 'We are concerned at potential predatory pricing by BT - we would be concerned at any joint agreements by BT with a major manufacturer'.

- In autumn of 1984, considerable pressure was put on the government, which was ultimately successful, to deny an operating license for a managed data network service called JOVE planned jointly by BT and IBM.

- Since that time, BT has made a number of moves into the new areas of higher value added services. It has, for example, taken a 20% stake in Cresta Communications and more recently formed a joint company with McDonnell Douglas, Edinet Ltd., aimed at the EDI market.

- On the question of partnership, few vendors expressed any particular interest in seeking these with BT; primarily their focus seemed to be on specialist companies that would provide their more generalised services with particular applications expertise.

- However, one vendor did point out that cooperation with BT was seen by them as of particular importance for international connections.

2. FRANCE

- Unlike the U.K., the French PTT environment is completely regulated with the DGT holding a monopoly position over all communications.

- Not surprisingly, the French services vendors interviewed saw the possibility of value added network services only in so far as they would be specifically authorised to operate such services by the DGT.

- No formal regulations or licensing procedures exist yet. Vendors wishing to develop value added network services must approach the DGT to discuss and develop an agreement to be able to proceed.

- One vendor is in the process of developing a credit card authorisation service commented, 'We are doing this in cooperation with the DGT'.

- As far as could be discovered, virtually all value added services developed to date have been in conjunction with Minitel, i.e., videotex systems.

- In addition to the encouragement given by the DGT to the development of videotex has been the recently announced (June 1985) joint venture company, INTERPAC, with CSC INFONET.

- One vendor cited the INTERPAC joint development as evidence that the approach of the DGT was beginning to change and that the DGT was not opposed to joint ventures with third parties for the development of VANS.

- This vendor referred to the liberalisation of France Cables et Radio (a joint shareholder in INTERPAC) as further evidence of this approach.

- With elections in France in March 1986, many vendors are looking forward to potential changes in policy which they feel may take place at this time.

- For example, one vendor, whilst expressing the view that the DGT has become more responsive in its attitudes towards new services, still felt that some liberalisation on the U.K. model was needed.

- INPUT has concluded that the DGT will for the moment continue to promote joint ventures as an unspoken policy towards the development of value added services. There are, therefore, in principle many opportunities for vendors to approach the DGT to commence development of such servcies.

- Clearly, the DGT is having to feel its way cautiously into these new areas which suffer from vagueness of terminology and lack of definition. To some extent, this cautiousness may hamper the development of new services in France.

- Vendors planning value added network services in the banking area spoke of the need for more cooperation from the DGT in developing their service, particularly in the area of protocol conversion.

- Another area of concern mentioned by some vendors was the area of international traffic, where more agreements and deregulation are needed to open up markets for VANS more effectively.

3. WEST GERMANY

- As already discussed, the key developments in the West German telecommunications market are Btx and ISDN.

- West German vendors recognize the need to formulate agreements with the DBP in order to develop potential new value added network services.

- Whilst this is still very much uncharted territory, as in other countries most vendors felt that the new facilities becoming available and planned for the future and the precedent of agreements with the DBP to date provide them with an environment in which services could be developed.

- However, the major and most serious concern of West German vendors related to the DBP's pricing policy for DATEX-P, which should represent the major vehicle for VANS development.

- One vendor of a travel reservations system commented that leased lines were used rather than DATEX-P simply because it was less expensive. They felt that the DBP's whole network installation and tariff policies were open to question.

- Another vendor specifically quoted recent and planned tariff increases for DATEX-P. They were:

- Twenty-five percent increase on July 1, 1985.

- Twenty-five percent increase planned for January 1, 1986.

- Twenty-five percent increase planned for January 1, 1987.

- This vendor considered that this tariff policy will have an extremely negative influence on the future growth of new business services.

4. ITALY

- The undeveloped telecommunications structure in Italy, relative to the other major European country markets, makes this the least advanced and most uninformed market in respect of positions and attitudes on value added network services.

- Vendors are aware, as in other countries, that no legal framework exists. One comment on electronic mail services was, 'The existing services operate on the fringe of regulation'.

- Consequently, nearly all vendors see the clarification of the PTT regulatory environment as a very high priority for establishing conditions that will encourage the growth of value added network services.

- It is also recognised by vendors that considerably more investment in telecommunications infrastructure is an even more pressing priority.

- A number of vendors also commented on their desire to see deregulation of the telecommunications environment along the lines of the U.K. example.

- Whilst recognising that the political realities were unlikely to allow this to happen to any great extent, some liberalisation was considered necessary, in the words of one vendor, 'to confine the power of the telephone company monopoly'.

B. USER DEMAND

- Market demand was only rated third in respect of its impact on the development of the VANS marketplace. The influence of industry associations, as a result of strong interest in the area of Electronic Data Interchange, was rated in second place.

- This section examines these areas along with the related topics of marketing and pricing.

1. VENDORS' PERCEPTION OF USER DEMAND

- In any newly emerging market there is bound to be a period characterised by the 'chicken and egg' syndrome, a stage of development where the market is 'supply' limited.

- Vendors, uncertain of the rate of user demand, may be relatively cautious in expanding their services and adopt conservative pricing policies. If the services are not available in sufficient quantity or at a sufficiently low price, then the 'apparent' user demand does not materialise.

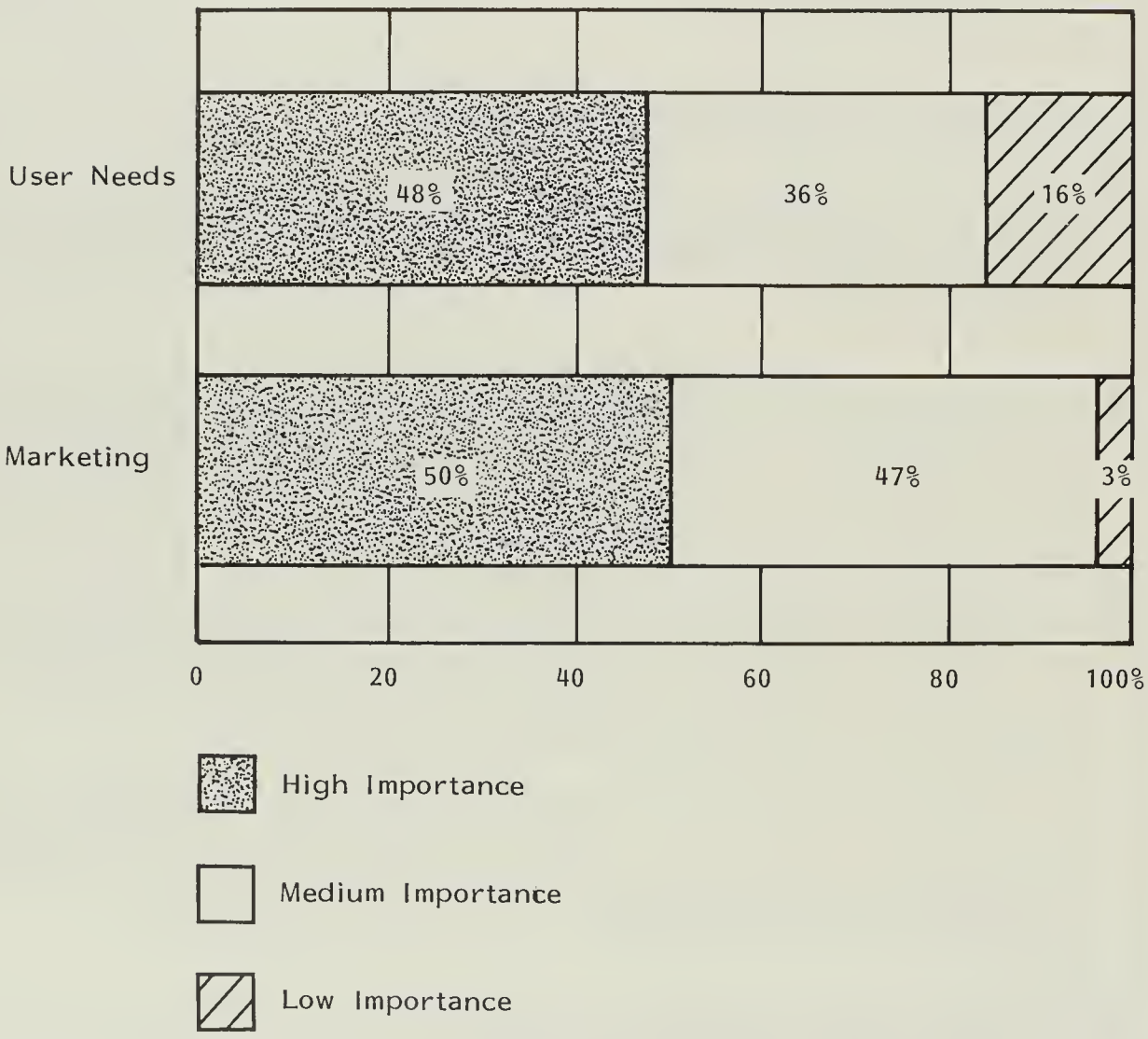
- Clearly, the various sectors of the overall VANS marketplace are at different stage of development. For example, videotex is a relatively mature market in comparison to that for EDI, which barely exists at all.

- Vendors were asked to rate the effect of various factors on market growth of value added network services. Exhibit VI-2 shows a comparison of the ratings for 'user needs' and 'marketing'.

- Although both these factors were rated as having high importance by approximately one-half of the sample, it is significant that 16% rated 'user needs' as of low importance whereas only 3% rated 'marketing' in this category.

EXHIBIT VI-2

VENDOR RATINGS OF "USER NEEDS"
AND "MARKETING" AS MARKET GROWTH FACTORS



- The importance of marketing is discussed in subsection 3 below.

- Exhibit VI-3 lists the various factors that are perceived by vendors to be either driving or inhibiting user demand for value added network services.

- Factors which emerged as the most frequently mentioned driving forces affecting user demand for VANS were:

  - Benefitting from completely new services in the communications area.

  - Increasing international communications needs.

- New communications services will include such facilities as encryption and other security aids, store and forward to include time-independent data transmission, protocol conversions, and comfort dialing.

- As large businesses have shown increasing global spread, so have their communications requirements. As one vendor commented, 'A major driving force will be meeting the needs of the multinationals'.

- Amongst the other factors, cost related issues showed up strongly.

- For example, one vendor who is currently operating a network service in the U.K. was able to quote a case where a client's planned communications costs could be cut in half through use of their network service.

- One potential cost reduction in paper handling services is, of course, the major driving force behind the interest in EDI.

- Using a value added network to distribute new products and services is also an important aspect likely to increase demand. One vendor commented, 'VANS are potentially a new distribution channel for potential new customers'.

EXHIBIT VI-3

DRIVERS AND INHIBITORS OF USER DEMAND

DRIVERS
• Reduction of communications costs. • Need to reduce cost of paper communication. • International communication requirements. • Wider awareness of computer and communications technology. • Opportunity for companies to offer additional products/ services and gain competitive advantage. • Organisations can benefit from new services not previously available, e.g., one-to-many transmission. • The need for better quality and presentation of information. • Resolve increasing complexity in business. • The need to service large populations of PC users for increasing communications needs.
INHIBITORS
• User inertia - reluctance to take up new methods of doing business. • Insufficient number of end users with keyboard skills. • Ill defined user needs in potential new application areas. • Lack of 'stable' vendors that customers can commit to. • Retain 'in-house' network to preserve competitive advantage.

- The most serious concern of vendors in respect to factors that are likely to inhibit the development of the market was user inertia. A typical vendor comment was, 'The development of EDI is very dependent upon the will of users; it is a highly speculative area'.

- The fear was expressed that it will take a long time to change fundamental business practices and that this will hold down demand.

2. INDUSTRY GROUPS

- One of the most important potential new markets for VANS is that of EDI. EDI sets out to serve the intercommunications requirements of 'communities' of companies, initially within one industry or sector of activity.

- As a consequence, this requirement and also the clearly high interest in EDI amongst vendors have led to the high rating (second most important market development factor) of industry groups or associations.

- Key to the development of inter-company electronic transmission of documents is the adoption of some common standard with which to communicate. This issue is examined in Section C below.

- At the forefront of initiatives to establish such standards are the industry associations.

- An example of the importance of an industry association to this kind of initiative is provided by ODETTE (a description of which is included in Chapter IV).

3. MARKETING

- Although market or user demand was only rated by vendors as the third most important market development factor (behind the PTT regulatory environment

and the influence of industry associations), marketing was rated as the most significant factor in terms of stimulating market growth.

- The markets for nearly all types of VANS are in their early formative stage. Consequently, they are characterised by supply limitation. If the services are not available, users cannot avail themselves of them.

- Thus, whilst in the longer term success can only be built on real user needs, the initial emphasis rests on the need to mount marketing initiatives to generate user interest and commitment.

- One vendor, for example, commented, 'There is a great need to educate the market, to undertake missionary marketing. The market is very immature'.

- Vendors mentioned a number of other marketing issues, which included:

  - The need to emphasize specific services.

  - The need to work with 'special interest' groups.

  - The need to establish a critical mass of users.

  - Quality and service.

  - Long-term nature of the business.

  - The need to establish credible and stable vendor image.

  - The need to emphasise well-researched market planning.

  - Targetting large companies.

- There was little observable pattern to the vendor responses on this issue, underlining the unformed and embryonic state of the market.

- The one exception to this was the issue of 'emphasis on specific services' which was mentioned by over half the vendors who commented on marketing issues.

- One of the most important conclusions to emerge from this study was the need (for most vendors) to approach the VANS market from the perspective of meeting specific defined business needs.

- Vertical or specialised cross-industry markets must be identified. The business reasons for the service must be carefully analysed.

- Vendors must recognize that emphasising only cost-saving benefits is likely to meet market resistance.

- In contrast, stressing business development benefits that can add value to the business is more likely to break down user resistance to new communications-oriented methods of doing business.

- Thus, potential benefits, such as those listed below, should be of key importance when both evaluating likely VANS applications and marketing them:

  - Increased management control.

  - Ability to handle increased volumes.

  - Improved customer service.

  - Ability to attract new customers.

- The emphasis must be on the potential added value to the customer's business. That added value represents potential revenues to VANS vendors.

4. PRICING

- Pricing considerations are always a key area in any marketing situation. Of the 30 vendors who commented on the importance of pricing to the development of VANS market growth, 13 rated it highly and 9 of some importance.

- This attitude profile is shown in Exhibit VI-4 together with some representative vendor comments.

- Amongst the vendor interviewed, there was a clear understanding of the need to establish the relationship between the amount of 'value added' in a service and the price of that service to the customer. As one vendor expressed it, 'being able to judge the value provided is the key factor'.

- For example, there is little added value in pure message switching. This end of the business will be dominated by 'lowest cost' suppliers who in Europe are going to be almost exclusively the PTT organisations.

- Services vendors must therefore plan to offer those additional added value services which can attract a premium price.

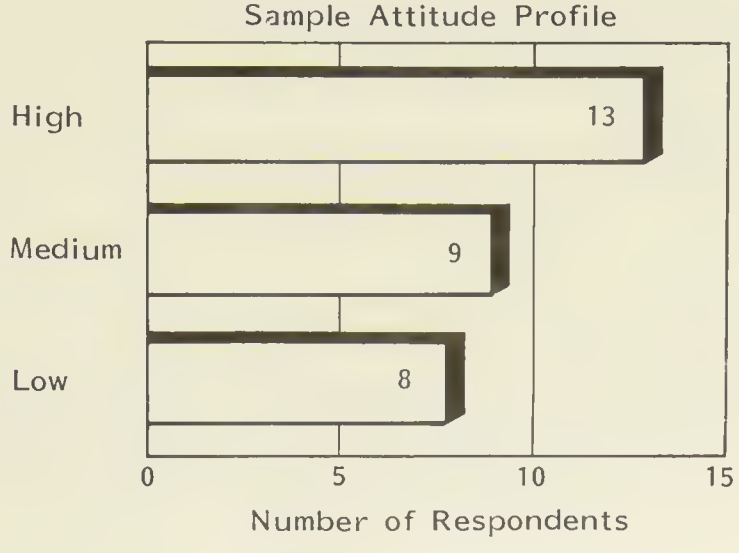
- Value pricing will therefore be a key concept for vendors. Pricing policy will play a major role in the development of the VANS market. Vendors will have to balance the opposing demands of charging sufficiently high prices in line with value delivered against the need for sufficiently low pricing to attract new users. The greater the perceived value, the easier it will be to balance these conflicting demands.

- Some parts of the VANS market, for example, some electronic mail services, will be driven by the need or desire to cut costs. Substitution for existing telex services is already a significant driving force in this area.

EXHIBIT VI-4

IMPACT OF PRICING ON MARKET GROWTH
VENDOR ATTITUDE PROFILE

High	Medium	Low
• Pricing will be Absolutely Key • Too High a Price will be the Most Important Barrier to the Use of VANS • Low Pricing can Inhibit Market Development	• Pricing can Help Stimulate Use • Pricing is Important for the Longer Term Providing Value is More Important	• The Market is Not Very Price-Sensitive • User Needs are Most Important, Price is Relatively Unimportant



- However, general market experience indicates that the impact of pure 'cost saving' is not always a strong motivating force, particularly where technological or organisational difficulties are perceived, as has already been commented upon in the previous section.

- One vendor talked about a 'low-price' technique for developing new markets. This can be a difficult strategy to implement without considerable financial resources. The motivation to save costs, particularly 'people' costs, usually occurs as a result of direct competitive pressures. Market growth for a VANS vendor is therefore only likely to be significant once a certain critical mass of users has been built up. This critical mass could take a long time to develop.

- Opportunities for VANS market growth are much more likely to occur in areas where these new services support the needs of business expansion. In these situations, realistic pricing, reflecting the true value of the service, is much more likely to be sustained.

C. STANDARDS

- For the VANS marketplace, there are basically two broad classifications of standards that are of importance:

  - Standards for telecommunications and computer software and hardware intercommunication.

  - Document format standards for business-to-business communication.

- 'Standards', clearly an important factor in the VANS marketplace, were rated fourth as a market development factor behind PTT regulations, industry associations, and market demand.

- In fact, vendors demonstrated a somewhat ambivalent attitude toward standards, as shown by the range of vendor opinion in Exhibit VI-5.

- Whilst standards are clearly necessary platforms upon which services and products can be based, there is also a commercial opportunity to be found amongst the multiplicity of standards and variations of levels within standards.

- That opportunity is certainly arising in the area of EDI, where service operators offering 'clearinghouse' systems can proffer a solution to companies unable to maintain compliance with the latest 'industry standard'.

- As one vendor actually commented, 'The lack of (universally applied) standards is how we earn our bread and butter'.

- A further factor is the view that any attempt to apply a universal standard represents a simplistic approach to the role of standards.

- Standards should be seen as interfaces or gateways from one system to another and not as rules for the internal working of networks which may cause many inefficiencies in their construction and operation.

- It is interesting to note that one of the most developed of the VANS market-places of today, videotex, does not have internationally accepted standards.

- The other key issue in terms of networking standards concerns the debate that is taking place in the industry between SNA and OSI.

- Considerable fear exists amongst independent vendors that adoption of SNA networks (as proposed for the joint British Telecom-IBM network that was subsequently not granted a license) would represent an overwhelming competitive advantage to IBM and its network services.

EXHIBIT VI-5

VENDOR ATTITUDES TOWARD STANDARDS

High Impact

- Standards are most important.
- Very important - must have a dictate on some standards.
- Standards are fundamental in order not to duplicate investments.
- Standards are the key challenge for VANS.

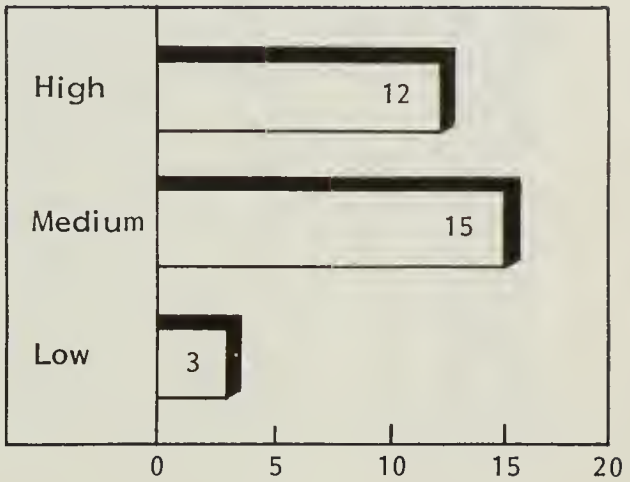
Medium

- Some standards are important for application-specific development.
- We need them only to communicate with other networks.
- Only important for some specialised types of VANS.
- Success will go to those who can be flexible with the technology.

Low

- Standards are not really that important.

Sample Attitude Profile



- OSI, on the other hand, is being seriously promoted throughout Europe both by governments and indigenous manufacturers as an anti-IBM weapon.

- Some vendors comments on the SNA/OSI issue are shown in Exhibit VI-6.

D. COMMUNICATION WITH OTHER NETWORKS

- One important way in which the market for VANS could develop is that of intercommunicating networks. Through such a route, services vendors can gain access to new markets and network vendors can increase capacity utilisation.

- Already this type of development is beginning to take place, examples being:

  - The recent establishment of INTERPAC (mentioned in Chapter IV) linking TRANSPAC and CSC's INFONET.

  - The complex linkage of networks in the U.K. travel industry.

- The vast majority (about 85%) of all vendors who expressed a view on this subject saw a clear need to establish such links.

- The prime focus of their interest was other commercial networks, but clearly the public networks and private networks were also seen as important links.

- Many different reasons were put forward for the importance of such network interconnection. In principle, these amounted to:

  - Establishing links with private networks (hybrid systems) and the users of those networks.

EXHIBIT VI-6

VENDOR COMMENTS ON THE OSI V SNA ISSUE

- It is good that the decision (on JOVE) went against IBM, otherwise OSI wouldn't have survived.
- OSI is not perceived as a necessary standard - it cannot be imposed- one must side with the market requirements.
- OSI cannot be imposed, but it is very important. The industry is still a long way from making it work. Standards development is a long evolutionary process. Vendors will continue to provide proprietary protocols.
- We must uncouple ourselves from SNA in order to be independent from IBM.
- OSI standards are very badly needed.
- We feel we must use proprietary standards. It is a problem if you are not prepared to commit to these, for the choice is then have a solution today or wait for OSI.
- In the end, market demand will determine the standards. The only market demand for OSI is in the U.K. at the moment.
- It appears to us that both IBM and some other organisations are not fully committed to OSI - some organisations are waiting - this is a major drawback.
- OSI is vital to achieving the objective of linking up various networks.

- Linking with other services in order to gain access to other services.

- In both cases, vendors are recognising that they cannot reach all the market through one network and must make access to services possible for as wide a catchement area as they can through network interlinkage.

- Exhibit VI-7 provides some vendor comments on this issue. One of the areas of strong interest was international links, and vendors were specifically questioned on their attitudes towards these.

- Some 90% of all vendors interviewed saw international links as an important issue. Given the international debate on transborder data flow issues and the possibility of restrictions in this area, vendors were also specifically questioned about this topic as well.

- Vendor responses on 'trans-border data flow issues' were:

  - A problem - 2 vendors.

  - Potentially a problem - 8 vendors.

  - Not a problem - 14 vendors.

EXHIBIT VI-7

VENDOR COMMENTS ON INTERCONNECTION BETWEEN NETWORKS

- A lot of links will be needed, but it will take some time for them to become established.
- The target is to achieve universality, the key is the transportability of services.
- We will see a lot of community networks and these will need to be linked together - a new class of system will evolve - supra networks that will interconnect with other service networks.
- The need for different networks to cross-talk will be very important.
- It would be unrealistic to think that we can get 90% of the market, therefore we will need to interlink.
- We need to participate on a large international network.

VII MARKET OPPORTUNITIES

VII MARKET OPPORTUNITIES

o This chapter describes potential areas of market opportunity using the VANS market definition, described in Chapter III, as framework.

A. DATA NETWORKS

1. PRIVATE NETWORKS

- Although not an opportunity for network services operators (in the first instance), this area does represent a considerable opportunity for manufacturers of telecommunications equipment and professional services companies.

- As described elsewhere in this report, there are many factors driving organisations to use, and thus rely on, more and more comprehensive communications systems.

- Many organisations, particularly large ones, will at least start to develop or commission such networks for their private use.

- Increasingly, these organisations are seeking professional services firms to develop and install these networks on a contract basis. Reasons for doing this include:

- The increasing complexity of modern communications technology.

- Serious shortages of skilled communications personnel either in-house or readily available on the job market.

- A wide choice of networking equipment and the inherent difficulties of selection.

- The need for high levels of security and reliability in network operation.

- INPUT believes that a further opportunity will arise to provide facilities management of networks. This market will, however, tend to be restricted to large companies since economies of scale will lead smaller companies to use third-party networks for data transport.

- A recent example of this type was the award of a contract to TRAVICOM to run the British Airport's cargo handling system.

- Opportunities will also arise for network services vendors to provide services that extend the use of a private network to geographic areas that would otherwise be uneconomic to serve.

2. CLOSED USER GROUP NETWORKS

- This area can be considered as very similar to that of private networks and the opportunities presented will be of a similar kind.

- An example of system development contracts is the one shortly to be awarded (at time of writing in autumn 1985) by Lloyds of London for a network to link up 240 Lloyds insurance brokers.

- It is understood that a facilities management contract would be involved, reported to be worth nearly $3 million per year. Not surprisingly, this contract is being hotly pursued by a number of vendors including IBM, ICL, GEISCO, Sperry, and British Telecom.

- This short list aptly illustrates the new competitive environment for network services.

3. ENHANCED SERVICES FROM PTT

- Opportunities in this area are hard to gauge and will exist as a function of the PTT's desire to subcontract some element of its network building or operating capability.

- Nevertheless, there have been very substantial services revenues generated already in this area, namely:

  - IBM's Systems Integration contract to build Btx for the DBP.

  - TRANSPAC software developed by CAP-Gemini-Sogeti.

  - CAP PLC's contract to build a packet switched network for the City of Kingston-upon-Hull.

4. INDEPENDENT NETWORK SERVICES

- As defined in Chapter III, this area of opportunity covers public networks operated to provide services to third parties.

- This area is evolving out of the network services traditionally offered by computer bureaus and the extensive worldwide networks operated by U.S. vendors such as:

- McDonnell Douglos Information System's TYMNET.

- Computer Sciences Corporotion's INFONET.

- GEISCO's Network Services.

- The key problem with the ossessment of morket opportunities for independent networks is that these services operote at the fringe (or beyond) of PTT regulotions.

- Cleorly, the situation is different in the U.K. from Fronce, Itoly, ond West Germony.

- Portiol liberolisotion ond the declared oim of the British government to foster the development of VANS hos, however, still left the outhorities in a dilemma os to the exact noture of whot does or does not constitute value odded network service. This is more fully discussed in Chapter V.

- Thus, vendors throughout Europe, unlike their couterparts in the completely deregulated U.S. environment, ore left in an unclear position as to whot morkets will be open to them.

- Clearly, one mojor area of opportunity is to estoblish joint developments with the PTT authorities.

- An exomple of this approoch, described in Chopter IV, is INTERPAC, o joint development between the French PTT and CSC's INFONET.

- In the United Kingdom, although o joint development between BT ond IBM (JOVE) wos denied o license, there ore other exomples of BT and services vendors developing and offering volue odded network services, for exomple, in the oreos of:

- Credit card authorisation.
- Insurance systems.
- EDI.
- Software distribution.

- As well as providing enhanced data transport services directly to the end user, other opportunities will emerge for selling network services:
  - To other service providers who do not actually run a network.
  - The provision of gateways to other networks.
  - Hybrid networks--networks which are part private, part public that enable vendors to reach an in-house audience or allow access to certain in-house facilities, e.g., a particular data base.
- The provision of network services is likely to become dominated by a limited number of major vendors who will command sufficient resources to provide:
  - Wide geographic coverage.
  - Comprehensive facilities in terms of security and service.
  - Sufficient investments made in communications hardware and software and expertise to compete as 'low-cost' providers.
- Vendors considering developing their existing networks or new ones will need to evaluate very carefully their market positioning and their planned levels of differentiation from competition.

- Key factors will be the degree of value added that can be offered and the extent to which these features effectively 'lock' the customer into the service.

- Exhibit VII-1 defines a hierarchy of services showing a comparison of competitive characteristics ranging from Bearer Services at level 1 (the monopoly of the PTTs) to Enhanced Services at level 3.

5. VENDOR ATTITUDES

- It is clear that the most obvious opportunities in this area for independent vendors lie in the partially deregulated U.K. market.

- Amongst the vendors interviewed, some already had substantial networks in place. They were either based in the U.K. or were representing the U.K. subsidiary of an American organisation. Only one other vendor not yet in operation expressed a desire for his company to enter this particular market sector.

- Some vendor comments concerning the market opportunities in the U.K. are shown as Exhibit VII-2.

- There was little interest expressed by the French vendors interviewed despite the setting up of INTERPAC as a joint venture or the presence of such U.S.-based networks as TYMNET.

- This illustrates the point that vendors are in general very cautious of getting involved in a confused market situation where although some vendors have clearly made agreements with the PTT, the overall situation remains unclear or, at worst, is seen as being prohibited by the PTT monopoly.

EXHIBIT VII-1

COMPETITIVE CHARACTERISTICS OF NETWORKS

	Examples of Service	COMPETITIVE CHARACTERISTICS		
		Economies of Scale	Character of Market	Sources of Competitive Advantage
Level 3: Enhanced Services	Electronic Mail, Protocol Conversion	Low ↕ High	Differentiated Quality/Service Competition ↕ "Commodity" (Price Competition)	Service Innovation, Support, Software ↕ Technology Innovation, Volume, Standardisation
Level 2: Switched Networks	Packet Swtiched Network			
Level 1: Bearer Services	Transmission Links i.e. Coaxial Cable, Satellite, etc.			

EXHIBIT VII-2

UNITED KINGDOM VENDOR COMMENTS ON AREAS OF OPPORTUNITY IN ENHANCED SERVICES DATA NETWORKS

- We see an opportunity to sell our network service to computer bureaus in areas where their own networks are uneconomic.
- There will only be a limited number of vendors who will actually provide a network. The value added is too low for us.
- The market is so confused that we are having difficulty in defining what position we want to take in this market.
- Our company is very interested in developing basic network services.
- Specific systems are the key to success in this area. The network should be designed to meet a specific need and be associated with the movement of valuable data.

- One French vendor, for example, commented:

  - 'We probably can't sell mailbox facilities because of PTT regulations'.

- The advice to vendors must be to discuss with the relevant PTT the type of service proposed. The more application-oriented, the more likely it is to succeed.

- In Italy, although as discussed earlier the market is undeveloped, there was a high interest in being able to provide enhanced services, particularly mailbox and electronic mail. Nevertheless, vendors are very cautious about what they might be allowed to do. For example, such comments were recorded as:

  - 'The public carriers should be providing these sorts of services'.

  - 'These services will only develop in a more advanced phase of market growth'.

- A very similar situation exists in Germany, summed up by the vendor who commented:

  - 'German vendors are not in a positon to develop VANS because of the PTT regulations'.

B. SPECIFIC SERVICES

- Vendors were asked to identify areas that were seen as opportunties for the development of value added network services. Exhibit VII-3 provides the profile of vendors responses to this question in respect of specific services.

EXHIBIT VII-3

PROFILE OF VENDOR INTEREST IN SPECIFIC SERVICES

SERVICE SECTOR	NUMBER OF MENTIONS				
	FRANCE	ITALY	UNITED KINGDOM	WEST GERMANY	TOTAL
Videotex	4	–	3	–	7
Electronic Mail	4	1	6	2	13
EDI	3	3	5	1	12
EFT	6	8	5	2	21
Insurance	4	1	4	1	10
Other Data Services:					
Data Collection	–	5	3	2	10
CAD/CAM	–	–	2	–	2
Total Number of Vendors Expressing Opinions on this Issue	7	12	12	4	75

- It can be seen from these responses that most interest was expressed in:

  - Electronic Funds Transfer, 21 mentions.

  - Electronic Mail, 13 mentions.

  - Electronic Data Interchange, 12 mentions.

- Insurance and Data Collection each received 10 mentions. Videotex was mentioned seven times and CAD/CAM twice.

- The general lack of pattern and the fact that not all vendors were able to express an opinion on likely opportunity areas was indicative of the early formative stage of the VANS market.

- The level of activity being shown by some specialist vendors, large multinationals, and by the telecommunications authorities must serve as a signal to vendors of the need to act quickly to establish a starting position in what will become a highly competitive marketplace.

- The area of electronics funds transfer stood out as by far the most frequently mentioned opportunity area. This is perhaps not entirely surprising given the publicity focused on this area, particularly that of retail point of sale applications.

- However, it must be recognised that growth in this area will be very much determined by the level of acceptance by retail store management and both the perceived and real attitude of purchasers to these systems; for example, public attitudes to direct debiting of accounts and the level of transactions dealt with in cash.

- Electronic mail opportunities have been much publicised and a number of services are operational. Not surprisingly, this area merited relatively high

interest except in Italy, where most vendors interviewed viewed this area as the province of the PTT authorities.

- A problem facing vendors in this market segment is that this is a quasi-commodity business. Consequently, lowest-cost production, economies of scale, and geographic marketing strength are all going to be important factors in determining success.

- Since the PTTs and very large network services companies have already taken up substantial positions in the market, this area is not recommended for new entrants without substantial resources.

- If opportunities occur to offer specific niche market electronic mail services, then this may be the basis of sufficient differentiation to support a successful service. It is most likely that such opportunities would occur in partnership with an established electronic mail service.

- There will also be a tendency for electronic mail services to be offered as bundled components of some other services. This development would favour established vendors.

  - An example of this approach might be the allocation of a mailbox as part of a service contract so the client can report faults to the service engineers.

- Electronic mail will also become integrated into sophisticated office automation systems.

- Electronic Data Interchange was viewed as an important opportunity by approximately one-third of the vendors expressing an opinion.

- The key driving force behind EDI is the reduction of costs of paper handling. Consequently, it is most likely to develop in market areas where:

- An industry is under severe cost pressure and subject to substitution by other products.

- There is a high level of competition.

- Rapid expansion of the business necessitates automation of paper procedures to obviate massive increases in staff costs.

- There is a real need to cut down time delays on data exchange.

- A very necessary pre-condition for EDI is that there exists some standard for intercommunication that is accepted generally by the served community, probably under the auspices of an industry trade association.

- Whilst massive cost savings can be demonstrated by EDI, there will be considerable resistance to its introduction by management since it will imply a cultural change in human attitudes toward inter-company working methods.

- Managers will, in many cases, be unwilling to replace existing clerical workforces. They will be keener to adopt these methods when rapid expansion or keen cost pressures are major priorities.

- The exceptions to this will be those industries or communities where data interchange is already taking place, i.e., as in the use of TRADACOMS standards in the retail trade.

- As has already been mentioned, key development areas for EDI in Europe are the motor industry and the retail food trade and its suppliers.

- Some developments have also taken place in the pharmaceutical industry. Additionally, interest has also been noted in the following areas:

- Aerospace manufacturers and their suppliers.
- Transportation industry.
- Footwear manufacturers.

- Insurance and data collection were two other relatively frequently mentioned applications.
- Insurance represents a good example of some of the key characteristics of successful VANS applications, namely:
  - Relatively high value transaction.
  - The need to communicate to a large number of third parties (brokers) spread over a wide geographic area.
  - The need to effect transactions efficiently and quickly for competitive reasons.
- The area of data collection could be considered as an adjunct of EDI. However, separate types of opportunity do exist in this category, for example, vendors mentioned the collection of drug performance data from doctors for pharmaceutical companies and the collection of market research data.
- The transmission of CAD/CAM information was mentioned by two vendors and this area is clearly gaining in significance with high interest in computer integrated manufacturing (CIM).
- Other areas of possible opportunity for specific services that emerged from INPUT's research included:

- Ticketing systems.

- Stock exchange and other market trading services.

- Land registry information access for solicitors.

- Academic/scientific networks.

- Software distribution.

VIII USER CHARACTERISTICS

VIII USER CHARACTERISTICS

- User research was conducted at two levels. The first was a general survey of levels of interest in identified VANS market segments, e.g., electronic mail, videotex, and EDI. This research was conducted in France, the U.K., and West Germany. (There was a total of 86 respondents in this category; see Appendix B for the analysis.)

- Secondly, a limited number (six) of interviews were conducted with users and industry associations on an in-depth, face-to-face basis.

A. USER NEEDS

- Some indications of anticipated use of value added network services can be gained from the ratings of the user level of interest in the use of networks and related areas.

- These are shown in Exhibit VIII-1 for:

  - Use of networks.

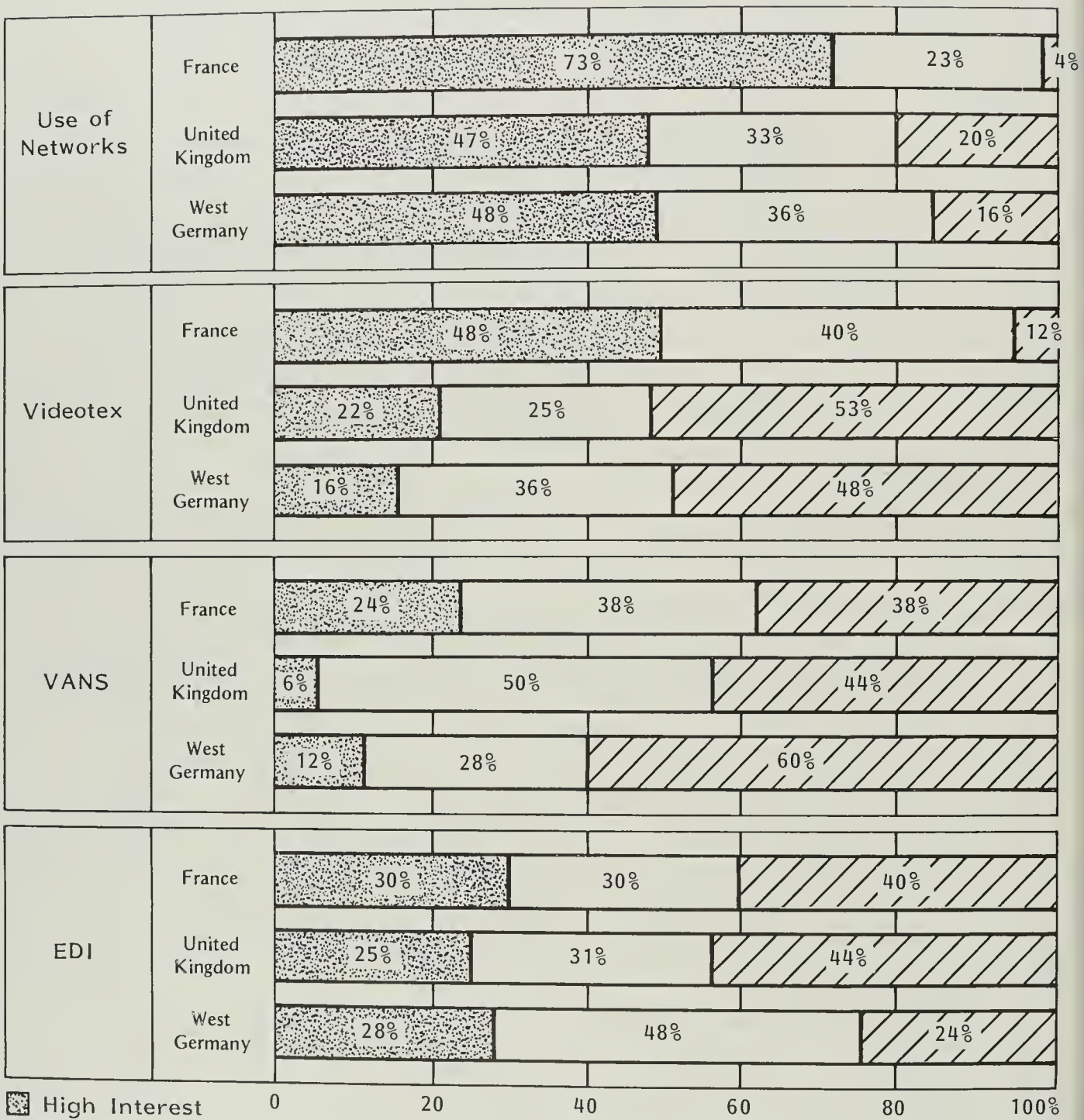
  - Videotex.

  - Value added networks.

  - Electronic Data Interchange (EDI).

EXHIBIT VIII-1

USER INTEREST IN VANS USAGE



- This profile clearly indicates a high level of interest in the use of networks in general (very nearly half the respondent group rated this of high interest), but a much lower rating for the specific VANS-oriented subjects.

- In particular, VANS as a subject rated much lower, with only around 10% considering this of high interest.

- Videotex and EDI, although of lower interest than networks, rated considerably higher than VANS supporting the conclusion that services must be specific and not presented as generic solutions.

- It can also be concluded that the term 'VANS' is little understood, or it is misunderstood by users, despite the fact that networking is clearly of importance to the majority of users.

- Exhibit VIII-2 shows the analysis of user attitudes to the importance of telecommunications systems. User data for this analysis was only available from France and the United Kingdom.

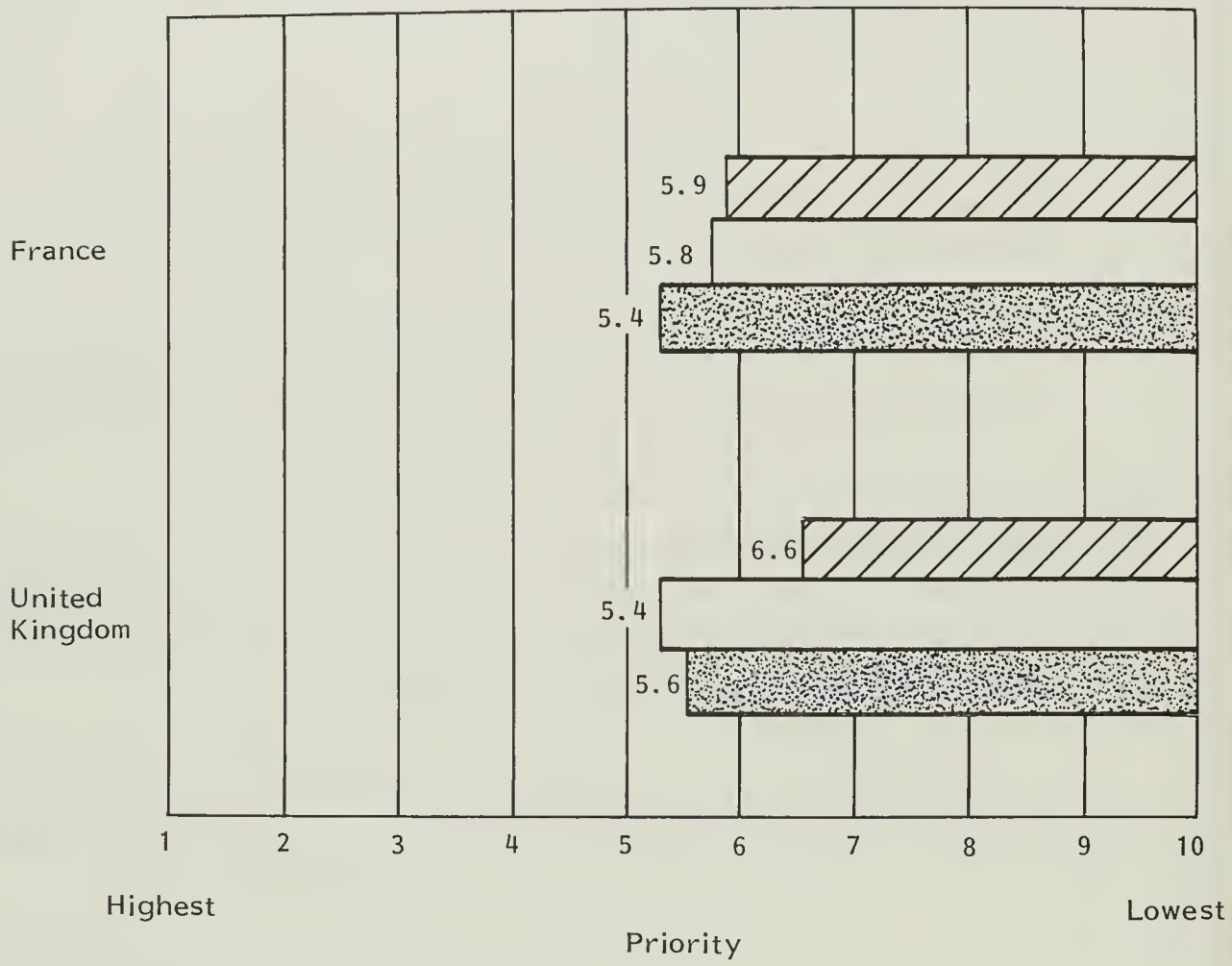
- Users were asked to rank various data processing management considerations on a scale of 1 (most important) to 10 (least important). Telecommunications needs were ranked quite highly by users, and in the U.K., there was a significant increase in emphasis between 1985 and 1990.

- Additionally, users were separately asked to rank the degree of priority being placed on the need for improvements in telecommunications facilities, again on the same scale of 1 to 10. A similar level of importance resulted.

- The level of importance being placed upon telecommunications needs and the evident shortage of relevant skills and expertise in this area are indicators of growing information services opportunities.

EXHIBIT VIII-2

IMPORTANCE OF TELECOMMUNICATIONS IN USERS' PLANS



- In planning to meet these anticipated needs for communications services, vendors must be aware of key customer criteria around which they can develop their marketing approach.

- Exhibit VIII-3 lists criteria of importance for network use described by the users surveyed in France, the United Kingdom, and West Germany.

- Cost and reliability were the only two factors that particularly stood out, but clearly the other factors mentioned are all important.

- Some further insight into the potential needs of users for network services are provided by Exhibits VIII-4 and VIII-5.

- Exhibit VIII-4 lists potential reasons mentioned by the users who were interviewed on an in-depth basis for using network services.

- Exhibit VIII-5 gives examples of user comments on the potential use of network services.

- Two specific types of value added network services, electronic mail and electronic data interchange, were analysed from user responses. Exhibits VIII-6 and VIII-7 provide user attitude profiles for each of these two areas, respectively.

- Clearly, electronic mail was the more popular with over one-half the sample anticipating at least some use within the forecast period and over one-half of these forecasting significant or high usage.

- Nevertheless, there existed a substantial minority, over one-third of the sample, forecasting no use of electronic mail by 1990.

- In the case of EDI, there was a much lower awareness of this type of service and a much lower usage anticipated.

EXHIBIT VIII-3

USER CRITERIA OF IMPORTANCE FOR NETWORK USE

CRITERIA	NUMBER OF MENTIONS
Cost	13
Reliability	12
Ease of Use	5
Speed of Access	5
Multiple Protocols Supported	4
Security	4
Geographic Coverage	2
Upgradeability	2
Total Number of Respondents	31

EXHIBIT VIII-4

POTENTIAL REASONS FOR USING NETWORK SERVICES

- Geographic spread - local call rate access.
- 24-hour-a-day service.
- Easy availability to new applications, state of the art services.
- Reduce costs of telecommunications requirements, i.e., access to low-volume sites.
- Provision of low usage applications that are not economically provided in house.
- Access to potential customers through the network.
- Be able to offer a better service to customers.
- Need for file transfers between applications in a heterogeneous environment and distributed data base.

EXHIBIT VIII-5

USER COMMENTS ON POTENTIAL USE OF NETWORK SERVICES

- Preparedness of vendor to customise services.
- Vendors must fully understand user needs.
- Fear of multiplicity of standards.
- Electronic payment systems.
- Few services that are developed or operational.
- Services are inadequately promoted and must offer ease of use.
- Performance and reliability are major concerns.
- Services are too restricted.

EXHIBIT VIII-6

USER ATTITUDE TO THE USE OF ELECTRONIC MAIL

High Use Anticipated	Significant Use	Some Use	Little Use	No Use Anticipated
• Will grow enormosly over next 5 years. • Will have replaced all internal paper documents by 1990. • We will need it for "real time" links between our factories and head office.	• We will use it instead of Telex. • We envision considerable use by 1988.	• Will be used in future. • Currently being studied. • We hope to use it by 1990.	• We see only a limited use for it. • Costs will have to fall first. • Only if it becomes cheaper.	• No use because lack of security and inadequate service. • Of no importance to us. • Not on the agenda.

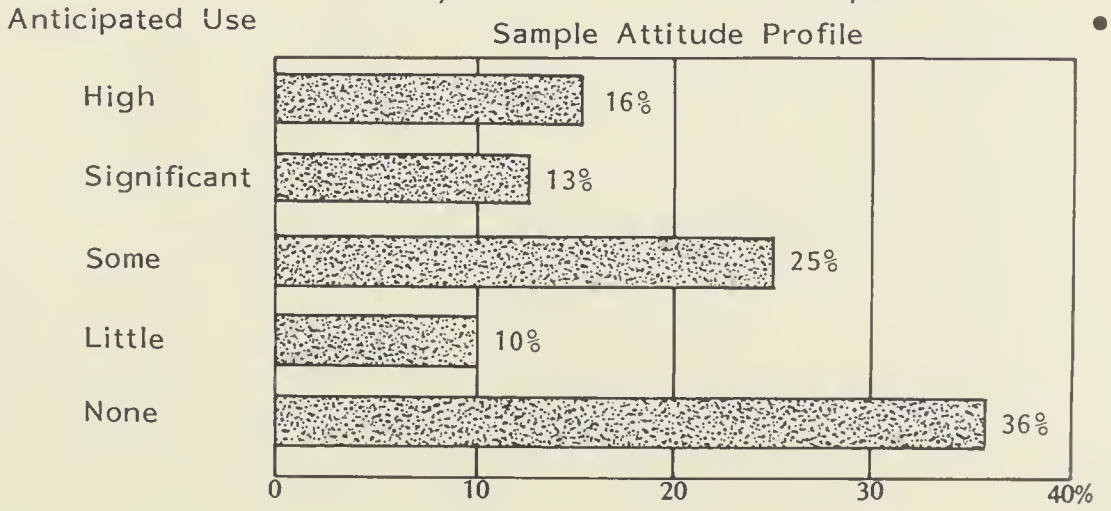
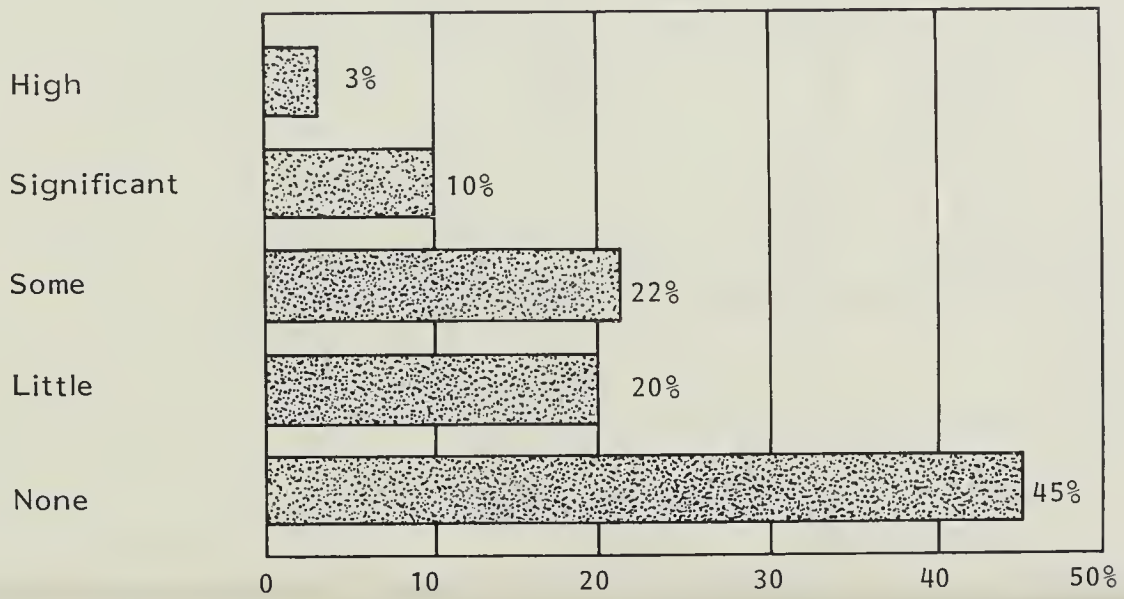


EXHIBIT VIII-7

USER ATTITUDES TO THE USE OF EDI

High Use Anticipated	Significant Use	Some Use	Little Use	No Use Anticipated
• Will be used heavily by 1987.	• We are currently using it in pilot mode. • Some significant use by 1986.	• We will make a limited start in 1986, then evaluate whether to expand. • Some use by 1988.	• Will all depend on the level of service and the relevant costs. • Anticipated in the long term	• Not at this stage. • We have no intention of using it. • Of no importance to us.



- Only just over one-third of the sample forecasted at least some usage, and very nearly one-half the sample (45%) predicted no usage.

B. PRICING CONSIDERATIONS

- Pricing is always a key marketing decision. The early development stage of most VANS market sectors and the sensitivity to communications costs exhibited by users will make pricing considerations an important focus of attention for VANS vendors.

- As was seen in Exhibit VIII-3, cost was the most frequently mentioned user criteria of importance for network use.

- Some users, however, viewed the potential cost savings from using certain VANS application to be sufficiently large as to make the service costs of low importance. One user in this situation commented:

  - 'The costs are not critical. There is no other choice but to use the system as the saving in labour costs is so substantial'.

- As the other extreme was the user who said:

  - 'I consider costs to be absolutely critical. Users will drive a hard bargain and will compare costs carefully'.

- One particular manifestation of the cost issue has arisen in the U.K. in respect of the pricing arrangements for the TRADACOM EDI service.

- This case represents the difficult balance of opposing arguments. For on the one hand, arguments for low pricing include:

- The need to establish a new untried service and attract a critical mass of usage.

- The need to offer competitive pricing against existing methods, the full cost of which may not be calculable or known.

- On the other hand, vendors will be stressing the new and additional benefits, such as increased security and speed of access, that should justify a higher price.

- Fundamentally, value added network services should be based on 'value added'. Pricing from the vendor's perspective should reflect that added valve.

- Vendors should, however, be aware from the results of this user analysis that there is a high level of cost consciousness amongst users. Consequently, many services will require sophisticated marketing approaches in order to convince users of the valuable benefits that can accrue.

- Applications for which the justification is pure cost saving should be avoided unless the vendor is prepared to play the 'lowest-cost product' strategy.

- The applications to seek out are those which bring genuine new business benefits or competitive advantages to their users.

IX CONCLUSIONS AND RECOMMENDATIONS

IX CONCLUSIONS AND RECOMMENDATIONS

A. KEY INDUSTRY TRENDS

1. EMERGENCE OF THE VANS MARKET

- The emergence of the VANS market is one of the major manifestations of the convergence of computers and communications.

- Whilst 'timesharing' represented an early, very basic form of convergence where the emphasis was primarily on the powerful central computer and its software, VANS represent a shift of emphasis onto the network and its capabilities.

- In VANS, the importance of the network and its capabilities are paramount. The focus is now on such features as:

  - Wide area connectivity (geographic spread).

  - Connection of 'communities' of users.

  - Reduction of cost to the user.

  - Ease of use.

  - Speed of operation.

- However, the computer industry has developed in the open commercial market, relatively unhindered by governmental regulation. The communications business has largely been regulated and dominated in European countries by the state-run monopoly PTT organisations.

- The emerging VANS industry is developing beyond the existing regulatory environment, as it has been defined. Consequently, it is operating in a largely grey area that borders between the unregulated computer industry and the highly regulated communications industry.

- The undefined nature of these boundaries are demonstrated by:

  - The difficulties experienced in the U.K. in trying to define guidelines for VANS even in a 'liberalised' environment.

  - The confusion amongst European services companies as to the nature of these markets, to what extent they are the PTT's monopoly, and whether they can be entered at all.

2. MARKET DRIVING FORCES

- The forces driving the potential demand for these services are many and varied. There are fundamental reasons why business, commerce, and industry need to use these new methods:

  - Cost pressures.

  - Other competitive pressures (e.g., service).

  - The decreasing information float.

- Thus, the markets for VANs will be driven by:

  - Cost reduction through substitution.

  - The need to communicate over a wide area, even on a global basis.

  - The complexity, likely higher cost, and lack of security associated with developing private networks.

  - The need to process more work with fewer people.

  - The need to offer the customer more sophisticated and ergonomic services.

  - The need to increase employee satisfaction.

- Other factors that will help to drive the development of VANS will be:

  - Initiatives by common interest organisations and industry groups to establish data standards for community networks.

  - Active encouragement of the market by government in order to assist economic development and growth.

3. MARKET INHIBITORS

- As well as the many clearly identifiable forces that are driving the formation of VANS markets, there also exist a number of factors that are likely to inhibit the development of these markets. These include:

  - The regulatory environment for communications.

  - Government attitudes and policies.

- Cultural/societal factors which will be particularly acute where new methods require changes in internal practices and organisation.

- The speed of vendors getting into the market to offer services.

B. THE OPPORTUNITIES

- The markets for VANS are extensive and potentially vast. This study has confined its research to those sectors most readily identifiable as targets for information services vendors.

- There will be many opportunities for professional services firms to assist organisations developing their own private networks. Additionally, some of these users will contract with services firms to provide facilities management for those networks.

- This research study has primarily focused on processing services revenues which can conveniently be considered under two headings: networks and the services that run on them.

1. NETWORKS

- This is the area which is most in contention with the PTT regulatory environment.

- In France, Italy, and West Germany, the development of a physical network can only be countenanced where it has been approved by the PTT. Services will develop at what one vendor described as 'the fringe of regulation'. INTERPAC, described in Chapter IV, is one such example.

- Clearly, the opportunities for vendors to offer enhanced services in Europe are restricted. Nevertheless, they do exist, as is shown by the examples of existing services referred to in Chapter IV.

- In the U.K., these services are licensing arrangements being issued by the DTI.

- In France, Italy, and West Germany, services that can be considered to operate on the borderline of the PTT monopoly exist through negotiation and arrangement with the respective PTT. Generally, these services are operated in conjunction with some other service.

- INPUT considers that in the long term there is an enormous demand for network services of all types. It is unlikely that they can all be met from a position of PTT monopoly.

- Vendors must therefore develop relationships with the relevant PTT in order to exploit the particular opportunities that have been identified.

- Of all the opportunity areas for VANS, this area is clearly the most capital intensive. The PTT is by definition a competitor and many large independent operators already have substantial networks in place.

- Vendors must therefore approach these 'quasi-commodity' markets with carefully prepared market development plans and sufficient financing to play the 'lowest cost producer' strategy.

2. SERVICES

- INPUT considers that the key strategy for most services vendors in the VANS marketplace is that of 'specific services'.

- The provision of these services represents a viable and expanding market irrespective of whether the vendor operates the network upon which it is based or hires that facility either from the PTT or a third party.

- Naturally it is in the interests of PTT organisations to encourage the development of these new services as they in general represent entirely new sources of revenue and capacity utilisation for the bearer service. Only in the case of services based on substitution, e.g., for telex, will this not be the case.

- The Prestel experience indicates the problems of marketing generic, unspecified services in a new area. VANS are a little understood concept to most users. Specific services must by definiton be promoted through focused marketing.

- The sales justification of a specific service will be the business benefits that it supplies. These represent the value added that is the source of revenue to the service supplier.

APPENDIX A: DEFINITIONS

APPENDIX A: DEFINITIONS

A. INFORMATION SERVICES

- 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.
  - Service 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).

B. REVENUE

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

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

- NON-CAPTIVE INFORMATION SERVICES REVENUE - Revenue received for information services provided within the U.S. from users who are not part of the same parent corporation as the vendor.

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

C. SERVICE MODES

- PROCESSING SERVICES which include the following:

  - REMOTE COMPUTING SERVICES

    . DATABASE - Characterised by the retrieval and processing of information from a vendor-provided database. The database may be owned by the vendor or a third party.

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

    . REMOTE BATCH - Where the user hands over control of a job to the vendor's computer, which schedules job execution according to priorities and resource requirements.

    . USER SITE HARDWARE SERVICES (USHS) - These offerings provided by RCS vendors place programmable hardware on the user's site (rather than in the EDP center). USHS offers:

- Access to a communications network.

- Access through the network to the RCS vendor's larger computers.

- Significant software as part of the service.

- BATCH SERVICES - This includes data processing performed at vendors' sites of user programs and/or data that are physically transported (as opposed to electronically by telecommunication media) to and/or from those sites. Data entry and data output services, such as key punching and computer output microfilm processing, are also included. Batch services include expenditures by users who take their data to a vendor site that has a terminal connected to a remote computer for the actual processing.

- PROCESSING FACILITIES MANAGEMENT (PFM) (Also referred to as "resource management" or "systems management") - The management of all or a major part of a user's data processing functions under a long-term contract (more than one year). This would include both remote computing and batch services. To quality as PFM, the contractor must directly plan, control, operate, and own the facility provided to the user, either on-site, through communications lines, or in a mixed mode.

- Processing services are further differentiated as follows:

  - Function-specific services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general ledger, accounts receivable, 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 onwed 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 softare, 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 user's site. Fees for work performed by organisations other than the package vendor are counted in professional services. There are several subcategories of software products:

- APPLICATIONS PRODUCTS - Software that performs processing that services 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:

  . 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.

  . 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.

  . SYSTEMS CONTROL PRODUCTS - Function during applications program execution to manage the computer system resource. Examples include operating systems, communication monitors, emulators, and spoolers.

- PROFESSIONAL SERVICES - Made up of services in the following categories:

  - CONSULTING SERVICES - EDP management consulting and feasibility studies, for example.

  - EDUCATION SERVICES - EDP products and/or services--related to corporations, not individuals.

  - 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.

  - SOFTWARE DEVELOPMENT - Including system design, contract programming, and "body shopping."

- 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:

  - 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.

  - INDUSTRY-SPECIFIC systems; i.e., systems that serve a specific function for a given industry sector such as seismic processing systems, automobile dealer parts inventories, CAD/CAM systems, discrete manufacturing control systems, etc.

- Revenue includes hardware, software, and support functions.

APPENDIX B: ANALYSIS OF RESEARCH SAMPLE

APPENDIX B: ANALYSIS OF RESEARCH SAMPLE

- Detailed interviews (nearly all face to face) were conducted primarily amongst information network services vendors. The PTT organisations, user groups, and a selected number of major users were also interviewed on a face-to-face basis.

- A second level of user research was also conducted on a wider basis in France, the U.K., and West Germany. This general survey addressed levels of interest in identified VANS market segments, e.g., electronic mail, videotex, and EDI. This survey was conducted by mail questionnaire as part of INPUT's annual user survey.

- Exhibit B-1 shows the analysis of the survey respondents by category and country.

EXHIBIT B-1

ANALYSIS OF INTERVIEWS

COUNTRY	INFORMATION NETWORK SERVICES VENDORS (Including PTTs)	USERS AND USER GROUPS (Face-to-Face Interviews)	GENERAL MAIL SURVEY OF USERS	TOTAL
France	7	4	26	37
Italy	12	-	-	12
United Kingdom	15	2	35	52
West Germany	7	1	25	33
Total	41	7	86	134

APPENDIX C: QUESTIONNAIRE

VALUE ADDED NETWORK SERVICES

VENDOR QUESTIONNAIRE

1. Do you offer (or are you planning to offer) any Value Added Network Services?

   If NOT please give details of any other network services offered, eg service bureau network, MDNS (managed data network service).

   If YES please provide brief descriptive detail of the services offered, target markets, type of technology used, history of its development to date.

2. Who would you describe as your principal competitors? Please rank in order of importance and estimate their market share?

3. What do you consider to be the most significant factors that will influence the development (or potential development) of VANS in your country/market?

PROMPTS

PTT Regulations
Technology (Modems, Cable TV, Satellite Transmission, Cellular Radio, VIDEOTEX, etc)
Market demand
Industry associations/groups

Standards
- SNA/ISO
- CCITT
- Banks - CHAPS/SWIFT
- Airlines - SITA

4. Are international links of any importance to your future plans? What geographic markets do you cover? (Are transborder dataflow issues of significance to you?)

5. Do you have or foresee a need for communications with other networks? How will VANS tie in to other services?

PROMPTS

In the same industry
Other commercial networks
Service bureau
Financial
Other

6. What would you describe as the most significant challenges facing the development of VANS?

7. What factors do you think will have the most effect on market growth (or act as Inhibitors)? Please give a High/Medium/Low impact rating.

PROMPTS

Pricing
Marketing
User needs
Regulations
Standards

8. What factors in your opinion are most significant in determining the success or failure for a potential VAN Service? Please list your view of risks or any assumptions about the market that have to be made.

+ ve factors	- ve factors
_____	_____
_____	_____
_____	_____
_____	_____

9. Where do you see the major opportunities for the development of VANS?

- Horizontal Services (eg Mailbox, Protocol Conversion, Error Checking)

_____

_____

- Vertical Services (eg VIDEOTEX, Database, EDI)

_____

_____

- Industry Application Services

eg Retail _____

Banking/Finance _____

Transportation _____

Hospital Authorities _____

Pharmaceutical Companies _____

Government _____

Public Utilities _____

Insurance _____

Industry Associations/ Groups _____

10. Do you foresee any need for commercial partnerships in order to develop market opportunities?

- Industry Associations
- Telecommunications companies
- Other vendors (Third party reselling)
- etc

11. What level of growth in VANS are you now experiencing or planning for?

12. What revenues are you generating from VANS at the moment and what is the breakdown?

13. How big do you think the market is at the moment (1985) and will be by (1990)?

14. What in your opinion will be the likely product life cycle for VAN services?

15. Are there any other general factors related to VANS that have not been discussed?

16. May we have a copy of any sales literature, brochures, company reports, etc.

17. Can you recommend any customers that we might contact for our user survey?

THANK YOU

APPENDIX D: LIST OF RELATED REPORTS

APPENDIX D: LIST OF RELATED REPORTS

- European Videotex Market Opportunities, 1985-1990.
- Office Videotex (U.S. Market), 1985.
- Check Guarantee and Credit Card Authorization Services (U.S. Market), 1985.
- Correspondent Bank Processing Services Market (U.S. Market), 1985-1990.
- Strategies for New Telecommunications Opportunities (U.S. Market), 1984.
- Market Opportunities in Network Services (U.S. Market), 1982.

About INPUT

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. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

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