TURNKEY SYSTEMS OPPORTUNITIES

WESTERN EUROPE, 1989-1994

INPUT

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Market Analysis Program—Europe

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Western Europe, 1989-1994

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Abstract

This report analyses the turnkey systems market in Western Europe and its growth potential over the period 1989-1994.

INPUT defines the turnkey delivery mode as those total solutions comprised of equipment and standard software which are sold and supported by a single vendor. In many instances, vendors also provide a degree of customization to meet the specific needs of clients.

INPUT's report covers the complete spectrum of turnkey systems sold by both equipment vendors and independent value-added resellers (VARs) who take title to the equipment in selling and supporting their systems. Independent software developers often compete directly with turnkey systems by selling their software products and professional services as a package, but without taking title to the equipment. The report also discusses this alternative delivery mode for VARs.

The following key issues are discussed: the growing significance of UNIX, the effect of declining equipment prices, and the evolution of a pan-European market during the 1990s. The report looks at how these will affect turnkey systems and, in particular, how these issues might separately affect the attitudes of equipment vendors and VARs toward the turnkey delivery mode.

The report identifies leading turnkey vendors for the overall Western European market, and by major Western European country. Profiles of four major turnkey vendors are used to illustrate different vendor development strategies.

Recommendations are made to vendors seeking to develop turnkey systems for the 1990s. In addition, key skills for selling turnkey systems are identified for the European market.

The report contains 144 pages, including 71 exhibits.

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Table of Contents (Continued)

Table of Contents (Continued)

Exhibits

Exhibits (Continued)

Exhibits (Continued)

I

Introduction

I

Introduction

A
Objectives

This report is produced as part of INPUT's Market Analysis Programme - Europe.

"Total solutions" is one of the in-phrases around the European market today. Equipment vendors are increasingly being forced to accept that the market does not want boxes, it wants solutions. Independent software vendors also see that clients want a "partner" to provide them with solutions, rather than modules of software and separate professional services.

For PC/workstation and minicomputer systems, many vendors have developed standard total solutions that they sell together with customization and support services. Within this highly active packaged total solutions market, this reports looks at turnkey systems, the segment in which standard total solutions are delivered and supported by a single vendor.

The main objectives of this report are to:

• Create a clear picture of the current structure of the European turnkey market within the overall packaged total solutions market by different types of vendors

• Understand the major forces affecting the turnkey market and how these could change this market over the next few years

• Identify the competitive structure of the turnkey market and estimate the overall size of the market and its growth potential to 1994

• Research the current attitudes of vendors and end users towards turnkey systems

- Identify the major national differences towards turnkey systems within Europe

- Recommend possible strategies for equipment vendors and independent software vendors towards the turnkey market for the 1990s

B
Scope

This report reviews the turnkey market for Western Europe, for the period 1989 to 1994.

It covers turnkey systems in detail, where a standard total solution is sold by a single vendor, whether an equipment vendor or an independent software vendor, by taking title to the equipment. It also discusses the directly competing market segment in which an independent software vendor markets a total packaged solution without taking title to the equipment, leaving the equipment vendor to contract for it, deliver and support it.

In both cases, the independent software vendor acts as a value-added reseller (VAR) for the equipment vendor. The report discusses equipment vendors' attitudes towards VARs, in particular how they impinge upon equipment vendors' channel marketing strategy for their equipment.

Exhibit I-1 illustrates how INPUT splits the information systems market into six primary horizontal segments. INPUT does not specifically analyse the equipment market. However, it covers the other five segments, which make up the information services industry, in depth.

In addition to these six horizontal segments, INPUT defines two total solutions delivery modes which cover all six segments. Only in these two vertical segments, turnkey and systems integration, equipment expenditure is included in INPUT's market estimates. In this report, therefore, market forecasts include estimates of equipment revenues for turnkey systems.

EXHIBIT I-1

Information Services Industry

Equipment

Turnkey (vertical band)

Systems Integration (vertical band)

Customer Service
Software Products
Professional Services
Processing Services
Network Services

[ ] Markets studied in-depth by INPUT
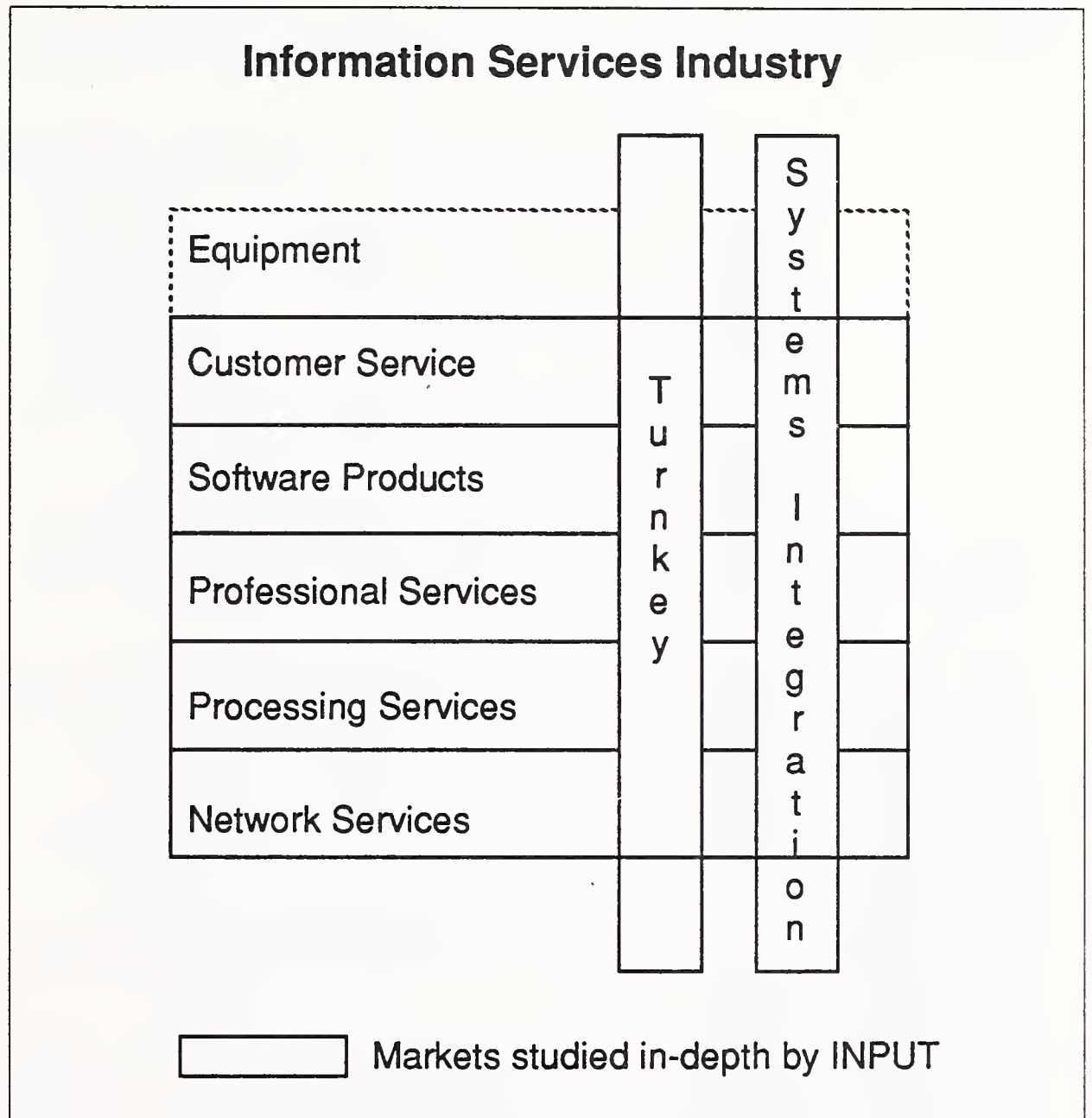
Exhibit I-2 breaks down the four horizontal information services, excluding customer services, plus the two vertical segments in detail. It shows that within turnkey systems, three levels of equipment platforms are included (workstation/PC, minicomputer and mainframe), plus software and support. This report uses the same breakdown to investigate the overall turnkey market.

This report does not cover systems integration or the segment of the total solutions market in which bespoke systems are sold. Neither does it cover the area of the market where end users build up their own total solutions by buying components of products and services.

EXHIBIT I-2

Information Services Industry Structure—1989

Information Services Industry

Processing Services
- Transaction
- Utility
- Other
- Systems Operations (Vendor-Owned Equipment)

Network Services
- Network Applications
  - VANs
  - EDI
  - Electronic Mail
  - Other
- Electronic Information Services
  - Data Bases
  - News
  - Other

Software Products
- Applications Software*
- Systems Software*
  - Systems Control*
  - Data Center* Management
  - Applications* Development Tools

Turnkey Systems
- Equipment*
- Packaged Software
- Customized Software
- Software Support & Maintenance

Systems Integration
- Equipment
- Packaged Software
- Other Services
- Professional Services

Professional Services
- Consulting
- Software Development
- Education & Training
- Systems Operations (Client-Owned Equipment)

Industry-Specific Sectors

Cross-Industry Sectors

*Broken out by Workstation/PC, Minicomputer, and Mainframe segments

Source: INPUT

Geographically, this report divides Western Europe into the following main countries and regions:

- West Germany
- U.K.
- France
- Italy
- Benelux
- Scandinavia
- Rest of Europe

C
Methodology

The European packaged total solutions market is extremely diffuse. The main equipment platform type from which packaged total solutions revenue is generated is the minicomputer. Over 60% of all vendors selling application software sell some in the form of turnkey systems.

To get an in-depth appreciation of the turnkey market and to be able to size it accurately, INPUT carried out the following research in Europe:

- 30 in-depth, formal interviews using the vendor questionnaire set out in Appendix C

- Over 150 informal interviews, concentrating on the major elements of the formal vendor questionnaire as relevant to that vendor

- 200 formal interviews with users

This tiered approach to vendors allowed INPUT to interview a large number throughout Europe, mainly through the informal interviews. This methodology has been particularly important to cover European equipment vendors.

Many equipment vendors operating in Europe have structured themselves geographically by national European market and vertically by industrial sector. This is particularly true of the larger equipment vendors, whether European or U.S.-owned. The responsibility for developing turnkey systems has often been delegated from the central head office to the national operating subsidiary. In many cases, the head office itself does not have a clear picture of the group's overall turnkey systems activities. In such cases, INPUT has had to contact the key subsidiaries to build up a picture of the group's packaged total solutions revenues, rather than gain such knowledge from head office managers.

Formal vendor interviews were carried out within a rigid structure so as to get balanced coverage of European vendors by type and by geographic coverage. These are broken down as shown in Exhibit I-3.

EXHIBIT I-3

Analysis of Formal Vendor Interviews

Country of Vendor Ownership, and Trading Area	Number of Interviews		
	Equipment Vendors	VARs	Total
Pan-European			
- U.S.	2	5	7
- France		1	1
- Italy	1		1
- U.K.		5	5
- West Germany	2		2
- Others	1		1
- Total	6	11	17
National Only			
- France		2	2
- Italy	1	2	3
- U.K.	1	3	4
- West Germany	1	1	2
- Others		2	2
- Total	3	10	13
Overall	9	21	30

Exhibit I-3 categorizes vendors interviewed as pan-European or national-only, and their country or origin. Pan-European refers to interviews conducted with vendors whose local organisations had the responsibility of covering the major European countries. National-only refers to vendor organisations whose responsibilities were only for the country in which they were located. In such companies, it was ocassionally the case that the overall organisation operated Europe-wide, whilst the manager interviewed was only from a local subsidiary (e.g., an Italian subsidiary of a German equipment vendor).

The breakdown of user interviews by country is shown in Exhibit I-4.

EXHIBIT I-4

STWE

Analysis of User Interviews

Country of User	Number of Interviews
Benelux	
- Belgium	8
- Netherlands	12
France	40
Italy	20
Scandinavia	
- Denmark	10
- Norway	6
- Sweden	4
Spain	20
U.K.	40
West Germany	40
Total	200

Only the results of the formal interviews with vendors and users have been used to produce the attitude and issue tables given in this report.

Market forecasts are based on non-captive end-user expenditures. These are defined by INPUT as those expenditures made externally by any organisation with some third-party vendor, rather than those made within the organisation itself.

Inflation effects are included in both historical and future growth rates.

D
Report Contents

The report is organised into eight chapters and six appendixes as follows:

• Chapter II is an Executive Overview of the complete report. It is designed for the executive or individual who wants to quickly identify the salient points of the report without reading it in its entirety.

• Chapter III defines the packaged total solutions market and specifically the turnkey sector. It looks at closely-related markets such as systems

integration and software products, and discusses how the market is split between the two major types of vendors—equipment vendors and independent software vendors.

- Chapter IV discusses the structure of the European turnkey market in 1989 and presents five-year market forecasts for the period 1989 to 1994. These are broken down by major European country and by key market sectors. It also discusses the size and structure of the wider packaged total solutions market.

- Chapter V looks at the leading vendors of turnkey systems and the leading turnkey vendors in the major European country markets. To illustrate typical vendor strategies and trends in the European market, four vendor profiles are also included.

- Chapter VI reviews the main challenges facing vendors of turnkey systems over the next few years and examines the major forces affecting these vendors.

- Chapter VII discusses the needs of users and why they buy or do not buy packaged total solutions. It considers users' attitudes towards UNIX and towards the type of vendors they prefer.

- Chapter VIII summarises INPUT's recommendations for vendors based on the findings of its research.

- Appendix A contains INPUT's definitions for terms used in the report.

- Appendix B gives the European exchange rates used in compiling market forecasts.

- Appendix C contains the vendor questionnaire used in formal INPUT vendor interviews.

- Appendix D contains the end user questionnaire.

- Appendix E gives forecasts for the period 1989 to 1994 by European country and by individual year.

- Appendix F reconciles the estimates and forecasts for the turnkey market given in this report with those presented in INPUT's report *The Western European Market for Computer Software and Services, Forecast and Analysis, 1988-1993*.

E
Related INPUT Reports

Readers may find it useful to refer to the following INPUT reports which relate to the findings of this report:

- Turnkey systems
  - *U.S. Turnkey Systems Markets, 1987-1992* (USA, December 1987)
  - *U.S. Turnkey Systems/VAR Market, 1988-1993* (USA, December 1988)

- VARs
  - *Alternative Distribution Channels* (USA, June 1988)

- Bespoke total solutions
  - *Commercial Systems Integration Western Europe 1988 -1993* (December 1988)

- Overall Western European market review
  - *The Western European Market for Computer Software and Services, Forecast and Analysis, 1988-1993* (December 1988)

II

Executive Overview

II
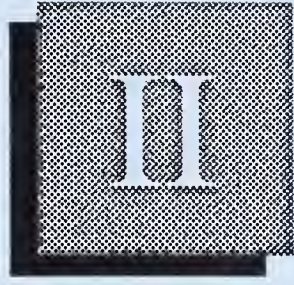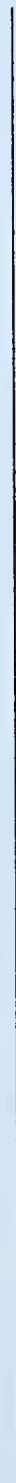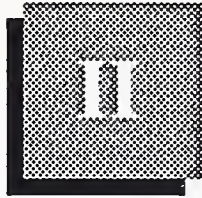
Executive Overview

A
Turnkey Market Opportunities

There will be a number of major issues facing European turnkey vendors over the next few years:

- the increasing demand for total solutions
- continuing downward pressure on equipment prices and margins
- greater competition to minicomputers from workstations and PCs
- the move to open systems, notably UNIX
- the problems of how to maintain control over end users
- the gradual evolution of a pan-European market

Exhibit II-1 summarises the resulting trends in the European turnkey market, as analysed by INPUT.

EXHIBIT II-1

Key Trends in the European Turnkey Market

- Continuing pressure on equipment prices

- Dilemma for equipment vendors trying to maintain profits and control over end users

- European equipment vendors trying to become more pan-European

- Larger vendors, both equipment and independents looking to expand their European coverage through acquisition

- Gradual evolution of a pan-European market

- Growth of UNIX

In today's PC market, equipment vendors have little direct contact with end users. By the mid-1990s, it is likely that the same will have happened to what is today the lower end of the minicomputer market. Super-micros and workstations will take over as standard platforms for part of this market, and in so doing create a similar market to that of today's PC sector, where solutions vendors tend to be independent software vendors selling turnkey systems. In addition, UNIX will create a layer between equipment and application software.

With continuing downward pressure on equipment prices and margins, equipment vendors are likely to react by looking more at owning or controlling application software. This will allow them to keep in direct contact with end users, whilst also benefiting from the profits of selling application software and associated services.

As a result, many equipment vendors will become turnkey vendors. They will either move more into owning their own turnkey systems, or into controlling the better VARs who traditionally market and sell packaged total solutions.

The gradual evolution of a pan-European market, stimulated by the EC and its Single Market initiative, will not have a major effect in the early 1990s. However, as the EC gradually breaks down the traditional fiscal, physical and social barriers within Europe, the opportunity to offer more pan-European turnkey systems will grow. One market that has already been effected is international banking.

The U.S. equipment vendors and the large VARs are in a strong position to exploit the liberalisation of Europe. However, most European equipment vendors and the smaller VARs are at a disadvantage, often locked into their traditional national market.

To fully exploit the growing pan-European market, vendors must become more European. To do this, European equipment vendors should enter into cooperative agreements between themselves to support the better international VARs. Alternatively, they should merge to get a true pan-European customer base.

If equipment vendors decide to expand more into turnkey systems, they could gain foreign customers by buying up nationally-based VARs. Similarly, the large VARs may also see that mergers or acquisitions are the way to expand. This could make the small, nationally-biased VARs highly vulnerable to being taken over.

The early 1990s will be a period of realignment for many vendors either directly or indirectly involved in the turnkey market. The strategic path set now will be crucial to how individual vendors meet the challenges of the 1990s. UNIX will undoubtedly force change on all types of vendors. For independent vendors, UNIX should be an opportunity; for equipment

vendors, it might become a threat if not managed successfully. Cheaper equipment is likely to cause equipment vendors to move towards developing their own turnkey systems in key market segments, whilst the European Single Market will create new opportunities for niche turnkey vendors.

B
The Quest for Total Solutions

"Total solutions" is one of the clichés in the European turnkey market today. All vendors, whether equipment vendors or independent software vendors, see that this is what end users want and what they must sell. INPUT also sees this trend, and realizes that turnkey systems is one of the delivery modes through which vendors can meet their customers' needs.

Exhibit II-2 illustrates the range of total solutions delivered by a single vendor. At one end there is the bespoke, totally-customized systems integration solution; at the other is turnkey systems.

EXHIBIT II-2

**The Total Solutions Market
Third-Party Systems**

Turnkey Systems	Custom Turnkey Systems	Systems Integration
Degree of Customization		

0%   100%
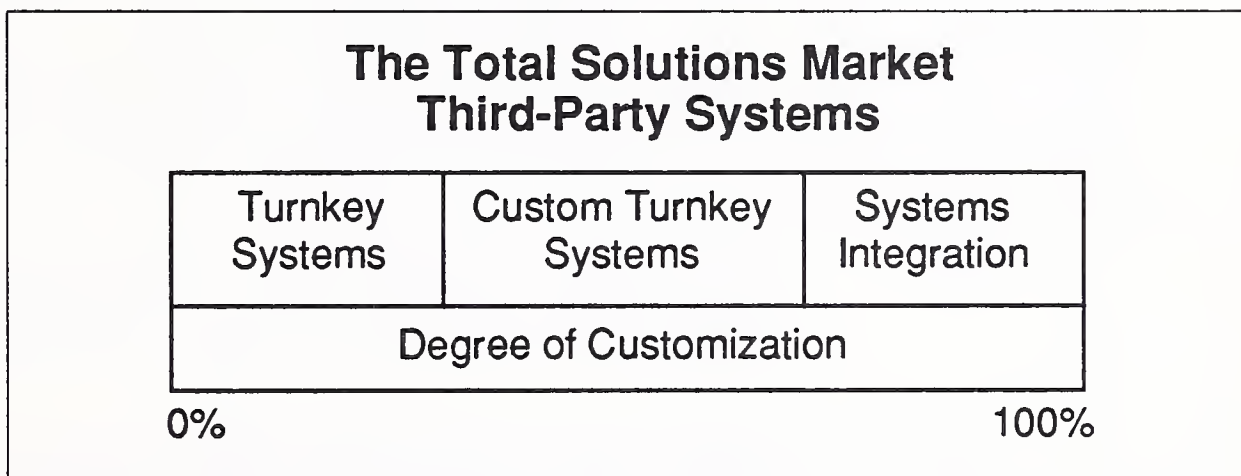
As Exhibit II-3 depicts, turnkey systems are sold over a wide range of equipment. At the low-power end, turnkey systems sold on PCs and workstations are rarely customized. Vendors offer regular version updates to users to give them the ability to improve their systems. On larger machines, customization is the norm.

EXHIBIT II-3

Turnkey Systems Price Spectrum

Mainframes — (always customized)

Minicomputers — (generally customized)

Workstations/PCs — (rarely customized)

| 0 | 10 | 100 | 1,000 | 10,000 |

$ Thousands
(including equipment costs)
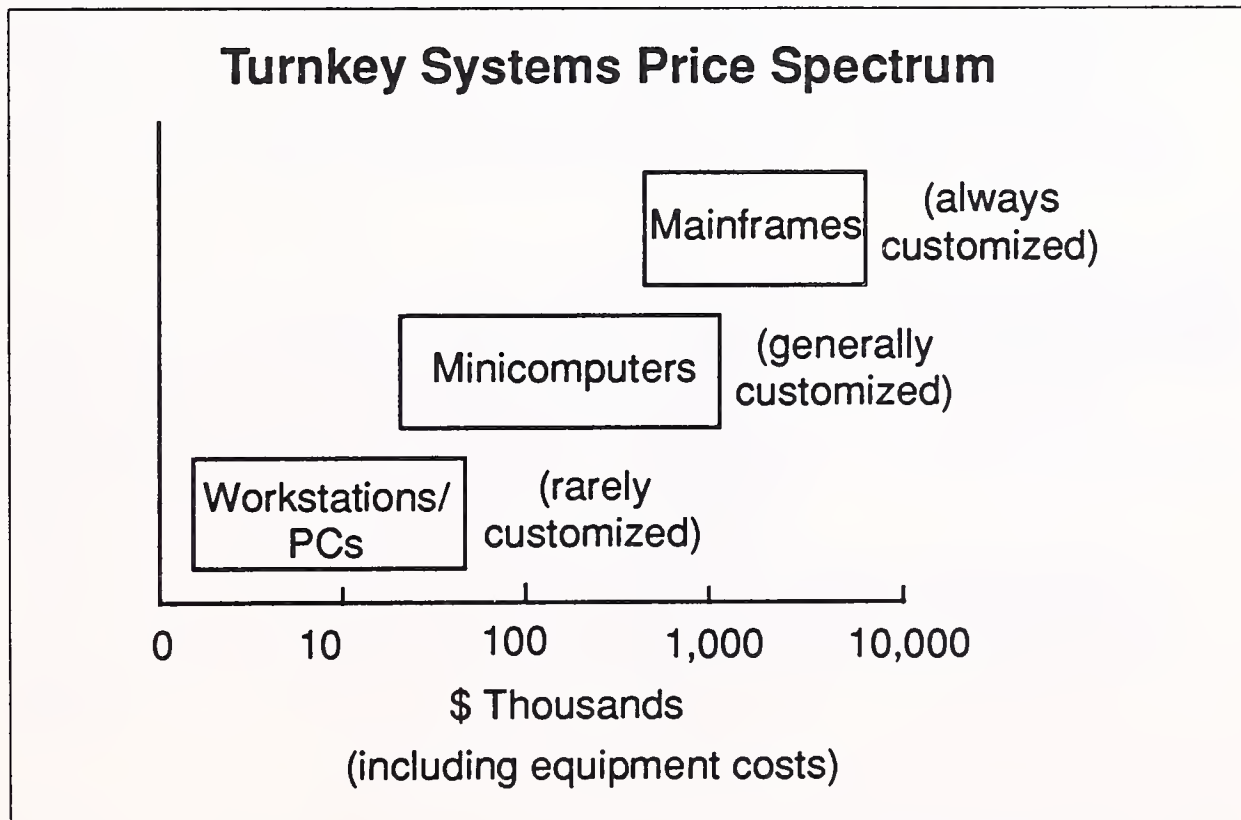
Turnkey systems is the prime total solutions delivery mode for PCs. Here equipment vendors have little control over end users, and use third-party sales channels extensively. In the minicomputer market, there are two competing total solutions delivery modes—turnkey systems and software product solutions. Turnkey is where only one vendor delivers the total solution. The vendor can either be an equipment vendor using its own equipment, or an independent software vendor acting as a value-added reseller (VAR), but taking title to the equipment from the equipment vendor.

For VARs, the normal delivery mode for minicomputers is without taking title to the equipment and working in partnership with one or more equipment vendors to sell a total solution. The VARs will generally make the total sale, deliver and support their application software. The equipment vendor will contract, deliver and support its equipment.

Those equipment vendors with policies of trying to maintain control over customers, such as IBM and Digital, prefer VARs to sell software product solutions rather than turnkey systems. Their ability to continue to do this into the 1990s is a major issue facing them.

Only equipment vendors deliver turnkey systems on mainframes. In its research, INPUT could only identify independent vendors selling software product solutions on mainframes, rather than turnkey systems.

INPUT's research indicates that end users buy turnkey systems because these total solutions give them a simple solution to what the end user sees as a complex technical problem. However, vendors believe that the main reason for end users buying their systems is that turnkey systems allow end users to check out the quality of the vendors before spending any money.

Turnkey vendors pride themselves on being close to the market and understanding what end users want. However, if INPUT's research is correct, then as far as understanding the reasons why users buy their systems, vendors are not as close to end users as they think they are.

C

Greater Power, but Cheaper Equipment

The European turnkey market is forecast to grow from $8.0 billion in 1989 to $19.5 billion by 1994. As is illustrated in Exhibit II-4, equipment vendors represent some $4.3 billion, or 54 percent of the total 1989 European turnkey market. This percentage is expected to drop to 50% by 1994, due to the slower growth of turnkey systems delivered by equipment vendors compared with those from VARs.

EXHIBIT II-4

Western European Turnkey Market by Vendor Type, 1989-1994

- ▨ Independent software vendors (VARs)
- ▨ Equipment vendors

CAGR = Compound Annual Growth Rate
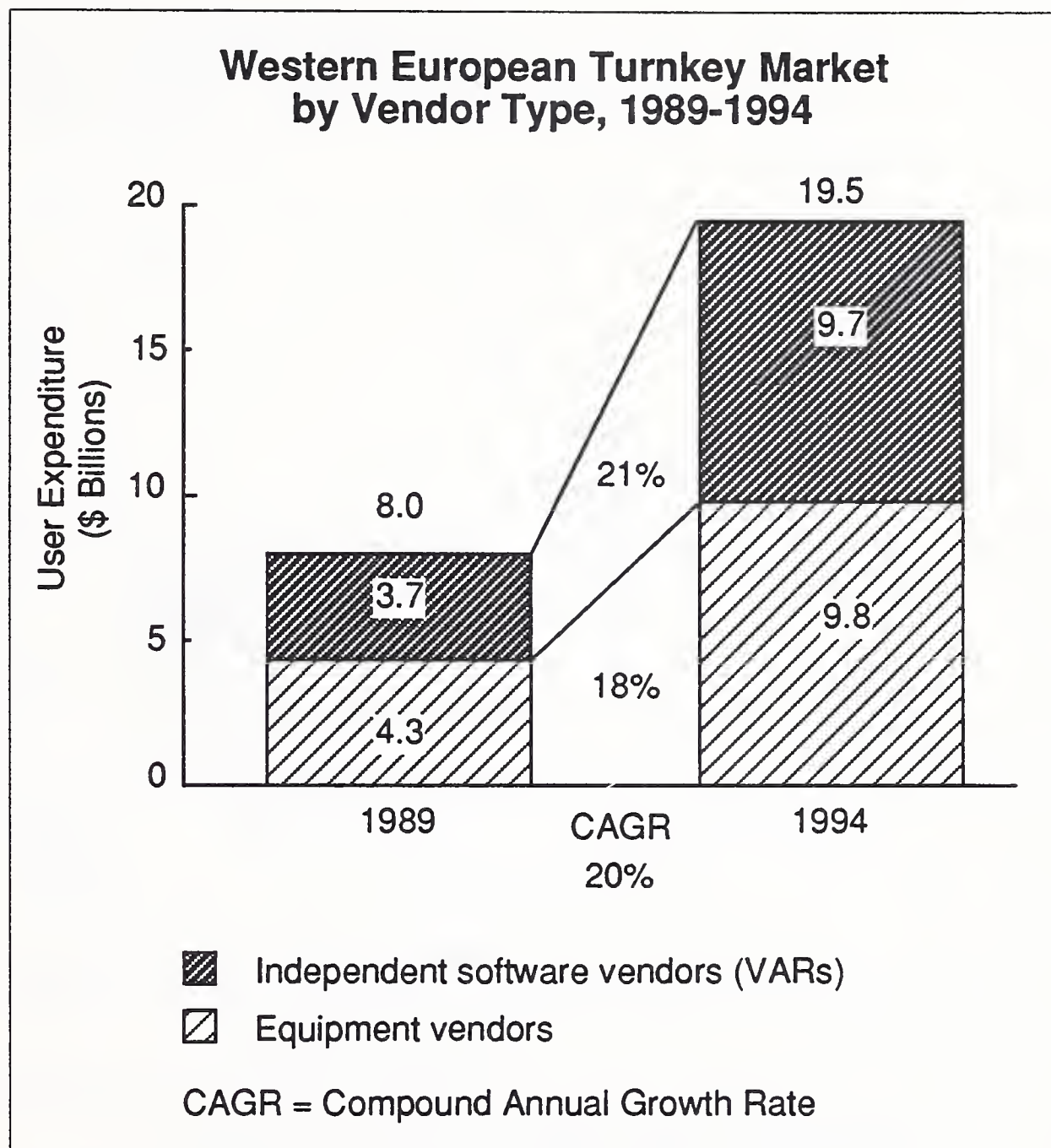
The effect of continuing downward pressure on equipment prices and the growing competitive power of the supermicro and workstation is expected to reduce the proportion that equipment represents in typical turnkey systems from 55% in 1989 to 45% in 1994. Exhibit II-5 shows the forecast breakdown of turnkey systems by the different component products and services.

Equipment is expected to grow by only 15% per annum on average over the five-year period to 1994, whilst standard software will grow by 24%, customization by 27%, and other professional services by 30% per annum. These other services, such as consultancy, training and education, are seen by all vendors as high growth areas.

With equipment falling to less than 50 percent of the packaged total solution price, it is no wonder that equipment vendors are looking more toward application software and associated services to maintain their profits.

EXHIBIT II-5

**Western European Turnkey Market
by Product and Service Component
1989-1994**
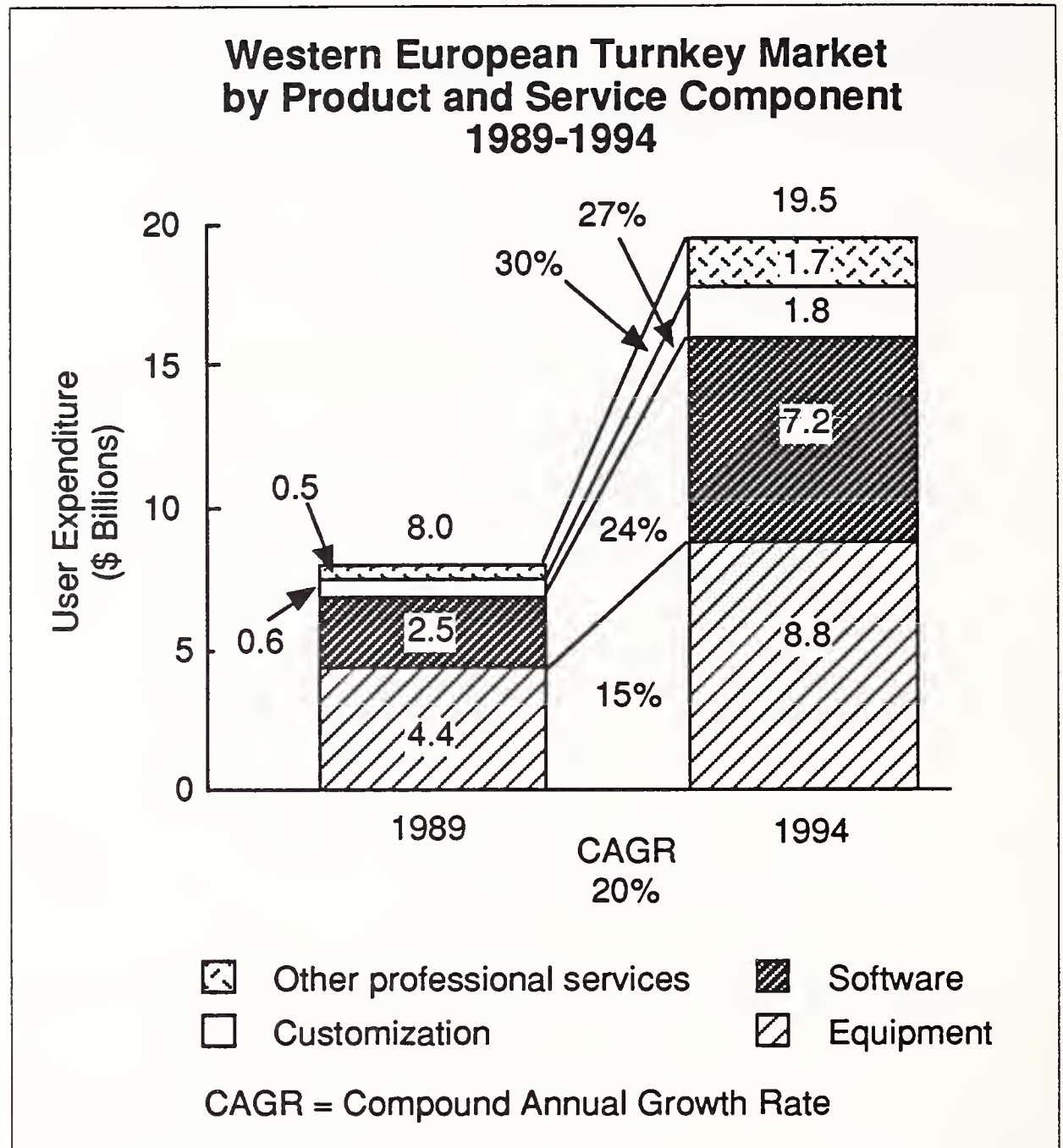
Minicomputers are by far the most important platform for turnkey systems, as illustrated in Exhibit II-6. It is in the minicomputer arena that major equipment vendors are currently fighting for control. The question of which sales channel to exploit for this equipment is a major issue facing equipment vendors in the 1990s.

Equipment vendors can support third-party sales channels, such as VARs, either retaining title to their equipment, or letting VARs sell turnkey systems by taking over the equipment title. Alternatively, they can use their own sales forces selling either equipment on its own or standard application software packaged up as turnkey systems. This software can either be owned by the equipment vendors or licensed in from an independent software vendor.

The different channel options are illustrated in Exhibit II-7. The channel that is picked for specific application markets in different European countries may be crucial to the success of individual equipment vendors over the next few years.

EXHIBIT II-6

Western European Turnkey Market by Equipment Platform, 1989

Mainframes
4%

Workstations/
PCs
37%

Minicomputers
59%

Total 1989 Market: $8.0 Billion

EXHIBIT II-7

Equipment Vendor Marketing Channels

Total Control

Partial Control

Loss of Control

Equipment Only
or Direct Turnkey
Sales
(Own sales force)

3rd-Party Channels
Retaining Title to
Equipment (VARs
selling software
product solutions)

3rd-Party Channels
Passing Title over
to Equipment
(VARs selling
turnkey systems)

D
UNIX—
Opportunities
and Threats

To add to the problems facing equipment vendors, UNIX threatens to loosen their control over the minicomputer market even more. IBM has stated that it has no current plans to port its proprietary version of UNIX, AIX, to its minicomputers, such as the AS/400. At the same time, it is strengthening its control over its minicomputer VARs selling packaged total solutions via the software products delivery mode.

For European equipment vendors, UNIX offers an opportunity to create a pan-European end-user base to compete with that of IBM and Digital. However, this would mean cooperation with other like-minded equipment vendors, to pool their national user bases. To date, there is little movement in this direction.

For all turnkey vendors, UNIX offers the ability to develop more complex total solutions more cheaply. As Exhibit II-8 illustrates, UNIX can act as a standard platform from which vendors can bring together third-party components to create unique total solutions. Through UNIX, turnkey vendors can become more packagers of third-party components than developers of original software.

EXHIBIT II-8

Effect of UNIX on the Turnkey Market

Application Software — Move from software product solutions to turnkey systems

Use of Kernel Software — Move from packaged total solutions to software products as components to total solutions

Layering

Equipment
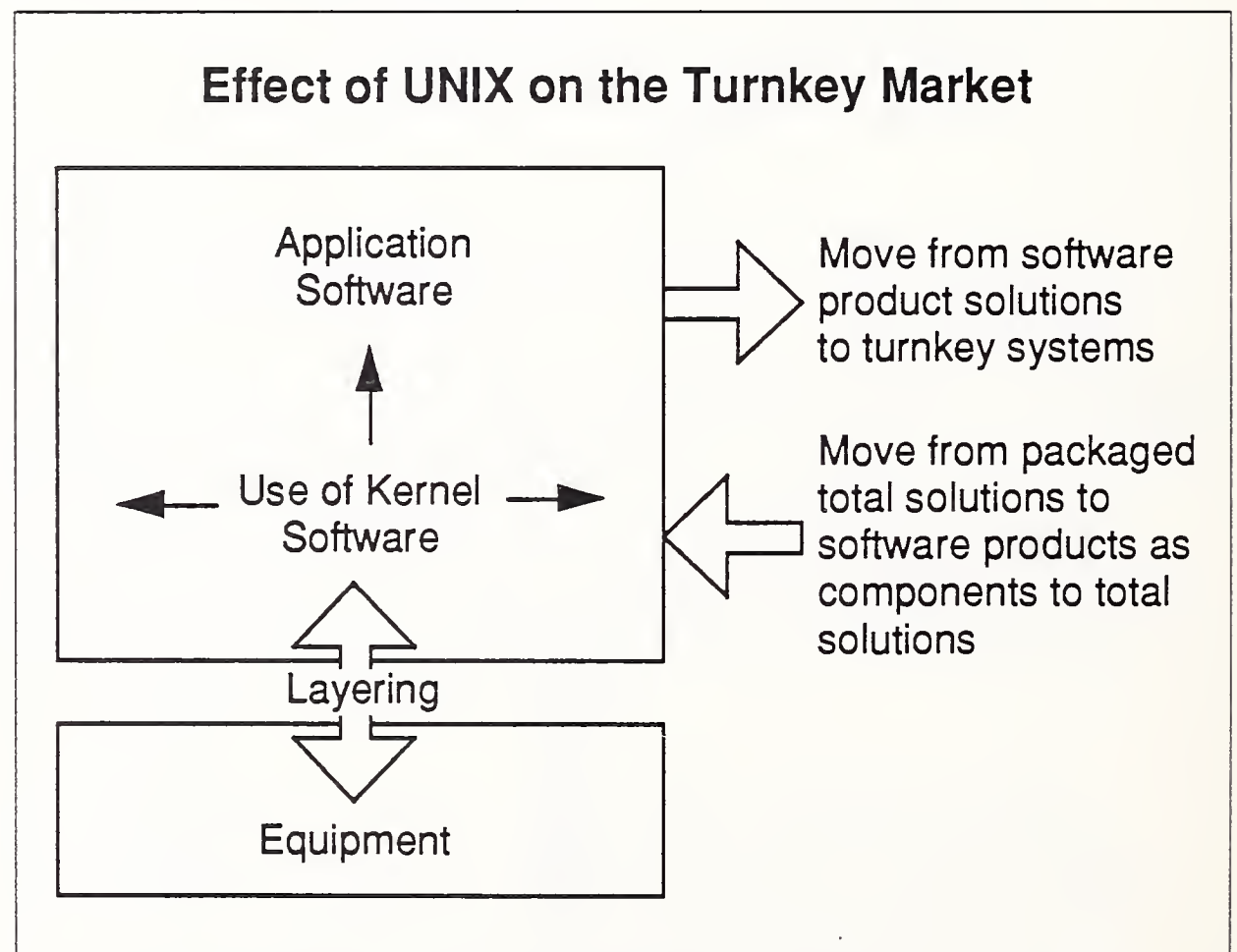
Exhibit II-9 illustrates that some 80 percent of vendors but only 60 percent of users see that UNIX is still a long way from being an acceptable industry standard today. In general, they feel that it will take another two to three years for UNIX to become an industry-wide standard. It was noticeable that users were much less well-informed about UNIX than were vendors. As a result, users were more optimistic that UNIX would

resolve their problems than were vendors, many of whom had significant reservations about UNIX's performance in certain application areas.

EXHIBIT II-9

User and Vendor Attitudes Towards UNIX

(Above results in response to the question: "Do you see that UNIX is still a long way off from being a true industry-wide standard?")

Total Sample   Users: 200   Average Standard Error   Users: 2.4%
               Vendors: 30   Vendors: 7.5%
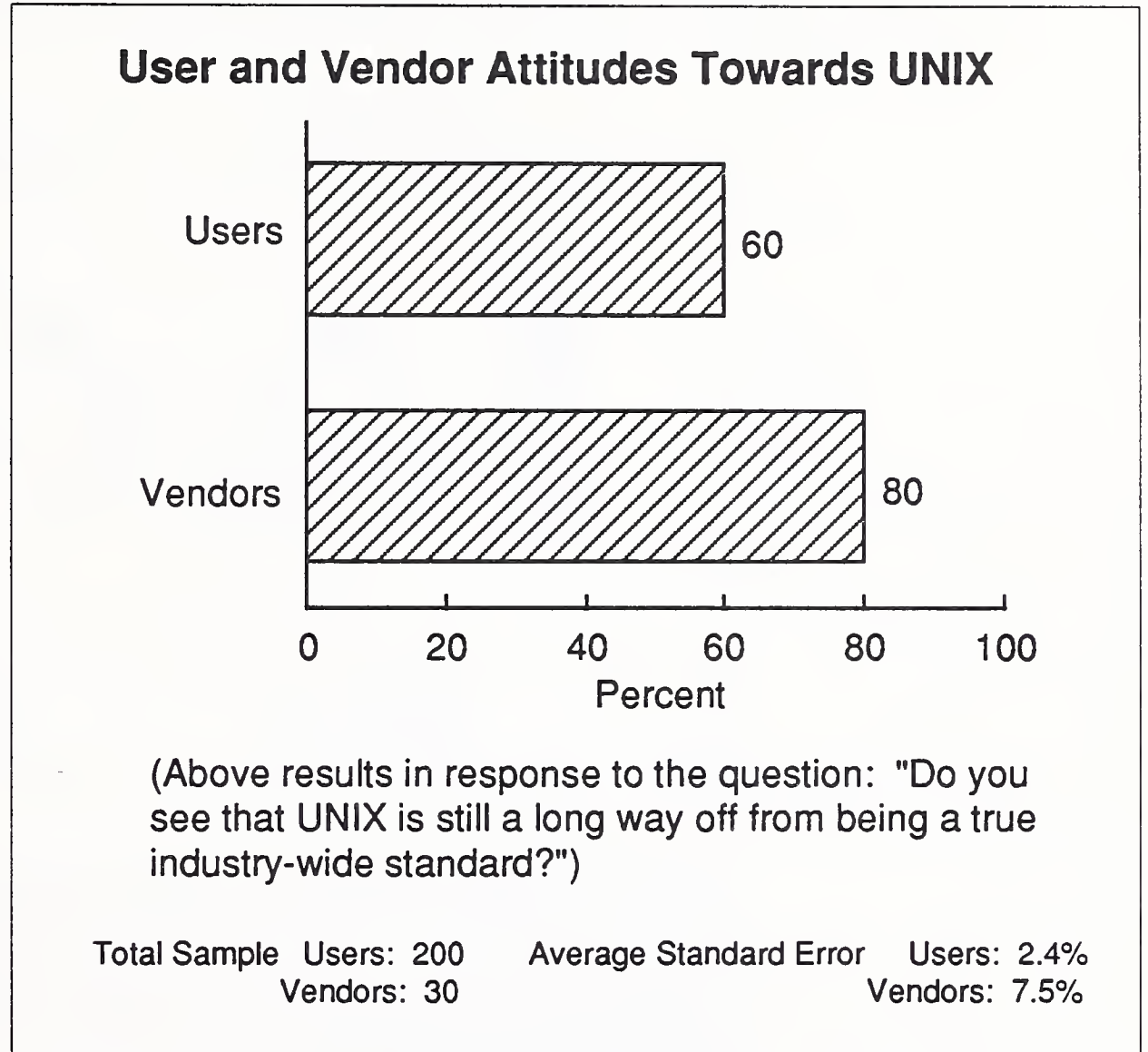
E

A Pan-European Turnkey Market

Today, a pattern of different types of vendors in specific packaged total solutions market segments can be seen. Exhibit II-10 illustrates the general pattern of U.S. equipment being used extensively by those vendors selling internationally around Europe, whilst European equipment tends to be more restricted to the national markets of the equipment vendor.

This pattern puts European equipment vendors at a disadvantage to U.S. competitors as they find it more difficult to recruit and keep the better VARs. IBM and Digital can offer VARs considerable assistance in exporting their packages throughout Europe. Both have developed sophisticated VAR programmes, allowing them to maintain control over the better ones.

EXHIBIT II-10

Equipment Strengths in the European Turnkey Market

International Application Markets	National Application Markets

Direct and 3rd Party Channels

U.S. Equipment	European Equipment
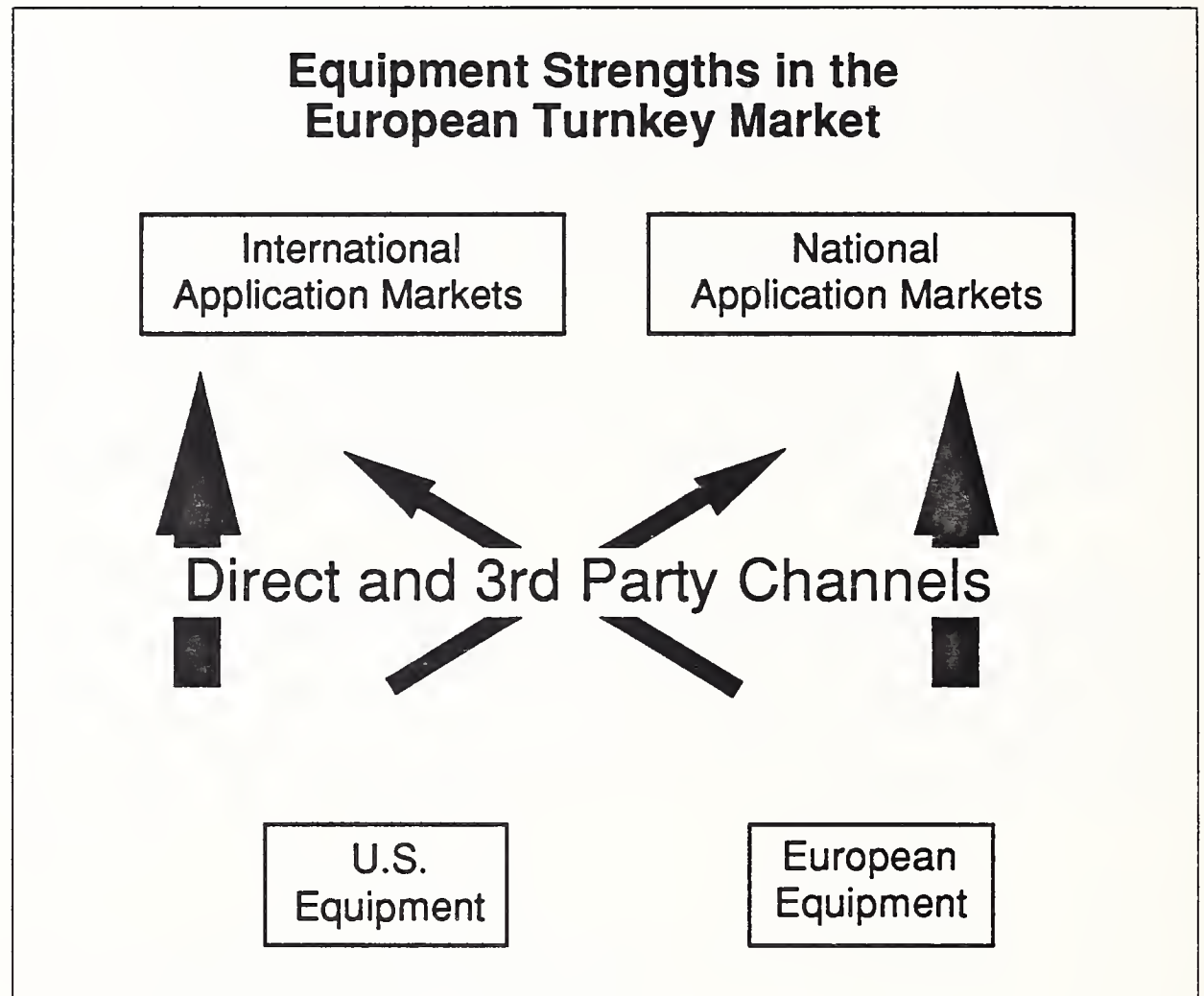
Currently, West Germany is the largest European turnkey market, as Exhibit II-11 illustrates. This is partly due to three of the largest European turnkey vendors, Nixdorf, Mannesmann Kienzle and Siemens, being German. It is also due to the strength of West Germany in manufacturing, an area where many turnkey systems are available, including both CAD/CAM and CIM.

As European barriers are gradually brought down in the 1990s, end-user markets will become more pan-European. This will allow turnkey vendors to develop their solutions to wider markets. This has already happened in segments such as international banking and insurance. However, there are still major cultural differences between the different national groupings in Europe, particularly in the areas of taxation and legislation. These will continue to cause problems for turnkey vendors trying to export standard solutions across European frontiers for many years.

EXHIBIT II-11

**Western European Turnkey Market
by Major Geographic Region, 1989**
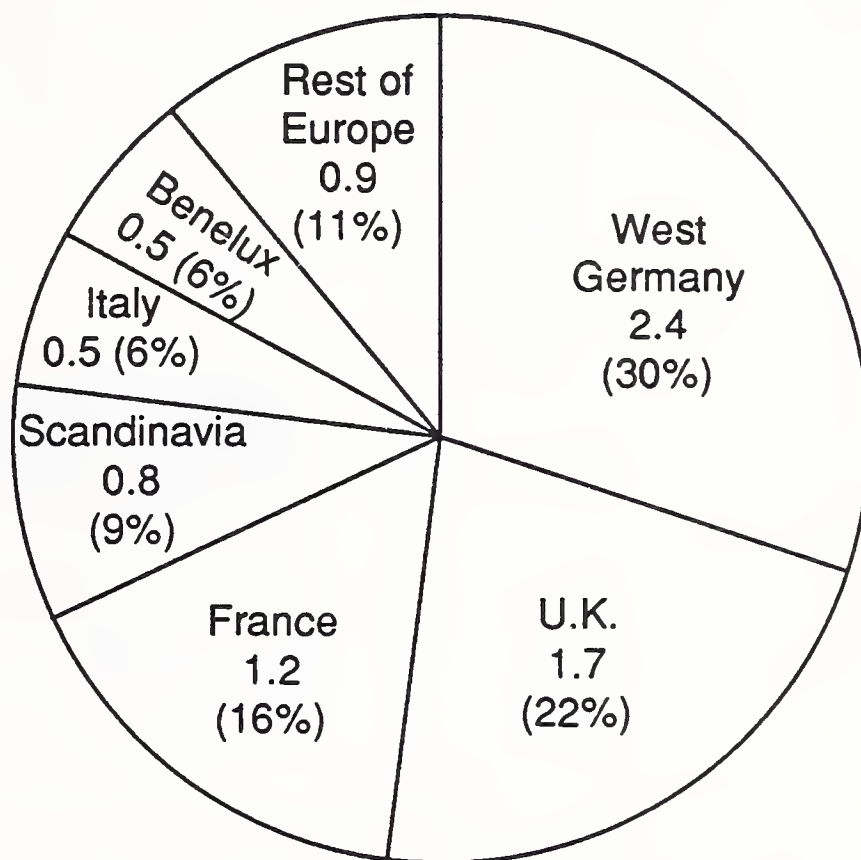
Total 1989 Market $8.0 Billion

Note: Figures are $ Billions and percentages are the proportion
of the total market

Exhibit II-12 illustrates INPUT's forecast for cross-industry and industry-specific turnkey systems over the period 1989 to 1994. In 1989, INPUT estimates that industry-specific systems represent some 60 percent of the total European turnkey market. By 1994, this is expected to increase to 65 percent. This is in part in response to the positive effect that the EC's Single Market initiative is expected to have on market segments such as banking and insurance, as well as on manufacturing, distribution and transportation.

EXHIBIT II-12

**Western European Turnkey Market,
Industry-Specific versus Cross-Industry Systems
1989-1994**
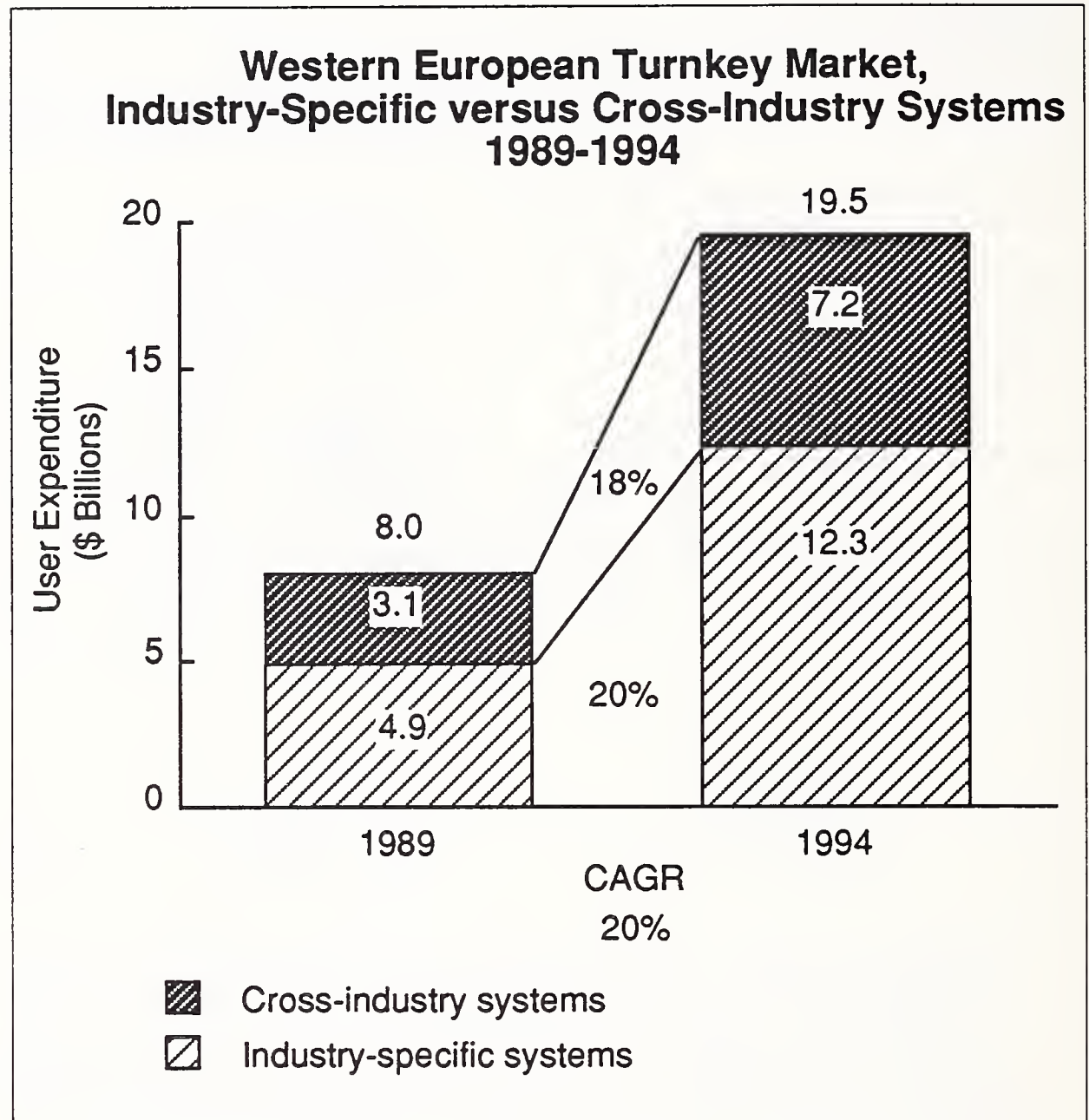
F

Challenges for the 1990s

The 1990s will see significant opportunities for vendors to sell packaged total solutions, either as turnkey systems, or as software products where equipment vendors retain the title to their equipment. Overall, INPUT estimates that the European software and services industry will grow by some 19% per annum over the next five years, whilst turnkey systems should grow at 20% per annum.

The question is which vendors will succeed in grasping these opportunities. There are strong indications that many equipment vendors are looking to the turnkey market as a way to maintain profits in the 1990s. The larger VARs are in an equally strong position to exploit new market opportunities.

This could mean that the small European VARs are under threat and should look very carefully at how they can protect themselves from predatory acquisition. Equally, European equipment vendors need to

restructure themselves so that they can compete more favourably with the large U.S. equipment vendors, such as IBM and Digital, in the minicomputer market. UNIX can be either an opportunity or a threat, depending upon how individual vendors exploit it.

Just as the 1980s saw major changes to the PC market, the 1990s could see the same happening to the minicomputer market. If this were to result, the control over the turnkey market will be a crucial element to the success of specific vendors.

Market Dynamics

III
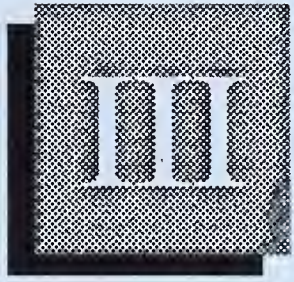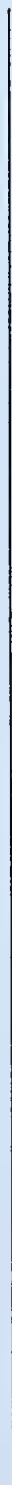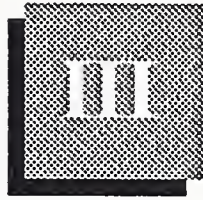
Market Dynamics

This Chapter defines the total solutions market and how turnkey systems fit into it. It looks at how different vendors deliver total solutions via both turnkey and VAR delivery modes. In particular, it analyses turnkey vendors into two main groups:

- equipment vendors
- independent software vendors

The relationship between these two vendor types is discussed, as is the issue of marketing channels for equipment vendors as it affects the turnkey market.

A
The Total Solutions Market

The turnkey market is that sector of the total solutions market where a single vendor sells a complete standard package of equipment, software and support. If necessary, the application software can be customized for individual end users.

The end user has two ways of getting a total solution to his computing problem. He can build it himself from components, or he can get a third party to do it for him. Depending upon the complexity of his application needs, the end user will either buy a solution made up of standard application software, or one specifically written for him by the third party.

The range of total solutions from third parties is illustrated in Exhibit III-1. It shows that the degree of customization can vary from zero to total customization. The distinction between systems integration and turnkey is that systems integration is a very large, totally unique contract built for a single customer. Turnkey systems are those where vendors have developed standard applications and sell them to as wide a customer base as possible, adding customization where necessary.

EXHIBIT III-1

The Total Solutions Market
Third-Party Systems

Turnkey Systems	Custom Turnkey Systems	Systems Integration
Degree of Customization		

0%   100%
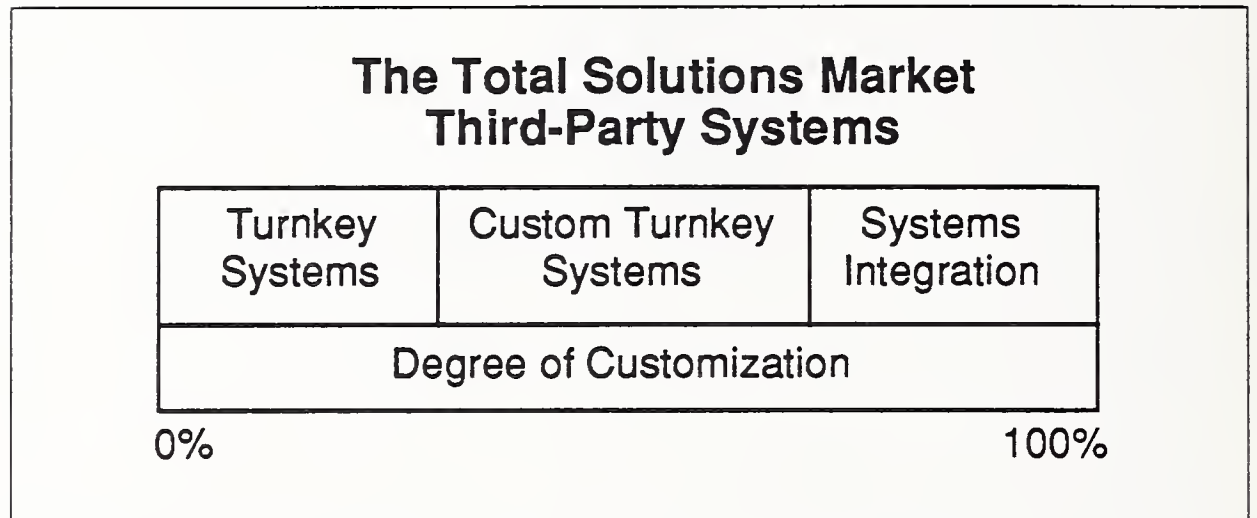
Within the turnkey market, INPUT defines two sectors:

- turnkey
- custom turnkey

Turnkey systems are those where vendors do not carry out any customization. They deliver, install and support the system, and will in general issue regular version updates. Custom turnkey is where the standard applications software can be customized for individual end users, if they so wish.

Although the division between turnkey and custom turnkey is generally clear, that between custom turnkey and bespoke systems can be blurred. If end users are buying mainframe systems, it is possible for the turnkey systems to be made up of standard application packages plus a high degree of customization. In these cases, it may be difficult to define in which category the solutions fall. In principal, INPUT uses the assumption that if the value of the standard application software is greater than the value of customization and other professional services, then the solution will be custom turnkey.

Turnkey systems are sold on the full range of equipment. The degree of customization and the price of the complete system increases with the power of the equipment platform. Exhibit III-2 illustrates this and shows that turnkey systems on PCs start at around $5,000 and go up to $50,000, including equipment. Systems on minis start at around $20,000 and can go up to $1 million. Mainframe systems mostly start at around $500,000 and can go well above $1 million.

Most turnkey systems are sold on PCs and minicomputers. Mainframe systems tend to have a high degree of customization and so, in general, fall outside the INPUT definition of turnkey.

EXHIBIT III-2

Turnkey Systems Price Spectrum

Mainframes (always customized)

Minicomputers (generally customized)

Workstations/ PCs (rarely customized)

0   10   100   1,000   10,000

$ Thousands
(including equipment costs)
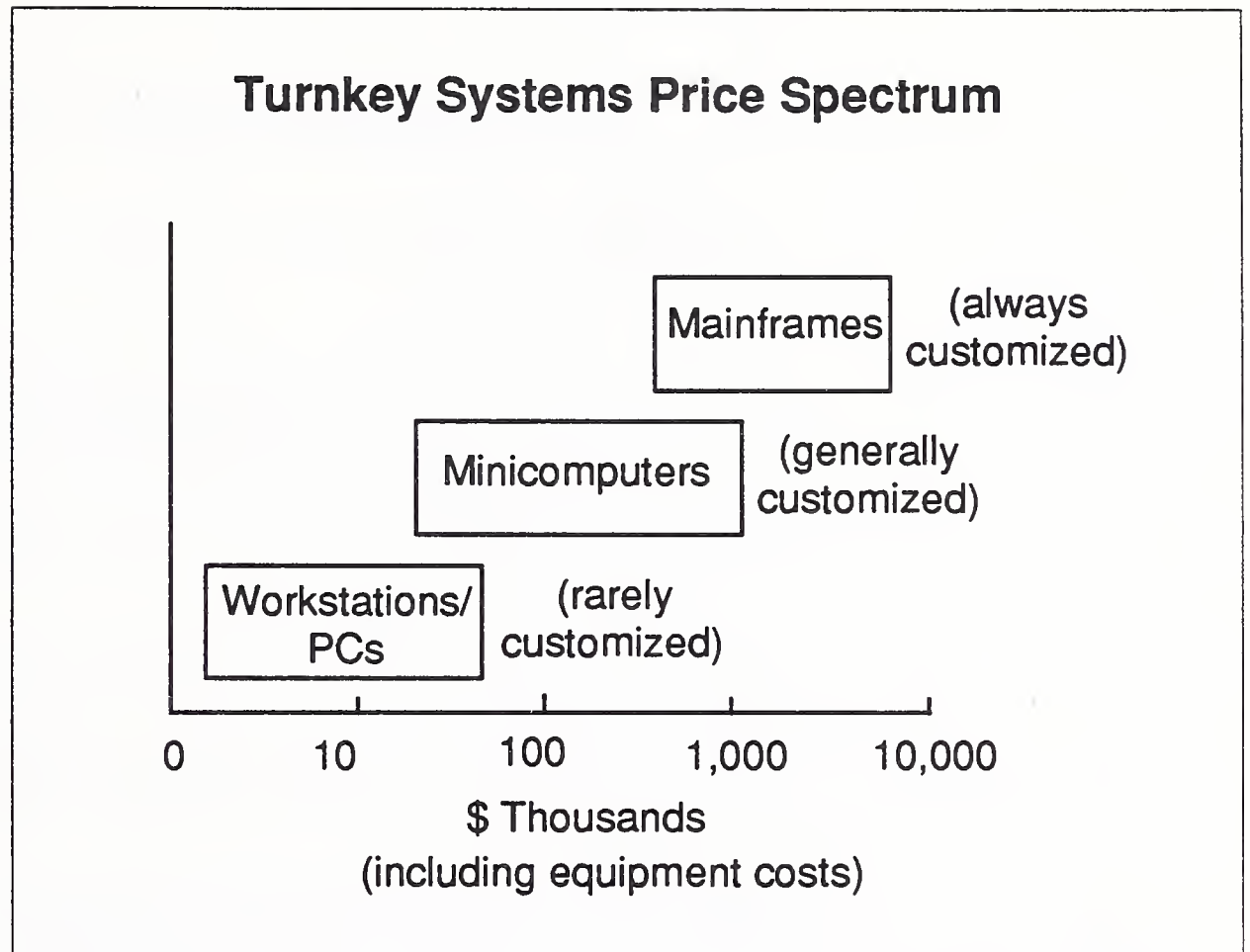
B

The Turnkey Market

1. The Components

There are four main layers of products and services that go into a turnkey system:

- equipment
  - plus maintenance and support

- system software
  - plus maintenance and support

- applications software
  - standard software
  - plus maintenance and support

- professional services
  - customization of the application software, if required
  - training, consultancy, etc., if required

In the turnkey market, these products and services are all packaged and sold by a single vendor. The same vendor will also undertake to maintain and support the total system.

2. Vendor Types

There are two principal types of vendors selling turnkey systems:

- equipment vendors
- independent software vendors

Equipment vendors follow a number of options in developing turnkey systems. They might develop their own specific applications software in-house; they might licence an application from an independent software vendor to sell it themselves, together with their equipment; or they might buy up third-party applications software or the whole independent software vendor, to gain control over specific applications.

Alternatively, the turnkey vendor could be an OEM who buys the equipment, relabels it and packages it up with his application software. For the purposes of this report, any OEM selling relabelled equipment in a turnkey environment is referred to as an equipment vendor.

Independent software vendors generally have developed the applications software in-house, although there are instances where they licence applications from other independents to market and sell themselves. To sell a complete turnkey system, they take title to the equipment from the equipment vendor, and then deliver, install and support it.

For minicomputer systems, these independent software vendors will generally have formal agreements with one or more equipment vendors by which they can take title to the equipment. In so doing, they act as value-added resellers, VARs. Certain equipment vendors, such as IBM, do not like using the phrase "VARs", preferring to call them "Agents". For PC systems, the independent software vendor may have an agreement with a distributor of the equipment rather than the equipment vendor.

The independent software vendor selling turnkey systems will generally limit himself to a small range of equipment, otherwise he will overextend his support capabilities. Equally, it is in the interest of the equipment vendor to limit the better VARs to just his own equipment, and this he tries to do through the formal agreement, which will probably be part of a well-thought-out VAR programme.

These different types of turnkey vendors are illustrated in Exhibit III-3. Both equipment vendors and independent software vendors take title to the equipment, although with independent software vendors, the equipment is not relabelled, but left under the equipment vendor's name.

EXHIBIT III-3

Types of Turnkey Vendor

1. Equipment Vendors	Puts own label on equipment a. Equipment vendor b. OEM
2. Independent Software Vendor	Takes title to equipment, but does not relabel a. VAR (with formal agreement with the equipment vendor) b. Independent software vendor (with no formal agreement with the equipment vendor)

Examples of equipment vendors selling turnkey systems are Nixdorf, which has developed banking systems, and Prime, with its CAD/CAM and related graphics systems. They have developed their own applications software that they sell as complete turnkey systems on their own equipment. Most equipment vendors of minicomputer systems have some application software that they own and sell with their equipment as turnkey systems.

An example of an OEM is Mannesmann Kienzle, which is an equipment vendor in its own right selling turnkey systems on its proprietary equipment, but is currently buying UNIX boxes and relabelling them under its own name.

Independent turnkey vendors are companies such as U.S.-owned Metier, with its project management system; and ARTEMIS, or Software Sciences, from the U.K. with its hotel management package and on-line financial trading system. Both of these companies sell turnkey systems on minis. Major turnkey vendors on PCs are Kalamazoo in the U.K. with its range of small business packages, or the French Sligos Group's MANAGIX. Kalamazoo boasts of some 4,000 customers for its systems and MANAGIX nearly 2,000.

3. Competing Solutions

Particularly for minicomputer and mainframe systems, many independent software vendors sell competing packages to turnkey systems, but without taking title to the equipment. The delivered solution to the end user has all the same components as in turnkey systems, but the equipment

vendor takes responsibility to contract, install and maintain the equipment. INPUT defines and monitors such sales by their component elements—software products, plus related professional services. In this report, these sales are referred to as software product solutions, and the wider market encompassing both turnkey systems and software product solutions as the packaged total solutions market.

In many areas of continental Europe, the word turnkey (in French "clé en main", and in Italian "sistemi chiavi in mano") is used for both systems integration and for software product solutions. In addition, southern European end users, Italians in particular, prefer buying solutions that are unique. Many have an adversion to buying mass-marketed products which could very well be sold to the competitor next door. In these markets, vendors have to package their solutions to look like bespoke solutions, even if in reality they are custom turnkey or software product solutions. Often vendors call their systems "turnkey", even though they are selling them as bespoke systems.

European readers should be careful to differentiate between their use of the term turnkey and the specific way INPUT defines and uses it in this and other reports.

The PC market has become a high-volume sales market, and equipment vendors have accepted that they have to use a range of third-party sales channels. In so doing, they have lost control over the end user. The same is not the case for minicomputer and mainframe systems, and equipment vendors still prefer to retain title to their equipment and so know who the end user is. For this reason, VARs often do not take title to the equipment, and deliver their application software as software product solutions rather than turnkey systems.

With software product solutions, the independent software products vendor will, in all probability, make the sale. As with turnkey systems, it will have a formal, commissioned relationship with one or more equipment vendor. The end user will receive a complete solution, but will have two contracts—one from the software products vendor, and one from the equipment vendor of their choice. The equipment vendor will be responsible for installing and maintaining the equipment. Either the software products vendor or the equipment vendor can deliver and maintain the system software. The software products vendor will deliver and maintain the application software, plus any additional services, such as customization, training, consultancy, etc.

The software products vendor will normally work with one or more equipment vendors as a VAR. The formal agreement will be different to that for turnkey systems, as, in this case, the VAR will not take title to the equipment. Exhibit III-4 illustrates how the total revenue is broken down for turnkey and software product solutions.

EXHIBIT III-4

Revenue Breakdown for Different Types of Packaged Total Solutions Vendors

Professional Services
Packaged Software
Equipment Commission
Net Equipment Value
Total Equipment Value

Software Products Solution Vendors

Turnkey Vendors

☐ Revenue passing through turnkey and software products vendor's books

⌐ ¬ Revenue passing through equipment vendor's accounts

There are some 3,000 VARs active in the European market selling either turnkey systems or component total solutions together with equipment vendors. The turnkey delivery mode is very rarely used for mainframe systems, is used only for about 20% of minicomputer systems, but is the dominant mode for PCs.

As discussed above, large systems are rarely used for packaged total solutions. INPUT has not been able to identify any independent vendors selling turnkey systems on mainframe platforms, although there are a few selling component total solutions on mainframes. The only vendor type selling turnkey systems on mainframes, as identified by INPUT, is equipment vendors, such as IBM with their CATIA CAD/CAM systems.

Minicomputer platforms are the most common types of equipment. Because the component delivery mode represents some 80% of systems delivered by independent software vendors on minicomputer systems, and turnkey only some 20%, this report considers in some detail vendors selling via software product solutions, as well as turnkey systems. Exhibit III-5 illustrates the different systems competing in the packaged total solution market.

EXHIBIT III-5

Range of Packaged Total Solutions
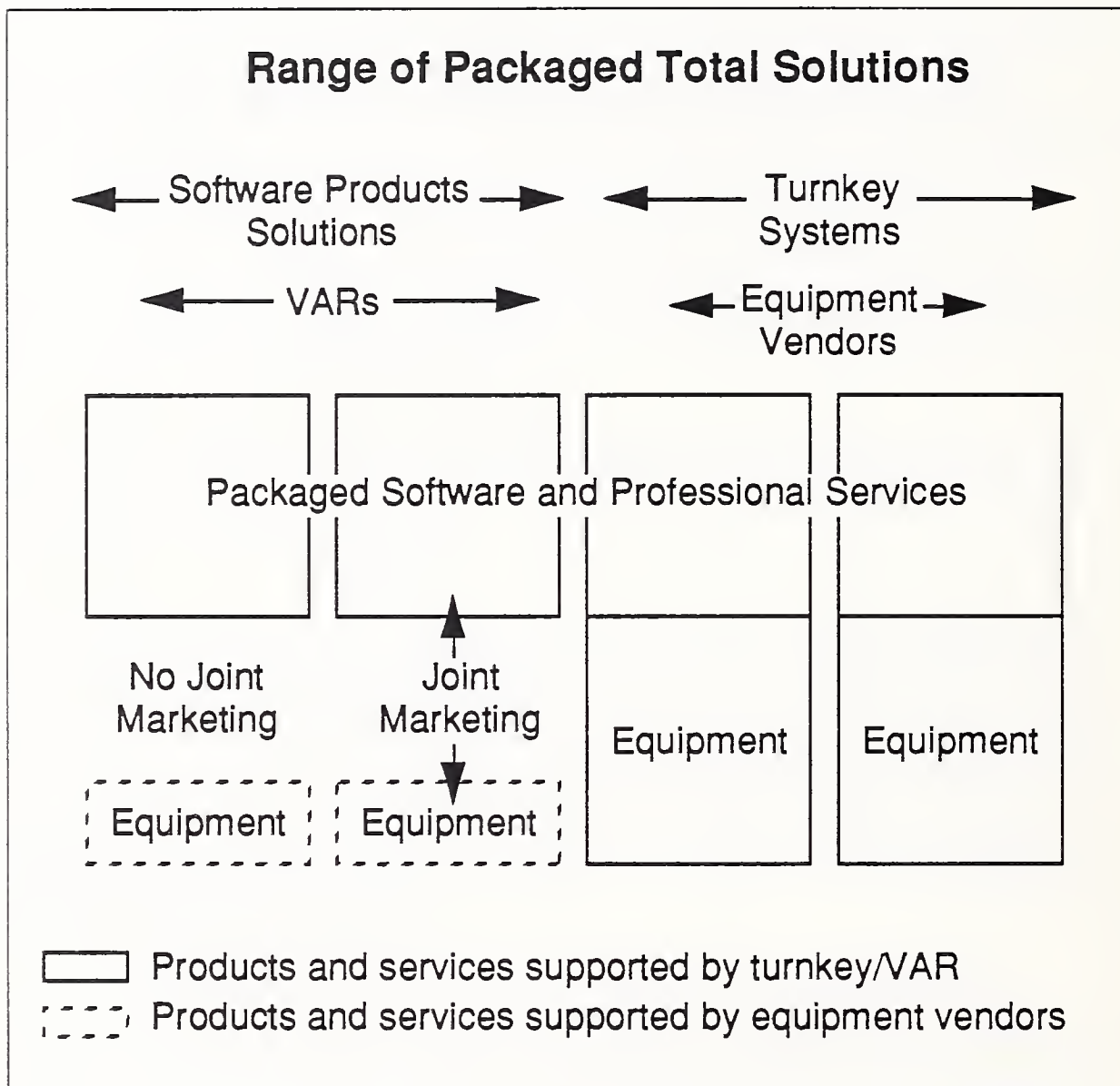
For end users, the question of whether one or two vendors deliver the packaged total solution is not important. Many of the key issues facing VARs are, therefore, the same whether they are delivering their systems as turnkey, or as components. With user research, INPUT has, therefore, not tried to differentiate between these two types of delivery modes.

In many instances, VARs who sell turnkey systems also sell software product solutions, but on different equipment. Typical examples are Metier and Software Sciences. Metier sells turnkey on Hewlett-Packard equipment, and software product solutions on IBM. Software Sciences sell turnkey on Data General machines, and software product solutions on IBM, Tandem and Stratus.

The fact that VARs sell turnkey on different equipment from that on which they sell software product solutions is often due to the attitude of specific equipment vendors. IBM in particular, and to a lesser degree Digital, try to maintain control over end users by retaining title to their equipment. Their strength in the minicomputer market and success in this strategy is directly reflected in the low penetration of turnkey systems and the high penetration of software product solutions in the European minicomputer market.

There are several examples of VARs that only sell software product solutions on minicomputers. SAP of West Germany sells packages on IBM and Siemens equipment in manufacturing and banking. The Australian-owned Paxus Group is a market leader with insurance systems sold on IBM. SD-Scicon of the U.K. sells plant maintenance systems on IBM mainframes and Digital and Hewlett-Packard minicomputers.

As discussed above, turnkey systems based on PCs are the more common delivery mode for independents, the reason being that it is a much freer market sector with equipment vendors unable to demand as much control over how their equipment is marketed.

4. VAR Programmes

In the 1980s, as pressure on equipment margins increased and as end users looked more to total solutions, equipment vendors saw the advantage of using VARs as an alternative marketing channel. IBM and Digital led the way, and have developed sophisticated third-party channel programmes. Other large equipment vendors have followed suit, such as Hewlett-Packard, Unisys, Bull, Olivetti, and ICL.

These VAR programmes are the creation of the equipment vendor. They are a way of tying specific VARs to their equipment. Companies like IBM and Digital have developed very sophisticated VAR programmes, which, because of the constantly shifting marketplace, they are regularly having to amend and change.

The latest Digital programme is called the Digital "Marketing Support Programme", and its structure is illustrated in Exhibit III-6. There is a range of agreements available, depending on how the third party is packaging its products and services on Digital hardware and selling it. To assist Digital in developing new markets, a VAR can either take title and sell turnkey, or not take title and sell software products. For new markets into which Digital wishes to develop, there is only the DASP programme, in which the VAR has to take title.

EXHIBIT III-6

Digital Marketing Support Programme

DASP Digital Authorised Solution Provider	CMP Cooperative Marketing Programme
Designed to allow Digital to attack new markets	Designed to allow Digital to consolidate in existing strategic markets

Channel Takes
Title

Channel Does
Not Take Title
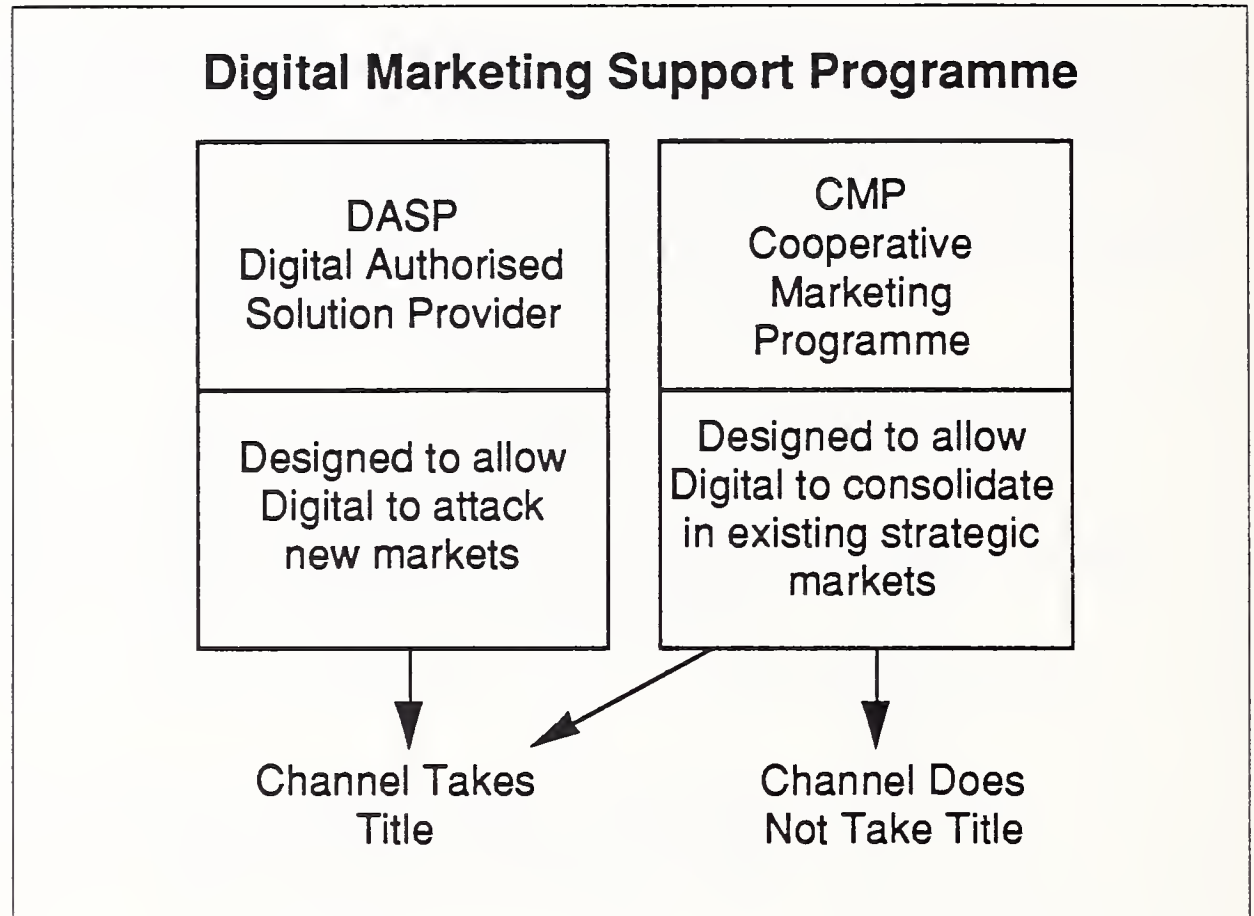
It is understood that Digital will revise its whole VAR programme again in late 1989/early 1990. This will be the third shake-up in two years. Its current programme constricts VARs too much, and the new programme will lease the rules in key strategic areas. Added to this, as discussed in Chapter IV, Digital is developing its own programme to license application software packages and sell them itself.

IBM has a similar range of VAR programmes, under the name of IBM's "Business Partner" Programme, as illustrated in Exhibit III-7. In the case of IBM, the principal support given is to those VARs, or Agents as IBM prefers to call them, who do not take title.

The main thrust of such programmes is to offer joint marketing to the better VARs, such as promotional literature, exhibition space, and involvement in customer seminars, all paid for by the equipment vendor. These can be of considerable benefit to the VAR, especially if they introduce them to new clients, or new business partners such as foreign distributors.

In return, the VAR is expected to show a high degree of allegiance to the equipment vendor, even if it is not written into the agreement. IBM, for instance, sees such Business Partners as "an extension of its direct sales force". It has been reported that IBM plans to extend the same benefits to IBM Agents as to IBM employees starting in 1989—IBM identity cards, discounts with hotels, car-hire firms and airlines, even the ability to join the IBM pension scheme.

EXHIBIT III-7

IBM Business Partner Programme

Re-marketed	PAA Project Assistance Agreement	GMA General Marketing Agent
Designed to allow 3rd parties to take title	Designed to support vendors with specific projects	Designed to support vendors in specific markets

Channel Takes Title

Channel Does Not Take Title
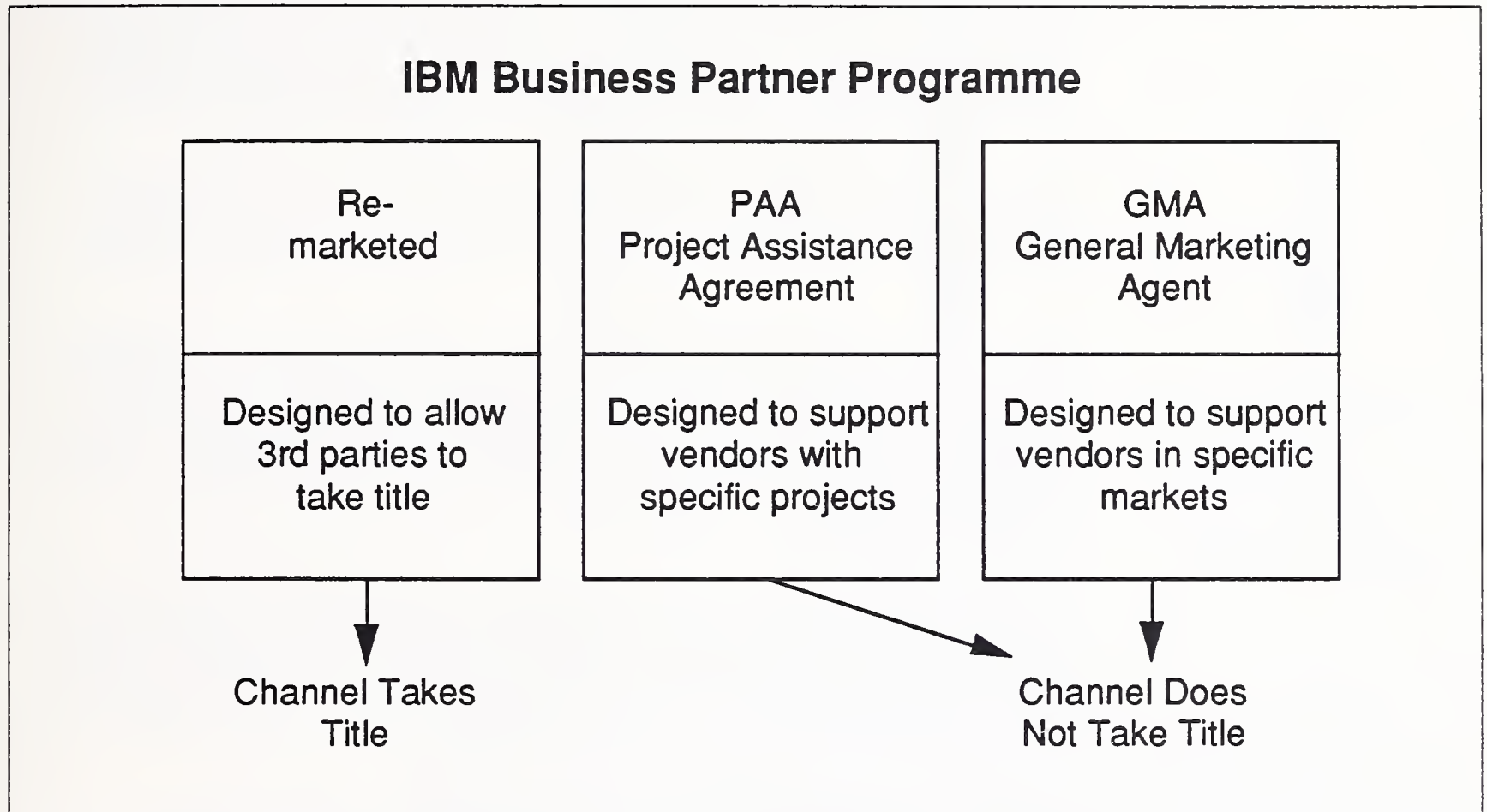
5. Software-Only Sales

Virtually all turnkey vendors also sell their applications software on their own, independent of any equipment sale. This can be due to end users wishing to acquire additional modules, or copies for spare equipment that they already have. In this case, such sales can be readily classified as software-product-only sales, rather than turnkey sales.

Software-only sales can also be due to a company having a specific corporate equipment policy, buying all its equipment under a central bulk contract, and purchasing its applications software separately. INPUT classifies all such sales as software products and not turnkey sales.

The reason for this is that a turnkey sale is that in which the end user is purchasing a total system, including the associated equipment and support. If the application software is sold on its own, even if it is the same standard software sold in a turnkey system, it is viewed as a software-only sale.

C

Control over End Users

In the turnkey market, equipment vendors can be directly involved in this market as vendors by selling their own application software packaged as turnkey systems, or by supporting VARs. Independent software vendors can either market and sell their application software as turnkey systems, or compete by selling software product solutions.

A very limited number of independent software vendors have developed their own equipment for the turnkey market. This has been the case in the CAD/CAM sector (e.g. Intergraph). In this area, demand for specific high-performance products has, in the past, forced vendors to look to customizing equipment and ultimately to building their own.

These instances are rare. INPUT defines such vendors as equipment vendors, even though they may have started as independent software vendors.

There will always be niche markets where the development of application-specific equipment will show marked advantages over standard equipment. Vendors will often market such systems as turnkey, in order to derive the maximum profit from delivering a highly efficient, finely-tuned total solution.

In today's highly competitive equipment market, there is little advantage to independent software vendors using their own resources to develop such application-specific equipment. There are a large number of equipment vendors prepared to take the risk and problems of such equipment developments.

Even if there is no incentive for the independent turnkey vendor to become an equipment vendor, the converse is not true. Many equipment vendors are looking to owning and controlling application software and selling turnkey systems.

In the turnkey market, the relationship between equipment vendors and independent software vendors is a two-edged sword.

Where equipment vendors support VARs, these two types of vendors work as a team to deliver a packaged total solution to end users. However, in those areas where equipment vendors have decided to develop and sell their own application software in a turnkey package, equipment vendors and independent software vendors are direct competitors.

The different marketing channels open to equipment vendors are illustrated in Exhibit III-8. Certain equipment vendors prefer to maintain control over the ultimate end user of their equipment, especially vendors of minicomputers and mainframes. There is, therefore, a tendency to work with independent software vendors selling packaged software products, rather than turnkey systems. IBM, in particular, has kept to this strategy. Today, both IBM and Digital have portfolios of many hundreds of VARs working with them around Europe.

EXHIBIT III-8

Equipment Vendor Marketing Channels

Total Control	Partial Control	Loss of Control
↓	↓	↓
Equipment Only or Direct Turnkey Sales (Own sales force)	3rd-Party Channels Retaining Title to Equipment (VARs selling software product solutions)	3rd-Party Channels Passing Title over to Equipment (VARs selling turnkey systems)
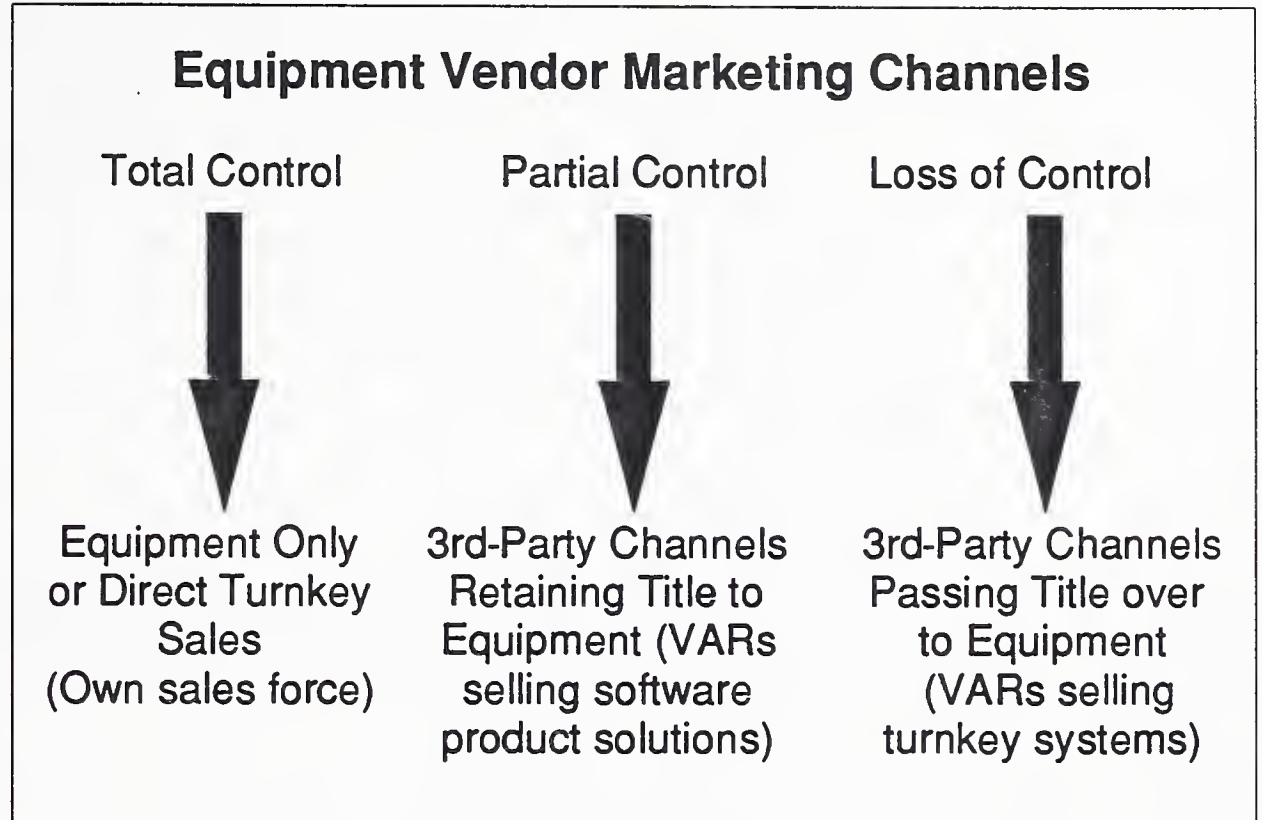
INPUT predicts that the 1990s might well see yet another shift in the way equipment vendors view the best way to sell their equipment. From actively supporting VARs in the 1980s, there is a strong possibility that they might shift more to selling their own turnkey packages. The reason for this would be an attempt to maintain control over the ultimate customer.

The widespread introduction of open systems, like UNIX, will allow end users to shift more readily between equipment vendors. The result for equipment vendors could be a loss of control over the end user, as has already happened in the PC market. Here, not only have equipment vendors lost control over end users, but software products vendors generally sell turnkey systems rather than packaged software products to assist end users in their choice of the best equipment.

If this were to happen in the minicomputer market through the development of UNIX, the control over the end user would shift to the vendor of application software, as has already happened in the PC market. To retain this control, equipment vendors may have to move more into their own application software to maintain their links with end users. This points to equipment vendors moving away from supporting VARs, to selling their own turnkey systems.

This they could do by developing their own applications, by acquiring applications or whole independent software vendors, or by simply licensing application software for their organisations to market directly with their equipment and support. The CAD/CAM market is just such an example of a sector where this has already happened. All the major players in this sector are equipment vendors selling their own turnkey solutions—Prime, IBM, Intergraph, and McDonnell Douglas.

Licensing agreements by equipment vendors are becoming more common. As an example of how complex such agreements can become, Unisys has the worldwide agreement to market and sell the U.K.-developed integrated manufacturing, distribution and financial control system, mTMS. When marketed by Unisys, it is a Unisys-labelled product. It is still sold by its creators, Bec Systems Software, on Unisys hardware, as both turnkey systems and software product solutions. In addition, it is licensed to Enterprise Business Systems for them to sell exclusively as a VAR under Digital's DASP programme, under the product name EMS.

This possible shift in marketing strategy by equipment vendors towards marketing and selling their own turnkey systems is a major issue for the turnkey market for the 1990s. For this reason, considerable attention is given in this report to these two types of vendors, the equipment vendors and the independent software vendors, and the relationship between them.

IV

Market Size and Forecast

IV
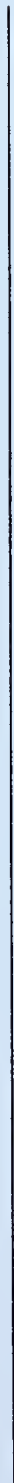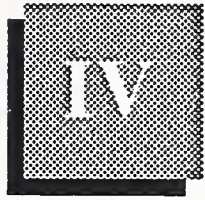
Market Size and Forecast

This chapter examines the size and structure of the European turnkey market over the period from 1989 to 1994. It discusses in detail the turnkey market alone and breaks the market down by:

- product and service component
- equipment platform
- vendor revenue and type
- country
- equipment vendor penetration
- industry-specific and cross-industry systems

It then looks at the wider packaged total solutions market, which includes software product solutions sold by software products vendors where they do not take title to the equipment, as well as turnkey systems.

A
Western European Turnkey Market

1. Market Size and Growth

The Western European turnkey market is estimated by INPUT to have grown from $7.0 billion in 1988 to $8.0 billion in 1989. This represents a growth rate of 14% per annum, significantly lower than the average for the European software and services industry of 19% per annum.

As Exhibit IV-1 illustrates, the market is forecast to grow substantially faster over the next five years. INPUT estimates that in the period from 1989 to 1994, the turnkey market should grow an average of 20% per annum, slightly above the 19% per annum estimated by INPUT for the overall European software and services market. By 1994, it is forecast to reach $19.5 billion.

EXHIBIT IV-1

Western European Turnkey Market
1989-1994

User Expenditure ($ Billions)

20

19.5

15

1988 = 7.0

10

8.0

5

0

1989   CAGR   1994
                20%
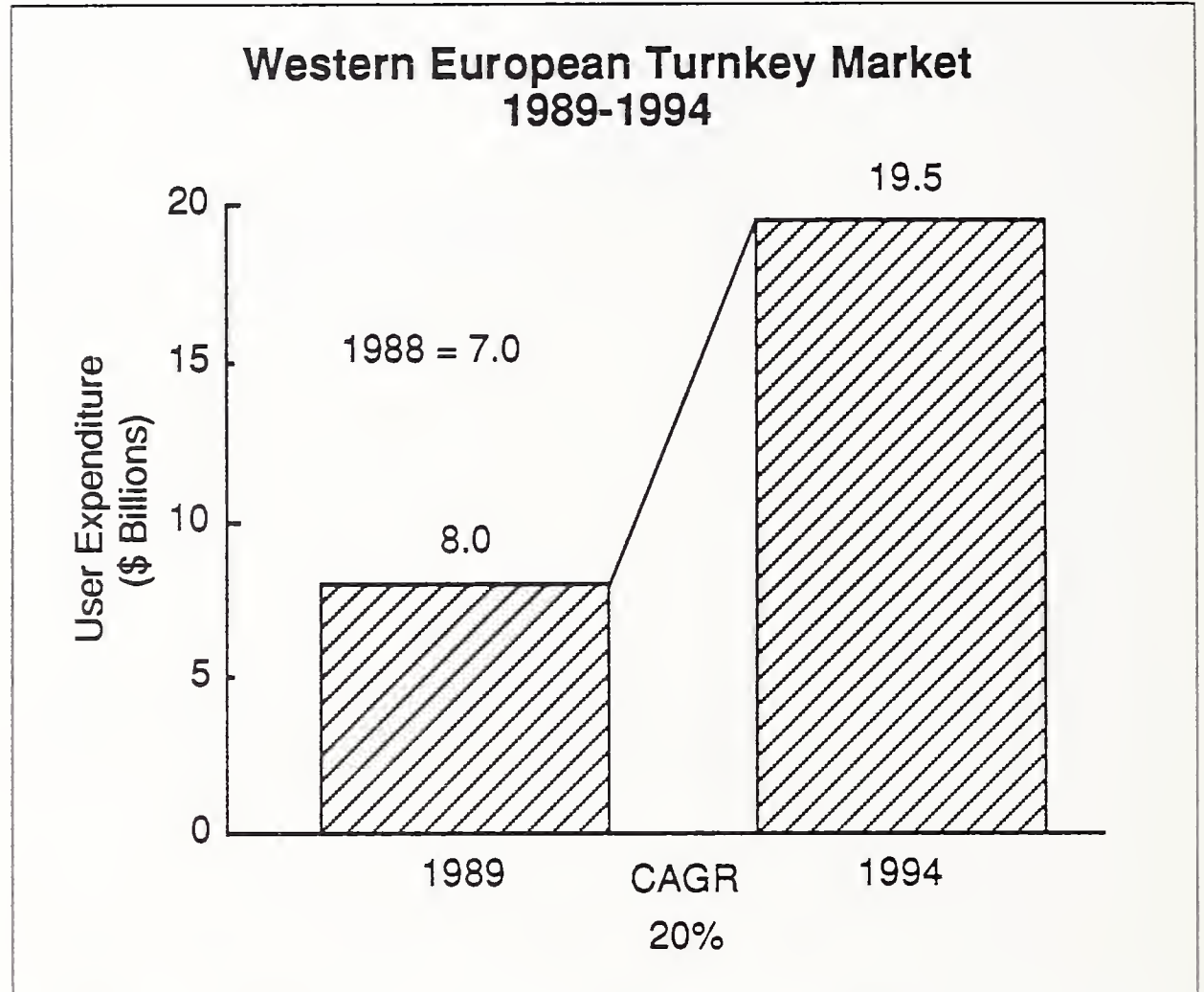
Exhibit IV-2 analyses the market in the major component products and services divisions.

In 1989, equipment is estimated to represent 55% of total market revenue. This is expected to fall to 45% by 1994. This is partially due to the continuing downward pressure on equipment prices, and, partially to the growing power of PCs and workstations, which will offer more economic platforms for turnkey vendors than today's minis. As a result, equipment is forecast to grow by only 15% per annum over this five-year period.

Software and services are expected to grow at a much faster rate than equipment. Standard software is forecast to grow at 24% per annum over the next five years. Customization is to grow even faster, at 27% per annum. This is due to the trend toward including more networking and other custom elements in European packages.

Other professional services, such as consultancy, training and education are expected to grow the fastest, at 30% per annum. All vendors interviewed by INPUT for this report are looking to this area of professional services as a high growth area with good margins.

EXHIBIT IV-2

**Western European Turnkey Market
by Product and Service Component
1989-1994**
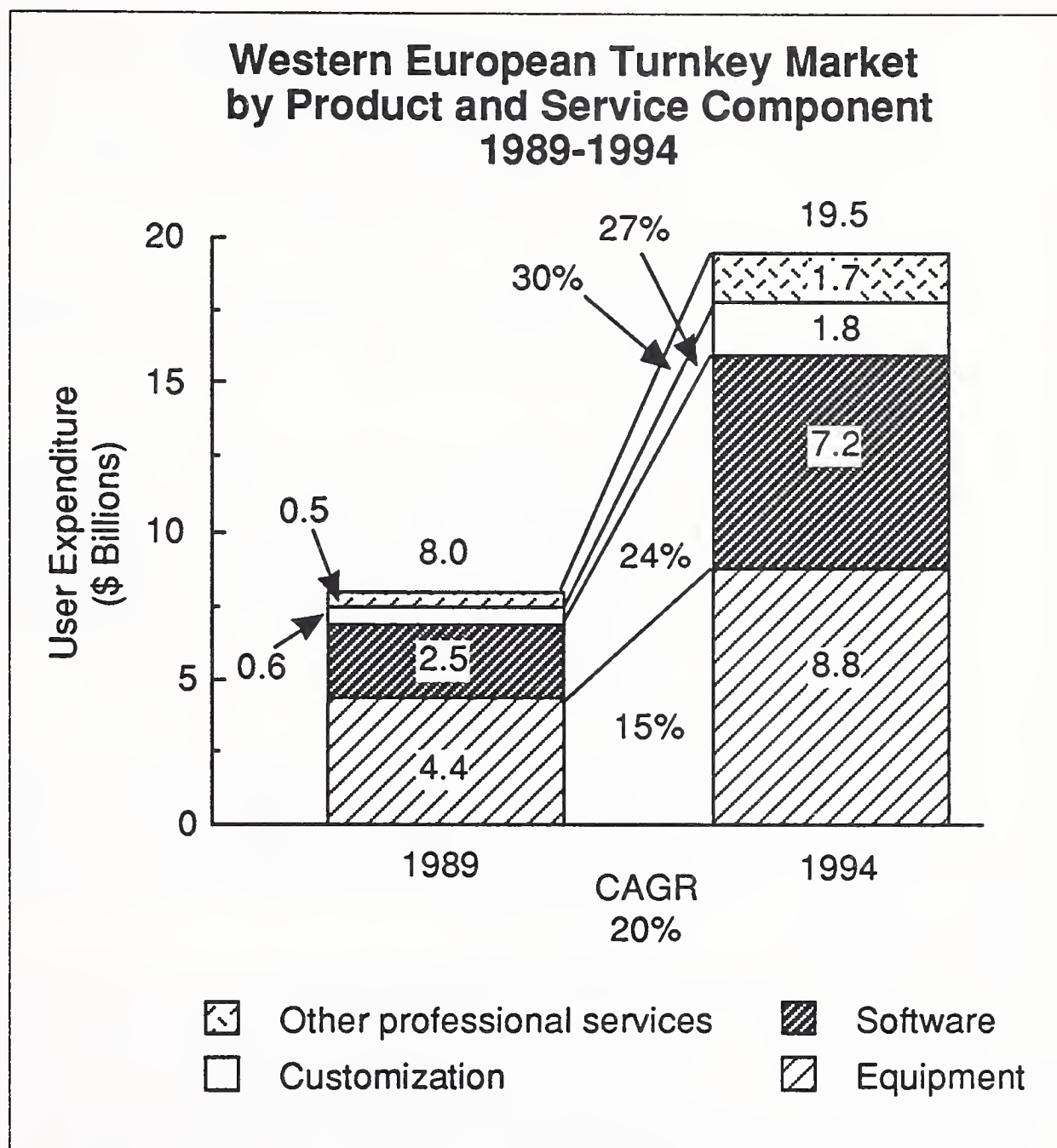
2. Vendor Country Origin

To understand how different forces may affect the market, it is necessary to appreciate the effect of ownership on the turnkey market. There are two principal types of ownership of vendors:

• European
• U.S.

European VARs have all started off by building up their businesses in one European country. If they have been successful and have reached the critical mass to become international, then they have moved into other European countries. In general, such steps have been initially to neighbouring countries, especially if the culture or language is similar.

One therefore finds the West German vendors, such as SAP AG, in Austria and the German-speaking parts of Switzerland. SAP AG sells plant maintenance, accounting and distribution systems run from both

Siemens and IBM equipment. Similarly, French vendors reach to Belgium and the French parts of Switzerland. Companie Genérale d'Informatique (CGI) sells personnel management and accounting systems on Bull, IBM and Digital equipment. Like many other French vendors, it has not only expanded into the other French-speaking areas of Europe, but also into Spain.

The British have no natural-language markets other than Ireland within Europe. Often they have followed the lead of the U.S. vendors who have become pan-European.

The U.K. has been the natural first step into Europe for many U.S. vendors. This has made Britain the most competitive national market in Europe for turnkey systems. Just as European vendors need a critical mass to go international within Europe, so have U.S. vendors needed similar size to launch themselves across the Atlantic. U.S. vendors in Europe are, therefore, all large international companies, with revenues well above $10 million.

It has not been too difficult for these U.S. vendors to make the second step and move out of the U.K. to the rest of Europe. The difference between them and the European vendors is that they do not have a special allegiance to any part of Europe, and so have often become truly pan-European.

Turnkey vendors who have the power and strength to go pan-European are usually not the VARs, but the equipment vendors. Their global revenues are in the billions of dollars, not millions. There are relatively few equipment vendors constrained to just one European market—most are British.

One sees the same pattern of international growth with equipment vendors as with the VARs. The European equipment vendors have all developed out of one European country, which will often account for over 50% of their sales. U.S. equipment vendors, on the other hand, have gone pan-European in a way that virtually no European equipment vendor has, and so have a much more even coverage around Europe.

Exhibit IV-3 shows the breakdown of the 1989 European turnkey market by equipment platform. Minicomputers are by far the most important platform for turnkey systems, accounting for some 60% of the total end user revenue generated by turnkey sales.

EXHIBIT IV-3

Western European Turnkey Market by Equipment Platform, 1989

Mainframes 4%

Workstations/ PCs 37%

Minicomputers 59%

Total 1989 Market: $8.0 Billion
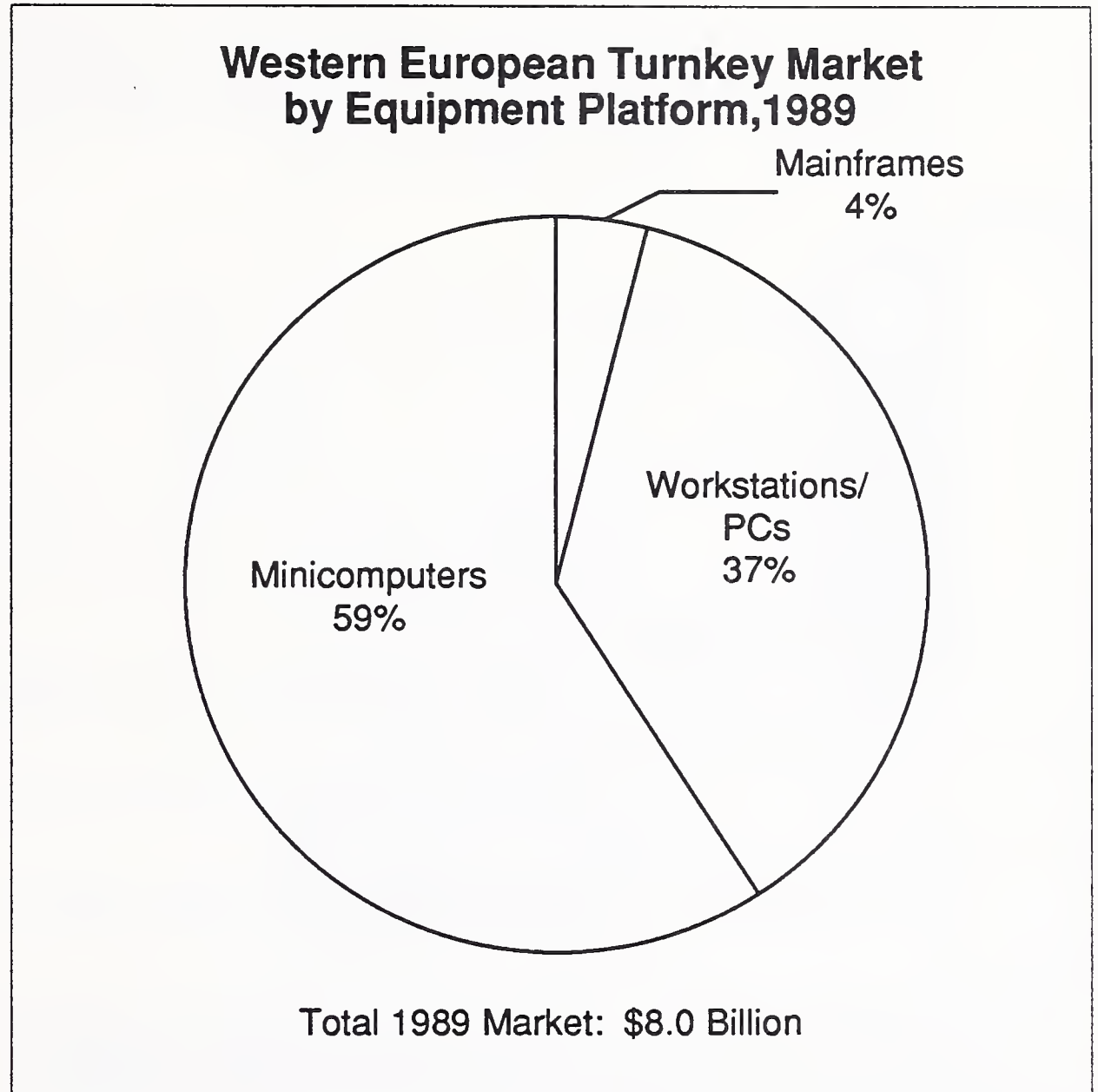
U.S. equipment vendors account for over 50% of sales in the European minicomputer market. The vast majority of them have set up their European headquarters in the U.K. Perhaps it is because of this competition that the U.K. has a number of smaller equipment vendors of its own to add further to local competition. As a result, the U.K. is the most competitive equipment market in any European country, though West Germany is the biggest.

The majority of equipment sales for European equipment vendors come from a small number of long-established, multi-billion-dollar companies. Generally each European country has given birth to one major equipment vendor. The major exceptions are West Germany which has two (Siemens and Nixdorf), and Spain which has no Spanish equipment vendor. Though there are a number of foreign companies who manufacture equipment in Spain—Fujitsu, IBM, Olivetti and Hewlett-Packard.

This pattern of equipment bases around Europe is illustrated in Exhibit IV-4. It shows how pervasive U.S. equipment vendors are, notably IBM and Digital, and how different European countries are dominated by national equipment vendors.

EXHIBIT IV-4

Major Equipment Vendors by European Country

Country	Structure
Benelux	Philips, plus most U.S. and European vendors
France	Bull, plus most U.S. and European vendors
Italy	Olivetti, plus major U.S. and European vendors
Spain	Mainly IBM, plus other major U.S. and European vendors
Scandinavia	Nokia and Norsk Data, plus major U.S. and European vendors
U.K.	STC (ICL), plus other U.K. vendors, plus all U.S. and most European vendors
West Germany	Siemens, Nixdorf, other German vendors, plus most U.S. and European vendors
Others	Similar to neighbours

Note: IBM is the leading equipment vendor in virtually every Western European country

3. Vendor Revenue Breakdown

Exhibit IV-5 reviews the 1989 turnkey market by major ranges of vendor annual revenue and by vendor type.

EXHIBIT IV-5

Western European Turnkey Market by Vendor Revenue and Type, 1989

User Expenditure ($ Billions)

	0-2.0	2.1-20	21-50	>50
	1.2	1.7	0.6 / 0.5	4.5 / 4.3

1989 Vendor Revenue ($ Millions)

▨ Equipment Vendors
▨ Independent Software Vendors (VARs)

Total 1989 Market: $8.0 Billion
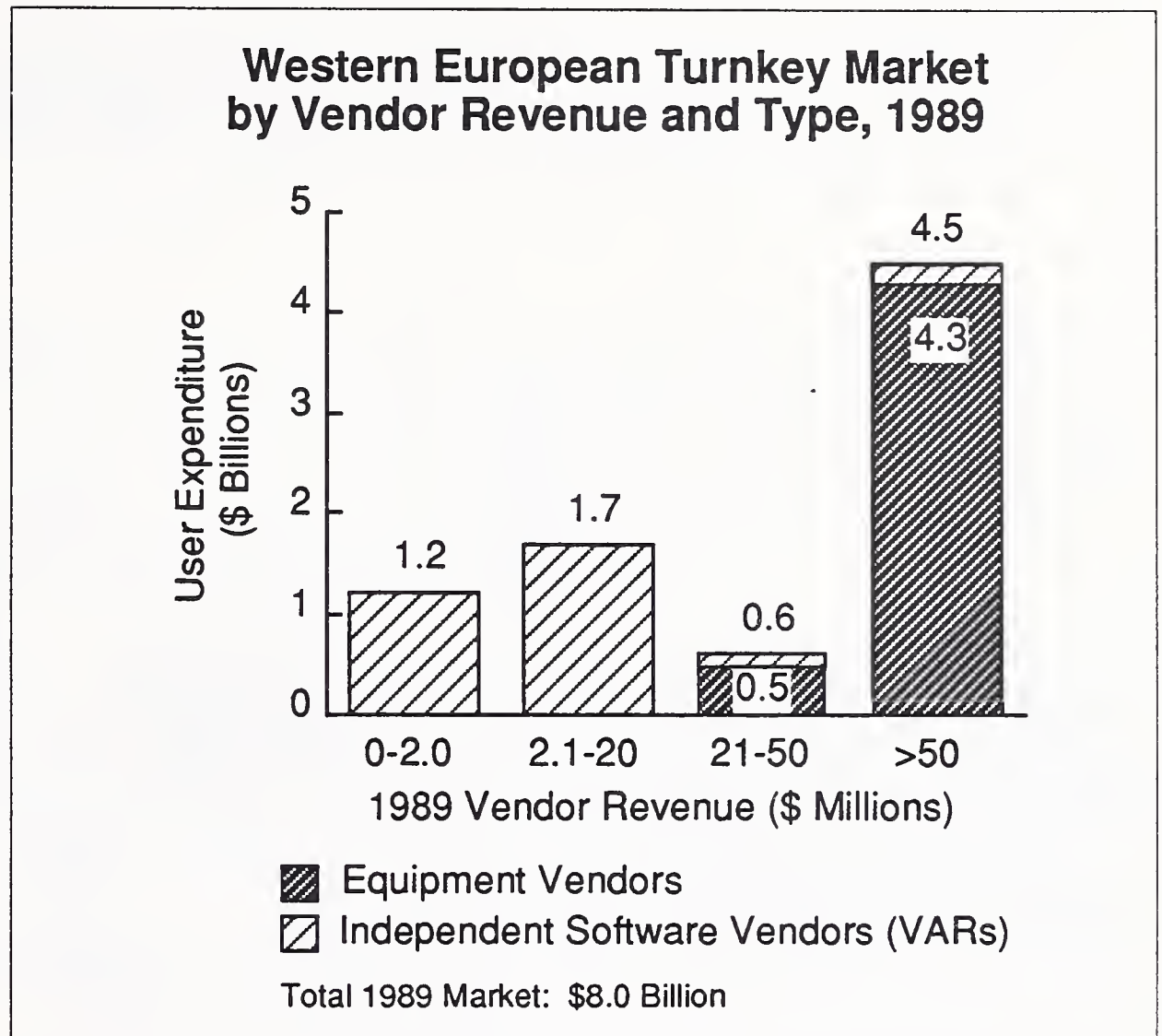
Two main revenue bands can be seen on the graph, one for vendors with annual revenues of over $50 million, the other for those with revenues between $2 and $20 million. The high end is dominated by equipment vendors and the low end by VARs. In other words, the majority of VARs have annual turnkey revenues in the $2 to $20 million range, whilst virtually all equipment vendors have annual turnkey revenues of $50 million and above.

The influence of a single equipment vendor is, therefore, some ten times greater than that of an individual VAR. Currently there are relatively few equipment vendors involved in the European turnkey market, some 10 to 15. This can be compared with around 3,000 VARs selling some form of packaged total solution, of which about 60%, or 2,000, are estimated to sell turnkey systems, often in addition to software product solutions.

4. Vendor Type Forecast

Exhibit IV-6 analyses the European turnkey market by type of vendor. In 1989, INPUT estimated that equipment vendors controlled 54% of total European turnkey revenues, and VARs, 46%. By 1994, the influence of equipment vendors is expected to fall to 50% of the total. The reason for this shift towards VARs is complex.

EXHIBIT IV-6

Western European Turnkey Market by Vendor Type, 1989-1994
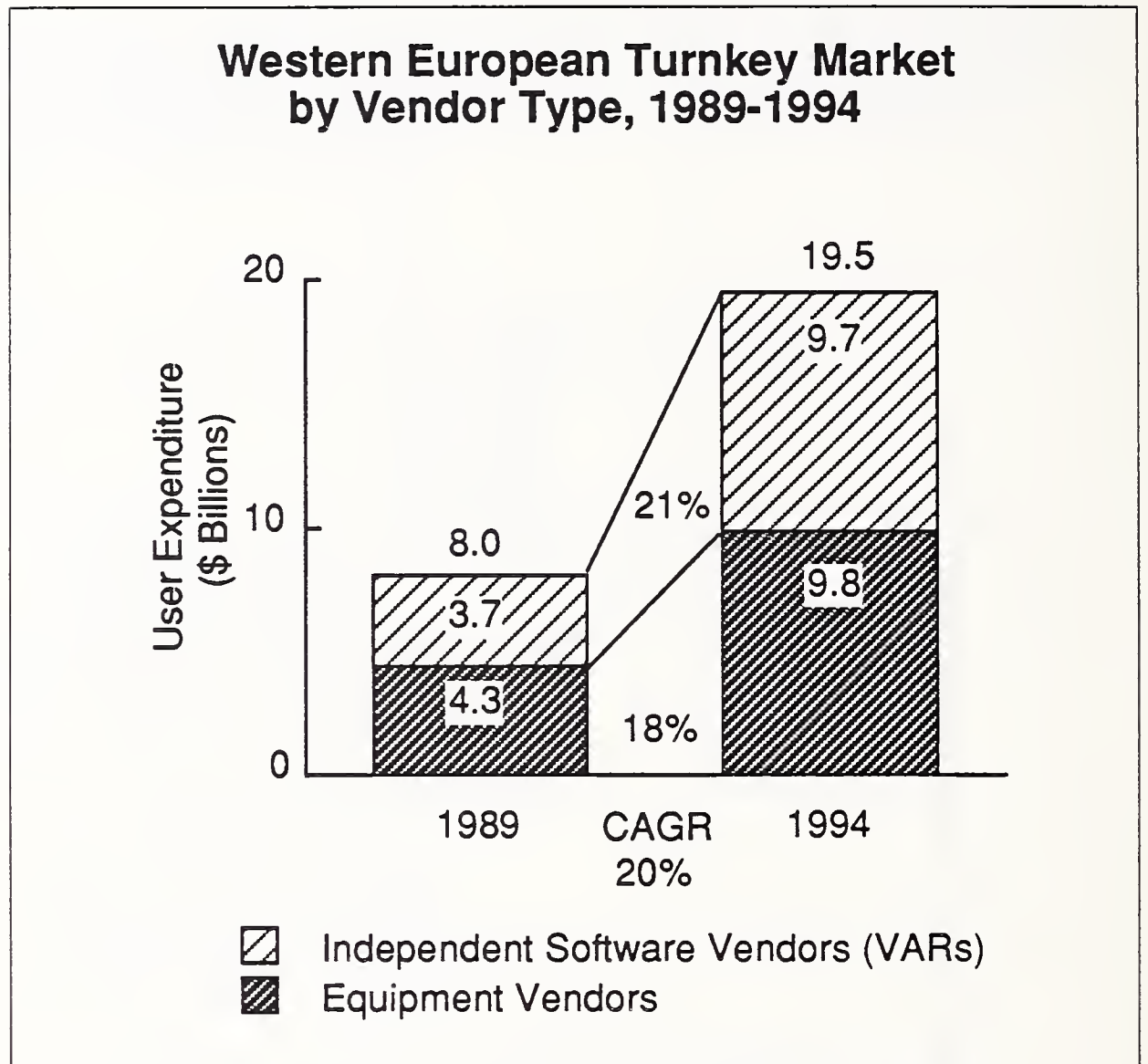
There are very different values for current growth rates for equipment vendors and VARs. Equipment vendors are presently growing at only 11% per annum, whilst VARs are growing at 25% per annum, over double the growth rate of equipment vendors.

The reason for this difference is that equipment vendors have been affected by very specific market forces, unlike the VARs. Equipment vendors are either in CAD/CAM, or in turnkey areas adversely affected by the switch from proprietary operating systems to UNIX.

CAD/CAM is a relatively mature market in many areas of Europe. Growth rates have settled down to 11-12% per annum and are unlikely to increase significantly over this level for many vendors. Some companies, such as Intergraph, have managed to grow well above this level, and expect to continue to do so.

In general, this low growth rate in CAD/CAM has affected the U.S. equipment vendors in turnkey. The European equipment vendors have all been affected by the move to UNIX. Since they have been locked into their proprietary equipment base and operating systems, any major move by the market away from these will affect them far more than the VARs, who can more readily switch to new equipment and operating systems.

Nixdorf, Mannesmann Kienzle, Norsk Data and Nokia Data have all reported mounting pressures to move as quickly as possible to UNIX offerings. It has not been an easy decision for them to rewrite their huge portfolios of applications from their proprietary operating systems to UNIX. Inevitably, there have been delays, and as a result they lost market share in 1988.

Equipment vendors' growth rates in 1988 suffered, as did their profits. Not only was the cost of moving their application portfolios to UNIX considerable, but chip costs soared in 1988. Mannesmann Kienzle reported spending £3 million in the U.K. alone, and it spent much of 1988 porting its applications to UNIX. Added to these cost problems, equipment prices have continued their downward trend. Nixdorf stated that equipment prices dropped by 20% in 1988.

For these four European equipment vendors dedicated to delivering their own turnkey systems, 1988 was a bad year, and UNIX could not have become the hot topic at a worse time. However, all have now responded to the challenge and either have already shipped, or will soon be shipping UNIX equipment and UNIX versions of their turnkey systems. An indication of the pressure that these companies are under is the fact that Mannesmann Kienzle will not have its own proprietary UNIX equipment for some time, and is currently buying it from a third party via an OEM agreement.

VARs, on the other hand, have been experiencing strong growth rates, generally in the range of 20% to 30% per annum. Growth rates of 40% to even 100% are not unheard of for certain independents. Such high growth rates are unlikely to continue long for these individual vendors, as within a few years their specific market sector will probably become saturated. However, the fact that individual vendors can achieve such high growth rates for a limited period indicates the tremendous opportunities for vendors if the right turnkey systems is developed for the right market niche.

All VARs interviewed by INPUT who have ported or developed their applications to UNIX report very strong growth rates. To compensate, other vendors must be suffering, and often these are the equipment vendors developing their own turnkey systems.

INPUT does not see that European equipment vendors will continue to suffer with abnormally low growth rates. Once they have successfully established their UNIX-based offerings, there should be little reason for them not to succeed as well as have the VARs. Nearly all equipment vendors are seeking to develop their own total solutions services. For some, this means developing turnkey systems. The 1990s will, therefore, see many equipment vendors developing more turnkey systems.

Because of the size of equipment vendors, any move by them into turn-key systems could dramatically affect the growth rate of the market. In penetrating the turnkey systems market, equipment vendors could possibly attack the existing business of the VARs, or alternatively begin to develop totally new turnkey businesses.

The question of which market equipment vendors might target hinges on whether or not they will change their preferred marketing channel for their equipment, as discussed in Chapter III. INPUT sees a number of signs that indicate equipment vendors are seeking to take over existing sectors of the VAR market.

IBM is already involved in turnkey, with its CATIA CAD/CAM package and its manufacturing system, MAAPICS, sold on AS/400s. Digital has kept out of the total solutions market to date, offering only tools and systems software. However, INPUT has learned from the company that it is to launch a new trial development to sell and support CAD/CAM software licensed from Matra Datavision under a new Digital Distributed Software programme.

IBM currently seems to be following the line of taking minority interests in independent software vendors, rather than taking them over completely. Some of these are VARs, such as MSA (Management Science America) Ltd. with their accounting packages.

Any major move by these two vendors into European turnkey systems would have a major effect on the overall market. To date their involvement has been marginal, except for IBM in manufacturing and CAD/CAM. Certain independent vendors interviewed by INPUT feel that both companies are beginning to make serious plans to move further into turnkey systems.

As far as other equipment vendors are concerned, Unisys is developing its own turnkey packages in a number of market areas: financial services, transportation, retail, etc. European equipment vendors, which traditionally have not been major turnkey vendors, are similarly looking more toward the turnkey market.

INPUT believes that growth rates for equipment vendors in the turnkey market will stay under the market average for the next year or so, but will then increase to above the average. Once the European equipment vendors with their turnkey systems have overcome their short-term problems of porting their huge application portfolios to UNIX, they should significantly improve their growth rates. U.S. equipment vendors are increasingly looking to the turnkey market, and, if they make any move into European turnkey systems, this will significantly increase their overall turnkey systems revenues.

INPUT forecasts an average growth rate of 18% per annum for equipment vendors over the period 1989 to 1994. This can be compared with 21% for VARs.

It must be pointed out that it is very difficult to make accurate predictions on the level of involvement of the equipment vendors in the future of this market. As discussed, UNIX could force equipment vendors to shift their preferred marketing channel, and to become far more deeply involved in the European turnkey market. They could become more involved by owning or licensing their own turnkey application software, rather than limiting their involvement to running programmes for VARs.

The question of which equipment channel is best is a major issue for many European equipment vendors for the 1990s. It does not affect those dedicated to developing and selling their own turnkey systems, like Nixdorf. However, it is very important for those European equipment vendors whose main third-party sales channel is their VAR programmes, such as ICL in the U.K., Bull in France, Siemens in West Germany and Olivetti in Italy. These companies have extended such programmes abroad, but in general do not have strong coverage outside their home countries. Olivetti, for instance, has pushed to become more pan-European, but can only boast of 18 U.K. VARs, as opposed to IBM's 167.

Europeans' concentration on specific national markets puts them at a disadvantage to their U.S. competition, in particular IBM and Digital. For any VAR thinking of going pan-European, there are considerable advantages in joining the special VAR programmes of equipment vendors that are already pan-European. Currently, these are the large U.S. equipment vendors, not just IBM and Digital, but also others such as Hewlett-Packard and Unisys.

These U.S. equipment vendors can assist VARs in exporting their packages across national frontiers. This can significantly cut down the risk of expansion for a VAR, and puts the larger U.S. equipment vendors at a major advantage to the European equipment vendors when recruiting the better VARs.

To compete, European equipment vendors need to either become more pan-European, or take matters into their own hands and develop their own turnkey systems. ICL has recently stated that it needs to find ways of collaborating with other like-minded European equipment vendors in order to succeed after 1992. It has tried to work with Nixdorf, but has not found common ground.

INPUT sees that such attempts for European equipment vendors to work together and to combine their traditional national strengths is an essential element in competing against the U.S. equipment vendors. If they cannot do this, they may be forced to control the better VARs by taking them

over. This strategy has many risks associated with it, as discussed in later chapters. Uncertainty over how the Europeans will handle this competitive situation adds to the problem of trying to assess a realistic future growth rate for the equipment vendors in this market.

5. Country Breakdown

Exhibit IV-7 shows INPUT's estimate of the country breakdown for the total European turnkey market for 1989.

EXHIBIT IV-7

Western European Turnkey Market by Major Geographic Region, 1989

- Rest of Europe 0.9 (11%)
- Benelux 0.5 (6%)
- Italy 0.5 (6%)
- Scandinavia 0.8 (9%)
- France 1.2 (16%)
- West Germany 2.4 (30%)
- U.K. 1.7 (22%)

Total 1989 Market $8.0 Billion

Note: Figures are $ Billions and percentages are the proportion of the total market
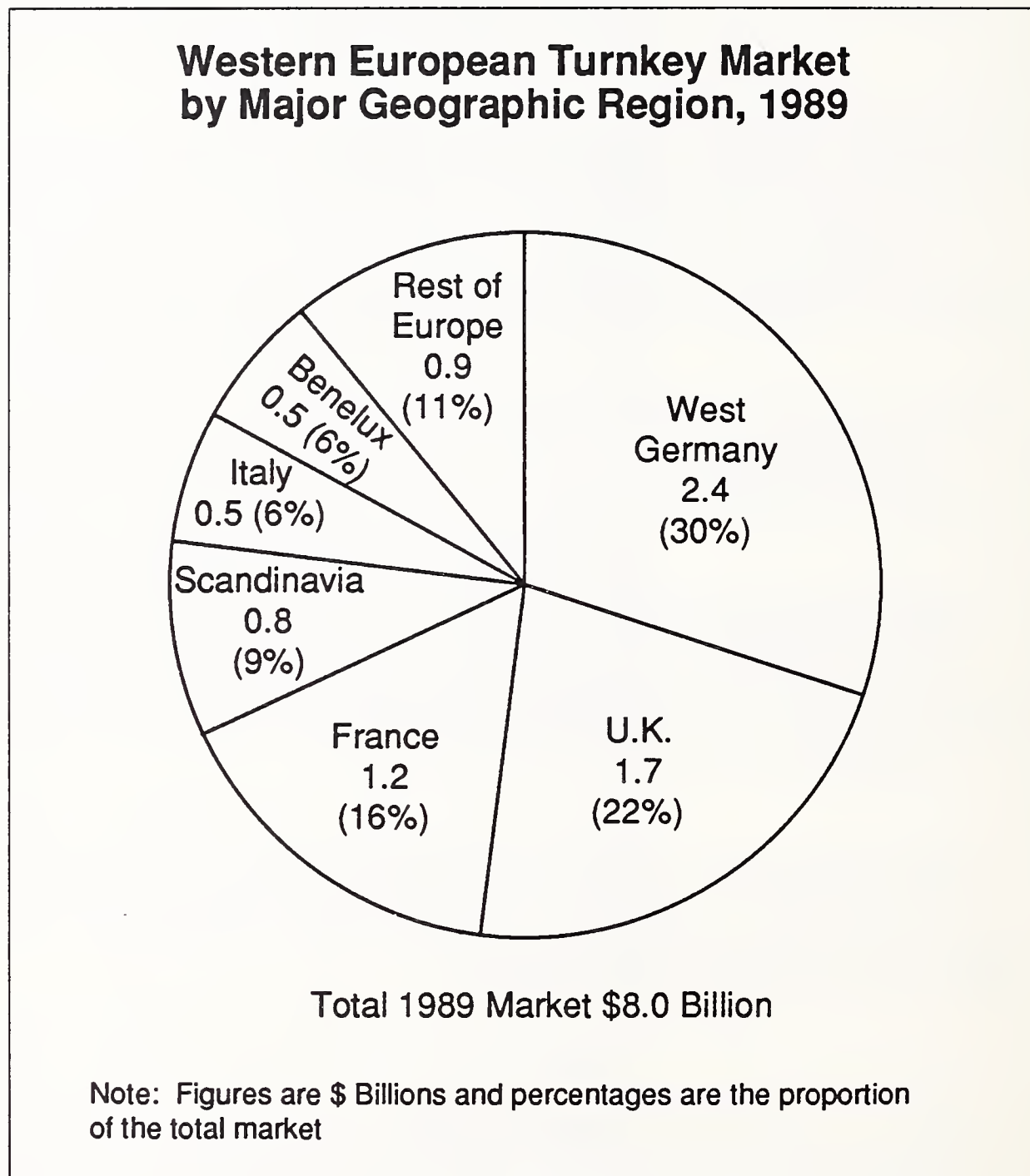
West Germany is by far the largest market, accounting for some 30% of the total market. The next largest national market is the U.K. at 22%, followed by France at 16%. These three countries account for nearly two-thirds of the total market.

West Germany's ranking is principally due to it being the leading manufacturing nation in Europe. CAD/CAM, CAE and CIM are all large markets in Germany. In addition, West Germany is the main market for both Nixdorf and Mannesmann Kienzle, the two leading European turnkey vendors. Both of these equipment vendors have a wide range of industrial, financial and general business turnkey systems. Norsk Data, the Norwegian equipment vendor, even developed its turnkey CAD/CAM package, Technovision, in West Germany, specifically so it could compete in this market.

The U.K.'s second place has much to do with the highly competitive environment created by U.S. equipment vendors using the U.K. as the stepping-stone into Europe. There are a large number of U.S. VARs who have their European head office in the U.K. In addition, there are also a large number of U.K. VARs.

The French turnkey market is dominated by domestic vendors. There are also U.S. vendors who have taken their general turnkey systems to France. Similarly, Italy is dominated by native Italian independent vendors, and Scandinavia by local national companies. The Benelux countries cannot boast of any large independents, although in the Netherlands, Philips has turnkey systems and supports VARs. In Belgium, the French are strong. Spain has local companies, principally around Barcelona, and also has French vendors. Switzerland and Austria are dominated by German vendors.

6. Equipment Vendor Penetration

The penetration of equipment vendors in different national turnkey markets is illustrated in Exhibit IV-8. Not only is West Germany the largest market, but it also has the highest penetration by equipment vendors, nearly 70%.

This penetration is due to the fact that some of the largest European turnkey vendors are German-based equipment vendors. Both Nixdorf and Mannesmann Kienzle use the turnkey mode as their principal delivery mode. West Germany has the largest European equipment vendor, Siemens, which has a limited portfolio of its own turnkey systems. West Germany's strong industrial base and large CAD/CAM market also helps to explain the high penetration of equipment vendors.

The second largest market in size and in penetration by equipment vendors, is the U.K. The reason for this is that the U.K. has not only been an easy first step into Europe for independent U.S. vendors, but also for U.S. equipment vendors.

EXHIBIT IV-8

Western European Turnkey Market
by Vendor Type and Major Geographic Region, 1989

Region	Values
West Germany	1.59 / 2.41
U.K.	1.12 / 1.76
France	0.62 / 1.24
Scandinavia	0.34 / 0.72
Italy	0.20 / 0.52
Benelux	0.22 / 0.48
Rest of Europe	0.29 / 0.88

User Expenditure ($ Billions)

(scale: 0, .5, 1, 1.5, 2, 2.5, 3)
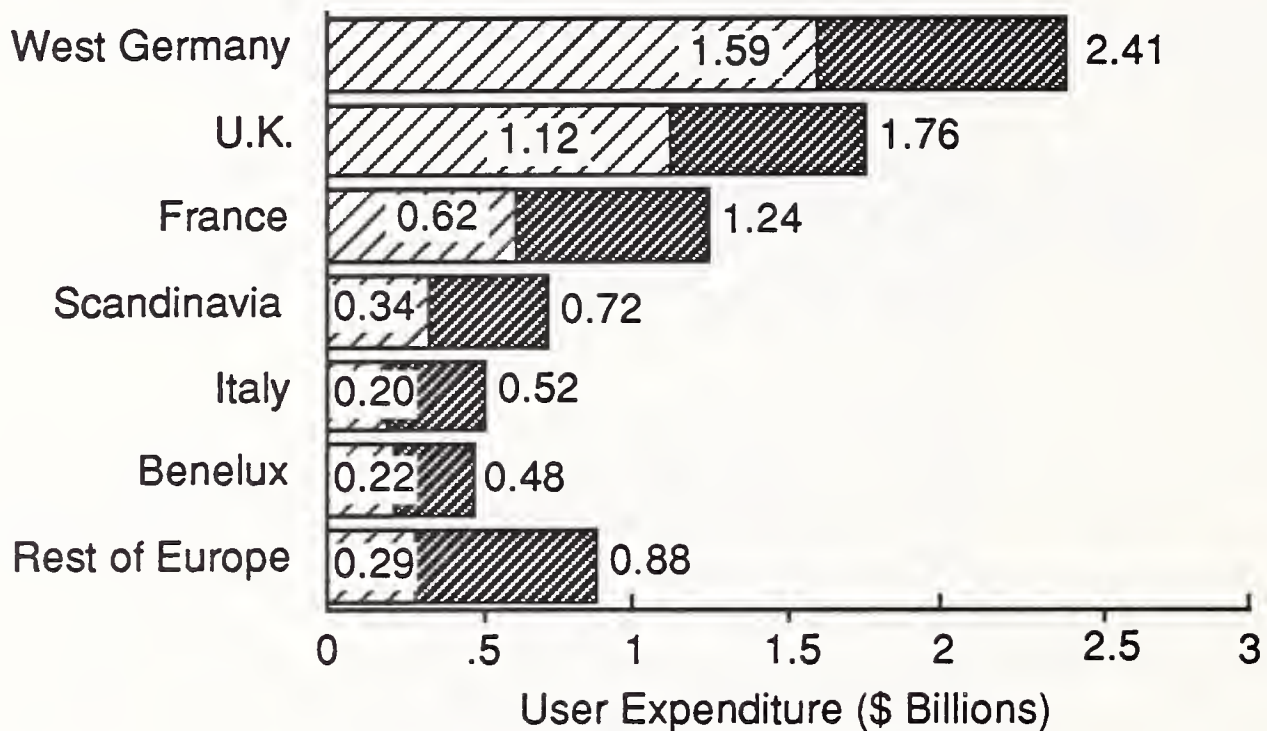
Total 1989 Market: $8.0 Billion

☐ Equipment Vendors
▨ Independent Software
Vendors (VARs)

The area with the next-highest penetration is Scandinavia, with both Nokia Data and Norsk Data being major turnkey vendors.

7. Cultural Differences

In addition to this pattern of equipment vendor penetration country-by-country, there are fundamental differences in the way European nationals view turnkey systems.

It is all too easy to think of Europe as a group of similar-minded nations. When it comes to buying software and services, nothing could be further from the truth. Exhibit IV-9 lists the major national purchasing characteristics for different European countries.

EXHIBIT IV-9

National Buying Characteristics

Country	Characteristic
Benelux	Prefer systems translated into Dutch for the Netherlands and French for Belgium, but may be prepared to accept English
France	Will only accept systems in French
Italy	Do not like the concept of packaged solutions which anyone can buy, but prefer solutions that are unique to themselves
Scandinavia	Prefer systems in their national language (Danish, Finnish, Norwegian, or Swedish), might be prepared to tolerate systems in other Scandinavian languages, or English
U.K.	Will only accept systems in English
West Germany	Do not like packaged solutions unless German, or, in the case of advanced technology such as CAD/CAM, like U.S. systems, but must be translated into German
Austria and most of Switzerland	As with West Germany
Others	Prefer systems in their national language (Greek, Portuguese, Spanish)

Cultural differences between European nations are still very strong, and these affect purchasing preferences. If to these one adds differences in tax regimes, legal systems and industrial standards, Europe is still a very long way from being a single market, even within the European Community.

One must not forget that many of these cultural differences have evolved gradually over decades, if not centuries. 1992 is not going to magically blow them away overnight. Turnkey vendors seeking to export their systems will continue to have difficulties in many application areas.

8. Industry-Specific Versus Cross-Industry

INPUT's forecast for the breakdown of the total turnkey market between industry-specific and cross-industry systems is given in Exhibit IV-10.

EXHIBIT IV-10

Western European Turnkey Market Industry-Specific Versus Cross-Industry Systems 1989-1994

User Expenditure ($ Billions)

1989: 8.0 — Cross-Industry 3.1, Industry-Specific 4.9
CAGR: 18%, 20%
1994: 19.5 — Cross-Industry 7.2, Industry-Specific 12.3

CAGR 20%

- ▨ Cross-Industry Systems
- ▧ Industry-Specific Systems
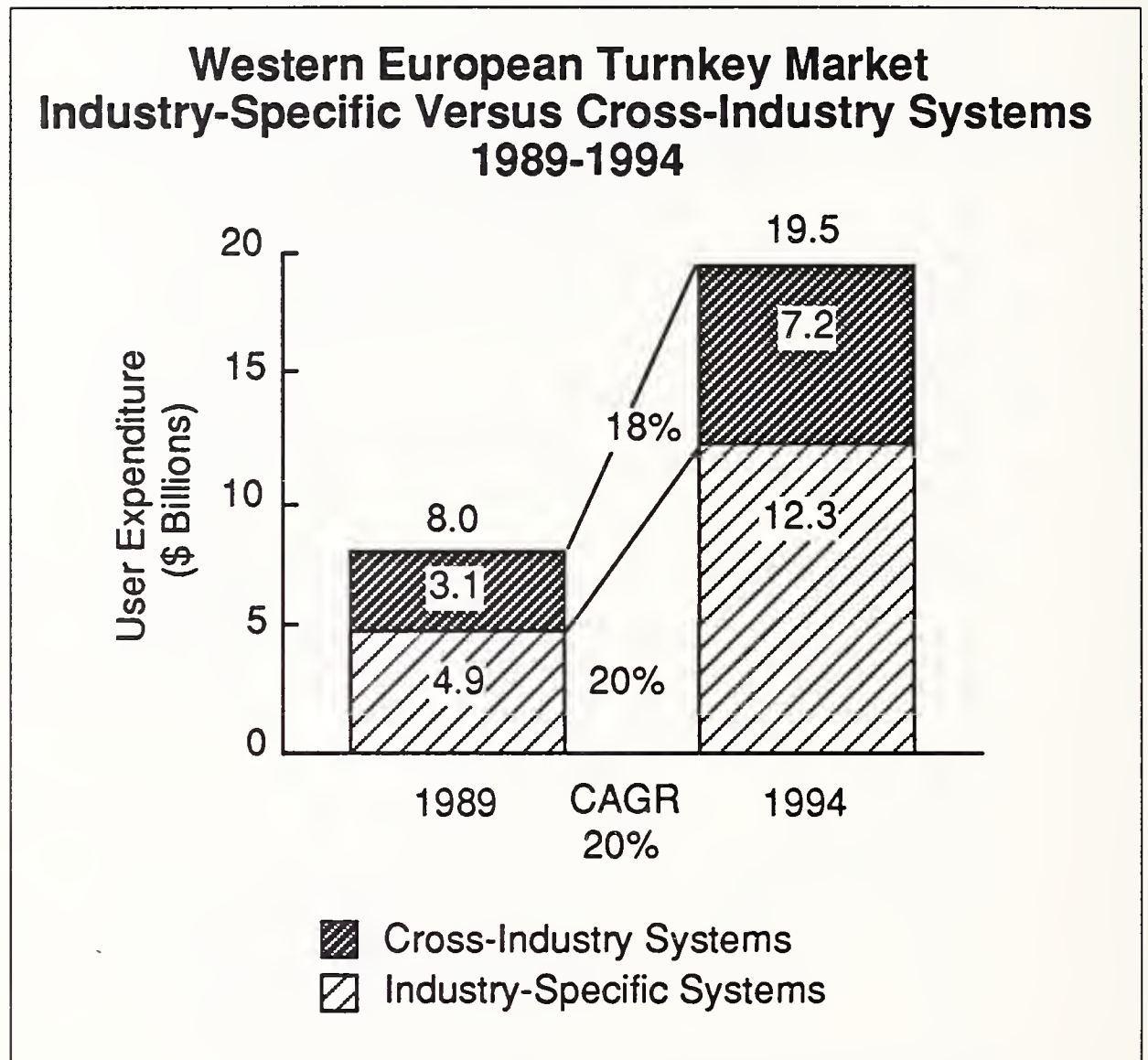
Industry-specific systems represent some 63% of the total market today, compared with around 37% for cross-industry systems. The growth of industry-specific systems is expected to be greater, at 20% per annum on average over the period 1989 to 1994, than cross-industry systems, at 18% per annum. This will result in the importance of cross-industry systems declining marginally to 36% of the total 1994 market.

INPUT believes that 1992 and the gradual development of the European Single Market during the 1990s will have a positive effect on certain industry markets, such as the banking and insurance service sectors, as well as manufacturing and distribution, and INPUT thus predicts a higher growth rate of industry-specific systems.

INPUT's estimate of the breakdown by major market sector is shown in Exhibit IV-11, for both cross-industry and industry-specific systems.

EXHIBIT IV-11

Western European Turnkey Market by Major Market Sector 1989-1994

Cross-Industry

Accounting — 1.21 / 2.7

Office Systems — 0.5 / 1.6

Others — 1.3 / 2.8

Industry-Specific

Manufacturing — 1.5 / 3.4

Distribution — 1 / 2.4

Banking & Finance — 0.8 / 2.3

Services — 0.8 / 2.2

Others — 0.8 / 2.1

0   1   2   3   4

User Expenditure ($ Billions)
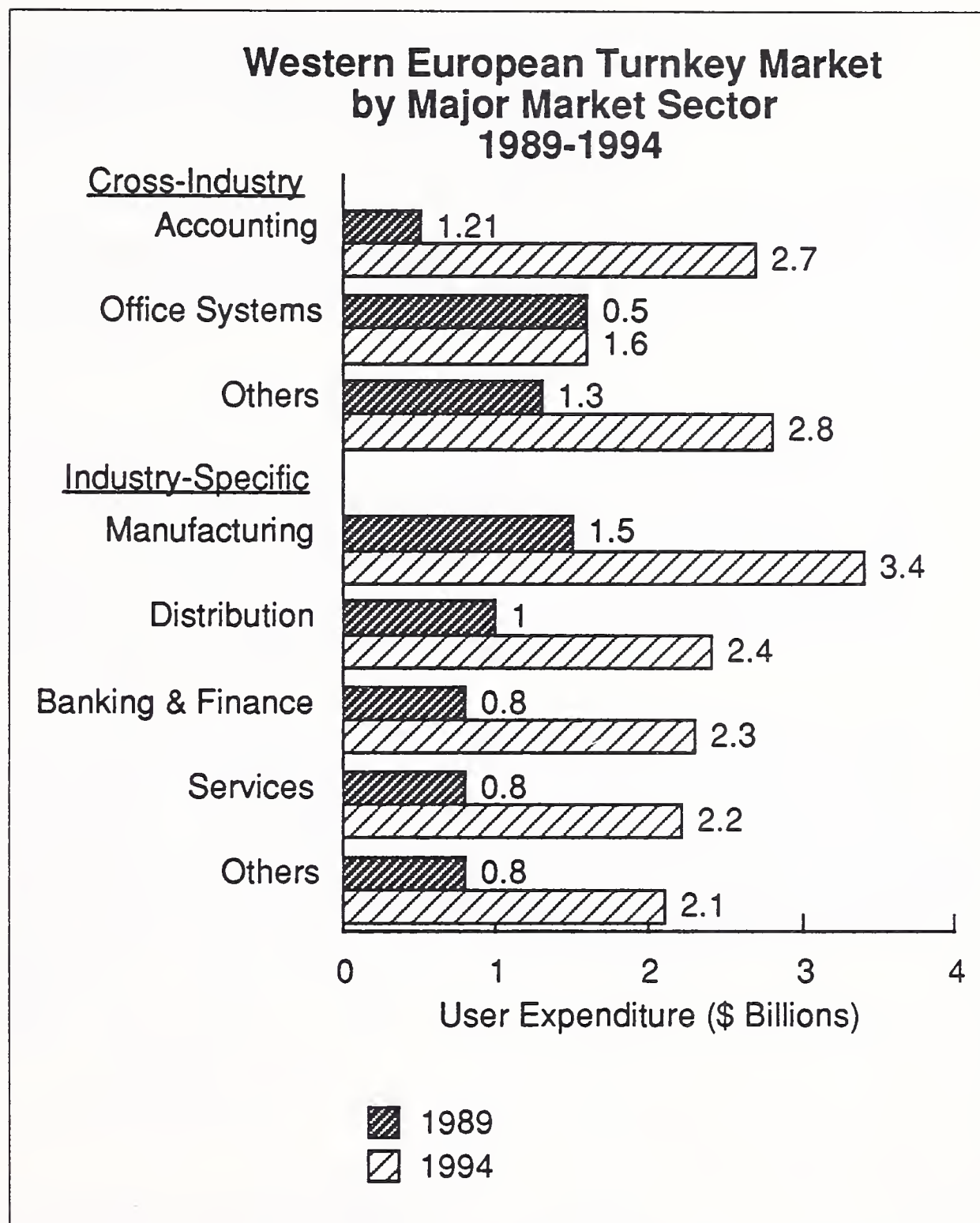
▨ 1989
▧ 1994

Accounting is the single most important cross-industry sector in 1989, and manufacturing the most important industry-specific sector. Accounting represents some 15% of all turnkey revenues in 1989 and manufacturing around 20%.

With 1992 being within the time-frame of this report, INPUT expects that banking and finance will have the highest growth over the period, at 23% per annum. End users and vendors in this sector are very sophisticated. The development of a European Single Market already offers considerable opportunities for international banks to expand into new European markets. They need one management reporting system that will be available from Milan to London, and from Paris to Madrid. Most existing systems cannot do this, so vendors have real opportunities to sell completely new systems across Europe.

User research shows a considerable interest in developing more accounting systems throughout Europe. Exhibit IV-12 shows the results of user research carried out by INPUT around Europe. The results show all areas that end users are developing or are planning to develop, not just those for turnkey systems.

European Software and Services Market
User Demands for New Systems

Other 11%

Accounting 22%

Networks 31%

Manufacturing 7%

Distribution 7%

Office Systems 12%

Marketing 10%

INPUT Survey: 200 User Interviews
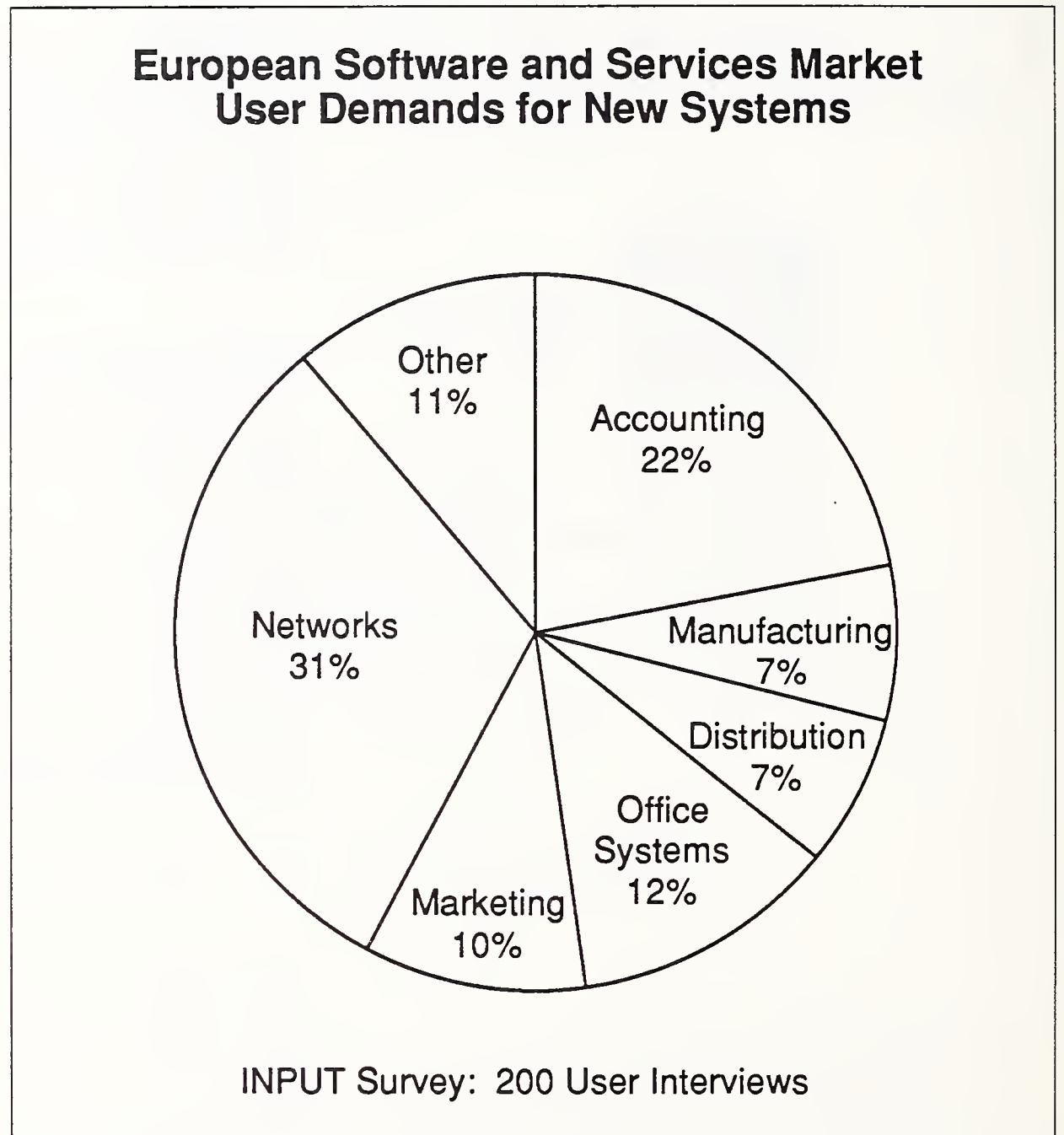
The area of most interest is in networks, both internal (within an organisation) and external (to other enterprises). Many turnkey vendors also see networks as a key target area. This might be handled by offering a complete automotive retail system, with networking included between sales outlets and head office, such as is being marketed by Kalamazoo in the U.K. Alternatively, it could be hospital management systems front-ended on PCs networked to minis, like those sold by Sinorg in France.

Some vendors are seeing PABX as key to the development of corporate or inter-enterprise systems. The PABX systems can link local area networks with national and international networks to give total voice, data,

text and graphics transmission capabilities. Nixdorf has developed its own PABX, as has Philips, and it is now packaging it into its turnkey offerings.

B
Western European Packaged Total Solutions Market

As discussed in Chapter III, many VARs do not sell their systems via the turnkey mode, but as software products, working in partnership with one or more equipment vendor. In these cases, the VARs do not take title to the equipment, leaving the equipment vendors to contract, deliver, install and support it.

End users are little concerned over whether one or two vendors deliver a total solution to their problems. Added to this, some 80% of VARs sell their packaged total solutions on minicomputers as software products, rather than turnkey systems. INPUT has, therefore, also looked at this wider packaged total solutions market, including total solutions sold by software products vendors acting as VARs with specific equipment vendors. It has only investigated those VARs with formal agreements with equipment vendors.

The INPUT definition of this wider packaged total solutions market is illustrated in Exhibit IV-13. It is made up of both turnkey systems and component total solutions made up of software products and related professional services. These component total solutions have been referred to in the report as software products solutions, as indicated in the exhibit. This exhibit can be compared with the INPUT definition of the overall information services industry, as outlined in Exhibit I-2.

EXHIBIT IV-13

Packaged Total Solutions and
the Information Services Industry

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                    ┌─────────────────────────────────┐
                    │  Information Services Industry   │
                    └─────────────────────────────────┘
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Processing Services	Network Services	Turnkey Systems	Software Products	Systems Integration	Professional Services

Application Software	Systems Software

"Packaged Total Solutions" →

Software Product Solutions	Software Only

Note:

Turnkey Systems: Standard application software, plus related professional service, plus equipment and where the turnkey takes title to the equipment

Software Product   Standard application software, plus related professional services
Solutions: delivered by a VAR, plus the equipment delivered and supported by the equipment vendor

1. Market Size and Growth

Exhibit IV-14 illustrates INPUT's estimate of the packaged total solution market for Western Europe, broken down by turnkey systems and software product solutions.

To make a true comparison between packaged total solutions delivered as software products and those delivered as turnkey systems, INPUT has estimated the total cost of equipment for software product solutions, including that element that goes through the books of the equipment vendors. It has also included related professional services, as are included in turnkey systems' revenues. The software products element of these software products solutions is around 30% of the total revenue shown.

EXHIBIT IV-14

Western European Packaged Total Solutions
Market by Type of Solution, 1989-1994

12.3

5.3

8.0

18%

19.5

20%

CAGR
19%

1989
Total Market = $13.3 Billion

1994
Total Market = $31.8 Billion

☐ Software Products Solutions (including all equipment
   and associated professional services revenues)
▨ Turnkey Systems
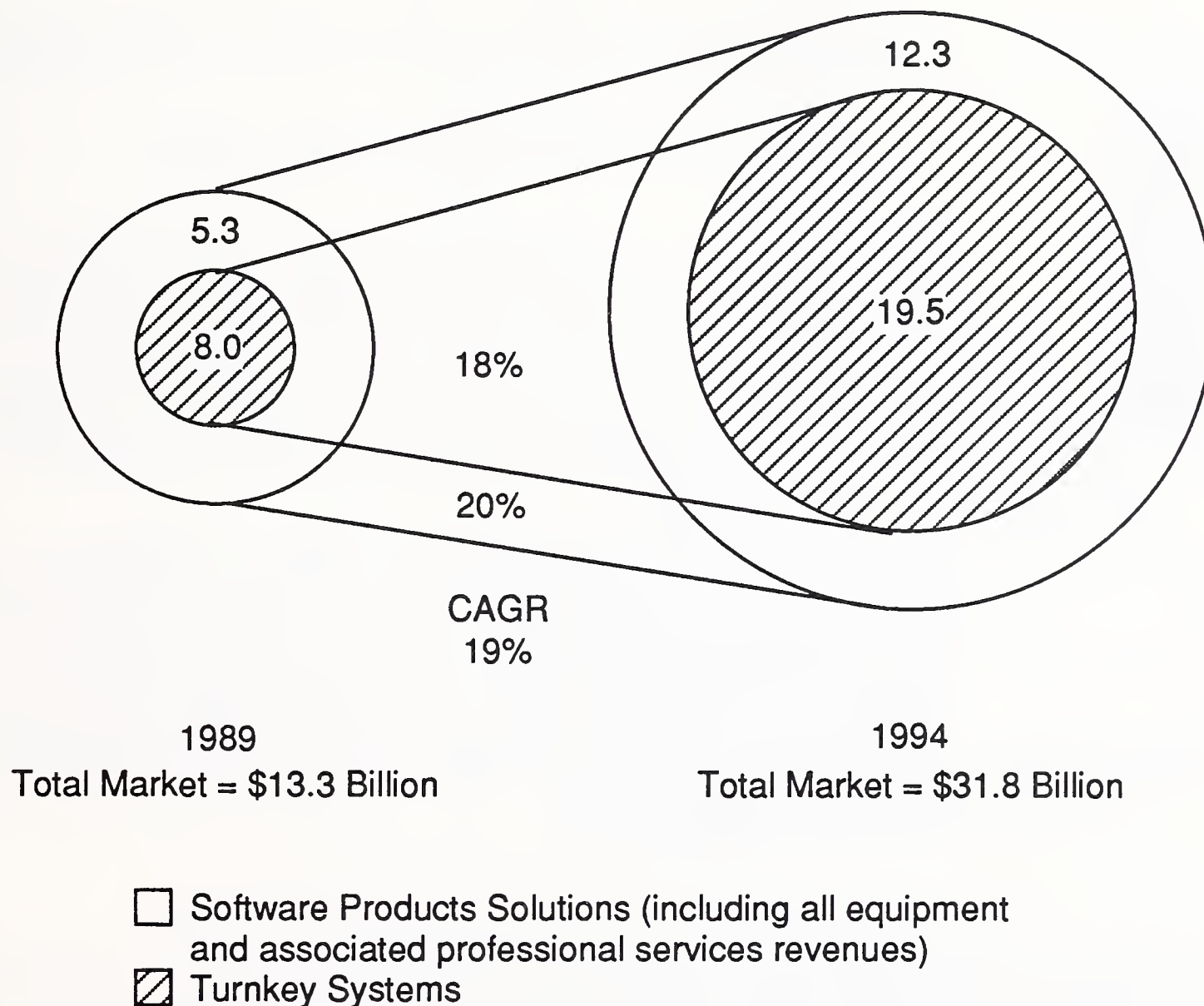
INPUT estimates that the packaged total solutions market totals some $13.3 billion in 1989 and should grow to $31.8 billion by 1994. On average the packaged total solutions market is forecast to grow by 19% per annum over this five-year period.

Within this overall market, software product solutions are seen to grow by 18% per annum on average, compared with 20% for turnkey systems. In 1989, the turnkey market represented 60% of the total packaged total solutions market. This percentage is expected to increase marginally to 62% by 1994.

This shift towards turnkey systems is due to three factors:

- the increasing competitiveness of PCs and workstations, with their open operating systems, allowing vendors to sell more turnkey systems rather than software products.

- the growing use of UNIX, also allowing vendors to sell turnkey systems rather than software products.

- equipment vendors moving more into turnkey systems

The first two factors are due to the growing use of open operating systems, and the loosening of control by equipment vendors over the type of solutions that VARs can sell. The third is the reaction to this loss of control by the equipment vendor. To counteract this swing to turnkey systems, certain equipment vendors will still probably try to maintain control over their clients, and so prefer those marketing channels for VARs where they retain title to the equipment.

It is very interesting to note that IBM has expressly stated that it has no plans to port AIX, its proprietary version of UNIX, to its minicomputers, such as the 36s, 38s and AS/400s. Currently, AIX is only available for PS/2 PCs and 6150 workstations. This fact, added to the reports of IBM strengthening its links with minicomputer VARs, points to IBM maintaining its policy of trying to control end users through retaining title to its equipment and keeping its VARs selling software product solutions, not turnkey systems.

2. Structure of the Packaged Total Solutions Market

Looking at the wider packaged total solutions market, it is possible to see separate patterns of development for turnkey systems and software product solutions. For clarity it is useful to break this wider market down into a number of key segments. There are four main factors which most affect its structure:

- vendor revenue (annual turnover)
- type of vendor (equipment vendor or VAR)
- ownership (European or U.S.)
- type of system (whether readily exportable across Europe or not)

Only VARs sell software product solutions. Most of these European VARs are in the $2 to $20 million per annum revenue range, and this revenue range is by far the most important revenue range for the overall packaged total solutions market. This pattern is illustrated in Exhibit IV-15.

EXHIBIT IV-15

Western European Packaged Total Solutions Market by Vendor Revenue and Type, 1989
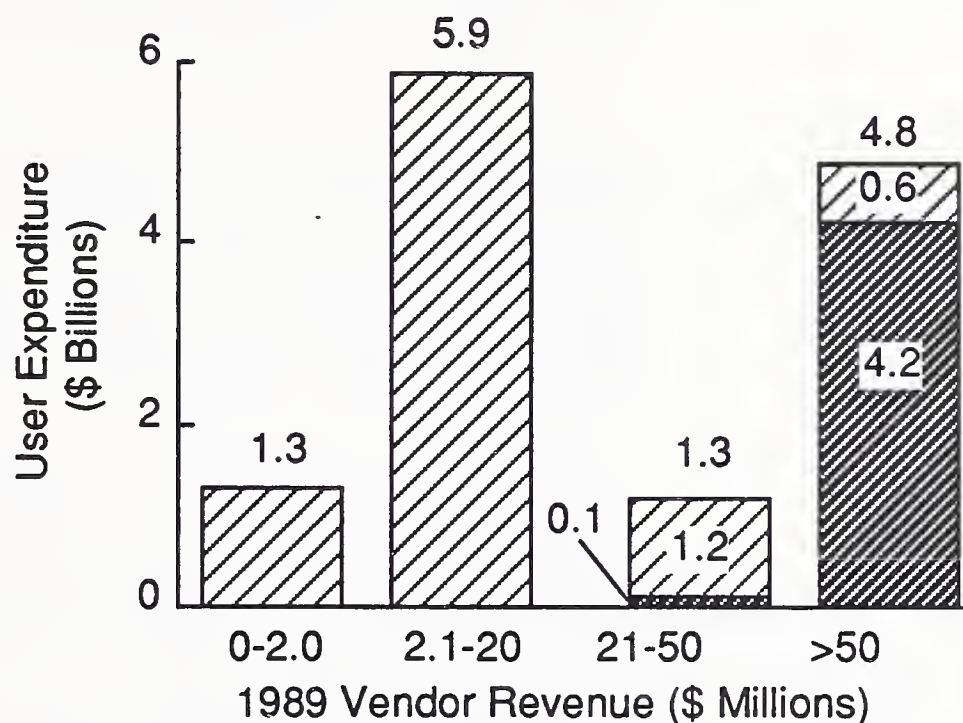
VARs

Equipment Vendors

Total 1989 Market: $13.3 Billion

Note: All equipment and associated professional services have been included as VARs selling software product solutions

Most vendors under $10 million turnover have rarely extended their sales beyond the frontiers of one country, whereas most vendors with a turnover greater than $20 or $30 million are in two or more European countries. This means that most VARs selling either turnkey systems or software product solutions are predominantly in only one European country.

There are VARs selling across a wide range of European countries, but numerically, they represent a very small proportion of the 3,000 VARs selling packaged software products throughout Europe. It is the equipment vendors who dominate international packaged total solution sales.

Equipment vendors are all in the high revenue range for the packaged total solutions market, selling their turnkey systems internationally rather than domestically. Most develop turnkey applications centrally which are then marketed internationally by their European subsidiaries. In some instances, such as Philips and Olivetti, these national subsidiaries develop

their own range of turnkey systems, often based on these centrally developed solutions.

The third of the four factors which affects the market structure is ownership. There are two major different types of ownership that effect the European market–European and U.S.

As discussed above, U.S. vendors are far more international than European vendors. Most European vendors, whether equipment vendors or independent software vendors, are still concentrated on their national European markets. Only a few, mainly U.K.-owned, have made a special effort to export their applications across European frontiers where there are major language differences.

The last of our four factors can now be introduced–type of packaged total solution. The problem for any vendor in this market is how to sell its solution in more than one country. Europe is made up of 17 nation states with 17 different cultures and 11 different languages. Today, it is certainly not one single market.

To export from one European country to another, vendors have to be prepared to translate promotional material, screens and documentation. Certain applications may need radical modifications to fit into the new local environment. A likely trouble area is tax computations. Each European government has control over its national taxes, and will change them at will. If relevant modules in an application are not carefully parameterized, the vendor could find that the cost of keeping up with multiple national taxation changes in different language versions is totally uneconomical.

Systems that do lend themselves to pan-European sales are those which are of general interest to any nationality, and so need little fundamental modification between countries. Typical areas are CAD/CAM and office systems. There are also a number of specific niche markets, such as manufacturing systems and international money markets.

Not too surprisingly, it is the general international application areas that the U.S. equipment vendors have targeted. One therefore finds CAD/CAM systems dominated by U.S. equipment vendors, such as Prime, IBM, Intergraph and McDonnell Douglas, and packaged up as turnkey systems.

Office systems has also been targeted, but in general, the solutions from the U.S. equipment vendors are sold as software product add-ons to existing systems, and not as total solutions. IBM has launched Officevision, its SAA product which front-ends the user interface to other IBM products, such as AS/400 Office and PROFS. Digital has a similar front-end integrator for a range of office systems, ALL-IN-1, and

Hewlett-Packard has NewWave Office. Although these are normally sold as add-ons to existing installations, Wang has developed an office system called Wang Office, which it plans to sell as a turnkey system. Electronic document systems and desktop publishing are fast-growing office systems markets.

With their roots in a specific national market, European equipment vendors have followed a different path if they have developed their own turnkey systems. They have gone for a very wide-range of turnkey services, both industry-specific and cross-industry, as have the independent software vendors. Within this broader strategy, Norsk Data is known for its manufacturing and CAD/CAM systems, and Nixdorf for its financial and banking systems. British Olivetti developed its own desktop publishing system in the U.K., which is now marketed throughout Europe by Olivetti.

The VARs selling internationally in Europe also tend to target the general international markets. Typical application areas for them are manufacturing, distribution, international banking and insurance. These international VARs are the larger ones and, in most instances, are selling systems on minicomputers. With the dominance of U.S. equipment vendors in this hardware sector, such as IBM and Digital, many of these international independents will use U.S. hardware rather than European. As discussed above, independents in this sector are generally selling software products systems, rather than turnkey systems.

Examples of international VARs are the BIS Group, recently acquired by U.S.-owned Nynex, selling banking systems as software products from IBM AS/400 machines, and Cullinet, another U.S.-owned VAR. They sell systems for distribution, manufacturing, personnel, materials management and banking around Europe which run on both IBM and Digital equipment.

With London being a major centre for world banking, especially following the liberalisation of foreign exchange dealings in 1986, many U.K. and U.S. independents based in the U.K. have developed banking systems. Even major equipment vendors like Unisys have moved in with their own turnkey systems. The highly competitive banking and financial market in the U.K. has given these vendors a major advantage when looking toward pan-European banking systems in 1992.

It must also be pointed out that these are all general trends. Even though CAD/CAM is dominated by U.S. equipment vendors, there are still many small VARs selling CAD/CAM throughout Europe, such as VersaCAD of the U.S. and Technische Software of West Germany. In the area of office systems, there are VARs such as ASL, owned by the Swiss Ascom Group, selling telephone management systems on Compaq 386 machines in the U.K., the Netherlands and Switzerland.

Exhibit IV-16 illustrates how a simple picture of the European packaged total solutions market can be built up, showing how different types of vendors have developed in different application markets.

EXHIBIT IV-16

Marketing Leverage

General International Application Markets		Culture-Specific Application Markets	
U.S. Equipment Vendors	U.S. (& U.K.) VARs	European Equipment Vendors	European (& U.S.) VARs
Turnkey Systems	Software Products	Turnkey Systems	Turnkey Systems/ Software Products
U.S. Equipment		European Equipment	U.S. Equipment
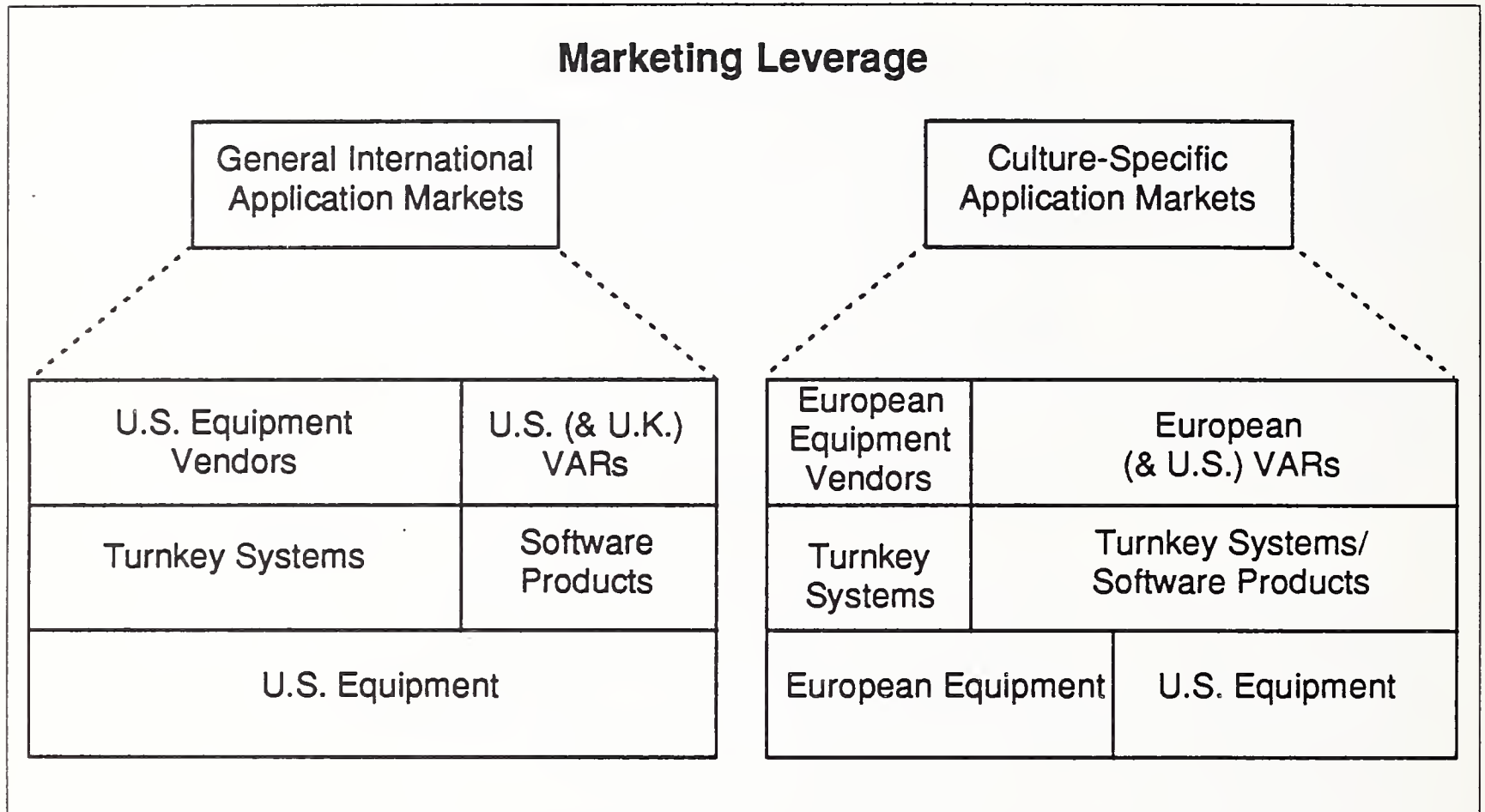
Those application areas of a general international nature, such as CAD/CAM, tend to be dominated by U.S. equipment vendors selling their own turnkey systems. The large U.S. VARs sell systems internationally in Europe from U.S. equipment. They also sell software products systems, and are in general international market areas, such as international banking and insurance, manufacturing and distribution systems.

Other application areas, which are more specific to individual national cultures, are covered by a mix of VARs selling both turnkey and software products systems and European equipment vendors selling turnkey systems. Such areas are health, local government, and national banking systems, and retail and professional services.

When using the terms general and culture-specific application areas, care should be taken to avoid confusing these with the terms cross-industry and industry-specific systems. General and culture-specific refer to the ease with which vendors might be able to export their packaged total solutions systems across different European cultures, as opposed to cross-industry and industry-specific which refer to particular market sectors.

V

The Competitive Scenario

V
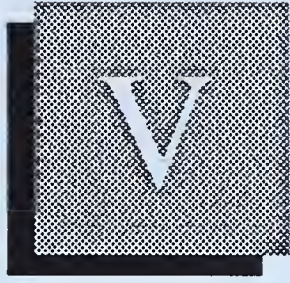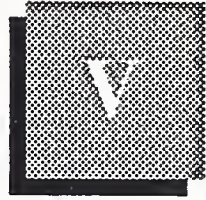
The Competitive Scenario

This chapter reviews INPUT's assessment of the leading turnkey vendors in Western Europe. The leading turnkey vendors in the following European countries are also covered:

- West Germany
- U.K.
- France
- Italy

Four vendor profiles are given to illustrate actual strategies being followed by leading vendors in the turnkey market. These are:

- Nixdorf
- Sligos
- Kalamazoo
- Prime

A

Leading Vendors

Exhibit V-1 lists INPUT's estimate of the top European turnkey vendors; all are equipment vendors.

Four of these (Prime, McDonnell Douglas, Intergraph and IBM) are heavily into CAD/CAM and related graphics systems. Five of these top ten (Prime, McDonnell Douglas, Intergraph, IBM and Unisys) are U.S. vendors; the rest are European. Of these European vendors, three are West German (Nixdorf, Mannesmann Kienzle and Siemens), and two are Scandinavian (Nokia Data and Norsk Data).

In total, these ten turnkey vendors represent some 40% of the total turnkey market sector. As discussed in Chapter IV, individual equipment vendors can have a major influence on the total European turnkey market. Nixdorf alone represents 14% of the 1989 Western European turnkey market.

EXHIBIT V-1

Top 10 European Turnkey Vendors, 1988

Rank	Company Name	1988 Revenues ($ Millions)	Market Share Turnkey Market (Percent)
1	Nixdorf	985	14
2	Prime	475	7
3	Mannesmann Kienzle	340	6
4	McDonnell Douglas	280	4
5	Intergraph	210	3
6	IBM	165	2
7	Unisys	145	2
8	Nokia Data	110	2
9	Norsk Data	100	1
10	Siemens	95	1
	Subtotal	2,950	42
	All Other Turnkey Vendors	4,070	58
	Total Turnkey Market	7,020	100

INPUT estimates that there are some 2,000 VARs selling turnkey systems in Europe, and only some 15 equipment vendors selling turnkey systems. This implies that a typical turnkey vendor in the European market had an annual revenue in 1988 of about $3 million. This can be compared with an average annual 1988 revenue of around $300 million for top equipment vendors selling turnkey systems.

B
Country Markets

1. West Germany

Exhibit V-2 lists the top West German turnkey vendors. Two German equipment vendors are at the top of the list, Nixdorf and Mannesmann Kienzle, and Siemens is at number five. Together, these three national equipment vendors control 37% of the German turnkey market.

EXHIBIT V-2

Top Vendor Rankings and Market Share, 1988
Turnkey Systems
West Germany

Rank	Company	Market Share (Percent)	Estimated Revenue (DM Millions)
1	Nixdorf	26	1,070
2	Mannesmann Kienzle	8	330
3	Prime	7	300
4	Intergraph	4	160
5	Siemens	3	140
6	Taylorix	3	115
7	IBM	2	70
8	McDonnell Douglas	2	70
9	GEI	1	50
10	Unisys	1	30
	Others	57	1,805
	Total Market	100	4,140

Other major vendors are the U.S. equipment vendors who are strong in CAD/CAM—Prime, Intergraph, IBM, and McDonnell Douglas. Germany is the major manufacturing centre of Europe, and German end users are very particular about the technical capabilities of their systems. Manufacturers in Germany prefer to buy German, although with CAD/CAM they recognize that U.S. vendors have superior technology. Taylorix sells turnkey systems on PCs–IBM, Siemens, and Toshiba.

2. U.K.

In the U.K., U.S. equipment vendors are at the top of the turnkey ranking, as Exhibit V-3 illustrates. The U.K. is McDonnell Douglas's major European market. In addition to CAD/CAM, it specialises in local government, police, ambulance and healthcare systems.

EXHIBIT V-3

Top Vendor Rankings and Market Share, 1988
Turnkey Systems
U.K.

Rank	Company	Market Share (Percent)	Estimated Revenues (£ Millions)
1	Prime	12	115
2	McDonnell Douglas	11	110
3	ICL	5	45
4	Mannesmann Kienzle	3	30
5	Nixdorf	3	30
6	Hoskyns	3	30
7	Kalamazoo	3	25
8	Olivetti	2	20
9	Intergraph	2	20
10	Unisys	2	15
	Others	54	510
	Total Market	100	950

ICL, the major U.K. equipment vendor, is at number three in the top ranking. It has a number of turnkey packages for minicomputers. However, it also concentrates on total solutions for its mainframes. These have a high degree of customization and so do not fall into the turnkey/VAR market.

Olivetti is an important turnkey vendor in the U.K. through its subsidiary, British Olivetti. Most of the turnkey developments in the U.K. market made by Olivetti have been developed locally, rather than exported from Italy. It has a wide range of systems, such as for building societies, office automation, accountancy and solicitors.

Hoskyns sell a range of turnkey systems on IBM, Digital and Hewlett-Packard equipment, principally minicomputers. Kalamazoo sells turnkey systems on PCs to small businesses.

3. France

As Exhibit V-4 shows, Nixdorf is at the top of the French turnkey market. There are only three French vendors in the top ten, of which two are VARs (Sligos and Concept).

EXHIBIT V-4

Top Vendor Rankings and Market Share, 1988
Turnkey Systems
France

Rank	Company	Market Share (Percent)	Estimated Revenues (FF Millions)
1	Nixdorf	8	580
2	Prime	7	465
3	Sligos	6	440
4	Mannesmann Kienzle	3	220
5	Intergraph	3	205
6	McDonnell Douglas	3	200
7	IBM	3	195
8	Unisys	2	165
9	Bull	2	120
10	Concept	1	100
	Others	62	4,330
	Total Market	100	7,020

Bull, the French equipment vendor, ranks only number nine. However, many French smaller VARs use Bull equipment. Sinorg, for instance, specialises in local government with packages for finance, elections, and healthcare. Until two years ago, French municipalities would only accept Bull equipment. Now they are more liberal, but are pushing for UNIX solutions, which Sinorg will launch in 1989.

4. Italy

Italians do not like packaged solutions. They prefer bespoke solutions that have been written for them, rather than a package which could just as easily be sold to competitors. The turnkey/VAR market in Italy is, therefore, small.

Four of the major turnkey vendors are equipment vendors, as illustrated in Exhibit V-5. Olivetti is the main Italian vendor. It has developed packages within its Information Services group for banking, insurance, manufacturing and government.

VARs that are involved in this market have very small turnkey revenue, generally less than 2 billion lira, or around $1 million.

EXHIBIT V-5

Top Vendor Rankings and Market Share, 1988
Turnkey Systems
Italy

Rank	Company	Market Share (Percent)	Estimated Revenues (Lira Billions)
1	Olivetti	9	55
2	Nixdorf	9	55
3	Sopin	6	40
4	IBM	6	40
5	Prime	6	35
	Others	64	405
	Total Market	100	630

C
Vendor Profiles

To illustrate how different vendors have developed in the European turnkey/VAR market, short profiles of five vendors are given below. These are not intended to be exhaustive profiles, but to be illustrations of different approaches to the European turnkey/VAR market.

1. Nixdorf

Nixdorf is Europe's largest vendor of turnkey solutions. In 1988, its global revenues were DM 5.4 billion ($2.9 billion).

The company was founded by Heinz Nixdorf in 1952 in the Federal Republic of Germany. Today it sells its products and services worldwide, although the German market still accounts for some 54% of total revenues.

Providing total solutions to business enterprises is the central element of Nixdorf's strategy. From the beginning, the company has been concerned about providing flexible computing systems rather than just equipment. Added to this, Nixdorf has aimed itself at the small to medium-sized firms.

As an equipment vendor, Nixdorf produces machines at the lower end of the power spectrum, from PCs to minis. It offers wide connectivity to other proprietary systems. It has also entered the PABX market and is the largest supplier of digital PABX systems in Germany. This development fits into Nixdorf's total solutions strategy, as its PABX systems can be linked directly to its equipment.

Nixdorf is selling the concept of the integrated office and factory. This means integrating computing with communications for high-quality, low-cost transmission of voice, data, text and graphics. The company is already in the cordless telephone market and plans to develop video telephone terminals for workstation-to-workstation communication.

Over the years, Nixdorf has built up considerable application software competence. Today, it is one of the largest application software companies in Europe. It serves some 200 vertical markets, the most important being banking and retail. Half of the top 50 European banks use Nixdorf's products. In the German retail market it is the leading vendor of POS terminals.

Nixdorf's total solutions strategy in recent years has unfortunately caused it problems. The strength of this strategy has been that it allowed Nixdorf to carve out a clear market niche for itself, especially in Germany and in banking. However, as the market has become more interested in UNIX, Nixdorf has been faced with the fact that it has to rewrite all its applications from its proprietary operating systems to UNIX.

Most of Nixdorf's applications are now ported to MSDOS, OS/2 and UNIX. Its COMET application software library runs to more than 80,000 modules, in 16 languages, for 34 countries.

The very heavy cost of doing this could not have come at a worse time. Banking sales, which accounts for some 30% of Nixdorf's business, began to stagnate in 1988. The cost of chips unexpectedly escalated, and Nixdorf reported a 20% reduction in equipment prices. The company suddenly found itself in a classic cost/revenue squeeze. 1988 was a black year for Nixdorf: after being a star stock on the German exchange, whose profits constantly rose, for the first time Nixdorf turned in a loss.

The traumas of 1988 caused Nixdorf's marketing and sales director, Arno Bohn to resign, and 1,600 of its 31,000 employees to be cut. The company has been criticized for being structured geographically rather than by market sector, and for being too heavily dependent upon the German market.

In a more open UNIX world, Nixdorf will face new competition as its clients will be freer to use a mix of vendors, rather than Nixdorf exclusively. To defend its corner, it will have to find ways of locking its clients into its total solutions. One of the ways the company sees it can do this is through its PABX development, linked to its UNIX-based PCs and Targon range of minicomputers. This allows Nixdorf to sell total corporate solutions, rather than just single-location company solutions.

2. Sligos

Sligos is one the leading French software and service vendors. It was founded in 1972, and 63% of its shares are held by the major French bank, Crédit Lyonnais. In 1988, Sligos' turnover was FF 2.0 billion ($319 million).

Sligos was one of the pioneers in developing card-based payment systems in France. Today it runs one of the largest processing services for over 300 banks. Just under 50% of its activities are related to electronic money. It makes plastic cards, develops customized payment systems and installs POS terminals.

Out of its financial services, Sligos developed into telematics and industrial systems. For its industrial market, it developed packaged solutions acting as a VAR on IBM minicomputers for accounting, payroll and personnel.

To develop more into the industrial systems market, Sligos acquired interests in another French software company, CMG. This company was founded in 1974, and by 1989 had grown to an annual turnover of FF 380 million ($59 million). In early 1988, Sligos bought out the remaining shares in CMG.

CMG has been very successful in developing and marketing both turnkey systems and VAR packages which run on both PCs and minicomputers. It sells turnkey systems run on IBM, Digital and Hewlett-Packard equipment, and acts as a VAR of IBM, Digital and Compaq machines. As with Sligos' minicomputer activity, virtually all of its sales are in France. It is one of the top three French vendors in CIM.

In mid-1988, following the success of buying into CMG, Sligos developed yet another area of turnkey/VAR activity by creating a new,

wholly-owned subsidiary, MANAGIX, to develop and sell turnkey systems to small and medium-sized businesses and chartered accountants.

MANAGIX packages its systems on IBM and Toshiba PCs. It uses XTs and ATs, as well as PS/2s, for which it also has an IBM dealership. It specialises in administration, commercial and stock control systems, linking PCs via LANs. In 1989 its turnover was FF 280 million ($44 million).

The French market has been slightly reluctant to accept packaged solutions. Sligos has, therefore, developed into this area step by step. Each time it targeted a specific segment, and through acquisition and internal development built up areas of expertise in both turnkey and VAR systems.

3. Kalamazoo

Kalamazoo was founded in 1904 in England to develop a revolutionary new method of manual recordkeeping invented in America.

A range of products was developed to improve the efficiency of recording business information. These ranged from special entry books to card filing systems. From these early beginnings has evolved one of the largest suppliers of systems to the smaller British businessman, and a company that in 1988 had a turnover of £52 million ($94 million).

Today, Kalamazoo has 120,000 customers in the U.K. It still has its manual book-keeping and business system services. These have been extended into a number of associated areas, such as business forms and general printing, manual payroll, accounting, personnel and ticking systems, and offices supplies. In additional, Kalamazoo has spread into computer-based services, which today represent over 50% of its turnover.

The company has some 4,000 customers using its computer-based products. Kalamazoo computer systems and services cover both PCs and minicomputers. The PC equipment base is typically IBM, Tandon, Unisys, NCR and Amstrad, whilst minis are IBM, Unisys, NCR and Datapoint. The computer-based products and services can be grouped under the following headings:

- equipment dealership and distribution service
- computer office supplies service
- software products
- turnkey packages
- professional services (consultancy, design, training)
- processing services

The market sectors that Kalamazoo targets are typically:

- very small businesses (with PC-based services)
- corporate accounting and banks
- local government services
- motor trade
- construction industry
- medical services

In many of these areas, the company has designed its own application software, which it can sell as turnkey systems or as separate software products.

One of the most interesting aspects of Kalamazoo's development is the way its computer-based services have evolved out of its traditional manual recordkeeping services. Computer-based services have not displaced Kalamazoo's range of manual systems; the company successfully still offers both.

An example of this integration of old and new technology is Kalamazoo's accounting packages for the small business. The company still offers traditional preprinted accounting ledgers and card systems that can be manually filled in. These can be enhanced technically by using "Payelog", a hand-held calculator preprogrammed with all relevant U.K. tax rates. This is designed to be used in conjunction with Kalamazoo's manual accounting ledger systems.

An additional level of sophistication is in "One-up", a turnkey accounting package on an IBM PS/2 model 30. It comes with a printer, a range of Kalamazoo computer stationary, pre-loaded software, blank diskettes, a manual, a tutorial, two days of free training, 12 months of free hotline support and a 12 month return-to-vendor warranty.

The screen format of One-up mirrors those of the old manual systems. This makes the transition from manual to computer systems as easy as possible for the small businessperson, who perhaps has never used a computer before.

For larger clients, Kalamazoo will develop bespoke solutions, or customize a range of turnkey packages. These need not be Kalamazoo packages, but can be one of a number of third-party packages.

4. Prime

Prime was established in 1972 in the U.S. In just 16 years, it has grown to a total 1988 revenue of $1.6 billion. Over the past ten years it has had an average growth rate of some 26% per year.

The creation of Prime was in response to the demands of the scientific and engineering world needing multitasking and multiuser computer capabilities. The first product that Prime launched was the superminicomputer.

Today, Prime has a very clear targeted strategy. It is involved in three related markets:

- CAD/CAM
- PICK-based applications
- GIS, or geographic information systems for computer mapping

All of these need specific, high-powered, finely-tuned computer systems. They all need high-quality graphic screens, plus other graphic-related peripherals. This all adds up to a need for well-defined systems that can be packaged up into turnkey total solutions.

CAD/CAM is by far the largest of these three Prime markets and is also one of the largest single turnkey market sectors in Europe. Prime is number two in the world in the CAD/CAM market, but number one in Europe. It plans to be number one in Computer Integrated Manufacturing (CIM) within the next four years. It is already the leading supplier of PICK systems, and is a major force in the GIS market.

Although graphics workstations can be operated separately from other corporate computing systems, there is a growing demand for integration of all computing activities. Prime has, therefore, been at the forefront in developing UNIX as an international standard, and is enhancing its own proprietary operating system, PRIMOS, to interconnect with UNIX. Prime was a founding member of UNIX International and is also a member of X/Open, the group working for open interconnectivity standards.

Prime sees three major technological developments driving the market:

- the growing power of desktop systems, through PCs and workstations

- the development of networks between these desktop systems

- the addition of specialized servers to provide electronic mail, to have fault-tolerant capabilities so that data is never lost, and to store images

By packaging all these together, Prime sees that it can extend the standalone graphics workstation to be an integral part of corporate computing facilities. Like the other turnkey vendors discussed in these profiles, Prime is seeing that it has to continue to extend the capabilities of its total solutions by adding extra value, either through additional software or additional equipment.

Prime has, in the past, seen that a key strategy development route is through acquisition, either to gain additional market share, or to bring in additional products and services. In 1987, it acquired Versacad. In February 1988, Prime bought the major CAD/CAM vendor, Computervision. With $0.6 billion of global revenues, Computervision significantly increased Prime's market share. In late 1988, Prime took over General Electric's CAD/CAM business, Calma. Also in late 1988, Prime signed a letter of intent to buy a major share in Wild Leitz Group's GIS division. This Swiss vendor manufactures UNIX-based systems running on Sun workstations resold by Prime.

This aggressive expansion by Prime has its risks. The first quarter in 1989 showed a loss. Commentators stated that this was due to Prime going for market share and neglecting its basic business. As a result, the hunter has now become potential game with MAI Basic Four putting in a hostile bid. Prime was forced to look for a white knight, which it has managed to do with DR Holdings Inc, owned by J.H. Whitney of the U.S.

VI

Vendor Challenges

VI
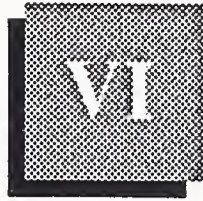
Vendor Challenges

There are a number of crucial issues facing turnkey vendors over the next few years. These are:

- the increasing demand to offer total solutions
- continuing downward pressure on equipment prices and margins
- greater competition to minicomputers from PCs and workstations
- the move toward open systems, notably UNIX
- the problems of how to maintain control over customers
- the gradual evolution of a pan-European market

In this chapter, these challenges to vendors are discussed, together with the results of vendor interviews carried out on these topics. The effects of these issues are analysed in the following areas:

- technical
- organisational

The vendor questionnaire used in these interviews is given in Appendix C.

A

Technical

There are a number of critical forces affecting the European turnkey market, which could radically change its structure over the next few years. Exhibit VI-1 outlines the major forces which INPUT expects will have an effect on the market. It groups them by the four main products and services that make up the turnkey market, as discussed in Chapter III.

EXHIBIT VI-1

Forces Affecting the European Turnkey Market

- Equipment

  - Lower equipment prices and margins

  - Identifying the best marketing channel

  - Vendor development away from the traditional niche geographic markets

  - Pan-European goals and the EC's Single Market initiative

- Systems Software

  - International non-proprietary standards and UNIX

  - Cost of rewriting applications to UNIX

  - Growing pool of UNIX end users

  - Growing range of UNIX equipment

  - Loss of control of end user by equipment vendors

- Applications Software

  - Stable prices and margins

  - VARs with different attitude towards a pan-European market to equipment vendors

- Professional Services

  - Higher prices and margins

  - Growth potential

1. Forces in the Equipment Sector

As was discussed in Chapter IV, there are two types of equipment vendors operating in the European arena:

- U.S.-owned equipment vendors, who, in general, have good pan-European coverage

- European-owned equipment vendors, who still are too concentrated on local and national markets

To compete successfully in the 1990s, European equipment vendors need to get better pan-European coverage. Nearly all have at least 50% of their global sales in their national market, and although this makes them strong domestically, it leaves them weak abroad.

The Single European Act and the whole 1992 legislative programme is a major step by the European Community (EC) towards trying to break down the old barriers and gradually to create a pan-European market. It has already fuelled the desire by many European companies to become more pan-European. For the European equipment vendors, it has highlighted the poor geographic coverage most of them have within the EC. It is ironic that it is the U.S. equipment vendors who should be able to take greater advantage of any liberalisation within the EC after 1992, because they have the better pan-European coverage, and hence better competitive position.

All equipment vendors interviewed by INPUT had given considerable thought to the gradual evolution of a pan-European market and what their strategies should be. Exhibit VI-2 lists some typical comments on strategies by both European and U.S. equipment vendors. The bigger ones felt that they were pan-European already. The smaller ones saw that they had to find new alliances to allow them to compete after 1992.

EXHIBIT VI-2

Equipment Vendor Comments on a Pan-European Strategy

- We do not need a specific strategy for 1992, we are already pan-European (U.S. company)

- We have been changing our strategy towards Europe for the past few years, 1992 will be too late (European company)

- By 1992 we will have specialist coordinators in Headquarters looking for collaboration with complementary, non-competing companies (European company)

- We have a complete strategy industry sector-by-industry sector (U.S. company)

- We are still looking and studying (European company)

A permanent issue facing equipment vendors is which is the best marketing channel through which to sell their equipment. All use third parties, to a greater or lesser degree. The norm is for third-party channels to represent around 30-40% of sales. This is the case for IBM, Digital, Hewlett-Packard and Olivetti. Others, like ICL and Siemens, use them for up to 50% of sales, smaller equipment vendors even more.

The general trend is for equipment vendors to increase their use of VARs. Hewlett-Packard, for instance, is planning for 50% of its sales to come through VAR channels by the early 1990s.

Not all these third parties are VARs selling packaged total solutions. Some are distributors, some sell partial solutions and some bespoke total solutions. With equipment margins getting thinner, there are significant advantages in using third parties. However, competition between equipment vendors to find good third-party channels is getting tougher all the time. This is just as true with VARs selling either turnkey systems or software product solutions, as with other types.

The poor pan-European coverage of European equipment vendors directly effects their ability to attract the better VARs, and hence to effectively use third-party sales channels throughout Europe. As discussed in Chapter IV, the Europeans are at a disadvantage when trying to attract the better international VARs. They can even be at a similar disadvantage with domestic VARs, who may prefer the greater opportunities that IBM and Digital might offer them.

In addition to growing competition in attracting VARs, all equipment vendors are facing downward pressure on equipment prices. All equipment vendors interviewed by INPUT admitted that their equipment prices were under pressure. With the prospect of equipment falling to under 50% of the total value of the delivered solution, it is not surprising that equipment vendors are seeking to become more involved in application software and related services. Some equipment vendors were not overworried about falling prices, as they were finding that clients were buying more equipment to compensate, but this was not the general view.

It was very clear from these interviews that there was not the same downward pressure on application software prices, or professional services used to customize turnkey packages, as on equipment. The reaction from equipment vendors was that they are looking more towards application software and total solutions as a way of counteracting falling equipment margins. Time and again equipment vendors told INPUT that they are total solutions companies, a very different perception of their traditional image.

One manager of a European equipment vendor stated that when he started in the company 20 years ago, equipment represented 70% of a total solution; currently it was 50% and very soon it would be 40%. With equipment becoming less and less valuable within the overall solution, no wonder equipment vendors are looking more and more to becoming total solution vendors.

Not all equipment vendors see that turnkey systems are the total solutions that they wish to sell. Those with only mainframes, or who concentrate on more-powerful machines, have end users demanding highly complex total solutions, needing very high degrees of customization. Equipment vendors, such as Control Data, are therefore beginning to offer bespoke total solutions, rather than turnkey systems.

Another issue facing any equipment vendor moving into the packaged total solutions market is whether to develop or acquire their own application software and so market their own turnkey systems, or to use VARs whilst retaining title to their equipment, letting them sell software product solutions. Falling equipment margins would argue against maintaining VAR channels, and for developing their own turnkey systems, so that the equipment vendor and not the VAR gains the profit from the application.

Many equipment vendors have been restructuring internally by national vertical markets in recent years. This is putting more pressure on national subsidiaries to meet local demands, as well as profit targets. These reorganisations were aimed at getting the equipment vendor's sales force nearer to the market. It is not too surprising that the result is that these salesmen see they too should be selling their own turnkey packages.

One equipment vendor told INPUT that he already has a policy of setting up VARs in key development areas, and buying out the most successful of them after two years. This strategy puts all the risk on the VARs, and little on the equipment vendor.

Another equipment vendor's strategy can be illustrated by IBM. Not only has IBM developed its own manufacturing package, MAAPICS, it has also allowed software products companies to develop similar packages which it supports through its VAR programme. IBM's version has greater functionality and is priced accordingly. As a result, there is a range of manufacturing solutions all available on IBM equipment.

There is a lesson to be learnt here for other equipment vendors, if they move into owning turnkey systems. They should not go for exclusive coverage of a specific sector with their own package, and they should choose carefully which functions they want their solutions to have, and hence what the competing packages can have that are owned by their VARs.

It must be pointed out that the packaged total solutions market is a high-risk market. There is a constant birth/death cycle, with new independent software vendors entering with new systems in specific market sectors, and others going to the wall. Only about 20% of VARs stay in business over 10 years; many go out of business in the first five years.

For this reason, there is a preference amongst some equipment vendors to leave these risks to the independent software vendors. This they could do during the 1980s, when VARs were seen as just an alternative marketing channel. In the 1990s, the emphasis could shift again. Equipment vendors are already beginning to offer total solutions, rather than leaving this to third parties. This implies strengthening ties between equipment vendors and VARs, possibly to the point where equipment vendors acquire the VAR, or licence their applications for the equipment vendor to sell.

2. The Challenge of UNIX

The gradual evolution of international non-proprietary standards is all to the benefit of the packaged total solutions vendor. It makes the job of putting total solutions together easier. The development of these standards also makes it easier for end users to buy components and develop their own systems. However, a packaged total solution should be cheaper than one developed by an end user, as it is a mass-marketed product, with its costs spread over a large number of installations.

UNIX will allow vendors to develop kernel software which can be linked to third-party software products more easily. For the packaged total solutions vendor, this can be a major benefit. It can allow vendors to link different functions into one complex package far more easily than has been the case in the past. Exhibit VI-3 illustrates how UNIX can allow different functions to be built around it. Different elements of such a packaged total solution could come from a variety of third-party vendors, brought together and marketed by a single principal vendor.

The overall effect of UNIX on the market is illustrated in Exhibit VI-4. For more-powerful equipment platforms, UNIX will allow the development of kernel packaging of new packaged total solutions. At the lower end, some turnkey systems will evolve into software products, allowing end users to buy them themselves and build up their own total solutions through components, whilst other total solutions currently sold as components of software products and equipment will become turnkey systems.

EXHIBIT VI-3

Packaging Turnkey Systems on UNIX

Added Value Professional Services		
System Management	User Interface	Commun-ications
	Application System	
	Database Management System	
	UNIX	
	Peripherals	
	Equipment Platform	
Support and Maintenance		

EXHIBIT VI-4

Effect of UNIX on the Turnkey Market

Application Software

Use of Kernel Software

Layering

Equipment

Move from software product solutions to turnkey systems

Move from packaged total solutions to software products as components to total solutions

A comparable situation has already developed in the PC market. Most packaged total solutions are now sold as standalone software products, or as turnkey systems. MS/DOS has become the effective industry standard operating system. A huge industry of software products has evolved and flourished around it. The turnkey vendors marketing systems on PCs have become packagers, linking together different software products under their design to create unique total solutions. They can concentrate resources on packaging and adding value, rather than writing original application software.

Vendors interviewed felt that, in certain market areas, UNIX could create a similar environment in the minicomputer market to that of MS/DOS in the PC market, where equipment and software has become layered. However, this was only seen as being feasible initially at the lower end of the minicomputer market where there is little customization.

Exhibit VI-5 illustrates the results of INPUT's research into vendors' attitudes towards how UNIX might affect minicomputer systems. The results of this research shows that vendors were on average undecided whether UNIX would have a positive, or negative effect on the minicomputer market. Many vendors felt that proprietary systems were still so strong in the minicomputer market that UNIX would have little real effect for some years. Others saw that UNIX was a real benefit, giving them the opportunity to export their application software more easily across national boundaries and different equipment vendor end-user bases.

Any possibility of UNIX creating a truly layered minicomputer market was not expected to happen for at least two to three years. With proprietary operating systems still accounting for some 85% of the European market, the minicomputer market has a long way to go to become comparable to the PC market, where a non-proprietary operating system rules.

Although UNIX offers considerable advantages to vendors, the cost of converting existing applications to UNIX can be high. Both Nixdorf and Norsk Data have reported major costs problems from this conversion. With their huge portfolios of in-house applications, the burden of doing a one-time conversion from their proprietary operating systems to UNIX has inevitably had a major adverse effect on their finances in 1988 and 1989. The other two major European equipment vendors concentrating on turnkey systems—Nokia Data and Mannesmann Kienzle—are also understood to have had similar cost problems.

The benefits to these vendors should come when they wish to develop and enhance their UNIX-based packages in the future. For now, they have to try to recoup the cost of the conversion to UNIX. This means that there will be considerable pressure from them to maintain turnkey prices for the next few years.

UNIX and Minicomputer Systems

Vendor Attitudes

Negative	Undecided	Positive

- 90% of mid-range operating systems are still proprietary

- The problem is to get IBM to more

- Proprietary operating systems are still very strong —VMS

- OSF and UNIX International have got to get together and this will take two years

- UNIX has been slowed down due to the lack of applications

- Something other than UNIX is needed, but I do not know what

- UNIX will make it easier to export throughout Europe

- UNIX is very important for layered products

- Certainly a long run benefit

	Number of Respondents
Very positive 5	2
Positive 4	5
Undecided 3	13
Negative 2	8
Totally negative 1	2

(Above results are in response to the question: "Could you indicate on a scale of 1 to 5 whether you see that UNIX will do to the minicomputer market what MS/DOS has done to the PC market in creating a standard operating system off which vendors can sell just application software as software products rather than total packaged solutions?")

With UNIX offering the possibility for turnkey vendors to link together very cheaply different products created by third-party vendors, INPUT also researched vendor attitudes towards different areas of the equipment market. The PC/workstation market is offering growing competition for the lower-end minicomputer market, especially for turnkey systems. Vendors were therefore asked about the attitudes towards the development of the supermicro.

Exhibit VI-6 illustrates the results of this research. Vendors were, on average, reasonably positive towards the development of the super-micro as a platform for turnkey systems. Some saw that the performance of this equipment was still lacking or that more powerful workstations were the better solution. However, many vendors saw that the smaller, more powerful equipment platform would offer a real alternative to the lower-powered minicomputer.

Similarly, vendors were asked about their attitudes towards peripherals. Exhibit VI-7 illustrates the results of this research. Vendors were very positive towards the development and use of new peripherals in turnkey systems. They saw that peripherals could add significantly to their offering, meet end-user demands for total solutions and allow them to differentiate themselves from the competition.

UNIX will allow vendors to link a wide range of peripherals into a central application package. INPUT sees that the growth of both UNIX and advanced peripherals, such as CD/ROMs, graphic aids, and high quality printers, will go hand in hand. Local area networks have already become an essential part of many turnkey systems, and this element will also continue to be of major importance to allow vendors to link different peripheral equipment together as a ready-made total solution for end users.

INPUT found that the attitude of many VARs towards equipment vendors is still often that they are "box pushers" and do not understand how to sell software. This opinion was expressed by a number of independent vendors. From INPUT's research this is a very dangerous misconception in the European packaged total solutions market. VARs should not underestimate the professionalism that equipment vendors have developed in selling turnkey solutions in direct competition to VARs.

INPUT sees equipment vendors looking very closely at the turnkey market as a strategic development area. If certain VARs are complacent over the marketing abilities of equipment vendors, they could have a rude awakening in the 1990s when suddenly they find equipment vendors competing very effectively in their traditional packaged total solutions markets.

EXHIBIT VI-6

Supermicros and Turnkey Systems

Vendor Attitudes

Negative	Undecided	Positive

- Advanced workstations are far more important

- Performance of supermicros is still appalling

- Equipment becoming less important as customers are looking for solutions

- In the future the importance of supermicros will grow

- Minicomputers are dead for us, our future is with supermicros

- Certainly for the immediate future

- If the industry can come up with the standards then supermicros will be good
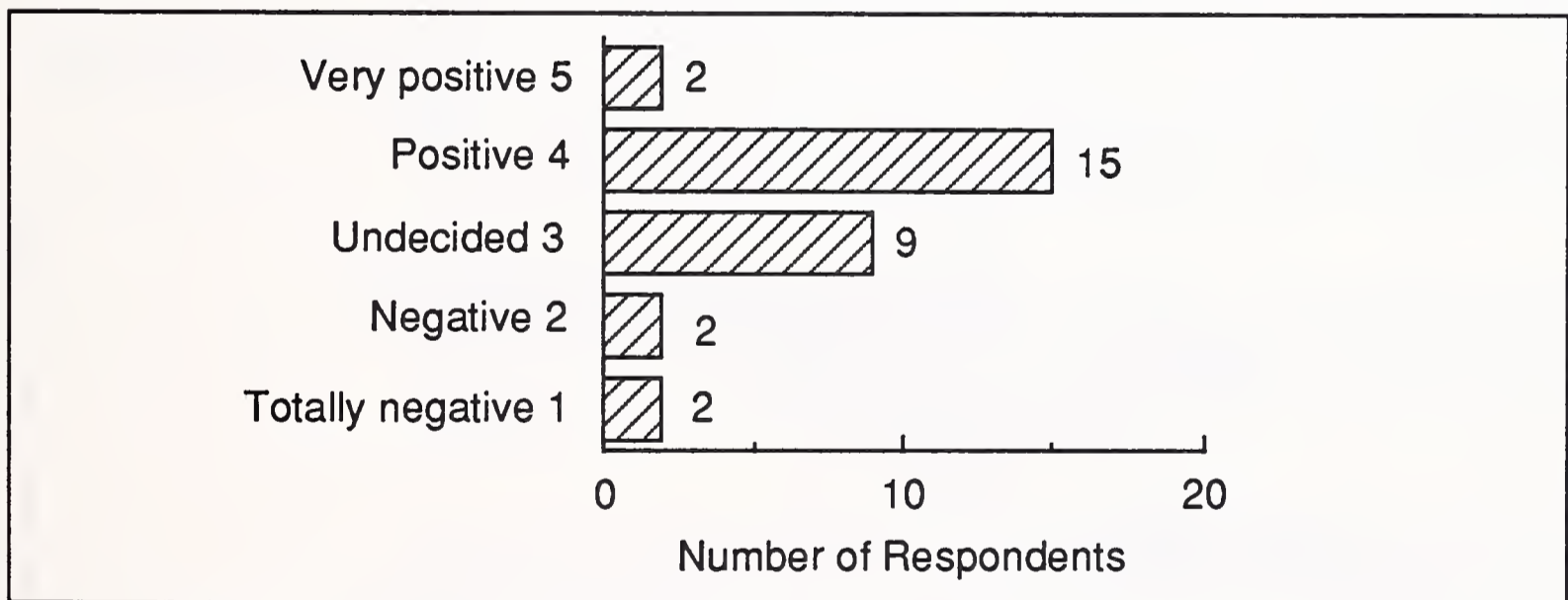
Very positive 5 ▨ 2

Positive 4 ▨▨▨▨▨▨▨▨ 15

Undecided 3 ▨▨▨▨ 9

Negative 2 ▨ 2

Totally negative 1 ▨ 2

0   10   20

Number of Respondents

(Above results are in response to the question: "Could you indicate on a scale of 1 to 5 whether you see that the development of the supermicro as a real competitor to the minicomputer is good for the turnkey vendor?")

EXHIBIT VI-7

Peripherals and Turnkey Systems

Vendor Attitudes

Negative	Undecided	Positive
• Customers have only so much to spend and do not want to spend it on equipment	• Depends upon the sophistication of the solution being offered by the vendor	• Peripherals are very good for us, especially for graphics
		• Italy is the 2nd largest market for CD/ROMs because of the inefficiency of central systems
		• Makes computing accessible to end users
		• Vendors can always use peripherals to add more value

	Number of Respondents
Very positive 5	2
Positive 4	19
Undecided 3	6
Negative 2	3
Totally negative 1	
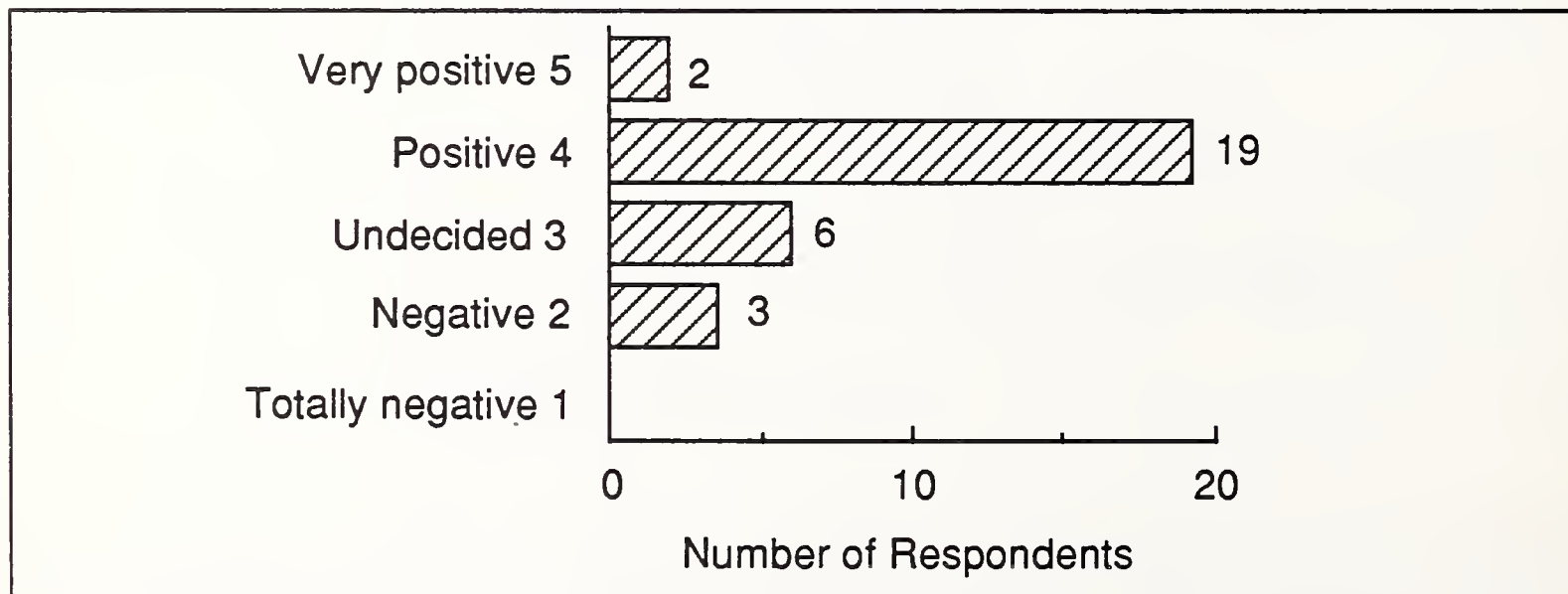
(Above results are response to the question: "could you indicate on a scale of 1 to 5 whether you see the growth of standard solutions to highly technical and complex problems through the development of new advanced, cheap peripherals (laser printers, CD/ROMs, high quality graphics screens) is good for the turnkey vendor?")

In the past, IBM and Digital standards have been the de facto international standards for minicomputer operating systems. VARs have often been able to produce cheaper solutions using IBM and Digital standards, rather than using other equipment vendors' proprietary standards, because they can simply use existing packages already written by third parties for the IBM or Digital standards. With UNIX, there will be an alternative to these two proprietary standards.

This could be a great opportunity for European equipment vendors without their own turnkey systems to fight back against the strength of IBM and Digital in the packaged total solutions market. UNIX will take the pressure off the European equipment vendors having to try to match IBM's or Digital's portfolios of software products written to their proprietary standards.

As a European pool of UNIX end users grows, VARs will have the opportunity to cross national boundaries by moving their applications between different European equipment vendors' UNIX-based platforms. This could be just as attractive as using IBM or Digital for their pan-European end-user base. All European equipment vendors have special strengths in their national markets. However, for this to be an effective alternative, there must be working cooperation between different European equipment vendors.

Individual European equipment vendors need to sit down together and work up cooperative international VAR programmes. The aim should be to make them just as effective, if not more so, than either IBM's or Digital's. It is very difficult for them to offer truly competitive VAR programmes on their own. There is a real possibility that they could offer a good pan-European customer base and a very strong VAR programme if they cooperated.

If they pooled their large national end-user bases, they could compete against IBM and Digital. However, such cooperation would need to be coordinated so that VARs achieve a single, efficient international programme to match those of IBM and Digital.

Some independent software vendors interviewed by INPUT see that UNIX will become the international standard operating system, and are already basing their whole future strategies around it. However, others expressed some doubt about the usefulness of UNIX to the packaged total solutions vendor.

Out of the 30 vendors interviewed, some 75% of equipment vendors and 50% of independent software vendors were offering UNIX-based solutions. When asked how near UNIX was to being an acceptable international standard, 75% of equipment vendors and 82% of VARs saw that UNIX was still a long way from being a true industry-wide standard, as Exhibit VI-8 illustrates.

EXHIBIT VI-8

Vendor Attitudes Towards UNIX

Equipment vendors: 75

VARs: 82

Percent

Total sample: 30
Average standard error: 7.5%

(Above results are in response to the question: " Do you see that UNIX is still a long way off from being a true industry-wide standard?")
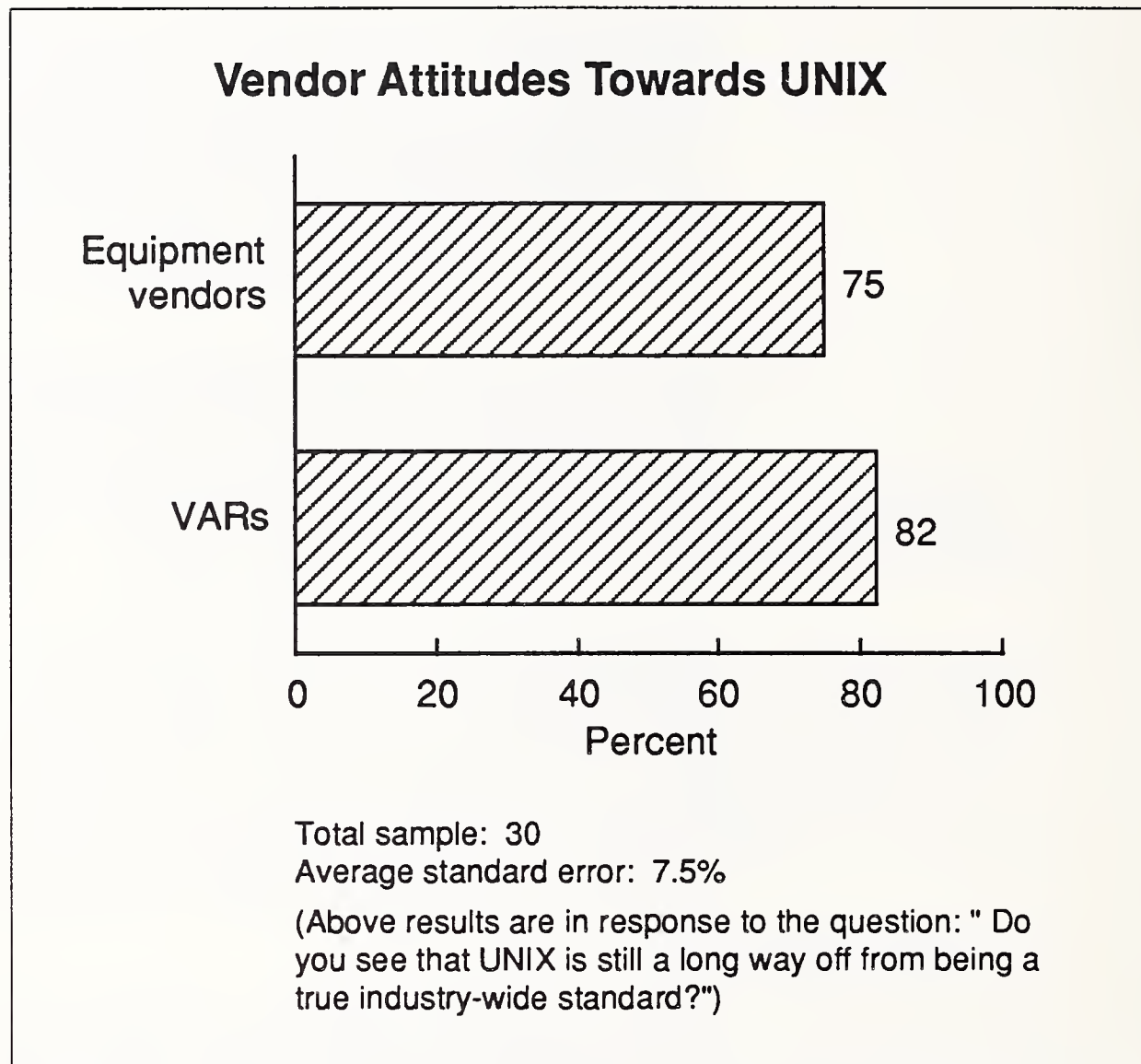
Many VARs packaging up their solutions on either IBM or Digital equipment were reluctant to admit that UNIX could become the acceptable international standard. These VARs see little reason to move away from the comfort of the all-embracing arms of these giants, and so well into the 1990s there will be three super-pools of end users and three acceptable international standards for packaged total solutions–IBM, Digital and UNIX.

Questions on UNIX provoked considerable comment from equipment vendors and VARs alike. Some of the key comments made by equipment vendors during INPUT's research are listed in Exhibit VI-9. The pressure for UNIX is seen as coming from the market, in particular the government and defence sectors. On a number of occasions, IBM and, to a lesser degree, Digital were referred to as being vendors who are against UNIX. Whether this is the case or not, many vendors interviewed perceived it as being so.

EXHIBIT VI-9

Vendor Comments on UNIX

- UNIX is good for end users, bad for IBM and Digital (U.S. equipment vendor)

- Wonder how many equipment vendors are really committed to UNIX and it is a long way off giving true portability (European equipment vendor)

- UNIX will become a standard in 2-3 years, particularly in the public sector and will become great success where complex solutions need communications (European equipment vendor)

- IBM and Digital will only ever pay lip service to UNIX as it is bad for them, for us UNIX makes it easier to sell promises (European independent software vendor)

- The ability of UNIX to act as a platform for turnkey solutions has not come across yet, as vendors are always trying to set themselves apart from the crowd and it is less easy to do this with UNIX (European independent software vendor)

- The move to UNIX is market led, but I see it as a backward step as it is not the most efficient solution (European equipment vendor)

- UNIX is still a long way off from being stable, but the main reason for going UNIX is because of the U.S. and U.K. government and defence areas (U.S. independent software vendor)

- UNIX is attractive to certain sizes of companies, on a specific development route, such as from PCs to minis (European independent software vendor)

- UNIX is not good for certain types of applications, such as on-line transactional processing (European independent software vendor)

- Today there are two main versions and many sub-versions. I see that, in the future, there will be two "clean" versions of UNIX (U.S. equipment vendor)

Perhaps the main feeling that came from these comments is that UNIX is not the panacea for all the ills of the industry. It is not universally liked and it is not always the best solution; but end users want it and so they will get it.

Between 1.2 million and 1.3 million UNIX licences were reported to have been issued in Europe by early 1989, and the growth rate for new licences is between 40% and 60% per annum. This far exceeds the growth of nearly all other software and only emphasises the growing force that UNIX is rapidly becoming. Currently, UNIX is reported to account for some 15% of minicomputer systems. This penetration could easily reach 30% by 1994, if these high growth rates continue.

The downside of UNIX is that it will gradually create a loss of control over the end user for the equipment vendor. The minicomputer market will become layered, in the same way that the PC market has. Equipment will be bought on its own merits, not because of the associated proprietary operating systems and application packages.

Control will move to the applications vendor. Equipment vendors will have to make a choice whether to lose control, as they have had to accept with PCs, or retain control through the relevant application software.

If they wish to do so by owning and marketing their own turnkey solutions, then they can follow the route of the major European turnkey vendors, like Nixdorf, and develop their own. Alternatively, they can consider licencing, as Digital is considering doing in the area of CAD/CAM. Lastly, they could simply buy up VARs, as Wang has recently done in the Netherlands by acquiring ACOSO with its healthcare, accounting and wholesale packages.

3. Application Software in a Pan-European Market

As already mentioned, application software does not appear to be under the same downward price pressure as is equipment. Some vendors report downward pressure, but this tendency is by no means as strong as it is in the equipment sector.

Equipment vendors involved in the turnkey market admit to trying to shift their profit margin from equipment to software as equipment prices come under more pressure. Their ability to do this is limited. There is inevitable pressure from end users for the unit price of software not to go up to compensate for falling equipment prices.

As far as the development of a pan-European market is concerned, the larger international VARs seem to have reasonably clear strategies towards 1992. However, the smaller national-based VARs have a much less clear attitude. Exhibit VI-10 gives some of the comments made by VARs towards the evolution of a pan-European market.

EXHIBIT VI-10

VAR Comments on a Pan-European Strategy

- 1992 will just increase our opportunities (U.S. company)

- We are not looking abroad; we are aware of 1992, but we have no plans (European company)

- 1992 is definitely going to cause a revolution in European banking (U.S. company)

- Our strategy is to acquire a client base and to buy foreign companies (European company)

- 1992 could be bad for us as more companies are now looking to Europe and so increasing competition (European company)

- We have been in the European market for some time and 1992 is not likely to make a big difference for us (U.S. company)

- We are actively looking for other similar-sized parties around Europe to cooperate with (European company)

- 1992 will affect our customer base more than us, although it will make bidding easier (European company)

Many large VARs feel that they are already European and 1992 will not do much to affect them. They have been trying to export their systems throughout Europe for years and see no reason why 1992 is going to suddenly make it any easier for them. The major effect of 1992 will be seen on their customers, and this will then be reflected in the products and services that they offer.

Many of the smaller national-based VARs, when interviewed by INPUT, were very uncertain as to what might be the benefits from 1992. Some saw it more as a threat than an opportunity, whilst others predicted that it would have little effect on them.

In many market segments, 1992 will not have an immediate effect. All application areas that are culture-specific, as discussed in Chapter IV, do not lend themselves to being easily satisfied by foreign applications. Many need major reforms in fiscal and legal regulations to allow applications to be cheaply exported across national boundaries. These will come, but not in the early 1990s.

There are already many application areas where packaged total solutions can be exported, such as manufacturing, distribution, engineering, design and office systems. In these areas, many vendors are already in more than one European country.

The opportunities for new pan-European packaged total solutions, because of 1992, will be limited during the early 1990s. International banking is certainly one application area; insurance is another. However, unless the EC forces through specific legislation to free individual end-user markets, the effect will be small.

What 1992 will do is to make it easier for EC companies to acquire and merge with one another. Though many packaged total solutions will not be readily exportable, VARs may be more vulnerable to being absorbed by either equipment vendors or larger VARs looking to expand their activities throughout Europe.

The larger VARs are just as interested in expanding through acquisition as are some equipment vendors. These VARs have not been hit by the pressure on equipment prices, as have the equipment vendors, and so tend to have better liquidity.

1992 will bring down many of the protective barriers put up by national European governments to stop foreign takeovers. The post-1992 period is, therefore, likely to see a very active European merger and acquisition market, with both VARs and equipment vendors involved.

4. Professional Services Allow Vendors to Differentiate

Professional services is the most buoyant sector of the packaged total solutions market for both turnkey systems and software product solutions. Customers want customization, plus additional services ranging from strategic consultancy at board level to operator training, and they are prepared to pay for it.

Nearly all vendors see good growth potential in this area. To satisfy the market, vendors must develop special skills in this area. This response could include special training centres or specialized consulting services.

Customer demand puts pressures on vendors to expand their organisations and range of activities. However, as factors like UNIX tend to reduce the differences between packaged total solutions, specialized professional services allow vendors to differentiate themselves from the competition.

There is considerable growth potential for professional services in all areas of packaged total solutions and over all types of equipment platforms. This should be a key target area for any turnkey vendor in the 1990s.

B
Organisational

The question of how vendors organise themselves and sell their systems is also of importance. It can be partially answered by looking at how vendors develop solutions and how they sell them.

1. How Best to Develop Systems

Any vendor has the option either to develop his packaged total solutions in-house, or use third-party expertise. Many vendors see that, to maintain their competitive edge, they have to keep the development of their applications in-house. This is especially true for VARs.

Exhibit VI-11 illustrates the response from vendors to questions about how they develop their systems, again with answers ranked between 1 and 5. In-house development was ranked significantly higher than either licencing from third parties or acquisition, especially for VARs.

EXHIBIT VI-11

How Application Software is Developed—Vendor Preferences

In-house: 3.9 (Equipment vendors), 4.5 (VARs)
Licencing: 3.4 (Equipment vendors), 3.1 (VARs)
Acquisition: 3.1 (Equipment vendors), 2.7 (VARs)
Via VARs: 4.2 (Equipment vendors), 3.8 (VARs)

Scale: 0 1 2 3 4 5
1 = not important, 5 = very important

Equipment vendors
VARs

Total sample: 30
Average standard error: 0.12
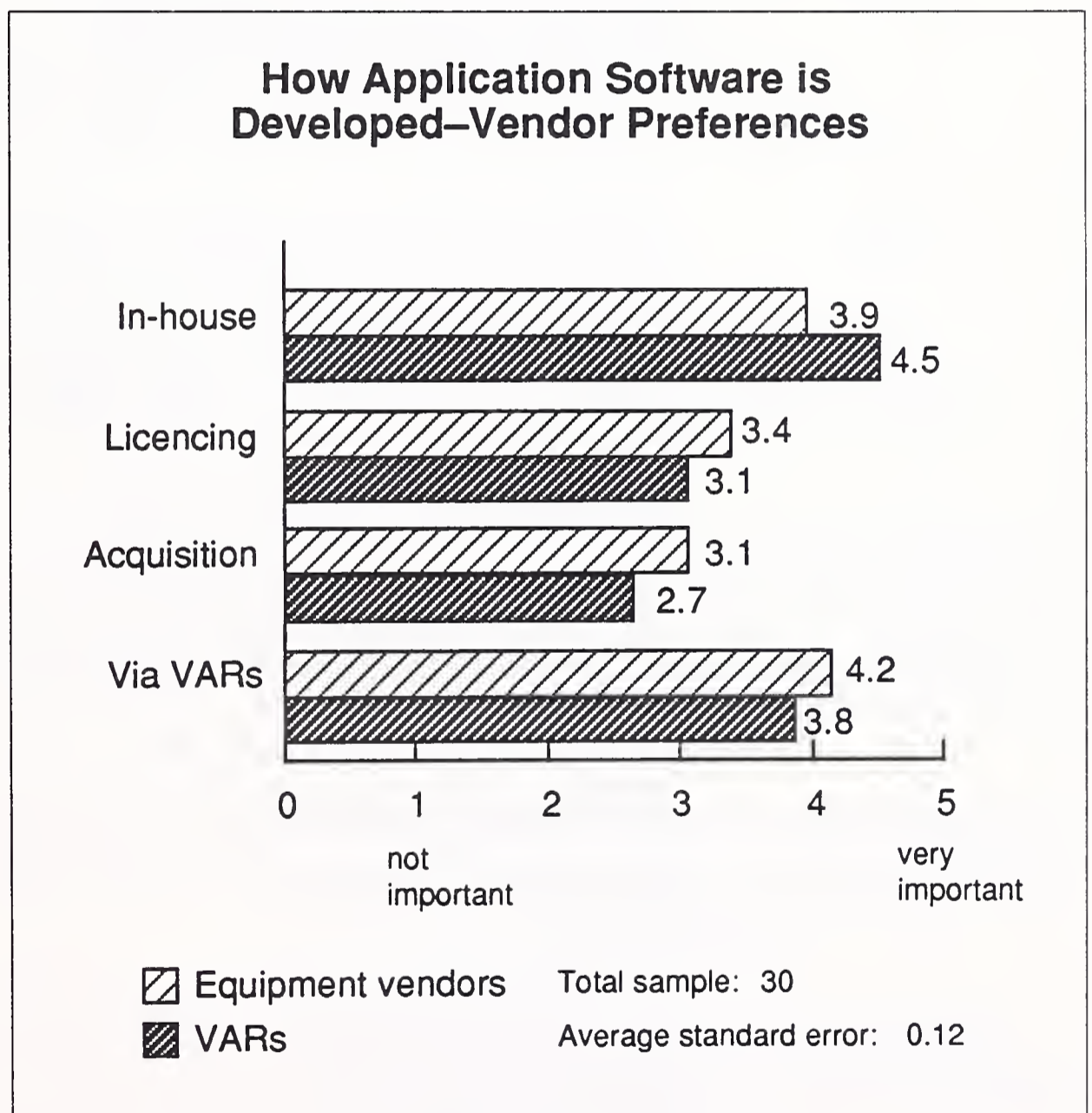
Four methods of development were addressed in INPUT's research:

- In-house—developing applications in-house
- Licencing—buying licences from third-party developers
- Acquisition—buying out companies that have developed application software
- Via VARs—developing through VAR channels

Developing through VAR channels was also seen as very important for both equipment vendors and independent software vendors. INPUT certainly found an attitude in certain equipment vendors that they wanted to develop more turnkey solutions rather than limit themselves to just exploiting this market by supporting VARs. A number of equipment vendors indicated that acquisition was the simple, low-risk way of doing this.

In today's market, independent software vendors have no interest in developing their own equipment. However, they do see it as important to be able to offer their systems on a range of equipment.

Those independent software vendors not interested in using a range of equipment are nearly always on either IBM or Digital machines. Such vendors also tended to be using large mini or mainframe platforms. In these cases, they tended to concentrate their knowledge on a single platform to ensure that they maximized the benefit from it, rather than spreading their expertise over a range of equipment.

To gauge vendors' attitudes on how they developed their systems, they were asked which they considered best:

- Own equipment—developing one's own equipment platform
- Range of equipment—offering a range of equipment platforms
- Range of operating systems—offering a range of operating systems

The two questions on equipment were only put to VARs. Exhibit VI-12 illustrates the result of the three questions. Not surprisingly, VARs were very much against developing their own equipment platforms. However, they showed a strong preference for offering a range of equipment platforms.

With the rapid pickup of UNIX, one would think that all vendors were keen to offer their solutions on a range of operating systems. As Exhibit VI-12 indicated, a range of operating systems is far more an issue for equipment vendors than it is for independent software vendors. The reason is probably that nearly all equipment vendors see that a form of UNIX is essential in addition to their proprietary operating systems. VARs are, on the other hand, still not committed to UNIX.

EXHIBIT VI-12

Importance of Different Types of Equipment and Operating Systems—Vendor Preferences

Horizontal bar chart. Categories (y-axis) and values:

- Developing own equipment: 1.2
- Offering a range of equipment platforms: 3.9
- Offering a range of operating systems: Equipment vendors 3.7, VARs 3.0

X-axis: 0 to 5. 0 = not important, 5 = very important.

Legend:
- Equipment vendors
- VARs

Total sample: 30
Average standard error: 0.20

Many VARs see that UNIX is a future rather than a current fact. Many felt that they wanted the dust to settle over which version of UNIX would become the true industry standard, before they make a move. However, this is not to say that some VARs are not already deeply committed to UNIX. Some undoubtedly see that UNIX is the way forward and wish to stop all offerings on proprietary operating systems.

With growing pressure on all vendors to offer value-added professional services to clients, a potential conflict is being created for the sales force, as to whether they should concentrate on getting new business, or keep existing clients happy with these value-added services.

This is an issue facing any sales organisation. In general, it is easier to sell extra services to existing clients than to go for new business. However, with specific market segments expanding very rapidly, no packaged total solutions vendor can afford to ignore new business.

Vendors' attitudes towards this question of how to allocate sales re-
sources were researched by asking which of the following two solutions
was best:

- Existing clients—concentrate development resources on existing
  client base rather than looking for new clients

- Value-added services—offering value-added services (consultancy) to
  existing clients

Exhibit VI-13 illustrates the results of these questions. Vendors saw that
they had to try to concentrate on both existing and new clients. Equip-
ment vendors were more positive towards existing clients than were
VARs.

EXHIBIT VI-13

**Where to Allocate Sales
Resources—Vendor Preferences**

Concentrate on existing clients: Equipment vendors 3.4, VARs 3.0

Offer value-added services: Equipment vendors 3.4, VARs 4.4

0 — 1 not important — 2 — 3 — 4 — 5 very important

☑ Equipment vendors
▨ VARs

Total sample: 30
Average standard error: 0.15
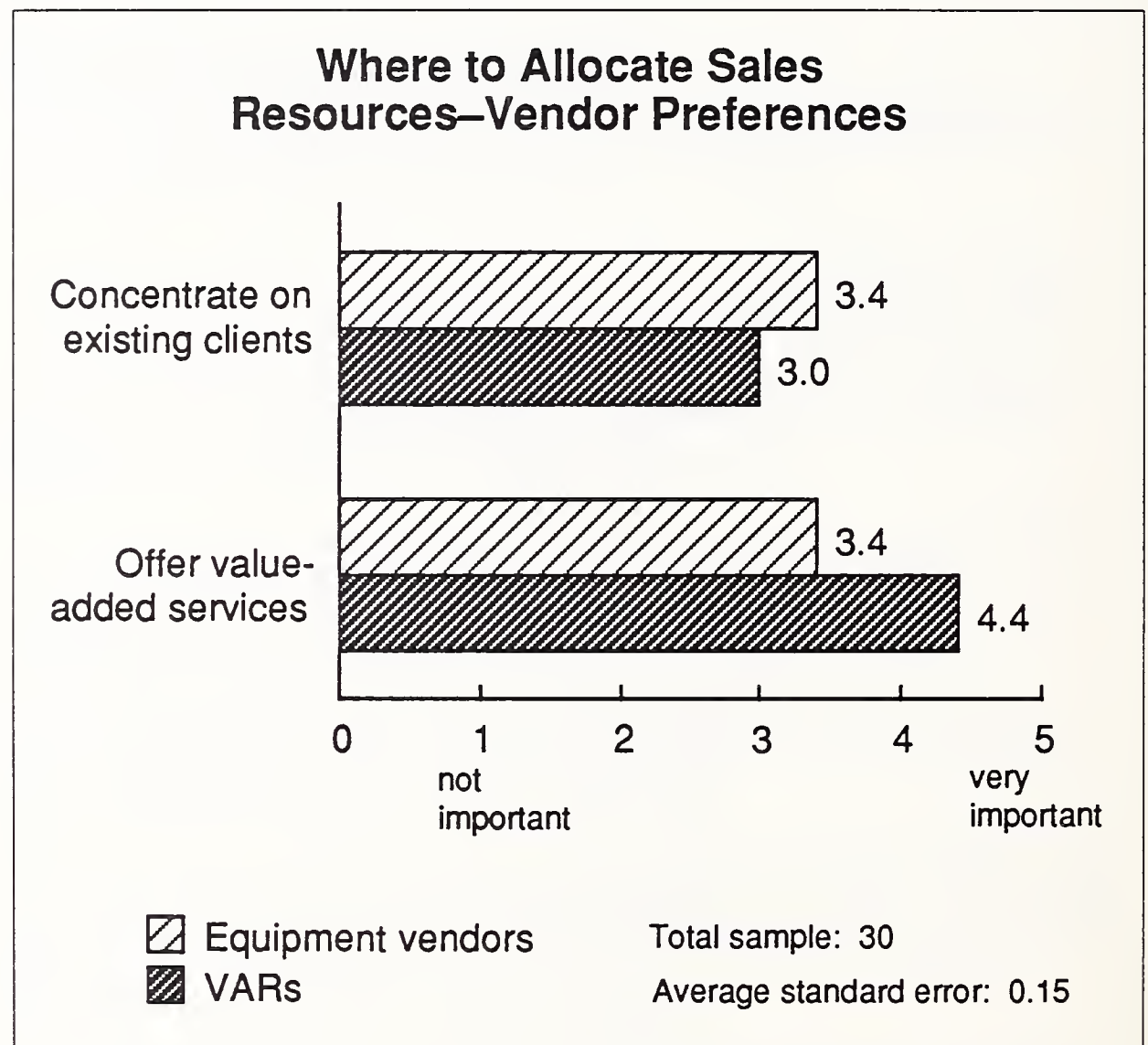
The attitude towards value-added services was the reverse. VARs were
far more positive than equipment vendors. These services are typically
consultancy and advice to clients at all levels, from the board down to the
education and training of clerical staff.

Equipment vendors seem to be well resourced to sell turnkey solutions,
but less so for these value-added professional services. This area of

value-added profession services is potentially highly profitable, more so than application software and certainly more so than equipment. VARs seem to understand the need for this type of service better than do equipment vendors.

2. Problems in Selling Packaged Total Solutions

Packaged total solutions need specific sales and management skills. Vendors, whether equipment vendors or independent software vendors, have to have a deep understanding of what end-users really want, rather than what they think they want.

Exhibit VI-14 lists the principal skills required to sell packaged total solutions, as seen by vendors. When vendors were asked by INPUT what special skills they felt necessary to sell packaged total solutions in the European market, the one consistent answer was "knowing what the end-user wants".

EXHIBIT VI-14

Vendor Skills Needed to Sell Turnkey Solutions

- Clear sales recruitment policy to provide salesmen who:
  - Speak the local language fluently
  - Understand the local environment
- Very well trained sales force so they:
  - Understand the application(s)
  - Understand the equipment
  - Know the customer and his needs
  - Understand how to solve customer problems
- Good contracting
- High quality of technical staff to provide:
  - High quality support and maintenance
- High quality management to ensure:
  - The sales/support team manages the total solution for the end user

For those solutions sold specifically by VARs, there can be other problems. There can always be a possible clash of interests between the sales force of the VAR and that of the equipment vendor. It is all too easy for both companies to find that their individual sales forces are going after the same business. This is called "channel conflict".

It can happen because the client has contacted both separately. Alternatively, it can occur if one side has told the other of a potential sale. Not wishing to lose any opportunity, the other side has also gone after it. Often the sales force of the equipment vendor will get a different commission or bonus if there is a VAR involved. This is where the conflict arises and, at worst, can lead to unpleasant scenes in front of clients.

Both VARs and equipment vendors accept the reality of channel conflicts. As one vendor put it, "This is just a fact of life, with many young salesmen out there all trying to meet their targets. You have got to live with it."

To minimise potential damage from channel conflicts, nearly all equipment vendors have established VAR managers whose job it is to support the VAR and resolve the conflict internally with their sales force.

The consensus of opinion from all interviewed by INPUT was that channel conflicts are, on average, not a major problem. Some VARs seem to have them far more often than others. Some have worse conflicts with specific equipment vendors, but no clearly definable pattern could be established by INPUT.

INPUT suspects that the larger, more important VARs have fewer such problems that the newer, smaller ones.

The only thing that can be concluded is that channel conflicts do occur. In general, they tend to be infrequent. They can nearly always be resolved by going through the relevant VAR channel within the equipment vendor. They are a fact of today's competitive world and will not disappear.

VII

User Needs

VII
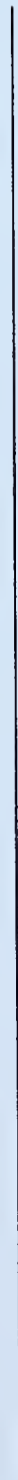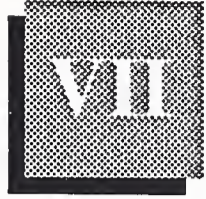
User Needs

Users buy packaged total solutions for a variety of reasons. INPUT's research shows that the prime reason is to obtain a simple solution to a highly technical problem. This is very different to what vendors perceive as being the reason why users buy their solutions, which is that users prefer packaged total solutions because they can check on the quality of the vendor and his product before spending any money.

This chapter looks at the different reasons why users buy packaged total solutions, and the attitudes that users have towards these systems and the vendors that sell them. The results of 30 formal vendor interviews and 200 user interviews are used in this chapter.

The vendor questionnaire used in these interviews is given in Appendix C, and the user questionnaire in Appendix D.

A
Major User Needs

All too frequently, vendors have the completely wrong idea of why customers buy their products and services. INPUT's research shows that this is also the case in the packaged total solutions market.

To assess the attitudes of users and vendors towards why they think users purchase turnkey systems, a number of questions were asked during the formal vendor and user interviews by INPUT. These questions were split into reasons why users might buy turnkey systems, and reasons why users might not buy turnkey systems.

Six questions on why users might buy turnkey systems were put to users and vendors. They were asked to rate their answers between 1 and 5, 1 being low and 5 being high. Exhibit VII-1 shows the results of this research.

EXHIBIT VII-1

Purchasing Factors for Packaged Total Solution Sales–User and Vendor Attitudes

Factor	Users	Vendors
One-stop shop	2.6	3.4
Tried and tested Solution	3.4	3.6
Speed of delivery	3.3	2.8
Standard price	2.8	2.1
Check on quality of vendor	2.9	4.0
Solution to highly technical problem	4.1	2.5

0 = not important, 5 = very important

Total sample: Users: 200, Vendors: 30
Average standard error: Users: 0.04, Vendors: 0.08

☐ Users
▨ Vendors

These questions were regarding the merits of:

- One-stop shop—the ability to have "one-stop shopping"

- Tried and tested solution—the ability for end users to buy a tried and tested solution

- Speed of delivery—the ability to buy a fully working package in weeks/months, rather than months/years

- Standard price—the ability for potential clients to be quoted a standard price

- Check on quality of vendor—the ability to ask existing end users about the quality of support and maintenance

- Solution to highly technical problem—a way to get a simple solution to a highly complex technical problem

In previous research, INPUT has found that vendors think that users buy on price, whereas users often state that they buy on quality of the maintenance and support of the vendor. In the packaged total solutions market, vendors are very close to end users, and so should have a good idea why they buy their systems.

Vendors did rank quality as the major reason why they thought users bought their systems, and price the lowest, unlike the results of other INPUT research. However, what was surprising was that users very clearly put their main purchasing reason as being that packaged total solutions gave them a simple solution to a highly technical problem. Vendors ranked this the next-lowest to price.

As total solutions get more and more complex, users are increasingly having problems identifying the best solution for their needs. For them, an off-the-shelf, ready-made total solution is ideal. That is exactly what the packaged total solution provides. However, if vendors do not perceive this to be the reason why users buy, then they could be marketing their products with the wrong sales arguments. Vendors are recommended to note this and use Exhibit VII-1 to identify their unique selling points for their marketing campaigns.

Both vendors and users were also asked questions on why users might not buy packaged total solutions, perhaps due to the following situations:

- DP policy—the trend towards central control over data processing (DP) policy and the attempt to impose corporate policies on what equipment and operating systems can be used anywhere throughout the organisation

- Industry-wide standards—the growing acceptance of industry-wide standards
allowing end users to build their own packaged solutions

- More powerful equipment—the development of cheap and very powerful desktop machines as platforms for software-only products

- Software-only products—the development of packaged software-only solutions as an alternative to full turnkey solutions

Exhibit VII-2 illustrates the results. In only the first two questions, the influence of central DP policy and standards, were there any major variations between the answers from users and vendors. Vendors felt that DP policy would be far more of an inhibitor than did users. On the issue of standards, it was the reverse, with vendors believing they would be far less of an inhibitor than did users.

EXHIBIT VII-2

Inhibiting Factors in Packaged Total Solution Sales—User and Vendor Attitudes

Factor	Users	Vendors
DP policy	2.6	3.4
Industry-wide standards	3.4	2.5
More powerful equipment	3.1	3.0
Software-only products	3.0	3.0

0 = not important   5 = very important

Total sample: Users: 200   Average standard error: Users: 0.04
Vendors: 30   Vendors: 0.10

▨ Users
▨ Vendors

The reason for the difference on the question of standards came out very clearly from the user research. Many users are just not worried about standards today, as they are still happy with the proprietary standards set by U.S. equipment vendors such as IBM and Digital, and European vendors like Bull.

Users of packaged total solutions look to vendors to supply and deliver total solutions to their problems. They still look to vendors to worry about nearly all of the technical problems, and as yet have not fully understood the importance of open standards and UNIX to their future purchasing decisions. It is often only in areas such as local and central government, where central DP rulings have been laid down, that individual users appreciate the benefits of UNIX.

B
Open or Closed Standards

The question of standards and UNIX should be just as much an issue with users as with vendors. However, users seem far less informed about UNIX than do vendors, and because of this, have much more confidence that UNIX will solve all their problems.

Exhibit VII-3 illustrates that only 17% of users currently use UNIX. There were a surprising number of users interviewed who had not heard of UNIX. Added to this, there was a marked difference between national groups of users on the current penetration of UNIX.

EXHIBIT VII-3

User Use of UNIX Solutions

Users [bar extends to 17]

17

0   10   20

Percent
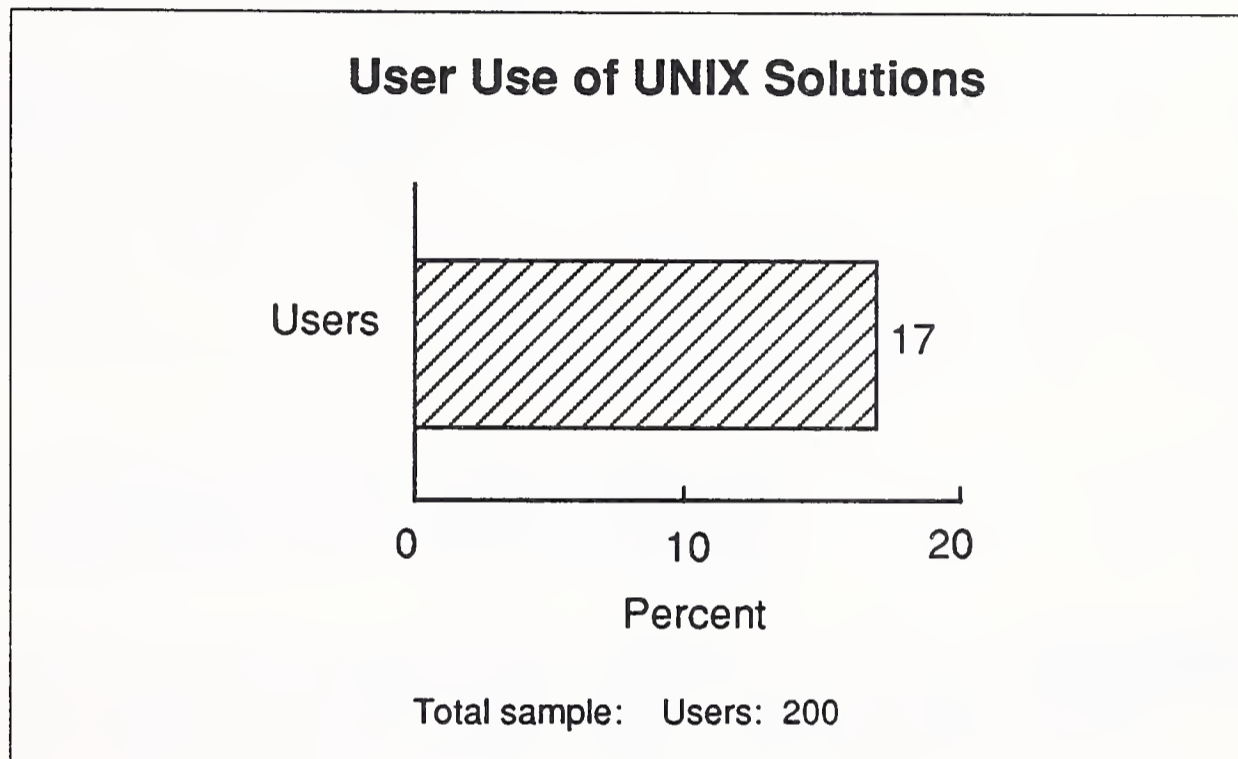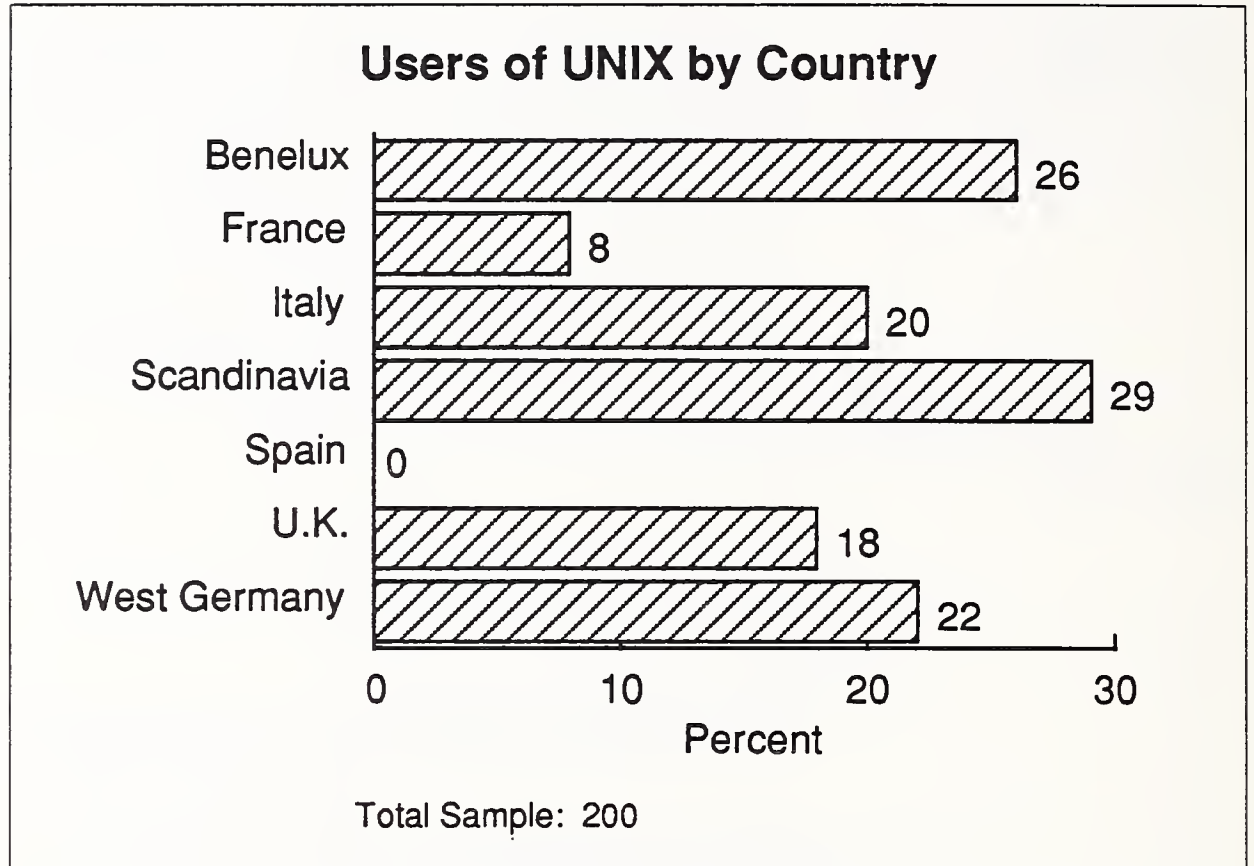
Total sample: Users: 200

Exhibit VII-4 illustrates the differences between the responses by country.

Out of the sample of 200 users, the area with the highest proportion of UNIX users was Scandinavia at 29%, whilst that with the lowest was Spain at zero. The Benelux also had a higher-than-average penetration of UNIX. Countries like the U.K., West Germany and Italy had percentages very similar to the average of all users. The next-lowest UNIX user was France, at only 8%.
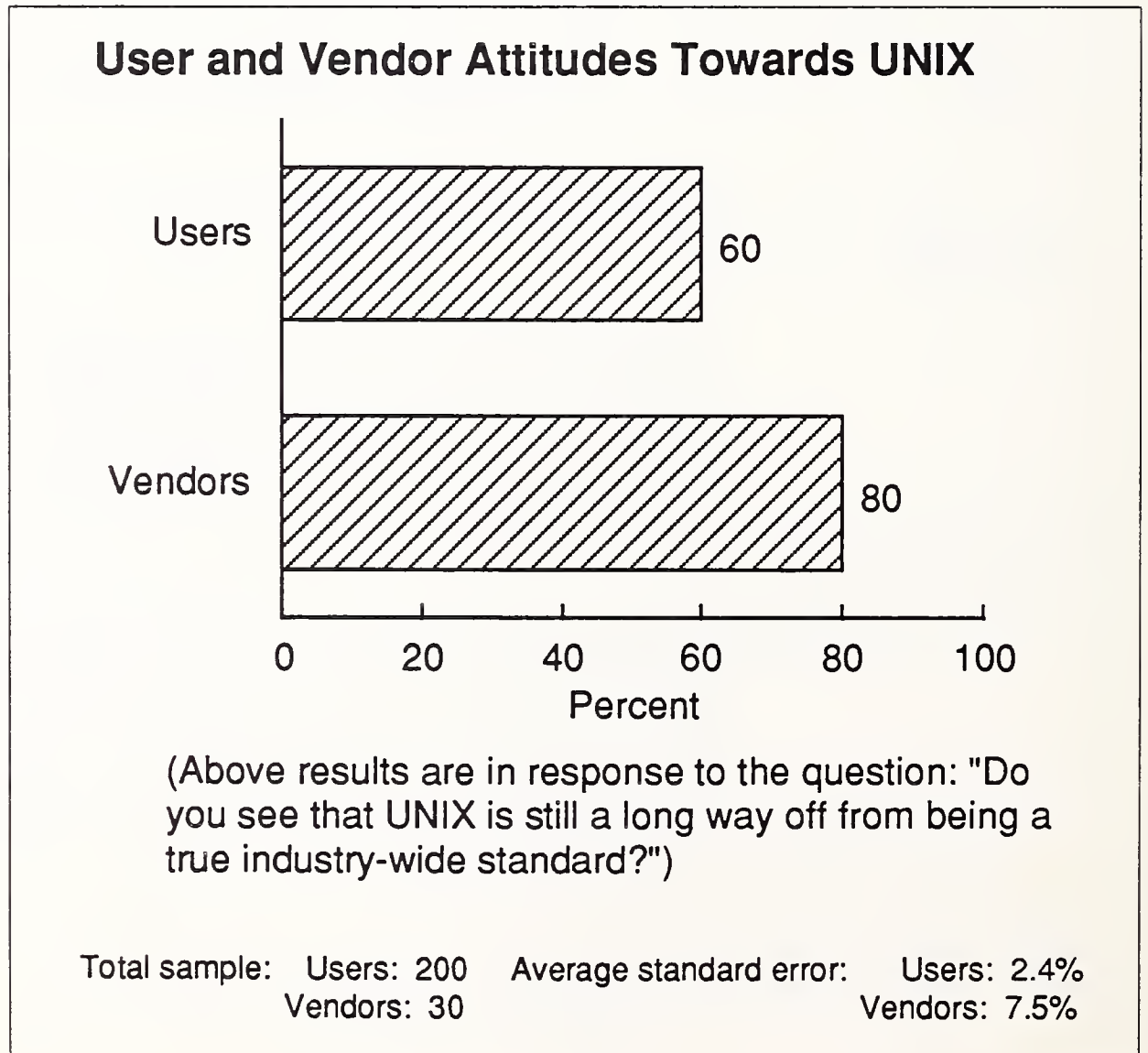
The zero rating of Spanish users is not surprising, as it is known that Spanish technology lags behind that of northern Europe. The fact that it has no equipment vendor of its own also puts it at a disadvantage. It has become very reliant on IBM, which has not been pushing UNIX as have other equipment vendors. In France, a number of users were only interested in proprietary standards, mainly those of IBM and also Bull.

EXHIBIT VII-4

Users of UNIX by Country

Country	Percent
Benelux	26
France	8
Italy	20
Scandinavia	29
Spain	0
U.K.	18
West Germany	22

Percent

Total Sample: 200

Users were asked whether they thought that UNIX was still a long way from being an industry-wide standard. Exhibit VII-5 compares the results with those of vendors.

EXHIBIT VII-5

User and Vendor Attitudes Towards UNIX

	Percent
Users	60
Vendors	80

Percent

(Above results are in response to the question: "Do you see that UNIX is still a long way off from being a true industry-wide standard?")

Total sample: Users: 200   Average standard error: Users: 2.4%
                Vendors: 30   Vendors: 7.5%

In general, users felt that UNIX was much nearer being a true industry-wide standard today than vendors. Sixty percent of users thought that UNIX was a long way from being a standard, whereas 79% of vendors felt this. However, it must be pointed out that some 40% of users did not feel themselves competent to comment on UNIX. The reason for this was that many users were still committed to proprietary operating systems, particularly those of IBM and Digital, and in France those of Bull.

For those vendors selling UNIX these results have two conclusions. For those users who know about UNIX, vendors seem to have done a very good job of telling them how good UNIX is. However, they still have to educate a large proportion of users as to what UNIX is all about, especially in Spain and France.

When asked about the likelihood of UNIX creating a similar market in the minicomputers to that already created by MS/DOS in the PC market, those users who knew about UNIX were very positive. In general, they thought that this would happen, and many looked forward to it.

C
Choice of Vendor

An important issue for vendors is whether users have a natural bias for or against them.

INPUT's research did not indicate any major opinions about vendors concerning whether they sold packaged total solutions as turnkey systems or as software product solutions. However, there were definite national preferences in certain countries towards local vendors.

West Germany was the country which most strongly indicated this national preference. The opinion passed on to INPUT was that users did not feel that non-German solutions could be as good as those developed by German vendors. The exception to this was in the area of CAD/CAM, where users accepted that U.S. vendors were probably better than German vendors.
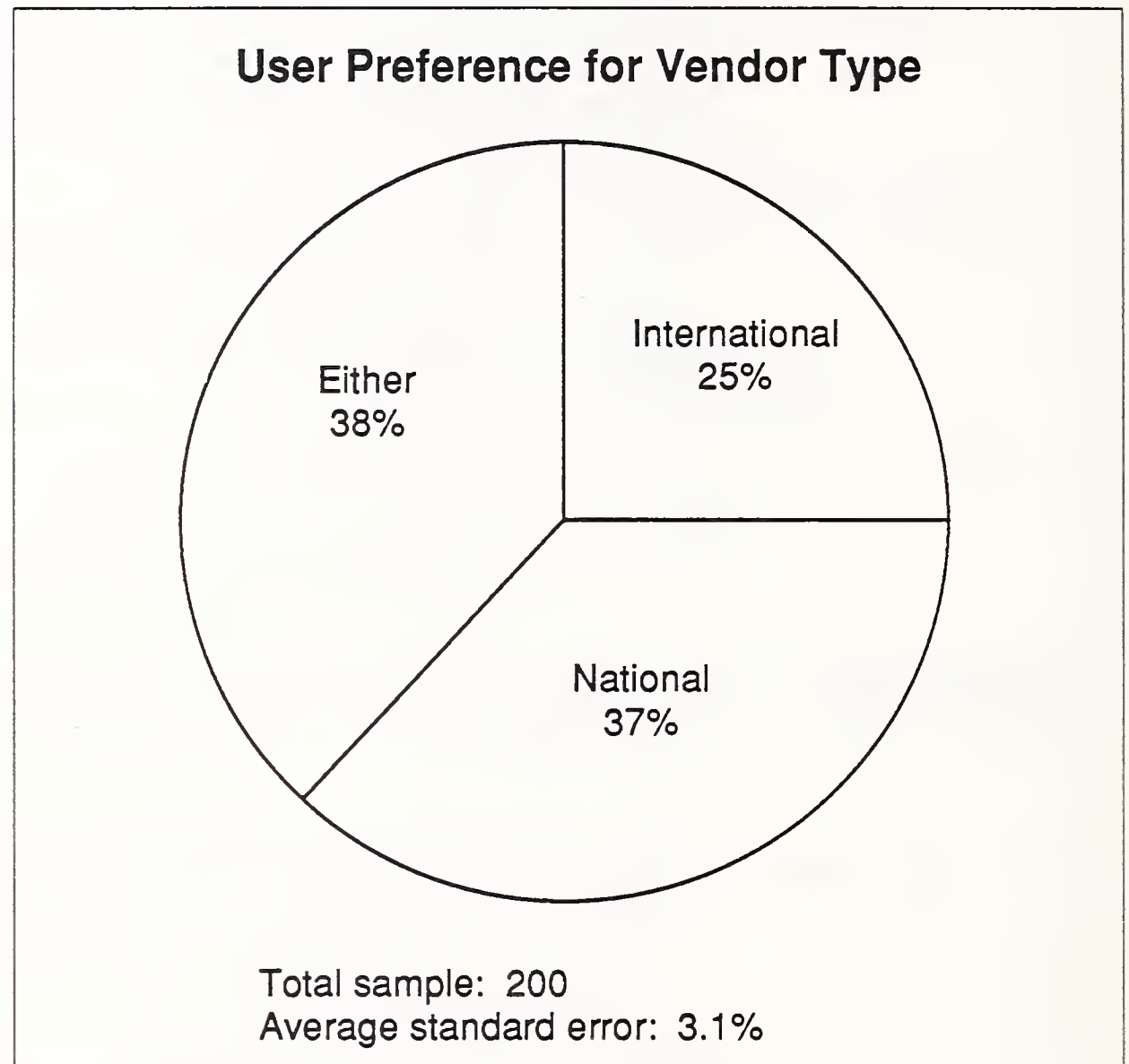
In most European countries there is a natural bias towards vendors of the same nationality as that of the user. 1992 is not going to change this.

With the move to a more open European market during the 1990s, vendors need to know how important it is that they should be seen as being international, rather than only operating in a single national European market. To research this issue, INPUT asked users if they felt it necessary that vendors be international. They were asked questions on preference in three areas:

- International—international throughout Europe
- National—significant national organisation
- Either—not concerned whether national or international

As Exhibit VII-6 illustrates, on average only 25% of the 200 users interviewed wanted international vendors. The rest were equally split between those who preferred national vendors and those who were not concerned.

EXHIBIT VII-6

User Preference for Vendor Type

Either
38%

International
25%

National
37%

Total sample: 200
Average standard error: 3.1%

In the answers to these questions, there were major national differences. These are illustrated in Exhibit VII-7.

The French, British and Spanish showed the greatest preference for option c—any vendor, as long as they could do a good job. The Italians, Scandinavians and Benelux users showed the least preference for this option.
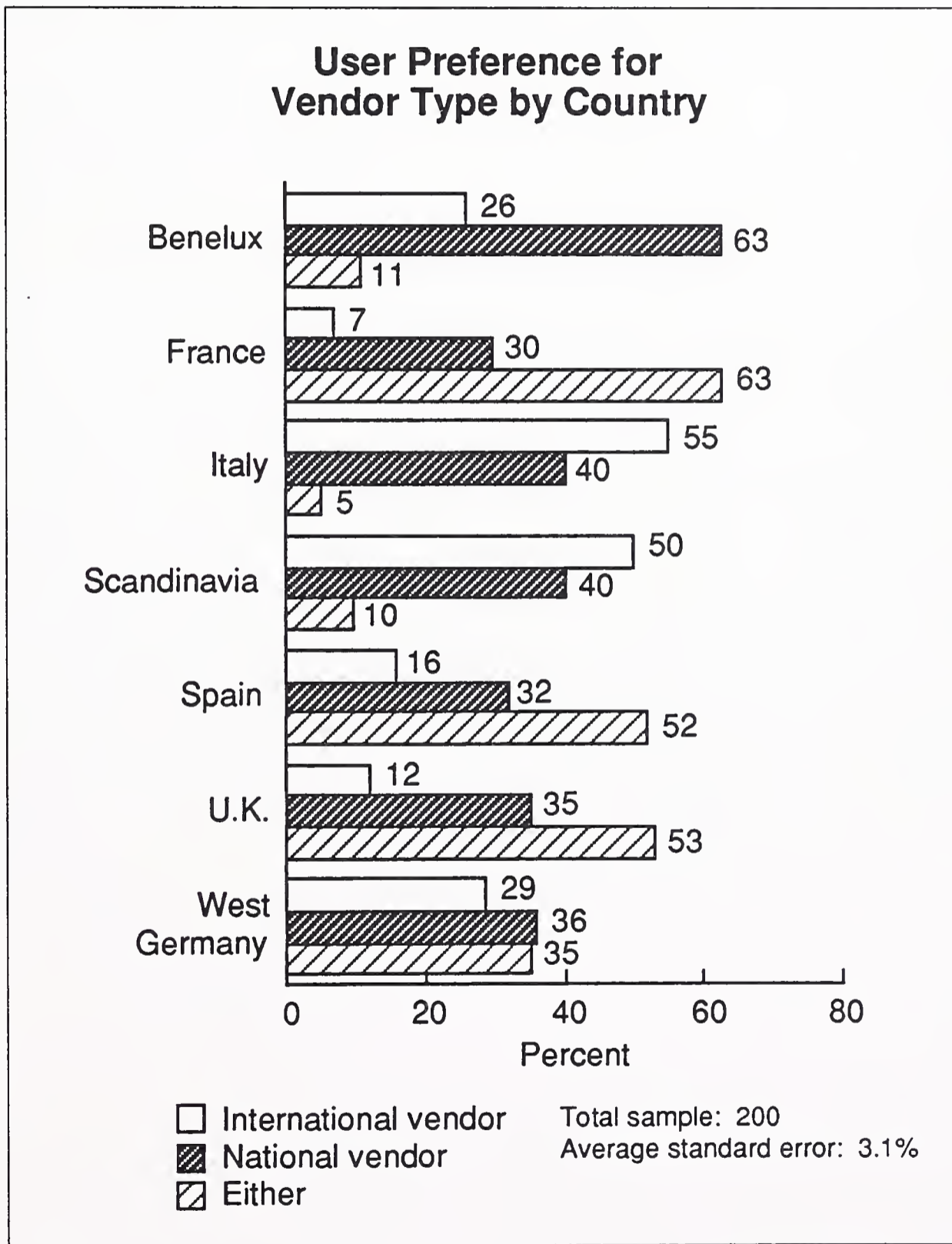
The pragmatic attitude by the French and British towards which vendors they choose has been borne out by other research. The most critical users seem to be Germans and Italians.

Italian and Scandinavian users stated a very positive preference for international vendors, option a. The French, on the other hand, showed least preference for international vendors. This research reflects on end users' businesses, not on the quality of different types of software and services vendors. Both Italy and Scandinavia are at the edge of Europe

and businessmen in both regions feel the necessity for good international communication. This is reflected in the types of software and services vendors they look for.

Although it might appear from these results that the French do not want vendors with international capabilities, this would be an incorrect conclusion. The correct conclusion would be that the French are more concerned to get a vendor who can do a good job, rather than one who is specifically international.

EXHIBIT VII-7

User Preference for Vendor Type by Country

Country	International vendor	National vendor	Either
Benelux	26	63	11
France	7	30	63
Italy	55	40	5
Scandinavia	50	40	10
Spain	16	32	52
U.K.	12	35	53
West Germany	29	36	35

☐ International vendor
▨ National vendor
▧ Either

Total sample: 200
Average standard error: 3.1%

VIII

Vendor Recommendations

VIII

Vendor Recommendations

In this chapter, INPUT looks at what strategies vendors should take in the European turnkey market over the next few years. Recommendations are made for both equipment vendors and VARs. Sales strategies are also reviewed.

A
Vendor Strategies

When developing existing or new turnkey systems, vendors should go through the checklist of strategic options set out in Exhibit VIII-1. These options are relevant to all vendors, whether VARs or equipment vendors, whether U.S. or European, whether small or large.

EXHIBIT VIII-1

Strategic Options for Vendors

- Which type of turnkey/VAR segment should be targeted

- In which geographic area within Europe will the system be sold

- What will be the preferred operating system standard

- Who will write the application development

- Who will handle marketing and support

- Who will control the sales channel

The type of turnkey segment refers to whether a specific application is:

- general international
- culture-specific

The difference between these application types is discussed in Chapter IV. Unfortunately, it is not possible to produce a definitive list for either sector. With 1992, and the gradual removal of the old European cultural barriers, applications are moving from culture-specific to general international and will continue to do so throughout the 1990s.

Vendors have to make their own judgment at any given time on just how international a specific market segment is, or will become. This means carefully researching which cultural factors still affect the market, and when and if the EC is going to remove them. One of the best ways of following these developments is to stay close to Brussels and the relevant industry Directorate in the European Commission.

1992 is just one of the major forces that will impact the European turnkey market. Exhibit VIII-2 lists the important forces.

EXHIBIT VIII-2

Trends Affecting All Vendors

- Lower equipment prices and margins

- Move to UNIX

- Attempt to maintain control over end users

- Move to more total solutions

- Become more pan-European

- Cost of converting own applications to UNIX

- 1992 and the gradual development of the European Single Market

Vendors have three types of geographic region within Europe to target. Their options are:

- a single European country
- a specific cultural region
- pan-Europe

In the past, vendors may have expanded abroad without enough consideration of the cultural differences around Europe. With increased competition in the 1990s, vendors should have a clear perception of what risks they are prepared to accept in expanding through Europe.

The decision of which operating system standard to employ is currently between one of four alternatives:

- IBM
- Digital
- other proprietary standards
- UNIX

As UNIX becomes more important and the European user base is built up, the third option of other proprietary standards will become less and less important. Certainly for the first half of the 1990s, the strength of both IBM and Digital standards will remain a major force in the overall European packaged total solutions market.

The option on who will write the application will not be seen as relevant for many vendors. They will only develop applications themselves. In reality, there are two options:

- write in-house
- use a third party

There are a growing number of vendors who will consider using third parties, in particular the equipment vendors who are new entrants into this market. Using an independent to do all the development work and then to either licence or buy the application, or even buy the independent itself is an easy and low-risk development route, if the cash is available.

Most vendors prefer to handle the marketing and support of their systems themselves, but there are options:

- use own sales force
- use third-party distributors

Many VARs use distributors as a way to develop abroad at minimal cost and risk. Once they are successful in a specific country, they then prefer to switch to their own sales force.

The question of control is different for equipment vendors and for VARs. For equipment vendors, it is a matter of which is the best marketing channel for their equipment. For VARs, it is a matter of who controls their turnkey operations.

As discussed in Chapter III, equipment vendors have various channel options related to control over end users:

- retain total control (use own sales force to sell own turnkey systems)
- maintain partial control (support VARs selling software products)
- lose control (allow VARs to sell turnkey)

Most equipment vendors do not like losing control over end users. In certain market conditions, there may be no choice over whether control is maintained or lost. This has already happened in large segments of the PC market and increasingly in the workstation market, but has not yet happened in the minicomputer market. With the spread of UNIX, it is certainly likely to affect the lower-power range of the minicomputer market during the early 1990s.

In the European turnkey market, equipment vendors can be classified into three groups:

- those with total commitment to own turnkey solutions (e.g. Prime, Nixdorf, Nokia Data, etc.)

- those with partial commitment to own turnkey solutions, plus strong commitment to supporting VARs (e.g. IBM, Olivetti, ICL, etc.)

- those with little or no commitment to the turnkey sector (e.g. Amstrad, Toshiba, Control Data, etc.)

The question of marketing channels only affects the second group, where they have different strategic options on how to be involved in the overall packaged total solutions market.

Equally, no VAR likes losing control of his business. To remain competitive in the 1990s, with the gradual development of the European Single Market, certain VARs may have to look for strategic alliances with other parties. The options open to VARs are:

- retain total control (no joint ventures or majority sale of shares)
- maintain partial control (consider joint ventures and cooperative agreements)
- lose control (be prepared to sell off majority of shares)

The option of maintaining partial control is often considered best by the smaller, national VARs. It may be a wise strategic move to form alliances with like-minded foreign VARs. These cooperative agreements could assist the small VARs in becoming more European, and give some protection against predatory acquisition from equipment vendors and the larger VARs.

1992 will ease acquisition regulations within the EC. Both equipment vendors and large VARs are already interested in buying market share in certain turnkey sectors. This means that smaller VARs can be vulnerable to complete loss of control by being taken over, especially after 1992.

B
Vendor Recommendations

Because some of the forces affecting the turnkey market in the 1990s will impact equipment vendors and VARs alike, certain general recommendations can be made to vendors. Exhibit VIII-3 lists these recommendations.

EXHIBIT VIII-3

General Vendor Recommendations

- Stay close to Brussels and watch specific legislation that might free specific end-user markets and reduce cultural differences

- Identify if the EC will support development programmes for new pan-European systems

- Monitor the development of UNIX as a European standard

- Watch how competitors are using UNIX to link different functionality into turnkey/VAR systems

- Identify the limitations of UNIX

- Look to using kernel software to develop turnkey/VAR solutions

---

The European Commission is gaining in strength as 1992 gets nearer. Its importance in when and how certain end-user markets might be changed through specific Single Market legislation is increasing. It is also developing a number of programmes to assist European companies in developing European services. Vendors should pay attention to these developments.

Since UNIX is likely to have a major effect on the European market, vendors should closely monitor its development. They should watch whether it develops into a single standard, or two. Currently there are two major versions of UNIX:

- UNIX International (led by AT&T, based around UNIX Version V)
- Open System Foundation (guided by IBM, centred around IBM's AIX version of UNIX)

There have been indications that these are coming together under one standard. Vendors should closely monitor both the advantages and disadvantages of UNIX by studying and working with UNIX themselves.

1. Equipment Vendors

Exhibit VIII-4 sets out a number of recommendations for equipment vendors involved in both the European turnkey market and the wider packaged total solutions market.

Any equipment vendor must decide which marketing channel is preferable, as discussed above. If he plans to support VARs, the quality of the VAR programme is crucial. With the growing competition for the better VARs, equipment vendors must give considerable thought to developing a very attractive VAR programme. For European equipment vendors, this means developing programmes that can effectively compete against those of the large U.S. equipment vendors.

Those European equipment vendors who fall into the "partially committed" group, as defined above, are the ones at the greatest disadvantage to the large U.S. equipment vendors. They are the larger European equipment vendors–Siemens, Olivetti, ICL, and Bull. They should give serious consideration to finding some way of working together to build up a pan-European user base and a pan-European VAR programme that will be most attractive to the better VARs.

EXHIBIT VIII-4

Recommendations for Equipment Vendors

- Decide whether to develop one's own turnkey solution, or use VARs

- Clearly define the position of any own turnkey development relative to other competitive packages in the relevant market segment

- Do not try to control a specific market segment by only offering an own turnkey solution, also use VARs with similar products

- Ensure that any VAR programme offers the best advantages to the better VARs, compared with competitive VAR programmes

- Ensure that the best technical support is given to any VAR

- Try to tie up the better VARs on one's own equipment through schemes such as cheap loans for software development

- If necessary, work together with other equipment vendors to provide the best pan-European VAR programme

- Target existing or evolving general international application sectors, rather than culture-specific sectors

- Understand the cultural difference around Europe when developing turnkey systems

- Look at acquiring national VARs, as a way to give the best entrance into specific national markets

2. VARs

Exhibit VIII-5 sets out recommendations for VARs.

EXHIBIT VIII-5

Recommendations for VARs

- Resist becoming locked into a specific equipment vendor's VAR programme from which it is difficult to escape

- Aim to become an important VAR that equipment vendors would like on their equipment

- If necessary, form joint ventures or make cooperative agreements with other like-minded VARs to give sufficient importance to the joint services

- Exploit the growing competition between equipment vendors for the better VARs by negotiating the best terms

- Exploit the growing competition between UNIX and proprietary operating systems by always being able to port to UNIX as an option

- Look for ways of enhancing your solution so it is clearly differentiated from the competition, such as offering a turnkey solution rather than software products

With the expected growing competition in the 1990s between equipment vendors for a share of the packaged total solutions market, VARs should aim to ensure that they are:

- strong enough not to be taken over by either equipment vendor or the large VARs

- important enough to be able to play one equipment vendor off against another to get the best available deal

The larger VARs are already in this situation. However, most VARs are not in this fortunate position, being small. INPUT recommends that they

give careful thought to just how vulnerable they are in their specific turnkey markets and especially look to whether this vulnerability is likely to increase in the 1990s through specific European barriers coming down as part of the Single European Act legislation. Having assessed areas of vulnerability, they should consider ways of trying to reduce this whenever possible, such as cooperation with like-minded, similar-sized, foreign VARs to make it harder for larger competitors to take them over.

C

Sales Skills

Exhibit VIII-6 illustrates the main factors that are essential in selling turnkey solutions. Both equipment vendors and VARs ranked these as important.

EXHIBIT VIII-6

Turnkey Vendor Sales Force Skills

- Fluency in the local language

- In-depth knowledge of each vertical market

- Understanding the needs of end users

- Good knowledge of computing

- In-depth knowledge of how to maximise the value of the product for the customer

Undoubtedly the most frequently-stressed factor for good turnkey sales forces is understanding the needs of end users.

One of the ways vendors ensure that their sales force has the best understanding of specific market sectors is to employ experts from these sectors to sell turnkey systems. For instance, an engineer would be taken on and trained to sell a specific manufacturing package, or a freight forwarder employed to sell packages to the transport market. This may be a far better way of ensuring that the right skills are obtained, rather than retraining a general sales person for the job.

From the research undertaken by INPUT, it is felt that equipment vendors tend to redeploy existing staff into turnkey key sales positions rather than to recruit specialists. VARs more often recruit experts from different market sectors. Equipment vendors could lose some competitive edge in the market to these VARs. Exhibit VIII-7 summarises INPUT's recommendations for sales forces in the European turnkey market.
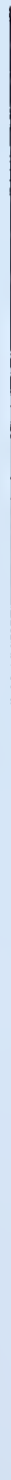
EXHIBIT VIII-7
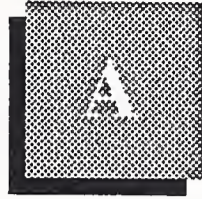
120

Recommendations for Sales Forces

- Use industry experts where possible

- Do not rule out distributors just because they are not on the staff

- Consider using distributors for specialised market segments, alongside vendor's staff

- Keep as close to end users as possible

A

Appendix: Definition of Terms

Appendix: Definition of Terms

A

Revenue

- *Captive Computer Services Revenue* - Revenue received from users who are part of the same parent corporation as the vendors.

- *Noncaptive Computer Services Revenue* - Revenue received for computer services provided from users who are not part of the same parent corporation as the vendor.

- *Other Revenue* - Revenue derived from lines of business other than those defined above.

- *Total Company Revenue* - Revenue received from total computer services and other sources of revenue.

- *Total Computer Software and Services Revenue* - Revenue received from services provided by vendors that perform data processing using the vendors' computers (processing services), assist users to perform such functions on their own computers (software products and/or professional services), provide a combination of hardware and software integrated into a total system (turnkey systems), include consulting, education and training, programming analysis, and facilities management (professional services), provide for systems design, integration and installation (systems integration), or offer network, enhanced management services, electronic mail, electronic data interchange, or electronic information services (network services).

B

Service Modes

- *Processing Services*

  - Transaction Services: uses vendor equipment and software at vendor site or customer site; may be interactive or remote-batch-oriented.

- Utility Services: access to basic software tools enabling the users to develop their own problem solutions (language compilers, assemblers, DBMS, sorts, scientific library routines, etc).

- Other Services: carry-in batch processing, computer output microfilm services (COM), data entry services, disaster recovery/backup services.

- Facilities Management (Systems Operations): vendor provides a complete operating information system for customer including equipment, software, personnel and facilities.

• *Professional Services* - Management consulting activity related to EDP systems consulting, production of custom software, education and training, and systems operations of client-owned computers (formerly identified as facilities management), where the vendor provides human resources to operate and manage the client facility.

• *Systems Integration* - delivery of large, multidisciplinary, multivendor systems, incorporating some or all of these functions: systems design, programming, integration, equipment, networks, installation and acceptance. Systems can encompass multiple product delivery modes.

• *Software Products*

  - Systems software and/or applications software packages purchased by users.

    ° Systems Software Products

      Systems Control Software: operating systems, communications monitors, network control, library control, windowing, access control, security, etc.

      Data Center Management Software: capacity management, scheduling, job accounting, performance monitors, tape management, utilities, downtime/repair monitoring management, etc.

      Application Development Tools Software: application generators, assemblers, compilers, 4GLs, automated documentation, languages, translators, database management systems, data dictionaries.

    ° Applications Software Products

Cross-Industry Applications Software: used by clients in many or all vertical markets (i.e. payroll, word processing, spreadsheets, accounts receivable).

Industry-Specific Applications Software: unique to a specific vertical market and sold into that market only (i.e., demand deposit accounting, MRP II, hospital patient tracking).

- *Network Services*

  - Network Management and Enhanced Services: network management functions, network transmission facilities, augmented with computerized switching and features such as packet switching, electronic mail, store-and-forward message switching, terminal interface and error detection and correction.

  - Network Applications

    ° Electronic Data Interchange (EDI): application-to-application electronic communication, based on established business document standards.

    ° E-Mail: a range of services that transmits documents consisting of text and graphic material to be read by a person—with the quality of document being high.

    ° All other application services in which the network is the principal part of the service, e.g., electronic funds transfer and some videotex services.

- *Electronic Information Services*

  - Databases that provide specific information via terminal-based inquiry such as stock prices, legal precedents, economic indicators, airline schedules, etc.

  - News services that offer current information, either general or for a specific category; i.e., financial or political

  - Other services that provide interactive access to databases and offer the inquirer the capability to send as well as receive information for such purposes as home shopping, home banking, travel reservations, etc.

* *Turnkey Systems* - an integration of systems software, packaged or customized applications software, CPU, equipment, and peripherals. These systems are developed to meet a specific set of user requirements. The value added by the vendor is primarily in the software, either packaged or custom-developed. Most CAD/CAM systems and many small business systems are turnkey systems. This does not include specialized hardware systems such as word processors, cash registers, and process control systems.
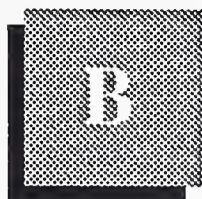
C

Other Considerations

When questions arise about the proper place to count certain user expenditures, INPUT addresses them from the user viewpoint. Expenditures are then categorised according to what users perceive they are buying.
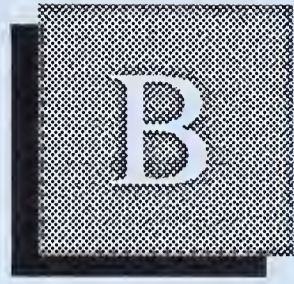
B

Appendix: U.S. Dollar Average Exchange Rates

B

Appendix: U.S. Dollar Average Exchange Rates

U.S. Dollar Average Exchange Rates

Country	Currency	Dollar Exchange Rate	Inflation Assumptions
Austria	Sch	13.60	+2.8
Belgium	BF	40.50	+3.0
Denmark	DK	7.53	+4.8
Finland	FM	4.32	+6.0
France	FF	6.55	+3.5
Italy	LR	1,409.00	+6.5
Netherlands	DfL	2.18	+1.1
Norway	NK	7.00	+4.5
Spain	Pta	121.00	+6.3
Sweden	SK	6.55	+7.0
Switzerland	SF	1.70	+3.0
U.K.	£	0.61	+7.7
West Germany	DM	1.93	+3.0

Source: Exchange rates—IMF (average rates for second quarter 1989)
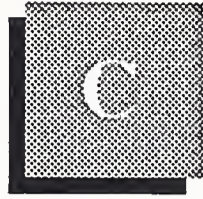Inflation—Barclays Bank (August 1989)

C

Appendix: Vendor Questionnaire

Appendix: Vendor Questionnaire

General

Both independent software developer and equipment vendor

QU:1   Do you:

a. sell complete packages of standard equipment and standard software that you have developed to end users and support these packages fully for your clients? (standard turnkey products)

yes _____   what is your approximate price range   _____

              what is your equipment base   _____

no _____

If independent software developer

b. act as a VAR on specific equipment?

yes _____   what is your approximate price range   _____

              what is your equipment base   _____

no _____

Both

c. customize these packages yourself for clients and again fully support them your-self? (customized turnkey products)

yes _____   what is the approximate added value   _____
                  associated with customization, on average

                  what is your approximate price range   _____

                  what is the approximate % of turnkey/VAR _____
                  packages that are customized

no _____

d. sell your turnkey/VAR application software on its own if this is all the client wants?

yes _____   what is the approximate % sold as software _____
                  only rather than turnkey/VAR

no _____   why not _____

If independent software developer

e. act as a sales agent for other turnkey/VAR vendors?

yes _____   what is the approximate % sold of your   _____
                  software and 3rd-party software

no _____

If an equipment vendor

f. support VARs on your equipment?

yes _____   what is the approximate range of price   _____
                  that your VARs sell at or you sell
                  your equipment at

                  what % of your business is VARs   _____

no _____

Market Profile

Both

QU:2   Could I ask you some questions about your turnkey/VAR products in Europe?

a. About how many years have you been in turnkey/VAR products?

_____

b. Which European countries do you sell your turnkey/VAR products?

_____

c. At what rate have your turnkey/VAR products being growing over the past few years?

_____

and do you see this changing over the next few years?

_____

d. What is the approximate split of your turnkey/VAR revenue between equipment and software today?

_____

and do you see this changing over the next few years?

_____

e. How are you expanding your European coverage, especially with 1992 coming up?

_____

f. What is your total European turnkey/VAR revenue for 1988 and how is this broken down by major European country, and turnkey/VAR product?

your products

_____

3rd-party products for which you are an agent

_____

QU:3   What do you see as being high-growth turnkey/VAR product areas?

_____

and low-growth turnkey/VAR product areas?

_____

and could you indicate what you think their growth/decline rates might be over the next 5 years?

_____

QU:4   What are the fundamental differences between different European countries towards turnkey/VAR products?

_____

Technical Issues

QU:5   Could I ask some more detailed questions about certain key technical issues relevant to today's turnkey/VAR market?

a. Are you already offering your applications on UNIX?

yes _____

no _____   will you, if so when _____

b. Do you see that UNIX is still a long way off being a true industry-wide standard?

yes _____

no _____

c. Could you indicate on a scale of 1 to 5 whether you see that UNIX will do to the minicomputer market what MS/DOS has done to the PC market in creating a standard operating system off which vendors can sell just application software as software products, rather than total packaged solutions?

_____

d. Could you indicate on a scale of 1 to 5 whether you see that the development of the super-micro as a real competitor to the minicomputer is good for the turnkey vendor?

_____

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e. Could you indicate on a scale of 1 to 5 whether you see that the growth of standard solutions to highly technical and complex problems through the development of new advanced, cheap peripherals (laser printers, CD/ROMs, high quality graphics screens) is good for the turnkey vendor?

applications developers   _____

turnkey/VAR vendors   _____

Marketing Issues

QU:6   How do you currently market your turnkey/VAR products?

a. Via your own sales force

yes _____

no _____

b. Via 3rd parties

yes _____   who _____

no _____

c. If yes to b, do you have any preference between these different outlets?

_____

d. What are the special skills needed to sell turnkey/VAR products in Europe (specialised marketing services, specialised support/maintenance staff, etc.)?

End-User Issues

QU:7   Concerning why end users buy turnkey/VAR products, could you indicate the importance you would place on the following factors which should help end users in buying turnkey/VAR products, on a scale of 1 - 5?

a. The desire to have "one-stop shopping"

_____

b. The ability to buy a tried and tested solution

_____

c. The ability to buy a fully-working package in weeks/months, rather than months/ years

_____

d. The ability to be able to be quoted a standard price to potential clients

_____

e. The ability to be able to ask existing end users on the quality of support and maintenance

_____

f. A way to get a simple solution to a highly complex technical problem

_____

g. Others. Please state _____

QU:8   And could you indicate the importance you would place on the following factors which would seem to inhibit end users in buying turnkey/VAR products, on a scale of 1 - 5?

a. The trend towards central control over DP policy and the attempt to impose corporate policies on what equipment and operating systems can be used anywhere throughout the organisation

_____

b. The growing acceptance of industry-wide standards allowing end users to build their own packaged solutions

_____

c. The development of cheap and very powerful desk top machines as platforms for "software-only" products

_____

d. The development of packaged "software-only" solutions as an alternative to full turnkey/VAR solutions

_____

e. Others. Please state _____

Vendor Issues

If independent software developer

QU:9   As an application software developer, could you indicate the importance of the following factors in becoming a turnkey/VAR vendor on a scale of 1 to 5?

a. Developing applications in-house

_____

b. Acquiring applications by buying licences from 3rd parties

_____

c. Acquiring applications by buying 3rd-party application software development companies

_____

d. Developing products as a VAR with specific equipment vendors

_____

e. Developing your own proprietary equipment platform

_____

f. Offering a range of equipment platforms

_____

g. Offering a range of operating systems

_____

h. Concentrating development resources on your existing client base (rather than looking for new clients)

_____

i. Looking to offer added-value services (consultancy) to existing clients

_____

If equipment vendor

QU:10   As an equipment vendor, could you indicate the importance of the following factors in becoming a turnkey vendor on a scale of 1 to 5?

a. Developing applications in-house

_____

b. Acquiring applications by buying licences from 3rd parties

_____

c. Acquiring applications by buying 3rd-party application software development companies

_____

d. Developing turnkey/VAR products through VARs

_____

e. Offering non-proprietary operating systems

_____

f. Concentrating development resources on your existing client base (rather than looking for new clients)

_____

g. Looking to offer added-value services (consultancy) to existing clients

_____

Channel Issues

If software developer and yes to being a VAR

QU:11   Do you act as a VAR on specific equipment?

yes _____

no _____

and if yes, which equipment vendors?

_____

QU:12   Could you comment on the following issues directly related to being a VAR?

a. Do you at times find that there is a conflict between your own sales force and that of the equipment vendor (channel conflict)?

yes _____   comment _____

no _____   comment _____

b. Can you offer any solutions to resolving channel conflicts, if you have experienced them?

always give the benefit of the doubt to the equipment vendor's sales force rather than one's own sales force _____

manage sales conflicts through a special VAR manager set up by the equipment vendor _____

other _____

If equipment vendor and yes to supporting VARs

QU:13   Which software developers act as VARs on your equipment?

yes ____ list them, or give types _____

no ____

a. What is the approximate range of price that your VARs sell at, or you sell your equipment at

_____

b. What % of your business is via VARs

_____

QU:14   Could you answer the following questions concerning how you have built up your VAR service?

a. Have you developed your VARs via:
   i.   a specific in-house strategy and then gone out and recruited VARs?

   yes _____

   no _____

ii.　just let interested VARs contact you?

yes _____

no　_____

iii.　a combination

yes _____　approximate split between i. and ii. _____

no　_____

QU:15　Could you comment on the following issues (even if you have decided not to sell your equipment separately and only to sell it via VARs)?

a.　If you have, or were to have your own equipment sales force, there will, at times, be a conflict between one's own sales force and VARs (channel conflicts)?

yes _____　comment _____

no　_____　comment _____

b.　Can you offer any solutions to resolving channel conflicts, if you have experienced them?

always give the benefit of the doubt to the VAR rather than one's own sales force

_____

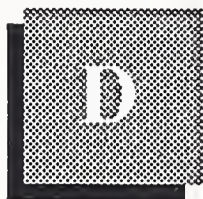manage sales conflicts through a special VAR manager set up by you

_____

other _____

D

Appendix: User Questionnaire

D

Appendix: User Questionnaire

I would now like to ask you some questions about packaged solutions where the vendor provides complete systems, equipment, systems software and applications all bundled together plus the associated support.

General

QU:1   Have you bought such complete packaged standard solution in the past few years from a single vendor, who has also supplied and maintained the equipment?
(N.B. INPUT defines this as turnkey)

yes _____

no _____

Alternatively have you bought complete packages, but where one vendor supplies the application and the equipment vendor installs and maintains the equipment?
(N.B. INPUT defines this as a VAR solution)

yes _____

no _____

If your answer to either of these was yes, then

a. What was the rough price   _____

b. What was the equipment platform   _____

    c. Were such packages customised for you by the vendor   _____

yes   _____   what was the rough extra % of value   _____
                                    associated with this customization

no   _____

User Issues

QU:2   Could you indicate the importance you, as an end user, would place on the following factors in buying complete packaged solutions, on a scale of 1 - 5 (1 being low and 5 high)?

    a. The desire to have such "one-stop shopping"

    _____

    b. The ability to buy a tried and tested solution

    _____

    c. The ability to buy a fully-working package in weeks/months, rather than months/years

    _____

    d. The ability to be able to be quoted a standard price by vendors

    _____

    e. The ability to be able to ask existing end users on the quality of support and maintenance of vendors

    _____

    f. A way to get a simple solution to a highly complex technical problem

    _____

    g. Others. Please state _____

QU:3   I also have some questions on factors which might stop you, an end user, buying such packaged solutions, again on a scale of 1 - 5 (1 meaning that they would not stop you buying, 5 that they would):

    a. The trend towards central control over DP policy and the attempt to impose corporate policies on what equipment and operating systems can be used anywhere throughout the organisation

    _____

b. The growing acceptance of industry-wide standards allowing end users, such as yourself, to build your own packaged solutions

_____

c. The development of cheap and very powerful desk top machines allowing end users to build your own solutions

_____

d. The development of stand-alone application software as an alternative to complete packaged solutions

_____

e. Others. Please state _____

Technical Issues

QU:4   Could I ask some more detailed questions about certain key technical issues relevant to today's market?

a. Are you running any applications under UNIX?

yes _____   when and why _____

no _____   will you, if so when _____

b. Do you see that UNIX is still a long way off being a true industry-wide standard?

yes _____

no _____

c. Could you indicate on a scale of 1 to 5 whether you see that UNIX will do to the minicomputer market what MS/DOS has done to the PC market in creating an standard operating system off which vendors can sell just application software, rather than complete packages solutions?

d. Could you indicate on a scale of 1 to 5 whether you see that the growth of the super-micro as a real competitor to the mini is good for you as an end user?

e. Could you indicate on a scale of 1 to 5 whether you see that the development new advanced, cheap peripherals (laser printers, CD/ROMs, high quality graphics screens) is good for you?

Marketing Issues

QU:5   Which of the following statements concerning computer services vendors that you buy services from would you agree with?

a. It is important that the vendor operates on an international basis throughout Europe

b. I am only concerned that the vendor is a significant organisation within my own national boundary

c. As long as my vendor can support me locally, I am not concerned with their overall position either internationally, or nationally
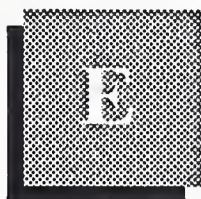
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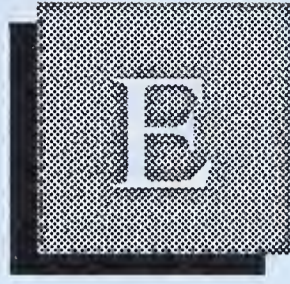
Appendix: Forecast Database

Appendix: Forecast Database

EXHIBIT E-1

Turnkey Market by Western European Country, 1989-1994

Country	Currency	Units	1989	1990	1991	1992	1993	1994	CAGR 1989-1994 (Percent)
Austria	Sch	Millions	2,279	2,690	3,212	3,871	4,703	5,736	20
Belgium	BF	Millions	6,496	7,672	9,145	10,992	13,400	16,495	20
Denmark	DK	Millions	1,413	1,670	1,996	2,399	2,925	3,600	21
Finland	FM	Millions	593	700	837	1,006	1,226	1,509	21
France	FF	Millions	8,142	9,534	11,279	13,512	16,377	20,062	20
Italy	Lira	Billions	734	857	1,011	1,205	1,451	1,762	19
Netherlands	Dfl	Millions	700	826	983	1,176	1,420	1,726	20
Norway	NK	Millions	1,011	1,194	1,427	1,716	2,091	2,574	21
Spain	Pta	Millions	33,925	40,041	47,810	57,619	70,004	85,389	20
Sweden	SK	Millions	1,655	1,956	2,337	2,809	3,425	4,216	21
Switzerland	SF	Millions	585	690	824	993	1,207	1,472	20
U.K.	£	Millions	1,077	1,260	1,487	1,777	2,159	2,643	20
West Germany	DM	Millions	4,643	5,387	6,291	7,430	8,886	10,779	18
Rest of Europe	$	Millions	97	115	137	165	200	244	20
Total	$	Millions	8,027	9,390	11,087	13,227	15,985	19,507	20

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F
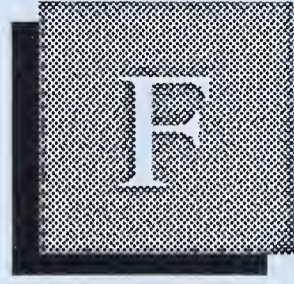
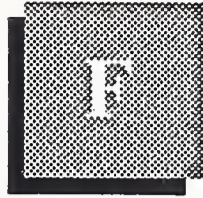# Appendix: Reconciliation of Forecasts

Appendix: Reconciliation of Forecasts

In December 1988, in its report *The Western European Market for Computer Software and Services: 1988-1993*, INPUT forecast the size of the European turnkey market as being $8.2 billion, growing to $9.6 billion by 1989 and $18.2 billion by 1993. This represented an average growth rate for the five-year period of 17% per annum.

The results of this report on the European turnkey market are significantly lower. The size of the 1988 turnkey market is estimated as $7.0 billion, rising to $8.0 billion in 1989 and to $19.5 billion by 1994. Over the period 1989 to 1994, an average growth rate of 19% is forecast. These differences for 1989 are illustrated in Exhibit F-1.

In many areas of Europe, vendors call software products solutions, where the equipment vendor retains title to the equipment, turnkey systems. As discussed in this report, INPUT defines such total solutions according to their component products and services, and not turnkey systems. The principal difference between the earlier forecasts and those given in this report is that software products solutions sold as packaged total solution have sometimes been viewed as turnkey systems.

This report estimates that in 1989 the packaged total solutions market is $15.3 billion, growing to $36.5 billion by 1994 (these forecasts included the equipment revenue going through equipment vendors' books). It can be seen that the forecast of the turnkey market in this report of $8.0 billion and the estimate of the overall packaged total solutions market of $15.3 billion for 1989 bracket the earlier turnkey forecast of $9.6 billion.

It is necessary to re-allocate the additional turnkey revenues estimated in the earlier INPUT reports to the other market sectors. These market sectors are illustrated in Exhibit F-1. Since the difference between the two forecasts is just for those packaged total solutions sold as software products solutions, the re-allocation is to the relevant component sectors of software products and professional services, as also illustrated in Exhibit F-1.

EXHIBIT F-1

The Western European Turnkey
Market, 1988-1989 Reconciliation

	$ Billions		
	1988 Report		1989 Report
	1988	1989	1989
Turnkey market forecasts			
- Total size	8.2	9.6	8.0
- 1989 difference		(1.6)	
Reconciliation through reallocation:			
- Software products		1.2	
- Professional services		0.4	
- Subtotal		1.6	
- Turnkey systems		8.0	8.0
- Overall		9.6	8.0