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INPUT

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EUROPEAN IT SERVICES

A MARKET IN DECLINE?

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Abstract

This study questions the wisdom of assuming that the market for IT services will continue to grow. The falling price of open systems hardware has led many equipment vendors to look for a larger contribution and added value from software and services.

This study identifies market drivers and inhibitors such as increasing price competition, the arrival of re-usable software, and the move of applications into the hands of the desktop user. These factors all raise doubts as to whether clients will continue to demand more services from the industry.

In particular the report addresses the impact of open systems on the size of the software and services market, and the potential for changes in vendor market shares as they challenge for position in a low-growth market over the next decade.

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Appendix

I Introduction

This report is produced as one of a series of reports in INPUT's Softwar and Services Planning Services for the Computer Software and Services Industry in Europe.

The report is designed to assist vendors in:

- Assessing product and marketing risk exposure
- Allocating resources to the transformation of their traditional business
- Obtaining insights into market developments
- Quantifying the potential success of competitive threats

A Scope of the Report

This report reviews and analyses the past ten years of change within the software, services and maintenance markets in Europe and forecasts a lik scenario for the next ten years.

The report assesses trends for the nine major sectors that constitute INPUT's definition of the information services market.

- Processing services
- Turnkey systems
- Applications software
- Systems software
- Equipment services
- Professional services
- Network services
- Systems operations
- Systems integration

Historic data and forecasts are given for Europe as a whole.

Full details of the definitions used by INPUT are given in the appendix - INPUT Definitions, 1992.

Software and services continue to attract widespread vendor attention. This report should be read in conjunction with other INPUT reports in order to identify key market and product trends, vendor strategies and opportunities.

B Methodology

This report is based principally on European research activities conducted by INPUT during 1992, and on reports published on this market by INPUT over the past ten years:

- A vendor research programme of over 500 interviews with key software and services vendors across Europe.
- A further 1,200 vendor and user interviews across all European market sectors to determine trends and opinions.
- INPUT's continuous analysis of the delivery modes and vertical industry sectors comprising the computer software and services market.
- INPUT's research programme into the customer services and user satisfaction in the European market place.

Additionally, INPUT used its extensive library and database of information relating to the software and services industry.

C Report Structure

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

- Chapter II is an executive overview offering a concise summary of the contents of the report.
- Chapter III describes INPUT's assessment of the dimensions of the main constituent sectors of the European software and services market. It proposes a "most likely" scenario for the impact of the trends to open systems, to end-user purchasing, and the relative success of different vendor groupings over the next decade to the year 2001.

D
Related INPUT Research Programmes and Reports

The following reports contain detailed analysis of key market sectors, offering commentary and recommendations for vendors active in Europe.

- *Computer Software and Services, Europe 1992-1997*
- *Systems Integration Europe - Market Analysis and Forecast 1992-1997*
- *Systems Operations Europe - Market Analysis and Forecast 1992-1997*
- *Software Applications Maintenance Opportunities*
- *The Impact of UNIX on Software and Services*
- *Collaboration and Merger & Acquisition Issues*
- Analytical profiles of leading independent software and service vendors in Europe

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II Executive Overview

A
Traditional Equipment Vendors to Regain Market Share

There is no doubt that European information technology (IT) services market growth has been badly hit by loss of business confidence. The gloomy business climate resulting from the recession in Europe has renewed focus on the IT services sector as a source of profit contribution and growth. The established independent professional services companies, which grew spectacularly in the 1980s, are now threatened by the equipment vendors. Hardware manufacturers have actually lost market share in software and services during the 1980s and have all declared their strong ambitions to grow this side of their business. INPUT continues to forecast growth, very moderate growth for the services sector, though product business might take market share from projects' business.

Traditional large systems equipment vendors have come under severe financial pressure as customers change their buying habits and shift their primary investment focus away from central computers and towards distributed application solutions, open systems and end-user responsibility. These vendors face a huge challenge in transforming the financial balance o their businesses to reduce overheads; witness their recent heavy cut-backs.

With the software and services market growth down to single figures, will this challenge prove too much for the dominant computer equipment vendors? Will the more highly valued software and services vendors take over as the IT industry leaders?

This scenario assumes that the trends apparent over the last ten years - the slow demise of equipment vendors as the dominant market force - will be reversed in the next ten. This is a controversial scenario given current customer and press opinion. Most analysts seem to be forecasting that this demise will continue at an accelerated rate.

INPUT bases its scenario on the perceived strengths of the equipment vendors as their customers look for partnership with vendors that can help

manage the implications of ever more complex information systems technology. Strengths include those such as long-term financial stability, access to marketing channels, and ability to develop easy-to-buy products out of complex high-technology components.

Product Business Will Grow at the Expense of Project Business

Research among IT managers in the second half of 1992 suggests that, on average, they do not expect any further trend towards spending more on software and services. Despite this, INPUT's analysis predicts that the balance is still strongly in favour of more use of products and services, as well as a greater proportion of the IT budget being used to purchase solutions from outside. The trend for many IT decisions to be taken outside of the IT department, and the need felt by many businesses to cut their overall IT budgets, will stimulate more software and services business; however, this is not necessarily the case for custom software development.

Below are the growth rates experienced for software, services and maintenance during the 1980s and INPUT's prediction for the 1990s. The compound average annual growth rates (CAGRs) for the whole market for each period show a very rapid decline:

5-Year Period	CAGR (%)
1981-1986	20
1986-1991	19
1991-1996	9
1996-2001	6

Exhibit II-1 divides the market among the major groups of vendors. It illustrates the fall in market share among equipment vendors during the 1980s and the likely rise in their share in the 1990s at the expense of their independent competitors. It normalises each year to 100%, so that overall market growth differences are removed.

INPUT does not expect growth rates to recover significantly when the recession eases. The lessons learnt by those purchasing software and services seeking value for money and business benefits will not be forgotten.

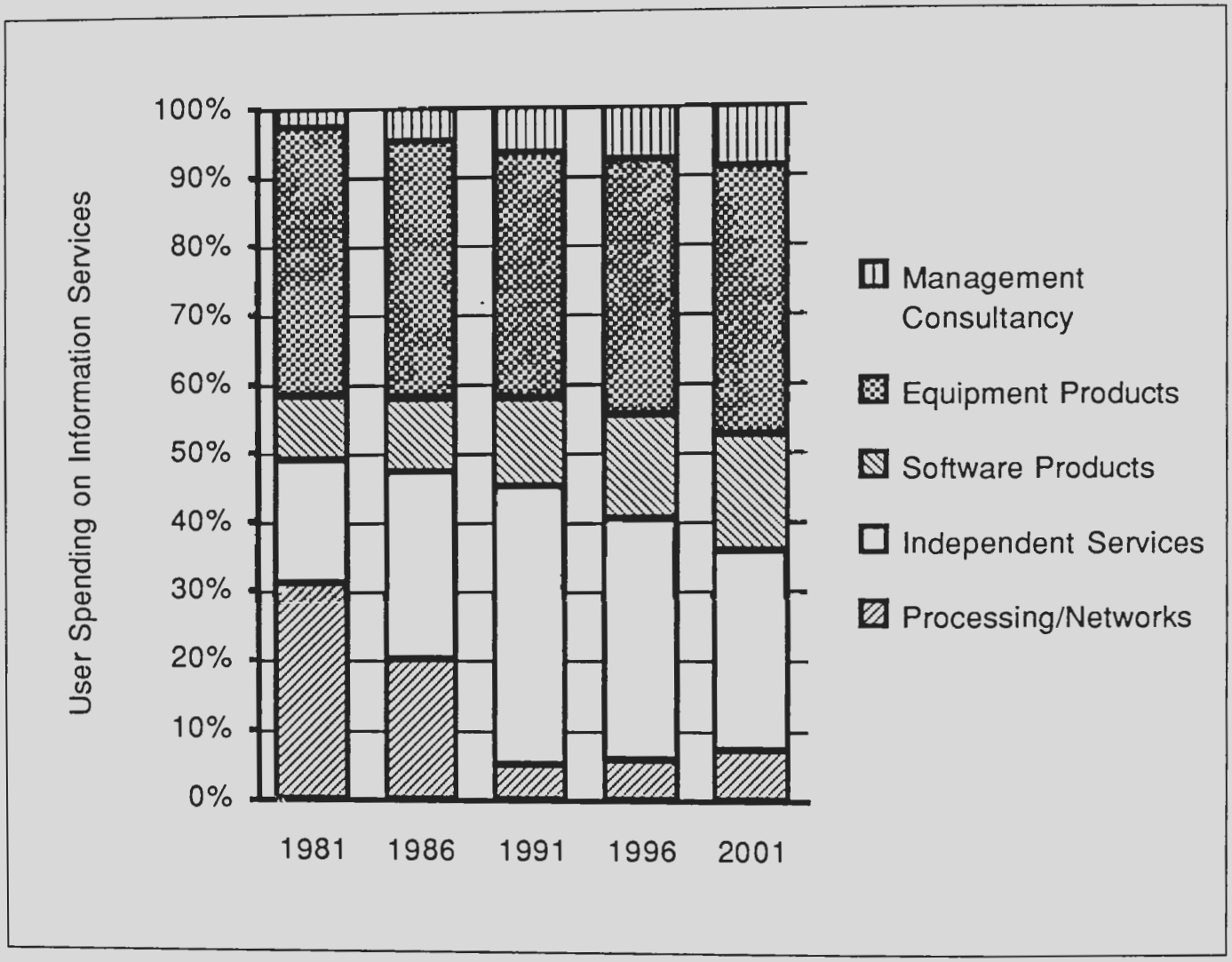
Management consultancies have experienced a severe hesitation in market demand in the past year. However, their skills will continue to be required in the business re-engineering, cost cutting and general transformation resulting from today's recessionary pressures.

The future for equipment product vendors looks positive only as long as they can maintain an image as the "safe" suppliers and can re-orient themselves to be responsive to new customer demands for application

support and high-tech systems management. Responsiveness is probably their biggest weakness in the face of younger, faster vendors from the other sectors. Today it is difficult to see how some of them will achieve this, but INPUT believes that as a group they will re-establish themselves as the dominant force in the market.

EXHIBIT II-1

Market Shares by Vendor Type, Information Services, Europe, 1981-2001



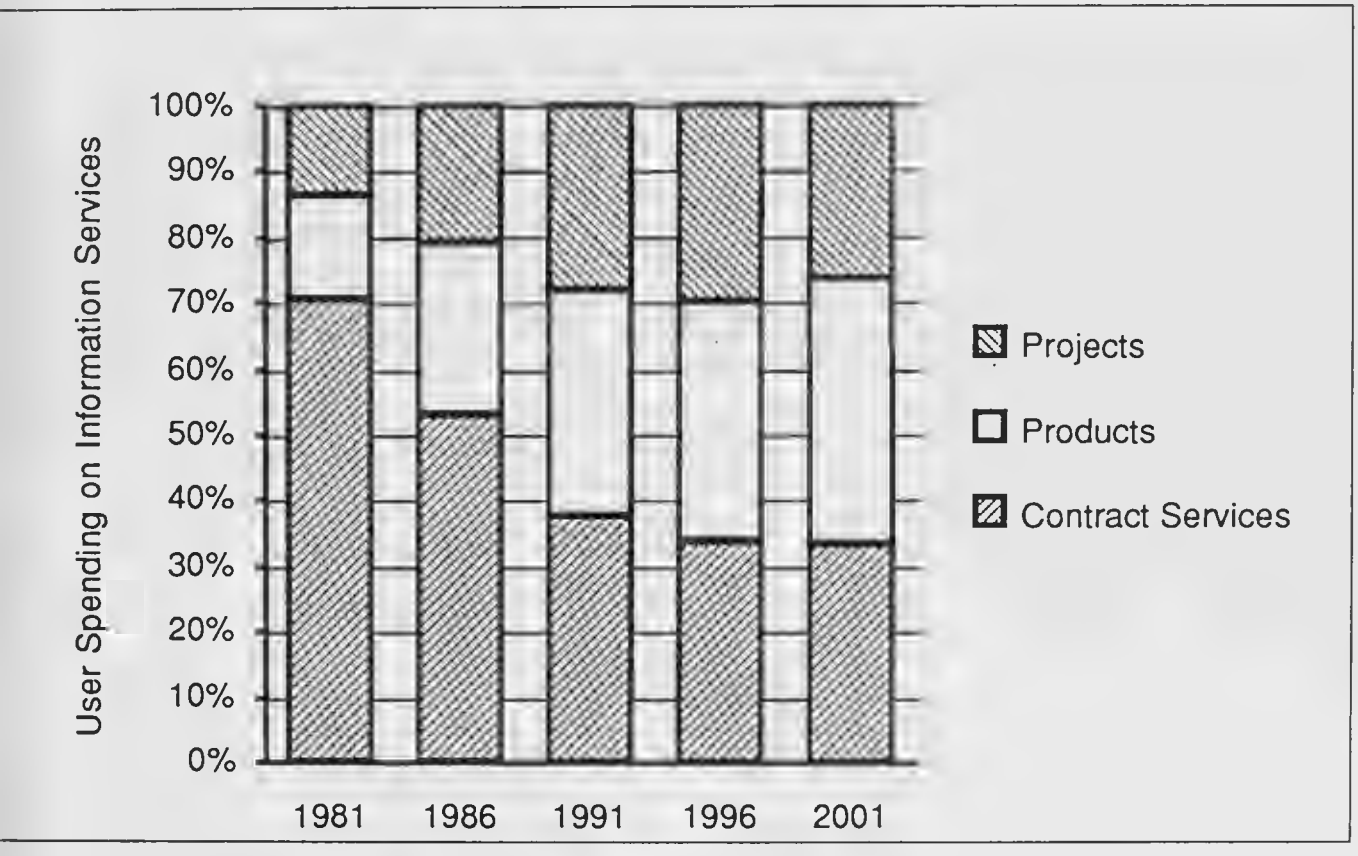
The value sought by customers is turning away from the professional service vendors' traditional strength of custom software development. The firm basis of these businesses has been the development of custom software, either in the form of projects or in the supply of contract staff to clients. These services have come under threat as software packages become more and more popular, and as customers restrict their use of external staff in a period of economic recession.

Software product vendors are expected to continue their consolidation around the most successful brand names. The market entry of the Telecom companies helps the processing and networking share to hold up during the 1990s.

Exhibit II-2 shows a simple form of product mix comparison. This illustrates the same two decades, also normalised to a full 100% scale. In this case the comparison is the market share by classification of different business styles: projects, products and contracted services.

EXHIBIT II-2

Market Shares by Business Style, Information Services, Europe, 1981-2001



- Projects - includes the majority of professional services, that element of turnkey systems, and the whole of systems integration. Projects tend to have a unique specification and completion date for each customer. The scenario assumes an overall decline in the share of projects in the 1990s, strongly contrasting to its rapid growth during the 1980s.

- Products - covers both software and services sold as products - systems and applications packages, the bulk of turnkey systems, and education and training. Products are generally available "off-the-shelf" and are sold in identical form to many customers. The process of productisation is expected to take market share away from the projects segment. What

form these products will take is still an open question. For example, it seems unlikely that the catalogues of new services now being produced by the equipment manufacturers will really make software and services easier to buy. However, INPUT expects their product development skills to win them more market share in the future.

- Contract services - include systems operation, network, processing and equipment services. They are usually characterised by a continuous renewable contract with agreed levels of service and response time. Processing and equipment services are the two delivery modes which have significantly decline in market share in the past decade. The strong trend to outsourcing in Europe is halting further overall declines in contract services.

The subsequent restructuring of staffing profiles and functions, both within the vendor community and in-house IS departments, is unsettling the whole industry with reduced profits, or losses, and widespread staff lay-offs.

There is little real growth expected except in niches such as systems operations or systems integration. The focus for all vendors is now on how to win profitable market share at the expense of competitors. This fiercely competitive environment should not be considered as a passing phase. From today this situation is normal.

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III Market Scenario and Forecasts

A
The European Recession - Reshaping the IT Industry

The gloomy business climate resulting from recession in Europe is combining with the major transformation occurring in the IT industry to make future predictions less and less certain. In this climate of change, value and profit for vendors and their customers have moved rapidly from hardware and systems software to applications and services. But even here the high growth rates experienced in the past are now just history.

Traditional large systems equipment vendors such as IBM, Digital, Unisys, Siemens Nixdorf, Bull and ICL have come under severe financial pressure from customers who change their buying habits and shift their primary investment focus away from central computers and towards distributed application solutions. These vendors face a huge challenge in transforming the financial balance to of their businesses; witness their heavy staff lay-offs and reductions in development spending.

Will this challenge prove too much for the dominant computer equipment vendors? Will the more highly valued software and services vendors take over as the industry leaders?

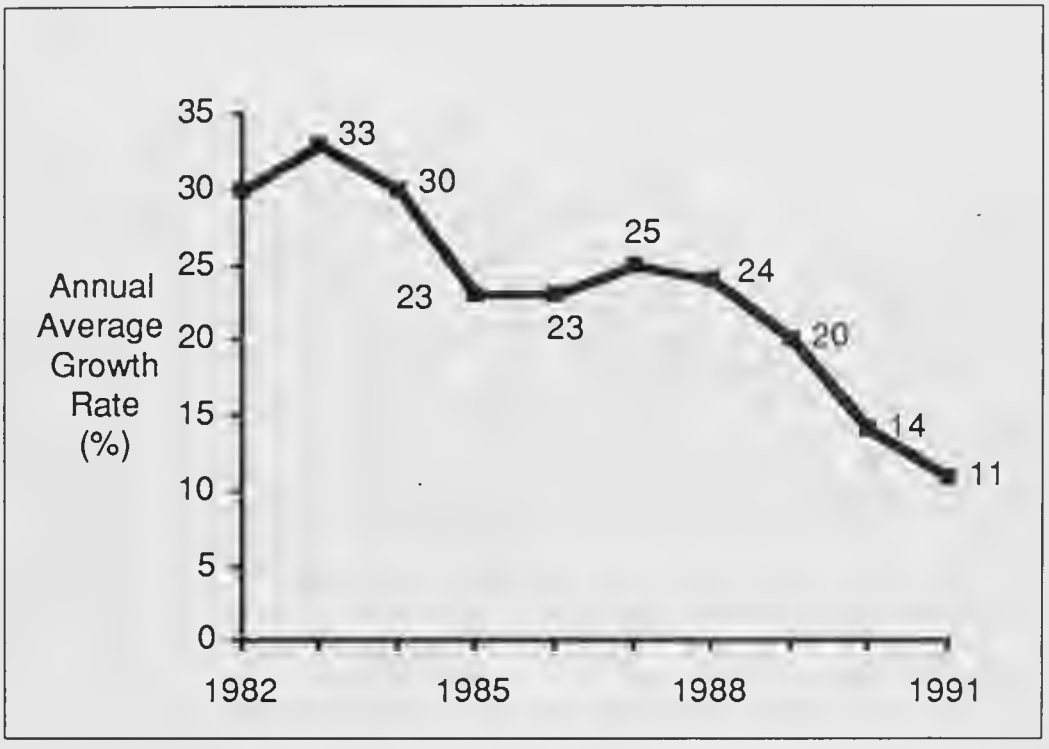
This scenario assumes that the trends apparent over the last ten years - the slow demise of equipment vendors as the dominant market force - will be reversed in the next ten. This is a controversial scenario given current customer and press opinion. Most analysts forecast that this demise will continue at an accelerated rate.

INPUT bases its scenario on the perceived strengths of the equipment vendors as their customers look for partnership with vendors who can help to manage the implications of more complex information systems technology. Strengths such as long-term financial stability, access to marketing channels, and the ability to develop easy-to-buy products out of complex technology.

European user spending on software and services, excluding maintenance, increased only 7% in 1991 and is expected to reach only 5% in 1992 - discounting the effects of inflation and exchange rate movements. Exhibit III-1 illustrates the fall in demand growth from 1981/2 to 1990/1, showing average European growth rates year by year including inflation.

HIBIT III-1

Average Market Growth in 1980s for Software and Services, Europe



Note: Excludes equipment services

This analysis questions the wisdom of the IT industry's headlong rush to switch from hardware products to software and services. Such low growth is bound to result in still more restructuring and staff cut-backs for both users and vendors.

The trend for users to switch spending from hardware to software and services continues. But there has been a continuous slow down in IT budget growth and steady improvements in IT staff productivity. As a result from the past six years, there has been a decline in software and services growth from a high 33% recorded in 1983 to only 11% in 1991. In the longer term INPUT sees no reason to forecast much improvement in growth prospects. The lessons learnt during recession by user/buyers about IT effectiveness and the value for money are not going to be unlearned when the economic pressures ease off.

The implications for an industry which is continually improving the productivity of its staff between 10% and 15% per year are of an

increasingly competitive market environment. A revenue growth of 5% does not offer prospects for profit growth. As vendors focus their attention on market share, rather than merely seeking a profitable revenue growth as in the past, there will be further slimming down and consolidation of the IT industry. The inevitable conclusion is that there are still many more job-losses to come in the software and services business.

B
Why INPUT Continues to Forecast Growth in Europe

Research among IT Managers in the second half of 1992 indicates equal numbers predicting that they will spend less on external software whereas service vendors predict that they will spend more! Plainly they do not see much change in the status quo and many are positively encouraged by the wealth of new tools and methodologies that they can apply to in-house custom developments.

However, INPUT's analysis predicts that the balance is still strongly in favour of more use of products and services, and that a greater proportion of the IT budget will be used to purchase solutions from the outside of the IT department. This decision, along with the need felt by many businesses to cut their overall IT budgets, will stimulate more software and services business; though not necessarily in custom software development.

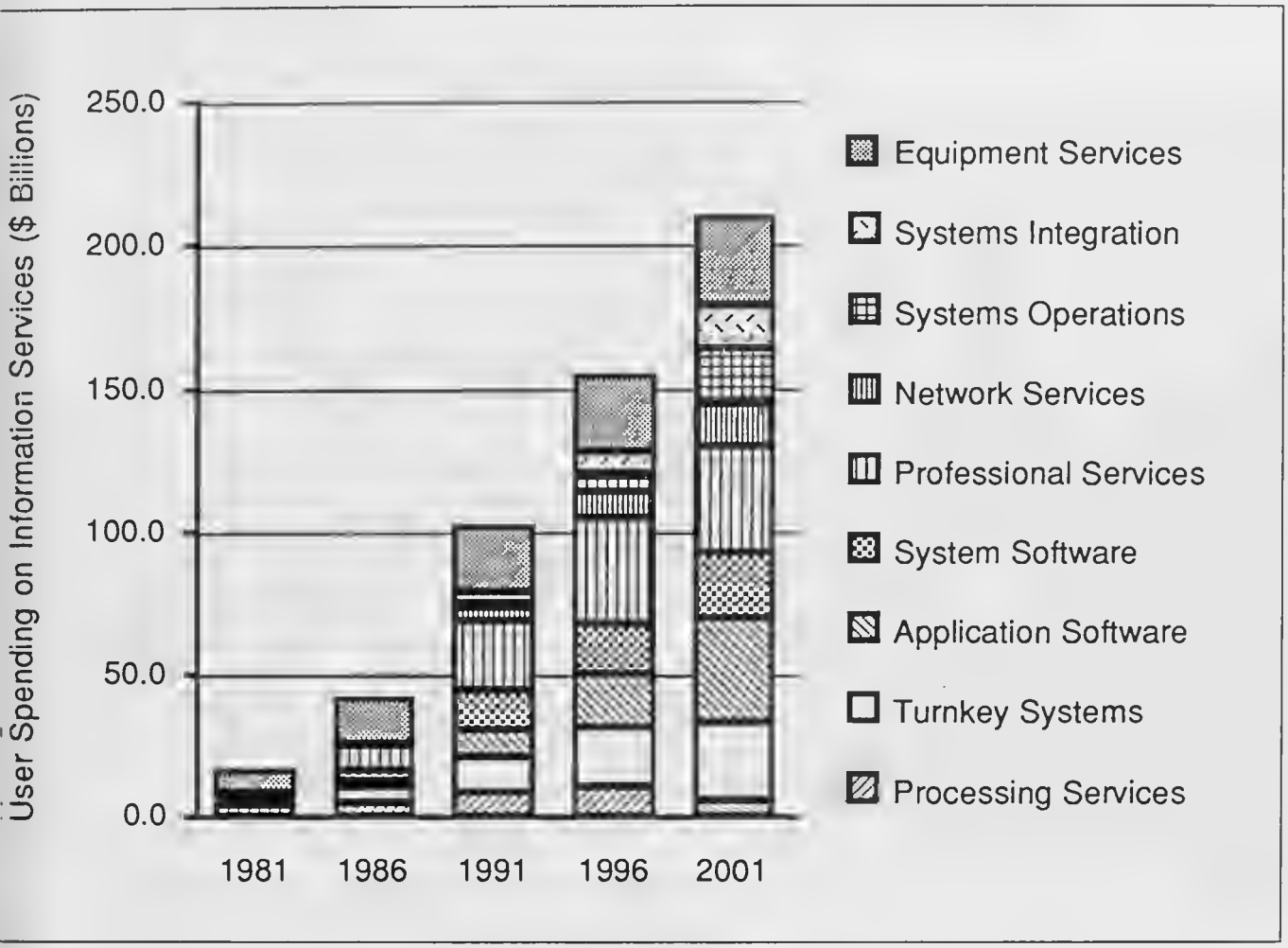
There is still some very healthy growth in the European Information Services market. In 1991, the best performing sectors in terms of delivery mode were:

- Systems operations - 1990-1991 growth of 22%
- Systems integration - 1990-1991 growth of 17%
- Applications software products - 1990-1991 growth of 15%
- Network services - 1990-1991 growth of 13%

Exhibit III-2 illustrates the extraordinary growth achieved by the industry in the last ten years, and INPUT's forecast for the next ten. Each of INPUT's delivery modes is shown.

EXHIBIT III-2

Market Size by Delivery Mode, Information Services, Europe, 1981-2001



At first glance the growth for each period in the exhibit looks similar. In fact, the CAGR for the whole market for each period show a very rapid decline:

Period	CAGR (%)
1981-1986	20
1986-1991	19
1991-1996	9
1996-2001	6

It is easier to analyse Exhibit III-3 if one pays attention to the relative growth or decline of the different sectors This conveys the same two decades, but normalised to a full 100% scale. Here the relative decline of equipment services and processing services can be seen as the other delivery modes rapidly grew in the 1980s.

EXHIBIT III-3

Market Shares by Delivery Mode, Information Services, Europe, 1981-2001

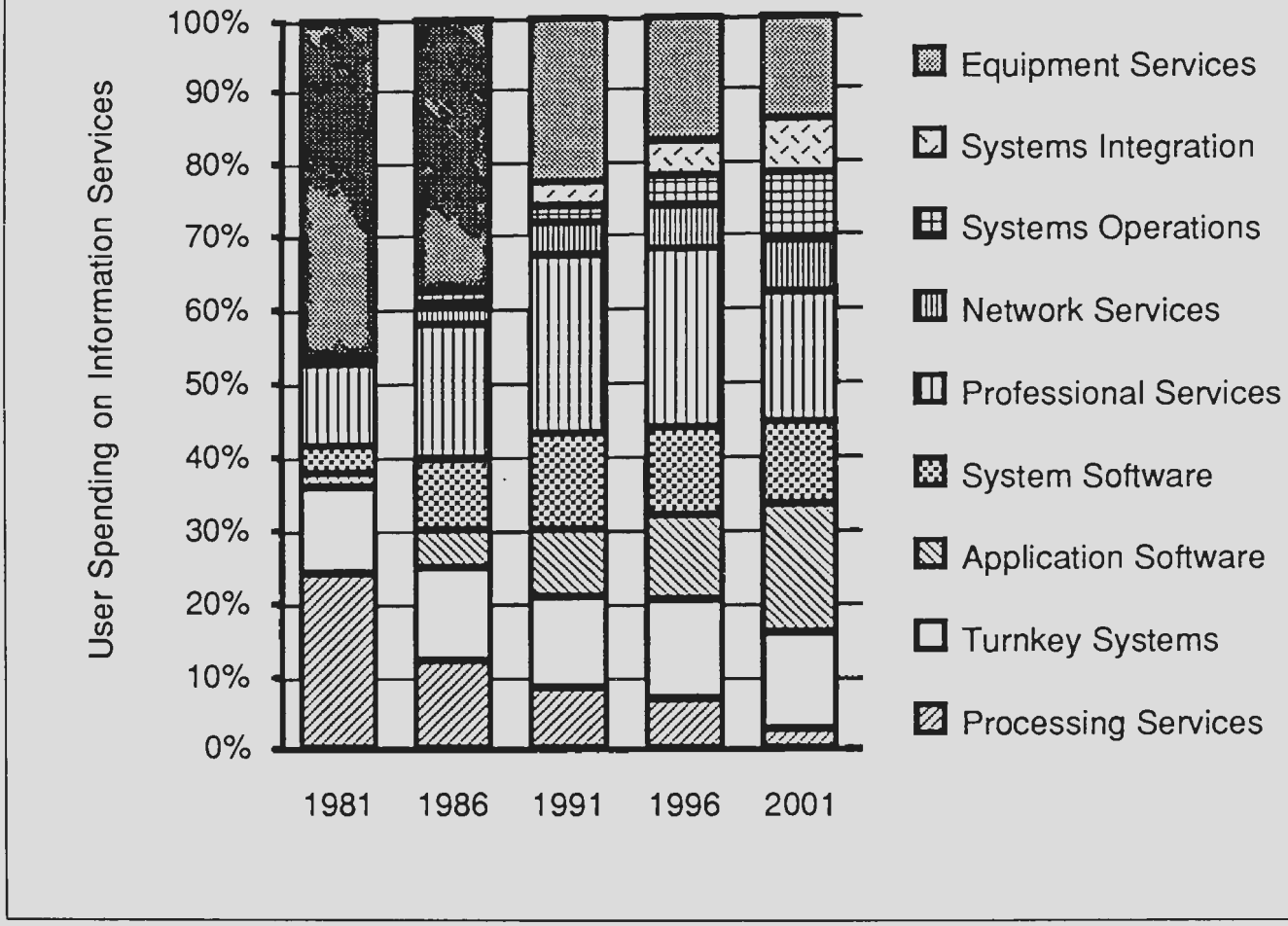


Exhibit III-4 shows a simpler form of comparison. This illustrates the same two decades, also normalised to a full 100% scale. In this case, the delivery modes are replaced with a classification of different business styles:

- Projects - includes the majority of professional services, that element of turnkey systems, and the whole of systems integration. Projects tend to have a unique specification and completion date for each customer. The scenario assumes an overall decline in the share of projects in the 1990s in strong contrast to its rapid growth during the 1980s.

- Products - covers both software and services sold as products - systems and applications packages, the bulk of turnkey systems, and education and training. Products are generally available "off-the-shelf" and are sold in identical form to many customers. The process of productisation is expected to take market share away from the projects segment. What form these products will take is still an open question. For example, it

seems unlikely that the catalogues of new services now being produced by the equipment manufacturers will really make software and services easier to buy. However, INPUT expects that these product development skills will win the businesses more market share in future.

- Contract services - include systems operation, network, processing and equipment services. They are usually characterised by a continuous renewable contract with agreed levels of service and response time. Processing and equipment services are the two delivery modes which have significantly declined in market share over the past decade. Further decline of overall contract services is being halted by the strong trend to outsourcing in Europe.

EXHIBIT III-4

Market Shares by Business Style, Information Services, Europe, 1981-2001

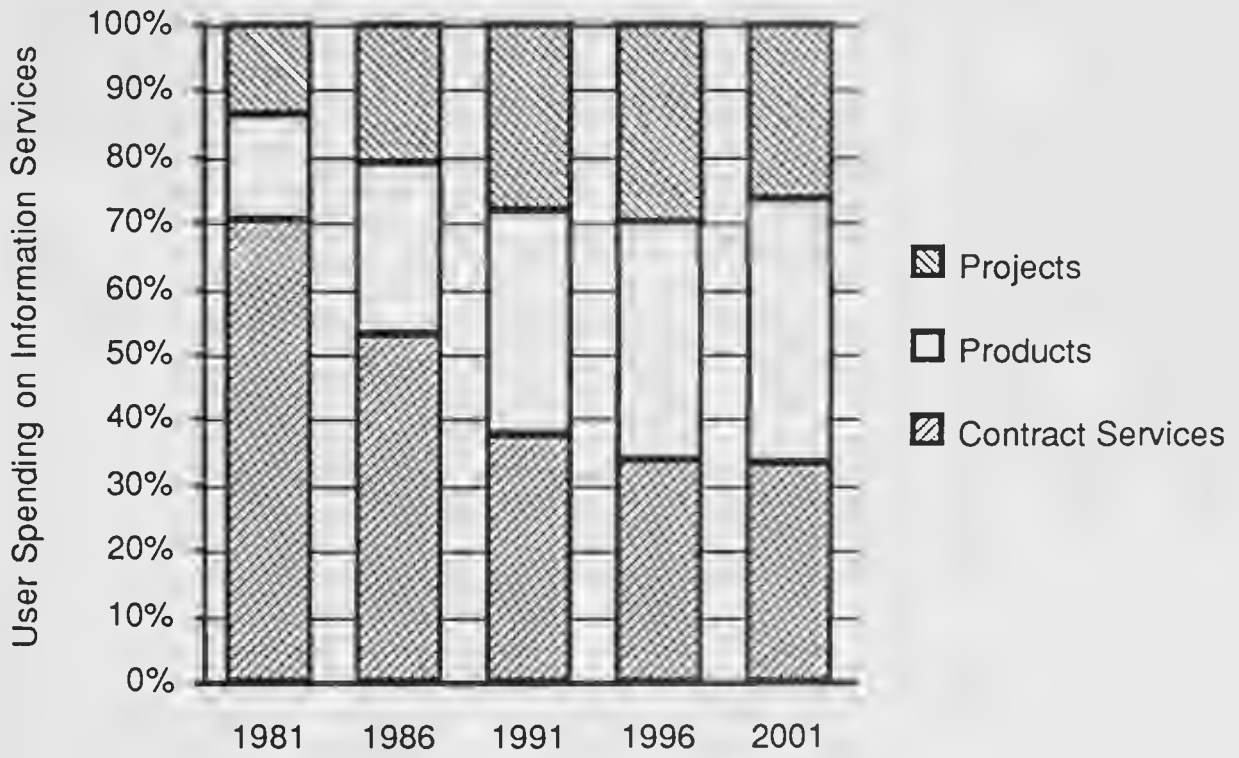


Exhibit III-5 shows the actual market values used to create these charts. These are INPUT's latest forecasts for the period from 1992, with actual historical figures for earlier years from INPUT studies published over the past decade.

EXHIBIT III-5

Market Size by Delivery Mode
Information Services, Europe, 1981-2001

	$ Billions				
Delivery Mode	1981	1986	1991	1996	2001
Processing Services	4.0	5.1	8.5	10.3	6.1
Turnkey Systems	2.0	5.2	12.6	20.9	26.7
Application Software	0.3	2.2	9.5	18.2	36.6
System Software	0.6	4.1	13.2	18.2	23.2
Professional Services	1.9	7.6	24.5	37.2	37.2
Network Services	0.0	0.9	4.4	9.3	14.9
Systems Operations	0.0	0.4	2.3	6.2	18.9
Systems Integration	0.1	0.5	3.5	7.8	15.7
Equipment Services	7.8	15.8	23.2	26.6	30.0
Total (rounded)	**17**	**42**	**102**	**155**	**209**

Of particular note in the forecast for the next decade is the predicted strong growth in packaged solutions - a combination of turnkey (off-the-shelf) solutions which include hardware, and software package products with bundled services.

Systems operations are also expected to continue increasing in popularity as outsourcing takes a strong hold in European countries other than France and the U.K. In 1992, desktop services have established themselves as a high-growth sub-sector. INPUT's research conveys that the complexity of managing large populations of desktop systems is creating demand for outsourcing all aspects of this workload. Similarly, application software maintenance is a small but high-growth sub-sector as vendors begin to diversify into the management of their customers' in-house-developed software.

The most vulnerable delivery mode is clearly professional services. The exhibits show a rapid decline in market share. This is expected to result from the slow demise of customer demand for custom software development, and to the emphasize the movement to integration, operations and business process analysis. These points are expanded upon later in this chapter.

Although recession is a primary cause of these changes, there is also an underlying saturation in market demand. This saturation results from a loss of confidence, among user management, that past IS investment has turned into a satisfactory return. So what are the main factors driving such a dramatic turn-around in the software and services sector? Who will survive

such a tidal wave of change? Exhibit III-6 identifies the main causes and expands on these reasons in the following text.

XHIBIT III-6

Forces of Change in Software and Services, Europe

- Popularity of Open Systems
- End-user purchasing
- Slow demise of custom software
- Fierce Competition

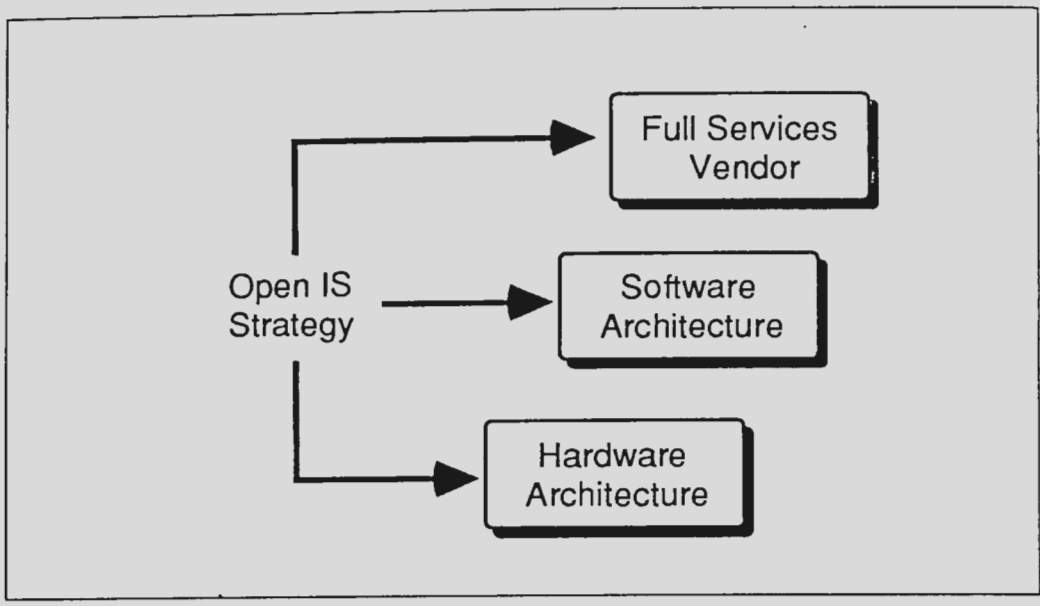
opularity of "Open Systems" in Europe

Open systems is a term which was intended to put users in the driving seat of the IT market rather than vendors. In Europe, it was the national governments who were quick to adopt many of the open standards produced by the industry in the mid 1980s - especially UNIX. In many ways, the open movement was intent on removing IBM from its dominant position in the IT market. Open systems were an alternative from buying IBM - and any of the other major proprietary operating system and network vendors.

Then every vendor joined in to offer open products conforming to standards, which devalued the meaning of open systems. Open systems is now starting to mean merely a greater freedom to choose between hardware, software or services vendors. Exhibit III-7 demonstrates how an open IS strategy leads to purchasing policies relating not only to hardware or software architects and vendors, but also to preferred service vendor selection. In many cases; however, it offers customers the chance to downsize systems. Yet above all else it offers customers the ability to "rightcost" (that is to get best value and benefit for their business).

EXHIBIT III-7

Impact of Open Systems on Vendor Selection



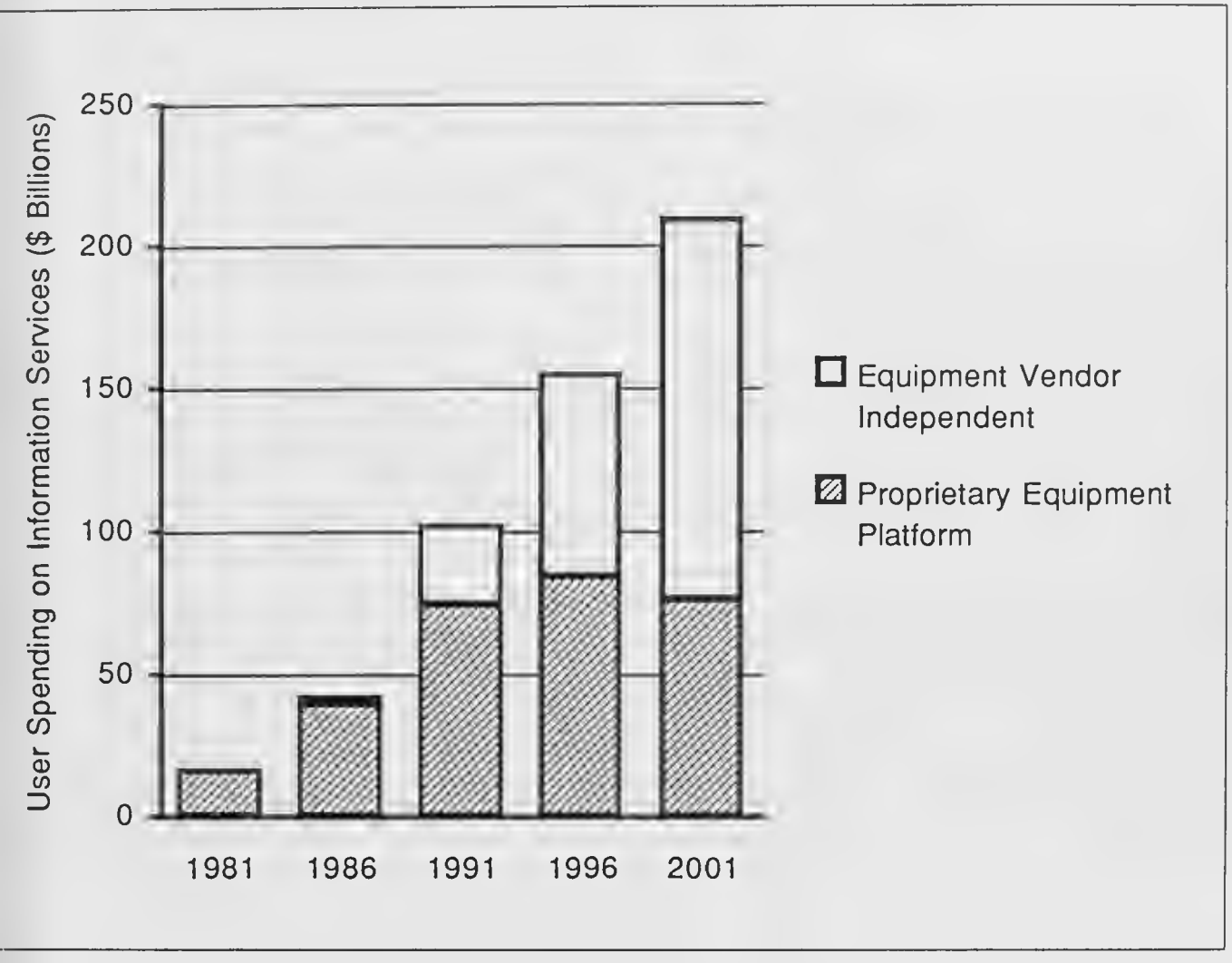
If this definition of open systems - as those which provide reasonable choices of vendor - is accepted, then much more than X-Open or ISO standards conformance can be included. Many consider the PC to be an open environment, some would even include the plug-compatible IBM mainframes.

The adoption of open systems occurs in natural corners of the market. Examples include the workstation sector, the PC/LAN server, office systems, large organisations downsizing their IT budgets, small business systems, mini-based distributed application platforms, and about half of Europe's large scale systems integration projects.

Exhibit III-8 illustrates the impact that this growth in "open" hardware sales is having - and will have - on the services sector in INPUT's scenario. A very broad definition of "Open Systems" information services would include: software, services and maintenance, which are independent of proprietary equipment platforms. Within ten years INPUT expects this label to apply to the majority of information services in the market as shown for the year 2001.

EXHIBIT III-8

Impact of "Open Systems" on Information Services, Europe, 1981-2001



Although proprietary replacement systems are still being delivered in volume, practically all *new* systems equipment sales are now open, with proprietary platform sales decaying rapidly (except for IBM's AS/400). This is leading to a highly competitive and shrinking hardware market. In turn, this is pushing all equipment vendors to boost their software and services business as much as possible as they seek the maximum share of their customers' IS budget.

Exhibit III-9 provides the data used to create the previous chart. It shows the assumptions made in the progress of equipment in independent markets by delivery mode. Application products, professional services, systems integration and network services are expected to be the main areas of strong spending.

EXHIBIT III-9

"Open Systems" Market for Information Services, Europe, 1981-2001

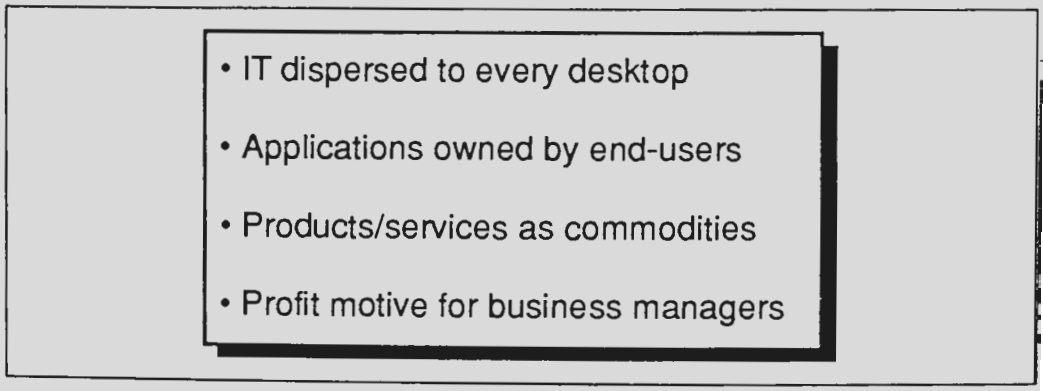
Delivery Mode	$ Billions				
	1981	1986	1991	1996	2001
Processing Services	0.0	0.0	0.0	0.5	2.0
Turnkey Systems	0.0	0.4	7.6	14.6	20.0
Application Software	0.0	0.2	6.2	12.7	27.0
System Software	0.0	0.3	3.7	7.5	15.0
Professional Services	0.0	0.4	3.7	18.6	26.0
Network Services	0.0	0.5	4.4	9.3	15.0
Systems Operations	0.0	0.0	0.0	0.5	9.0
Systems Integration	0.0	0.0	1.1	5.5	16.0
Equipment Services	0.0	0.2	0.5	1.1	3.0
Total (rounded)	**0**	**2**	**27**	**70**	**133**

D
The Move to End-User IT Purchasing

The gradual displacement of the IT department as the sole purchasing authority for IT is visible in most organisations. The main factors driving this change are listed in Exhibit III-10.

EXHIBIT III-10

Forces of Change in End-User Purchasing, Europe



Desktop computing is part of everyday jargon now - already half of all purchased equipment is probably installed away from the computer centre - in departments, on desks, on laps, in vehicles and at home.

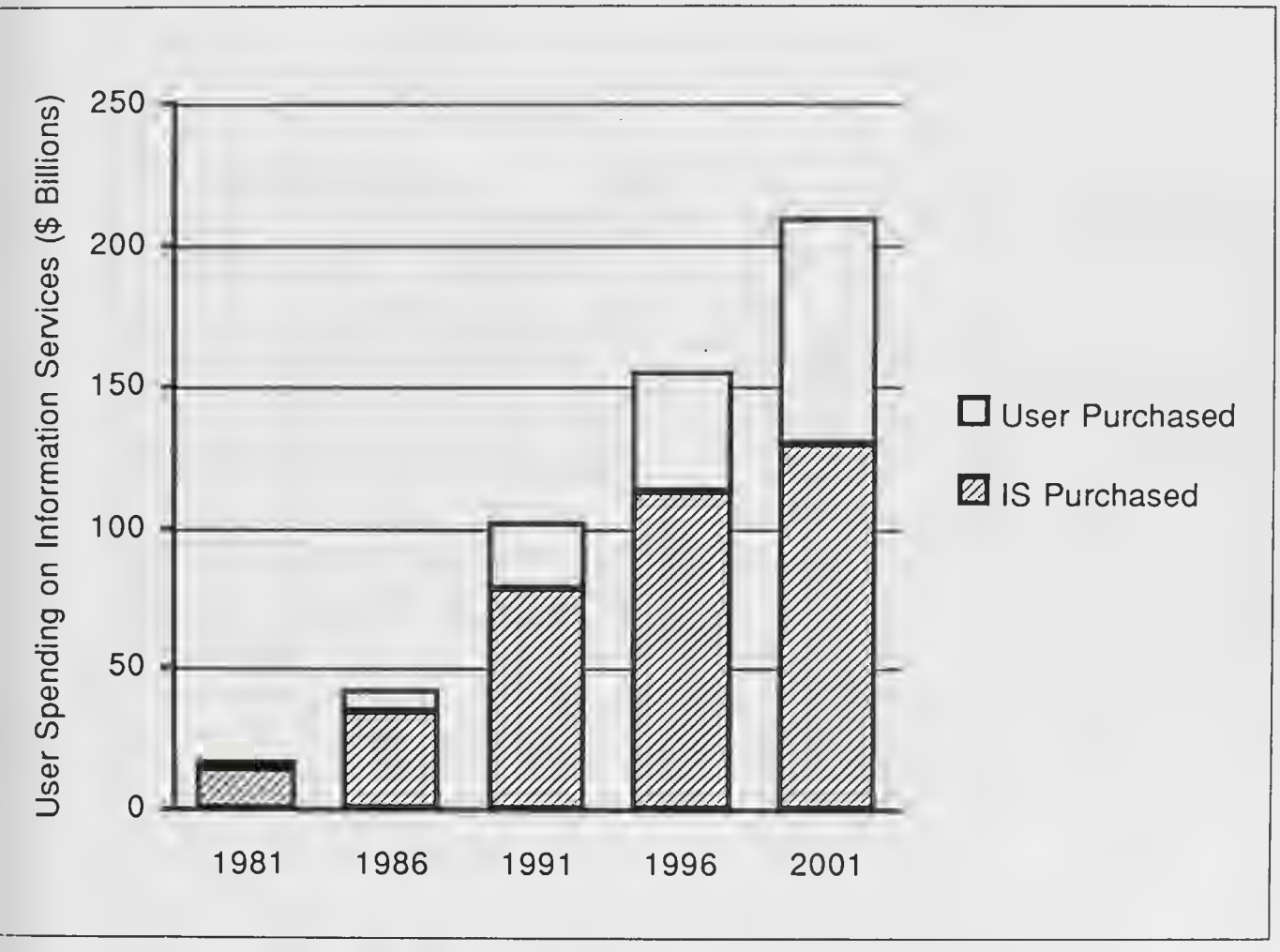
The end-users know more about the many departmental or personal applications than the IT department ever will. End-users are also learning that the service from IT experts improves if the end-users themselves

develop a strong sense of ownership for applications - even those end-users who are managed by the computer department. If they pay directly for the level of service that they need, they can ensure that their investment is worthwhile.

Exhibit III-11 shows INPUT's scenario for the effects of this trend to End-User Purchasing on the purchase of software, services and maintenance to the year 2001.

EXHIBIT III-11

Impact of End-User Purchasing of Information Services, Europe, 1981-2001



Product developers and technologists constantly create products and services that are easier and cheaper to buy. As more IT products become commodities in price, volume and distribution so they become easier for non-IT people to buy. The need to involve IT experts in their purchase decreases.

The trend to devolve management responsibility to business units is also encouraging end-user management to get involved in the justification of IT

purchases and in measuring their contribution to the business unit's operations. IT systems purchases are both encouraging and following this trend to dispersed management and local profit centres.

By the year 2001, INPUT expects that the typical IT department will retain responsibility for only half of all IT purchases, although they will remain responsible for IT strategy and infrastructure systems. This will result in about 35 to 40 percent of information services being purchased by user management, rather than an IT department, compared to only 23% in 1991.

The scenario for this Exhibit was produced by:

- forecasting the proportion of each of INPUT's nine delivery modes in Europe, which would be attributed to end-user purchasers
- calculating the actual attributable end-user market for each delivery mode from INPUT's forecasts
- combining these revenues to show the size of the overall information services market attributable to end-users and IS departments.

Exhibit III-12 shows the assumptions used for end-user purchasing within each delivery mode to generate the above chart.

EXHIBIT III-12

End-User Market Size by Delivery Mode Information Services, Europe, 1981-2001

	$ Billions				
Delivery Mode	1981	1986	1991	1996	2001
Processing Services	1.0	1.4	2.4	3.1	3.1
Turnkey Systems	0.9	2.6	6.9	12.5	21.4
Application Software	0.1	1.1	5.2	10.9	29.3
System Software	0.1	0.5	2.1	3.6	7.0
Professional Services	0.1	0.4	1.6	2.7	3.9
Network Services	0.0	0.6	3.1	6.5	8.9
Systems Operations	0.0	0.0	0.2	0.5	2.8
Systems Integration	0.0	0.0	0.0	0.0	0.0
Equipment Services	0.4	1.0	1.6	2.1	3.0
Total (rounded)	**2.6**	**7.6**	**23**	**42**	**79**

Turnkey systems and application software products are the primary contributors to this trend. Most other sectors will continue to benefit from the expertise of the internal IS management and staff; though INPUT detects a tendency for their role to become more strategic and consultative as they

move away from a software development function into a business support role.

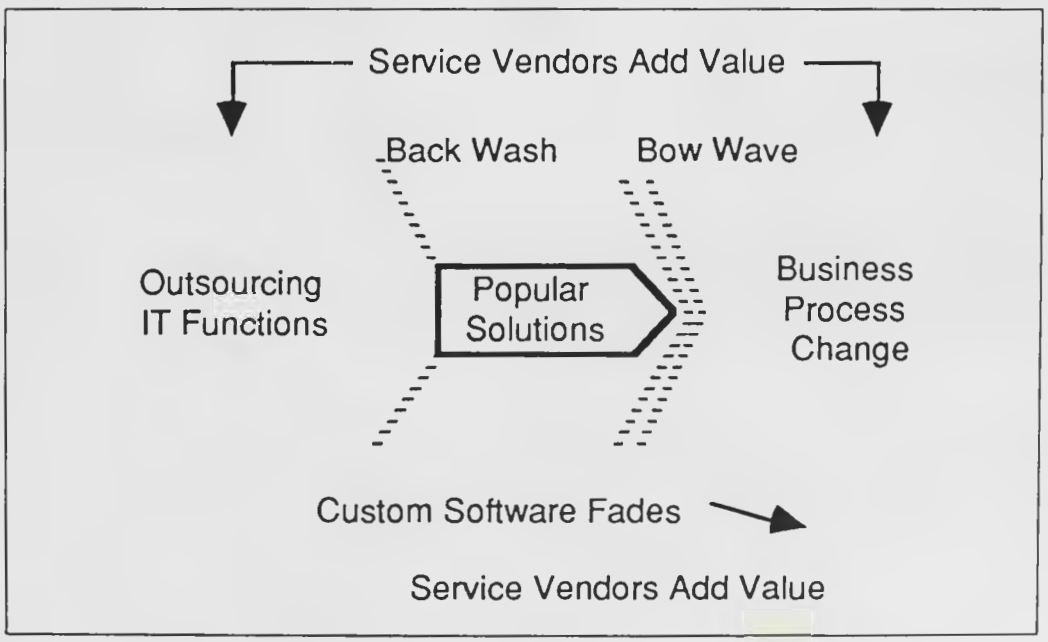
The Tidal Wave of Change for Custom Software Developers

The traditional IS department, and the traditional professional service vendor founded themselves on the capability to develop custom software to meet unique systems and application needs. The escalating cost of employing such skilled labour, the arrival of re-usable software - either as application packages, as structured programs or as object oriented software - and the lack of funding due to the cost of maintaining old software, are all leading to the slow demise of requirements for custom software. There is no longer an unlimited demand for custom development by teams of analysts and programmers.

The growth in function-rich software packages - popular standards - both within the IS department and at the desktop is leading to a dramatic change in the need for IT skills. Exhibit III-13 illustrates the effect of this rapid move to popular solutions.

EXHIBIT III-13

The Tidal Wave of Change in Information Services



As the demand for custom software fades, three other requirements become important:

- Linking IS needs to new business processes
- Integrating standard solutions for maximum benefit
- Operating the computer systems more cost effectively

The rise of popular solutions is creating a bow-wave by demanding a stronger relationship between IS systems and the business processes relevant to today or tomorrow's business. IS departments and professional service vendors need to bridge the gap between business process needs and the supporting IS requirement in order to add real value to the available standard products.

Systems integration skills relevant to today's client-server technology are scarce and expensive to recruit. It is natural for many organisations to seek such capabilities from an external vendor.

The concept of outsourcing has been successfully applied to systems operations for over five years in Europe. INPUT researchers identify a continued rapid growth in demand, particularly stimulated by the transition to open systems and the desire to let third parties manage the support of systems which will eventually be replaced.

F
The Battle for Vendor Market Share

Software and services market shares are under threat. Over the last few years the equipment vendors have pushed software and services business to recover lost hardware margins, to retain control of major accounts and to counter stagnant maintenance revenues. What effect is this having on the market in Europe?

Bright prospects for the software and services market in Europe continue to attract competitors from other business sectors. Telecommunications vendors, equipment distributors, third party maintainers, and network service vendors have all achieved visible market shares from nowhere over the past decade. Most impressive has been the progress made by management consultancies as they have broadened their portfolio further into IT-related services.

The following paragraphs single out some key characteristics of the important vendor groups serving these delivery mode sectors.

1. Equipment Product Vendors

The emphasis being placed by equipment vendors on their software and services offerings is well publicised. Over the last ten years they have typically increased such revenues tenfold while user spending in the market has grown by a factor of eight. This apparent increase in market penetration seems to have resulted in some cases from the unbundling of software and services from equipment charges. Thus, although unbundling has contributed to market growth, it may have been for software or services for which there were few or no real alternative sources.

The equipment maintenance market has only experienced modest growth in the last decade (14% in 1980 falling almost to zero today). So despite improving their software and service position, the equipment vendors' overall market share has fallen, as shown in Exhibit III-14 ,which compares to 1981, 1986 and 1991 positions.

As a group, the equipment vendors have not performed as well as perhaps expected. This has led to a significant loss of confidence among customers. When questioned by INPUT as to which vendor group was likely to be most successful in future, their customers all ranked the equipment vendors potentially the least successful.

Despite this, once again, INPUT's analysis concludes differently. The vendors' financial strength, their control of channels to market, and their ability to productise new technology, all suggest that they will win in the long term against the lesser independent services vendors.

2. Telecommunications Vendors

During the 1980s, the British, German, French and Spanish PTTs (national telecommunications service vendors) set their sights on a share of the computer software and services market in response to de-regulation and the threat of competition especially from AT&T. Although all of them have large in-house IS capabilities, their impact in the open market has been minimal to date - around a 1% market share overall.

Several European PTTs have been active in acquiring software and service companies. France Telecom and the Italian SIT seem to have been appointed as guardians of national interest in their respective country's computer services sector. In the future these companies will most likely concentrate more on extending their networking capabilities from public to private networks, rather than competing outright for a major share of computer systems business. AT&T is particularly active with growth plans in Europe via both its NCR and Istel subsidiaries.

IT managers expect the Telecom vendors to be the most successful of all in the computer services sector due to the importance of networks, the de-regulation of the Telecom sector and the PTTs financial strength.

3. IT Distributors

As third-party distribution finds wider favour with the major product vendors, so the opportunity arises for distributors to offer added-value services and to establish the primary sales channels for software products. INPUT expects the distributors' market share to grow significantly from the 1991 estimate of 1%. Demand for new desktop services and the outsourcing of all such support is likely to fuel services growth for these vendors; especially those who provide responsive national or pan-European coverage.

4. Management Consultants

Perhaps the most important change in the shape of the European market has been the rise of the management consultants. Their IT-related business has grown around 20 times since 1980, giving them a 7% market share by 1991. This sector continues to grow as a threat to the traditional vendors, some of whom have attempted to expand into management consulting themselves, but with little success for those who have tried to do it organically rather than by acquisition.

Most vendors see management consulting as the most influential activity in creating demand further down the chain for computer products, systems and services. Recent announcements by both IBM and Digital indicate that they are developing their own capabilities in this area, as well as fostering alliances with many of the major management consultancies.

The big question mark for these new ventures centres is on the continuing perception of "independence" for the clients. Independent advice is valued much more highly than that offered by a vendor with an interest vested in the outcome. However ridiculous this perception may seem, at present it is a huge barrier to enter into this market by vendors from other sectors - e.g., equipment vendors. Will the next ten years see such vendors successfully positioning their consulting services in direct competition to the established independents?

5. Professional Services Vendors

This is the largest and the most fragmented group. It comprises most the traditional vendors - some 9,000 vendors operating in Europe with over a $100,000 turnover. They have prospered over the decade, but with real market growth falling below 10% in Europe, they will have to have a very clear market focus and strong management skills to hold off threats from the other vendors in the 1990s.

In times of rapid change software and service vendors face a lengthy list of difficult business and technical issues. Among those which will change the profile of the industry the most are: the need for industry sector skills; the move to full service strategies by the largest vendors; and the investment necessary in risk management skills and processes.

Exhibit III-14 shows the market share by type of vendor, how it has changed over the past decade with extraordinary growth, and how INPUT predicts it will change over the next decade of very modest market growth. The percentage figures show the approximate share of the whole market for each vendor group over the past decade. The total information services market of $100 billion in 1991 includes software and all types of services including equipment maintenance.

The vendors are grouped by their current business image and INPUT assumes that they will generally not change that image over the next decade. So, for example, however much software and service business an equipment vendor does, and however much he buys in products or acquires in professional service vendors, he is still assumed to be an equipment vendor for the purposes of this analysis.

There is increasingly fierce competition between the equipment vendors and the independent vendors for larger shares of near static user budgets. In the past, these two groups worked together primarily as allies. Today they find themselves competing for the same customer's budget.

EXHIBIT III-14

Market Size by Vendor Type, Information Services, Europe, 1981-2001

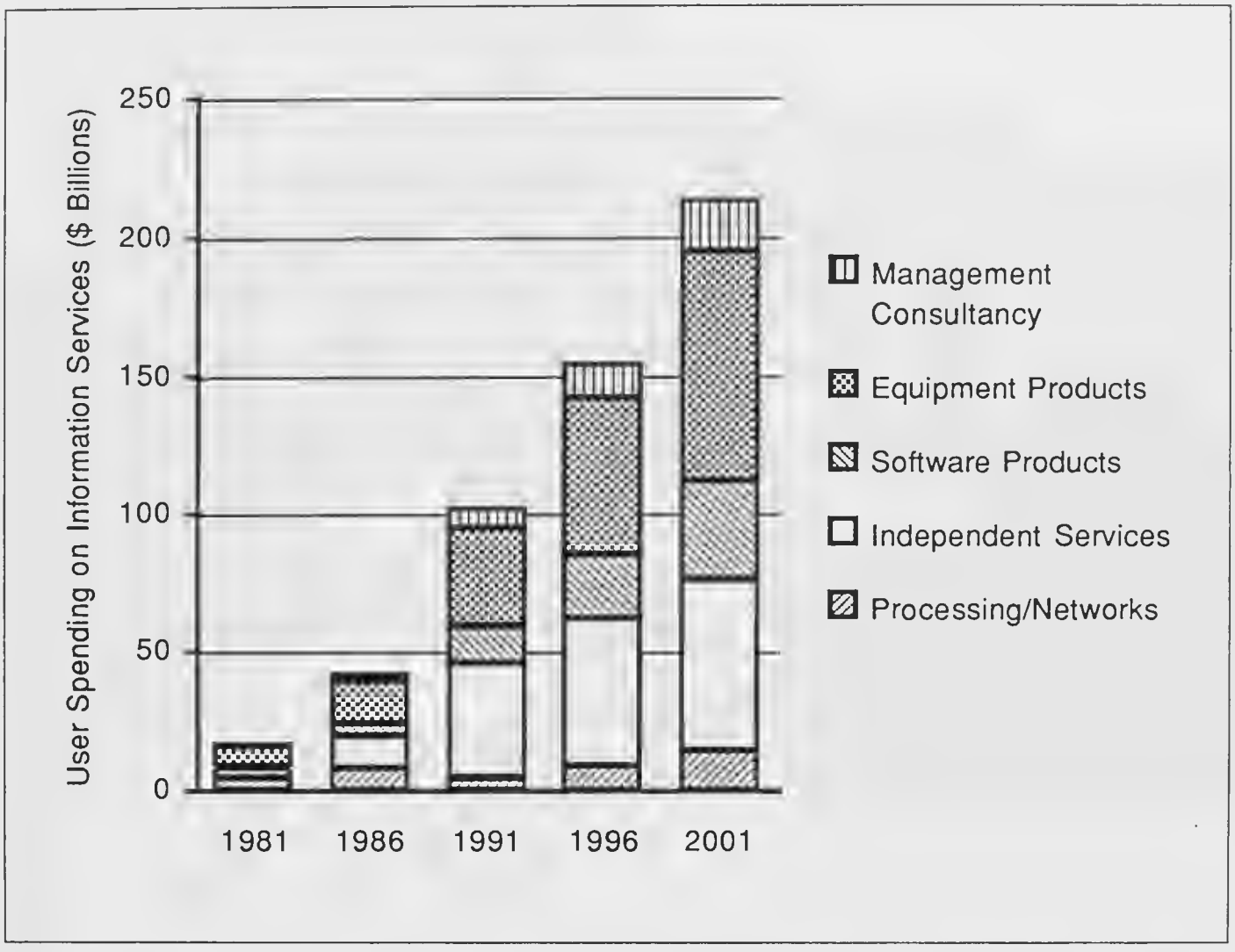


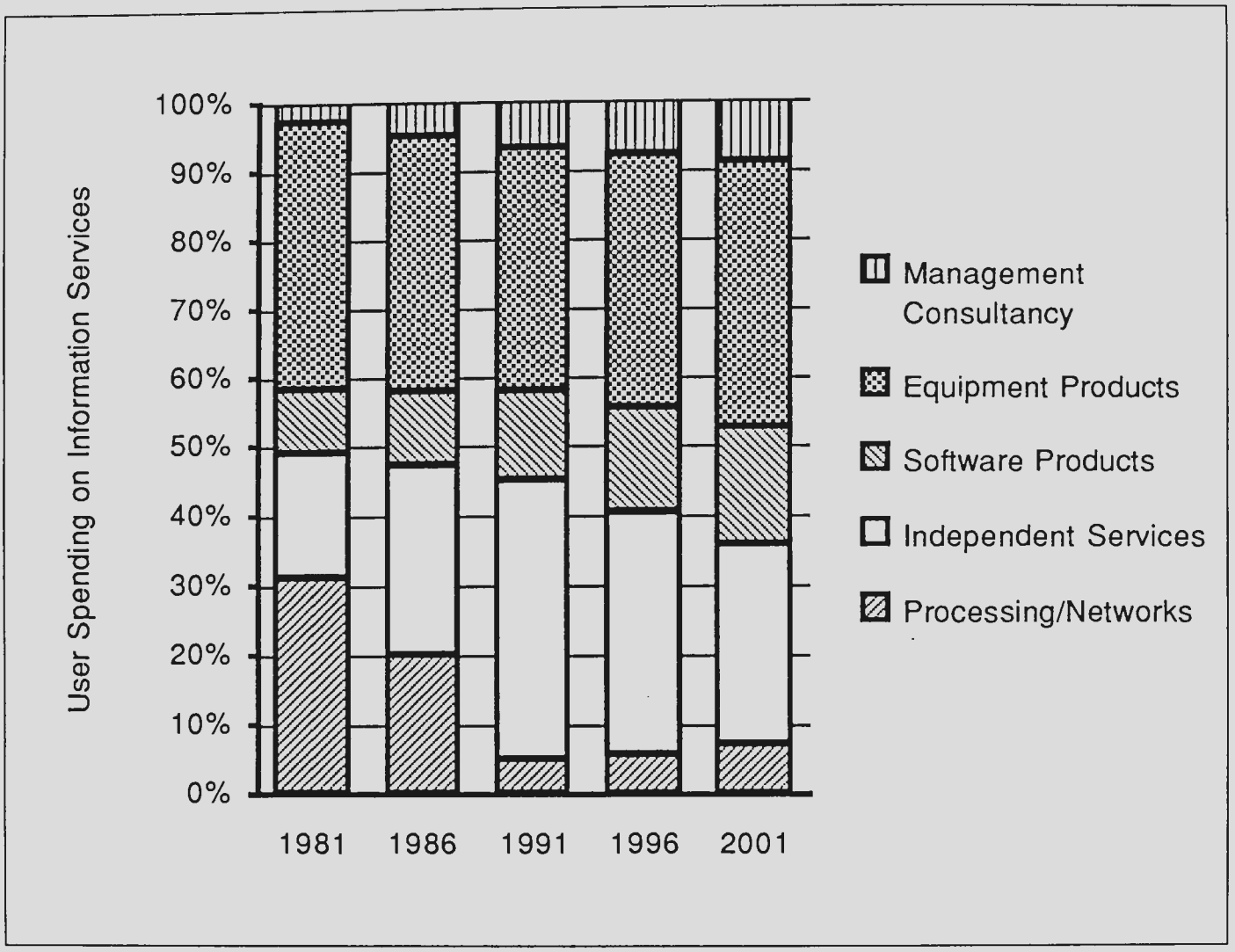
Exhibit III-15 illustrates the fall in market share among equipment vendors during the 1980s and the likely rise in their share in the 1990s at the expense of their independent competitors.

Management consultancies experienced a severe hesitation in market demand in the past year. However, their skills will continue to be required in the businesses of re-engineering, cost-cutting and general transformation resulting from today's recessionary pressures.

The equipment vendors, led by IBM, are reacting to these market changes with a stronger focus on software and services as the means of differentiating themselves in the product market. As a result, they deliver an added value to their customers by restoring profit margins and building on customer loyalty.

EXHIBIT III-15

Market Shares by Vendor Type, Information Services, Europe, 1981-2001



The future for equipment product vendors also looks positive as long as they can maintain an image as the "big/safe" suppliers, and can re-orient themselves to be responsive to new customer demands for application support and high-tech systems management. Responsiveness is probably their biggest weakness in the face of younger faster vendors from the other sectors. Today, it is difficult to see how some of them will achieve this goal, but INPUT believes that, as a group, they will re-establish themselves as the dominant force in the market.

Software product vendors are expected to continue their consolidation around the most successful brand names. Fierce price competition on open platforms will continue to increase the level of investment required to develop, launch and deliver a successful product that will reduce the huge number of different products and vendors. Control of channel to market will become the most key success factor.

For the independent vendors, the days of rapid market growth are over. Competition threatens to take market share. These independent professional service and software vendors, led by Cap Gemini Sogeti in Europe, are faced not only with new competitors, but also with a major wave of change in their business mix.

The value sought by customers is turning away from their traditional strength of custom software development. The traditional basis of these businesses has been the development of custom software, either in the form of projects, or in the supply of contract staff to clients. These services have come under scrutiny as software packages become more popular, and as customers restrict their use of external staff in a period of economic recession.

Larger players still acquire smaller ones, especially in preparing a local presence in Europe's country markets. Partners are also starting to behave as competitors do by diversifying into professional services.

The entry of the Telecom companies will help the processing and networking share to hold up during the 1990s. This is primarily the activities of the European and U.S. telephone companies, and major network services vendors such as Reuters.

During the past ten years, the computer software and services market in Europe has grown at a compound annual growth rate of 20%, and has increased over eight times in size and complexity. The industry will never see such rapid growth again, except in small innovative niche areas of the market.

Recession has taken a hold all over Europe since the Gulf war, with a severity which varies widely from country to country. The resulting financial constraints on IS budgets has compounded on existing financial crisis within the industry caused by the downsizing phenomenon. Desk-top computing, open systems and low cost networking have all quickened the pace of product cost-performance improvement. As a result, many product vendors have turned to services as a means of restoring margins and retaining account control.

The subsequent restructuring of staffing profiles and functions, both within the vendor community and in-house IS departments, is unsettling the whole industry with reduced profits or losses and widespread staff lay-offs.

G

Key Vendor Issue - Full Service or Niche Specialist

The leading vendors in the market, both independents and equipment vendors, all eye each other's unique skills or market position jealously.

These are vendors who have a pan-European or global presence, and are expecting to grow their service business faster than any other activity.

Services required in the market range in a variety of areas: from giving advice on how IT can improve the business, to fixing a faulty printer, from managing the operation of a dozen mainframes, to training end-users, from running a multi-million development project, to installing new software issues.

Management consultants, field service engineers, software experts and project managers are just a few of the special skilled individuals needed to meet the clients' needs for full service from his preferred supplier. Of course, few offer this diversity in skill, but many large vendors see it as a way of extending their market reach and establishing a more mutually profitable partnership with major accounts. The uppermost question is: "How do we get there from here"?

The vendors are dividing into two camps: those who can offer a "full service" globally to multi-national clients; and those who offer a "best of breed" niche composed of specialist services. The new strategies that many of the leaders adopt will face the huge cultural barriers from both staff and customers. However, many clearly believe that they have to become full service companies in order to survive and meet the needs of both clients and shareholders.

A Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programmes. The structure defined in Exhibit A-1 is also used in Europe and for the worldwide forecast.

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

For 1992 INPUT has added one delivery mode and defined three new submodes to its Information Services Industry Structure:

- *Equipment Services* has been added as the ninth delivery mode. INPUT has forecasted the equipment maintenance, support and related services market through its Customer Services Programmes for a number or years. Starting in 1992, the equipment services portion of the customer services market will be included in the total information services industry as defined by INPUT. Other portions of this market (such as software support) are already included.

- Two new submodes have been defined in the *Systems Operations* delivery mode - *desktop services* and *network management*. They are defined on pages 5 and 6.

- A fourth submode has been defined within the Professional Services delivery mode—*applications management*. This change reflects a shift in the way some software development and maintenance services are purchased. A complete definition is provided on page 6.

A series of definitions for computer equipment have also been added.

Changes from the 1991 INPUT *Definitions of Terms* are indicated with a ☆.

B
Overall Definitions and Analytical Framework

1. Information Services

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

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)
- A combination of computer equipment, packaged software and associated support services which will meet an application systems need (called *Turnkey Systems*)
- Packaged software products, including systems software or applications software products (called *Software Products*)
- People services that support users in developing and operating their own information systems (called *Professional Services*)
- The combination of products (software and equipment) and services where the vendor assumes total responsibility for the development of a custom integrated solution to an information systems need (called *Systems Integration*)
- Services that provide operation and management of all or a significant part of a user's information systems functions under a long-term contract (called *Systems Operations*)
- Services that support the delivery of information in electronic form—typically network-orientated services such as value-added networks, electronic mail and document interchange (called *Network Applications*)
- Services that support the access and use of public and proprietary information such as on-line data bases and news services (called *Electronic Information Services*)
- Services that support the operation of computer and digital communication equipment (called *Equipment Services*)

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

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

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

2. Market Forecasts/User Expenditures

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

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

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

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

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

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

3. Delivery Modes

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

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

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

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

- *Turnkey Systems*
- *Systems Operations*
- *Systems Integration*

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

4. Market Sectors

Market Sectors or markets are groupings or categories of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as Banking, Transportation, Utilities, etc. These are called "industry-specific" markets.

- *Functional Application* markets, such as Human Resources, Accounting, etc. These are called "cross-industry" markets.

- *Other* markets, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line data base market.

Specific market sectors used by INPUT are defined in Section E, below.

5. Trading Communities

Information technology is playing a major role in re-engineering, not just companies but the value chain or *Trading Communities* in which these companies operate. This re-engineering is resulting in electronic commerce emerging where interorganisational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organisations—commercial and non-commercial—involved in producing a good or services.

- Electronic commerce and trading communities are addressed in INPUT's EDI and Electronic Commerce Programme.

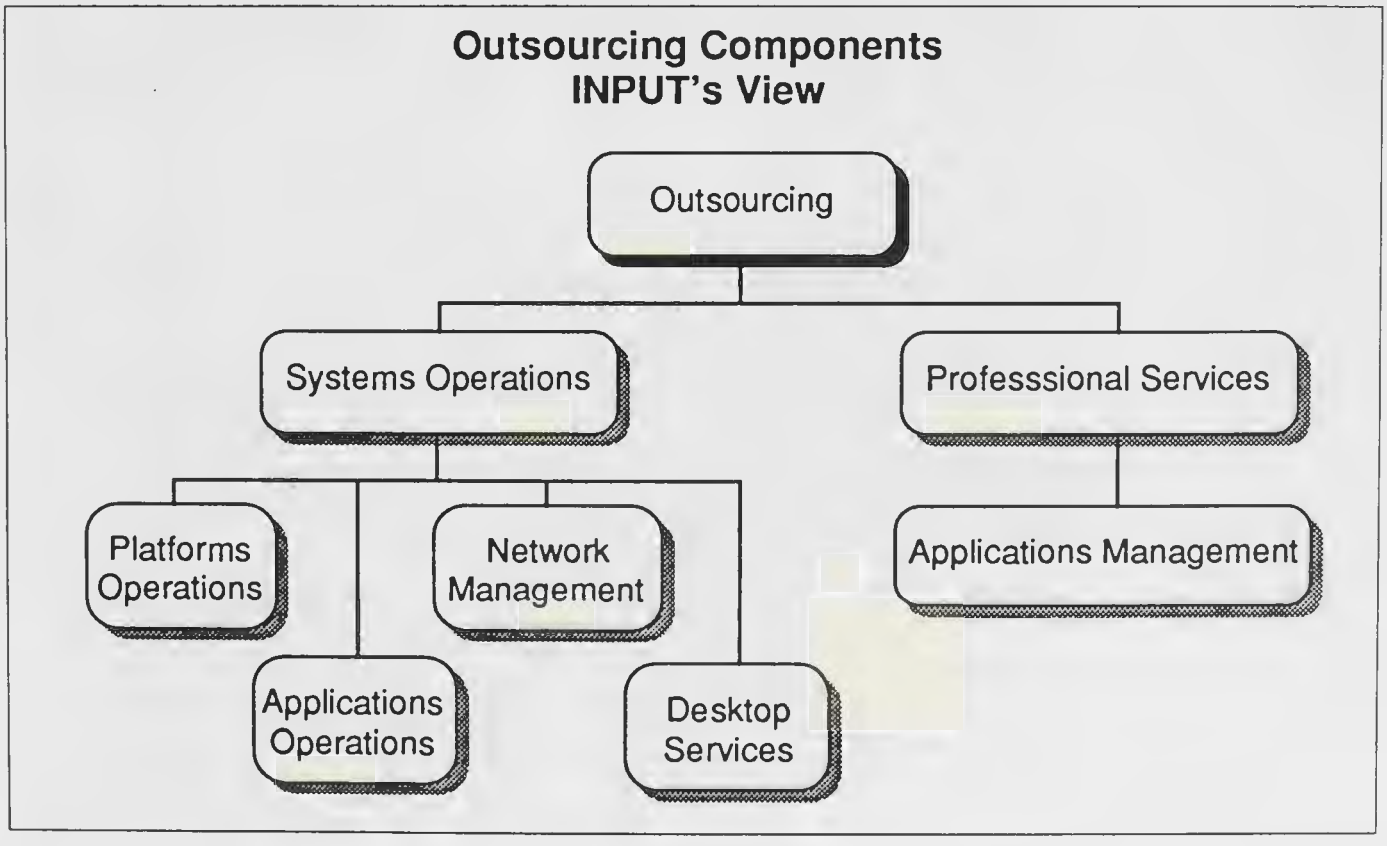
6. Outsourcing

Over the past few years a major change has occurred in the way clients are buying some information services. The shift has been labeled *outsourcing*.

INPUT views outsourcing as a change in the form of the client/vendor relationship. Under an outsourcing relationship, all or a major portion of the information systems function is contracted to a vendor in a long-term relationship. The vendor is responsible for the performance of the function.

INPUT considers the following submodes to be outsourcing-type relationships and in aggregate to represent the outsourcing market. See Exhibit A-1. Complete definitions are provided in Section C of this document. INPUT provides these forecasts as part of the corresponding delivery modes.

EXHIBIT A-1



- *Platform Systems Operations* - The vendor is responsible for managing and operating the client's computer systems.

- *Applications System Operations* - The vendor is responsible for developing and/or maintaining a client's applications as well as operating the computer systems.

☆ *Network Management* - The vendor assumes full responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client.

☆ *Applications Management/Maintenance* - The professional services vendor has full responsibility for developing and/or maintaining some or all of the applications systems that a client uses to support business operations. The services are provided on a long-term contractual basis.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity between the personal computers and/or intelligent workstations in the client organisation. The services may also include performing the help-desk function. The services are provided on a long-term contractual basis.

C

Delivery Modes and Submodes

Exhibit A-2 provides the overall structure of the information services industry as defined and used by INPUT. This section of *Definition of Terms* provides definitions for each of the delivery modes and their submodes or components.

1. Software Products

INPUT divides the software products market into two delivery modes: systems software and applications software.

The two delivery modes have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organisations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

Information Services Industry Structure—1992

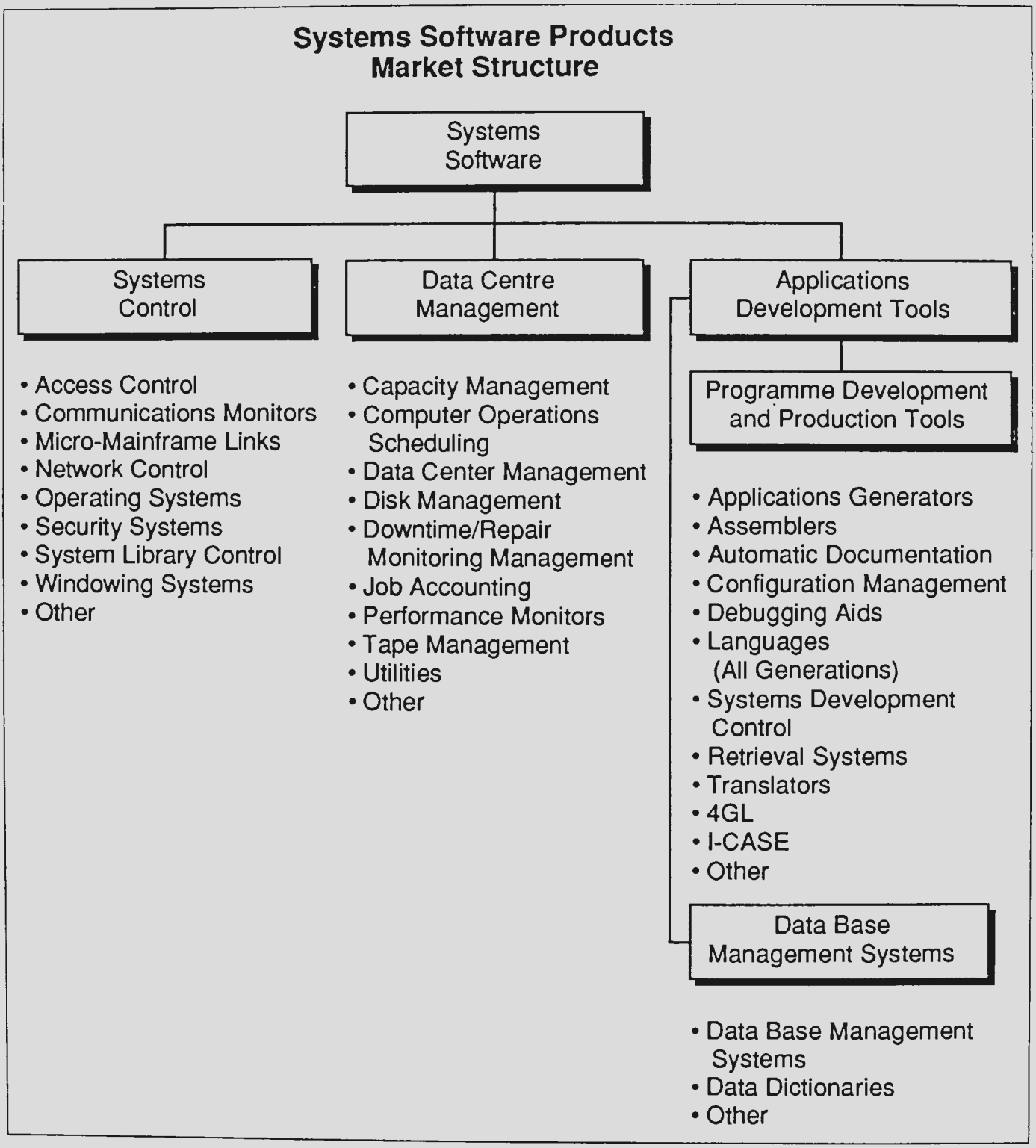
Systems Software Products	Applications Software Products	Turnkey Systems	Equipment Services	Professional Services	Systems Integration	Systems Operations	Processing Services	Network Services
–Mainframe	–Mainframe	–Equipment	–Equipment Maintenance	– Consulting	– Equipment	– Platform Operations	– Transaction	– Electronic Information Services
–Minicomputer	–Minicomputer	–Software Products	–Environmental Services	– Education & Training	– Software Products	– Applications Operations	– Utility	– Network Applications
–Workstation/ PC	–Workstation/ PC	–Professional Services		– Software Development/ Maintenance	– Professional Services	– Desktop Services	– Other	
				– Application Management/ Maintenance	– Other	– Network Management		

Source: INPUT

a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-orientated or user interface functions. INPUT divides systems software products into three submodes. See Exhibit A-3.

EXHIBIT A-3



- *Systems Control Products* - Software programmes that manage computer system resources and control the execution of programmes. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

- *Operations Management Tools* - Software programmes used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

- *Applications Development Tools* - Software programmes used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, data base management systems, report writers, project control systems, CASE systems and other development productivity aids.

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

b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organisation. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups of market sectors. (See Exhibit A-4.)

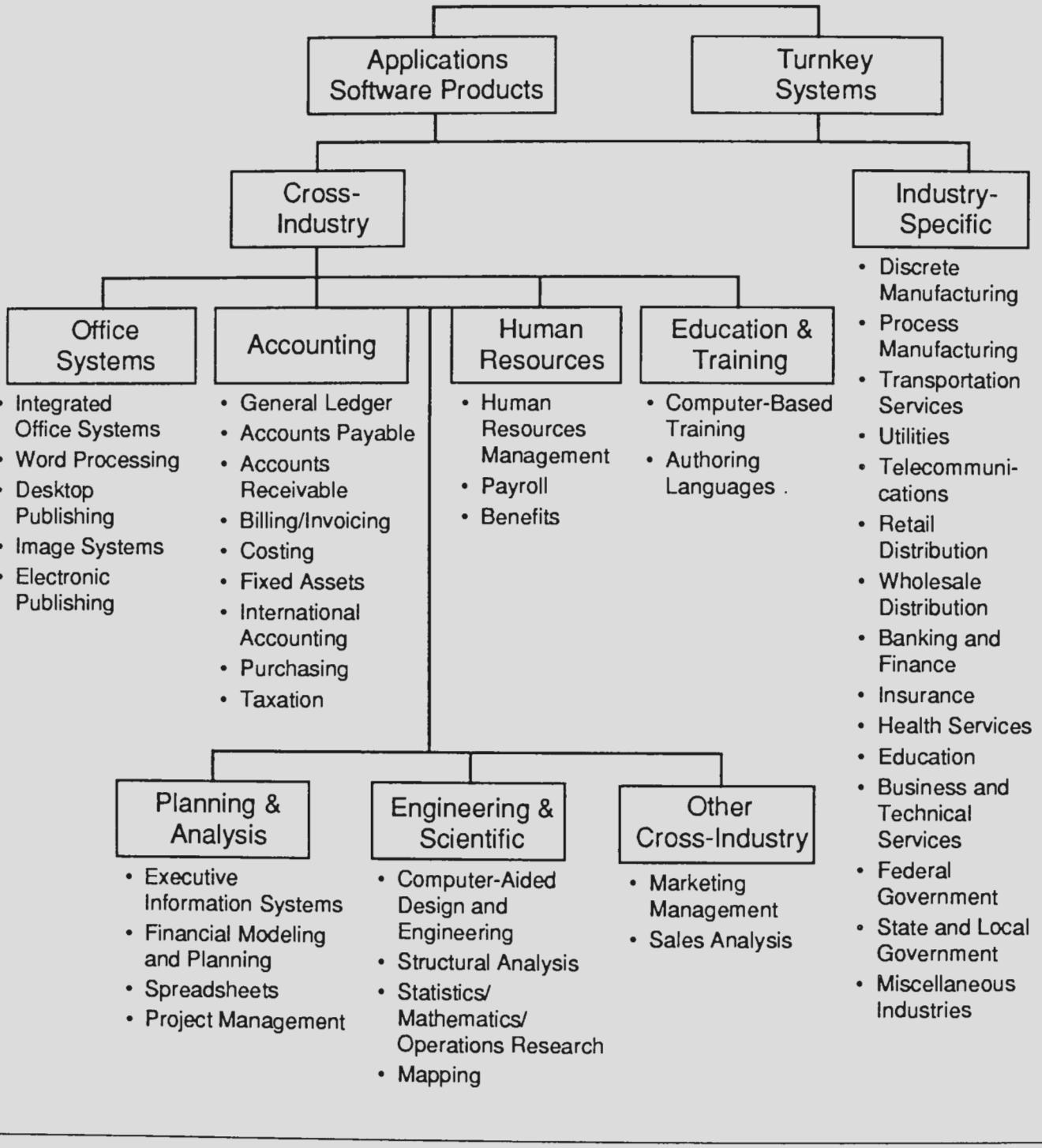
- *Industry Applications Software Products* - Software products that perform functions related to fulfilling business or organisational needs unique to a specific industry (vertical) market and sold to that market only. Examples include demand deposit accounting, MRPII, medical record keeping, automobile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

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

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

EXHIBIT A-4

Application Products and Turnkey Systems



2. Turnkey Systems

A turnkey system is an integration of equipment (CPU, peripherals, etc.), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT categorizes turnkey systems into two groups of market sectors as it does for applications software products. (See Exhibit A-4.)

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

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

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

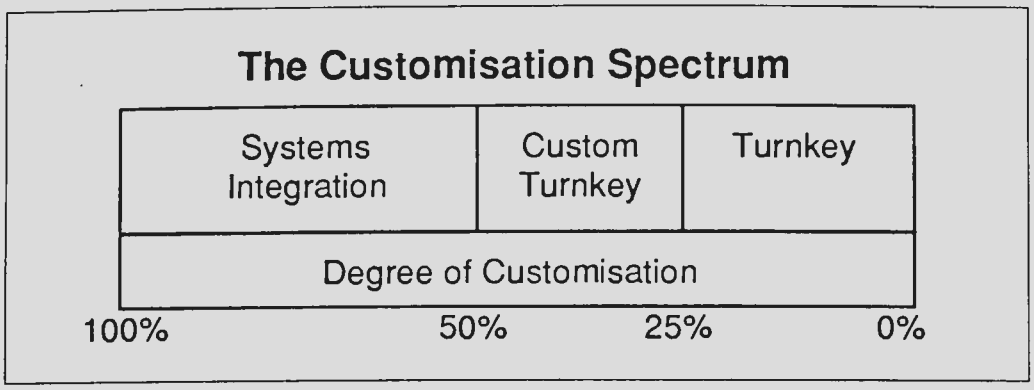
- *Value-Added Reseller (VAR):* A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also includes many of the other components of a turnkey systems solution, such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

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system
- Software products - prepackaged systems and applications software products
- Professional services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit A-5 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.

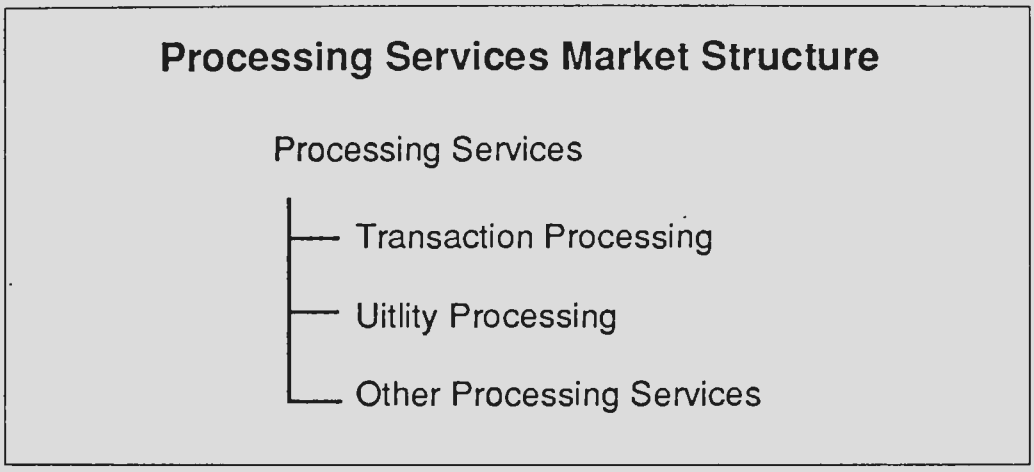
EXHIBIT A-5



3. Processing Services

This delivery mode includes three submodes: transaction processing, utility processing, and "other" processing services. See Exhibit A-6.

EXHIBIT A-6



- *Transaction Processing* - Client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor site or customer site to process specific applications and update client data bases. The application software is typically provided by the vendor.

- *Utility Processing* - Vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programmes or process data on the vendor's system.

- *Other Processing Services* - Vendor provides service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services, backup and disaster recovery, etc.

4. Systems Operations

Systems operations as a delivery mode was introduced in the 1990 Market Analysis and Systems Operations programmes. Previously called Facilities Management, this delivery mode was created by taking the Systems Operations submode out of both Processing Services and Professional Services. For 1992 the submodes have been defined as follows.

Systems operations involves the operation and management of all or a significant part of the client's information systems functions under a long-term contract. These services can be provided in either of two distinct submodes where the difference is whether the support of applications, as well as data centre operations, is included.

- *Platform systems operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- *Applications systems operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

☆ *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the voice communications of the client. A network management outsourcing contract may include only the management services or the full costs of the communications services and equipment plus the management services.

☆ *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organisation. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

Systems operations vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price. (Refer to Exhibit A-7.)

The components of a systems integration project are the following:

- *Equipment* - information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software products* - prepackaged applications and systems software products.

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

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

EXHIBIT A-7

Products/Services in Systems Integration Projects

Equipment

- Information systems
- Communications

Software Products

- Systems software
- Applications software

Professional Services

- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Programme/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operations/maintenance

Other Miscellaneous Products/Services

- Site preparation
- Data processing supplies
- Processing/network services
- Data/voice communication services

6. Professional Services

This category includes four submodes: consulting, education and training, software development, and applications management. Exhibit A-8 provides additional detail.

- *Consulting:* Services include management consulting (related to information systems), information systems re-engineering, information systems consulting, feasibility analysis and cost-effectiveness studies, and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and systems operations.

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

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

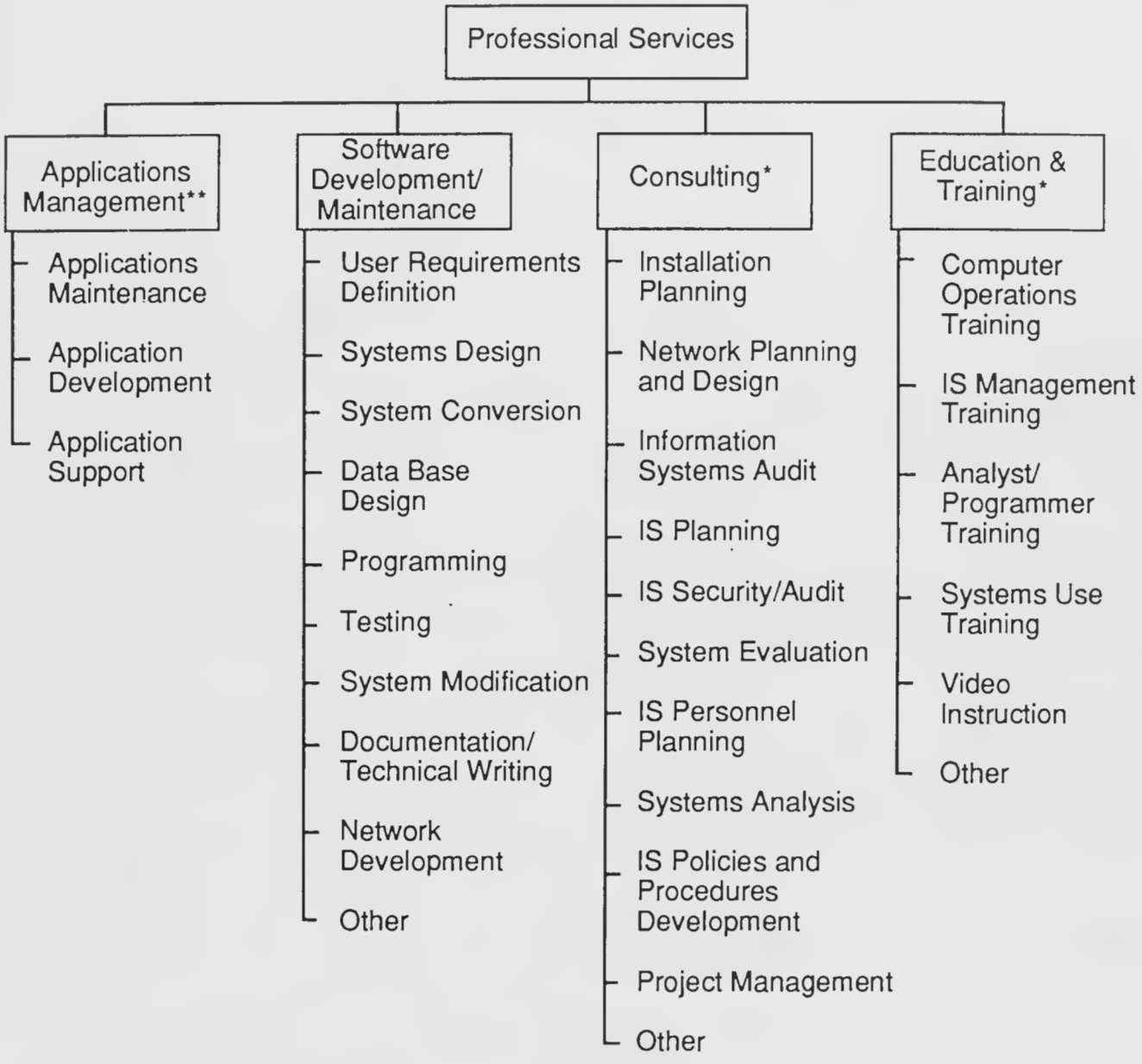
☆ *Applications Management*: The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may develop and implement new application systems for the client.

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

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

EXHIBIT A-8

Professional Services Market Structure



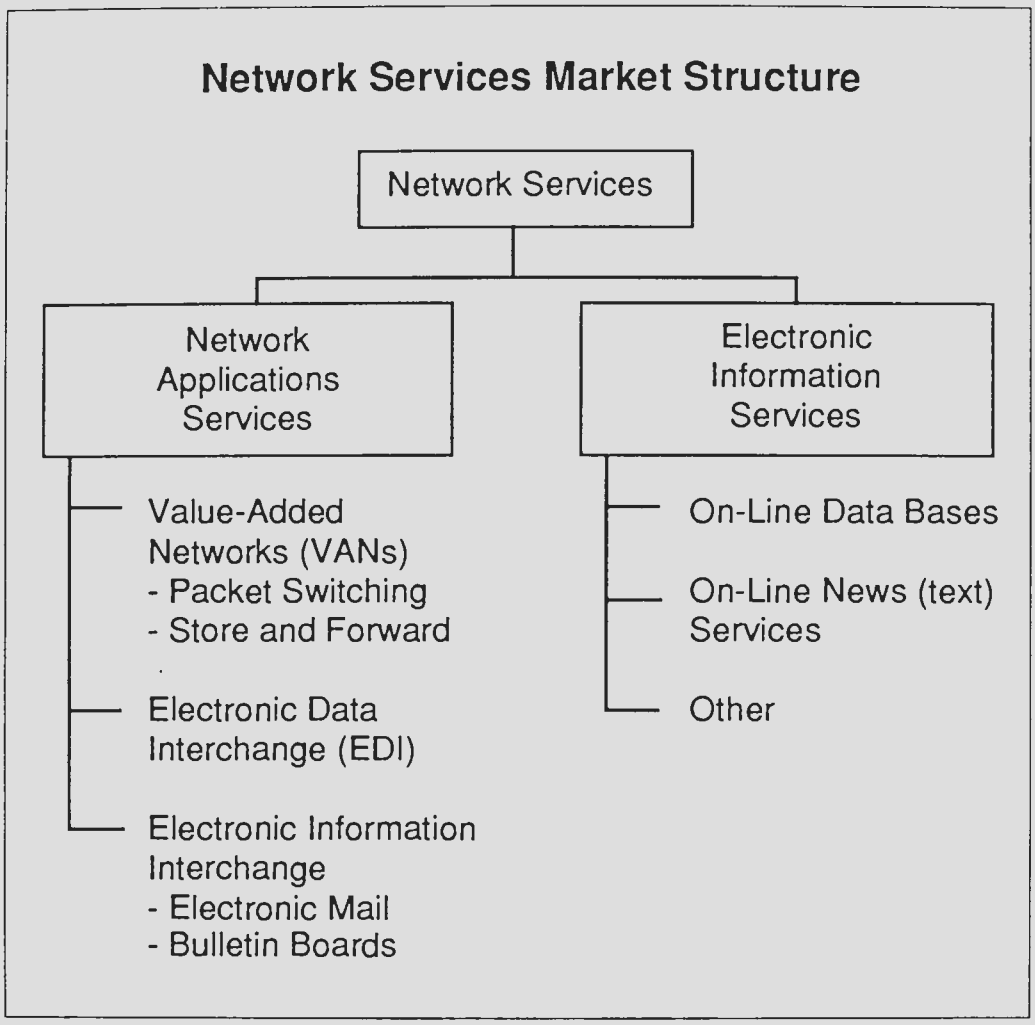
*Related to computer systems, topics, or issues

**Vendor assumes full responsibility on contracted longer term basis

7. Network Services

Network services are a variety of telecommunications-based functions and operations. Network service includes two submodes, as shown in Exhibit A-9.

EXHIBIT A-9



a. Electronic Information Services

Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including items such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, automobile valuations, etc. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the data bases. They may load extracted data into their own computer systems; the vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's data bases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

The two kinds of electronic information services are:

- *On-line Data Bases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

- Unstructured, primarily textual information on people, companies, events, etc. These are often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM optical disks to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

b. Network Applications

Value-Added Network Services (VAN Services) - VAN services are enhanced transport services which involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

While VAN services were originally provided only by specialized VAN carriers (Tymnet, Telenet, etc.), today these services are also offered by traditional common carriers (AT&T, Sprint, etc.). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

Electronic Data Interchange (EDI) - Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

Electronic Information Interchange- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

8. Equipment Services

☆ The equipment services delivery mode includes two submodes. Both deal with the support and maintenance of computer equipment.

☆ *Equipment Maintenance* - Services provided to repair, diagnose problems and provide preventive maintenance both on-site and off-site for computer equipment. The costs of parts, media and other supplies are excluded. These services are typically provided on a contract basis.

☆ *Environmental Services* - Composed of equipment and data centre related special services such as cabling, air conditioning and power supply, equipment relocation and similar services.

D
Computer Equipment

☆ These definitions have been included to provide the basis for market segmentation in the software products markets.

☆ *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

☆ *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel connected to a processor, and generally cannot be included in other categories such as terminals.

☆ *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters.

☆ *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

☆ *Communication Devices* - Includes modem, encryption equipment, special interfaces, and error control

☆ *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories

☆ *Computer Systems* - Includes all processors from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional, but this category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

☆ *Personal computers* - Smaller computers using 8-, 16-, or 32-bit computer technology. Generally designed to sit on a desktop and are portable for individual use. Price generally less than $5,000.

☆ *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as data base access, file storage and back-up, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.

☆ *Minicomputer or midsize computers* - Minicomputers are generally priced from $15,000 to $350,000. Many of the emerging client/server computers are in this category.

☆ *Mainframe or large computers* - Traditional mainframe and supercomputers costing more than $350,000.

E
Sector Definitions

1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the 1987 revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-10.

INPUT includes all delivery modes except systems software products and equipment services in industry market sectors. See Exhibit A-9 and section E-3 (Delivery Mode Reporting by Sector).

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

EXHIBIT A-10

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetalic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete products
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Distribution	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Distribution	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx 67xx	Depositary institutions Nondepositary institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

EXHIBIT A-10 (CONT.)

Industry Sector Definitions

Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389x	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amusement and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organisations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc.

- In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

- INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

Accounting - consists of applications software products and information services that serve such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

- Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

Human Resources - consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations
- Benefits administration
- Government compliance
- Manpower planning
- Compensation administration
- Applicant tracking
- Position control
- Payroll processing

Education and Training - consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

Office Systems consists of the following:

- Integrated office systems (IOS)
- Word processing
- Desktop publishing
- Electronic publishing
- Image systems

- IOSs—such as IBM's OfficeVision, HP's NewWave Office and DEC's All-In-1—typically include the following core functions, all of which are accessed from the same desktop: electronic mail, decision support systems, time management and filing systems.

- Office systems graphics include presentation graphics (which represent the bulk of office systems graphics), paint and line art, page description languages, and electronic form programmes.

- The fundamental difference between electronic publishing and desktop publishing (within the office systems sector) is that electronic publishing encompasses a method of document management and control from a single point—regardless of how many authors/locations work on a document—whereas desktop publishing is a personal productivity tool and is generally a lower end product residing on a personal computer.

- Electronic or computer publishing systems that are sold strictly and specifically to commercial publishers, printers, and typesetters are excluded from cross-industry consideration and are included in the discrete manufacturing industry.

Engineering and Scientific encompasses the following applications:

- Computer-aided design and engineering (CAD and CAE)
- Structural analysis
- Statistics/mathematics/operations research
- Mapping/GIS

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

Planning and Analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)
- Financial modeling or planning systems
- Spreadsheets
- Project management

Other encompasses marketing/sales and electronic publishing application solutions.

- Sales and marketing includes:

  - Sales analysis
  - Marketing management
  - Demographic market planning models

3. Delivery Mode Reporting by Sector

This section describes how the delivery mode forecasts relate to the market sector forecasts. Exhibit A-11 summarizes the relationships.

- *Processing services* - The transaction processing services submode is forecasted for each industry and cross-industry market sector. The utility and other processing services submodes are forecasted in total market in the general market sector.

- *Turnkey systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- *Applications software products* - The applications software products delivery mode is forecasted for the 15 industry and 7 cross-industry sectors. In addition, each forecast is broken down by platform level: mainframe, minicomputer and workstation/PC.

- *Systems operations* - Each of the systems operations submodes is forecasted for each of the 15 industry sectors.

- *Systems integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional services* - Professional services and each of the submodes is forecasted for each of the 15 industry sectors.

EXHIBIT A-11

Delivery Mode versus Market Sector Forecast Content

Delivery Mode	Submode	Market Sectors		
		Industry Sectors	Cross-Industry Sectors	General
Processing Services	Transaction	X	X	
	Utility			X
	Other			X
Turnkey Systems		X	X	
Applications Software Products		X	X	
Systems Operations	Platform	X		
	Applications	X		
Systems Integration		X		
Professional Services		X		
Network Services	Network Applications	X		
	Electronic Information Services	X		X
Systems Software Products				X
Equipment Services				X

- *Network services* - The network applications submode of network services forecasted for each of the 15 industry sectors.

  Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems software products* - Systems software products and its submodes are forecasted in total for the general market sector. Each submode forecast is broken down by platform level: mainframe, mini-computer and workstation/PC.

- *Equipment services* - Equipment services and its submodes are forecasted in total in the general market sectors.

F

Vendor Revenue and User Expenditure Conversion

The size of the information services market may be viewed from two perspectives: vendor (producer) revenues and user expenditures. INPUT defines and forecasts the information services market in terms of user expenditures. User expenditures reflect the markup in producer sales when a product such as software is delivered through indirect distribution channels (such as original equipment manufacturers (OEMs), retailers and distributors). The focus on user expenditure also eliminates the double counting of revenues that would occur if sales were tabulated for both producer (e.g., Lotus) and distributor (e.g., ComputerLand).

For most delivery modes, vendor revenues and user expenditures are fairly close. However, there are some areas of significant difference. Many microcomputer software products, for example, are marketed through distribution channels. To capture the valued added through these distribution channels, adjustment factors are used to convert estimated information services vendor revenues to user expenditures.

For some delivery modes, including software products, systems integration and turnkey systems, there is a significant volume of intra-industry sales. For example, systems integrators purchase software and subcontract the services of other professional services vendors. Turnkey vendors incorporate purchased software into the systems they sell to users.

To account for such intra-industry transactions, INPUT uses conversion ratios to derive the estimate of end-user expenditures.

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