SOFTWARE PRODUCT PRICING AND SUPPORT STRATEGIES IN EUROPE 1987 - 1992

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Abstract

The importance of support and maintenance to the software product user has reached new heights as more users view software support as a critical purchase selection factor. Additionally, equipment vendors are increasingly integrating hardware maintenance and software support functions within the customer services organization. This report analyzes the current pricing and support mechanisms in place in Western Europe and describes the conflicting trends affecting pricing and software support over the next three years.

Issues discussed in the report include pricing by processor power, bundling and unbundling of services, user problems with upgrades and revisions, and pricing trends as seen by both the vendor and the user. This report focuses on user requirements — present and future — for software support and reflects how vital it is for vendors to identify and satisfy user service requirements while at the same time being able to price products at marketable levels.

This report contains 143 pages and 58 exhibits.

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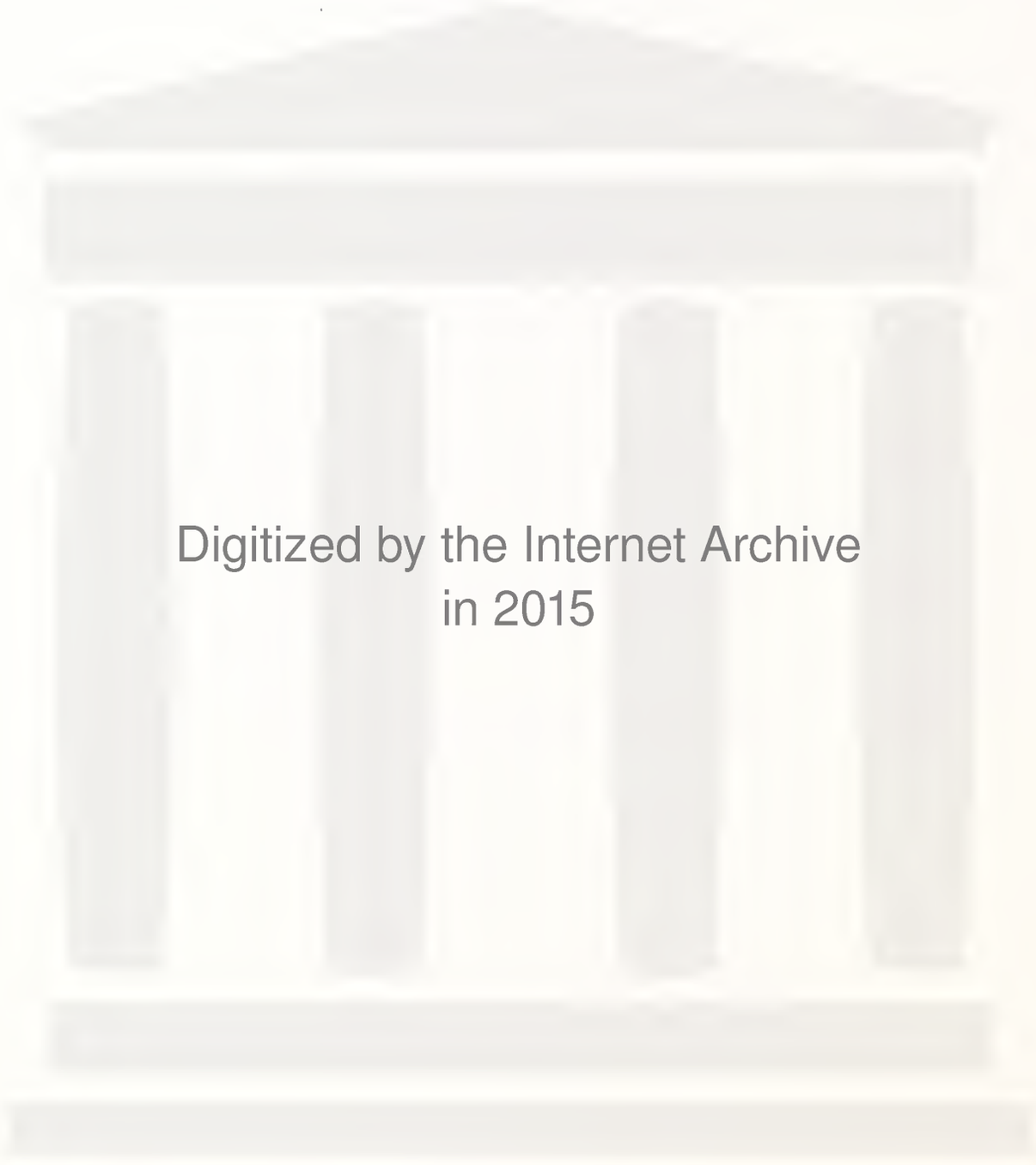

Exhibits

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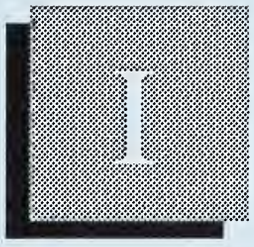


Introduction

Introduction

A

Objectives of the Report

This study was produced by INPUT as part of its 1987 European research programme. The topic was chosen due to the high degree of interest expressed by INPUT clients.

Effective pricing of software products and their auxiliary support services is perceived by vendor management as a critical on-going management task in today's volatile and complex market environment. A number of factors are combining to make long-term pricing and market positioning decisions increasingly difficult. These factors include:

- Pressure on profit margins,
- Emergence of new competitors, both small, specialist and maybe inexperienced, as well as large, rich groupings resulting from mergers and acquisitions,
- Continuing arrival of increasingly sophisticated microcomputer software products priced at one hundredth (or less) of an equivalent mainframe product,
- The continuing requirement for investment in product upgrades and renewals, due to changes in the hardware or operating software platforms upon which modules must run,
- Top-end competition from large systems and services companies.

The main objectives of this report are:

- To enable vendors to develop effective pricing strategies to cope with the run-up to the 1990s,

- To help vendor management to develop product support and maintenance strategies which complement their pricing policies.

In this way product suppliers can go forward with a coherent marketing stance.

B

Scope and Methodology

The report addresses pricing and support issues related to:

- Mainframe- and minicomputer-based software products. This includes both system and application software, as supplied by equipment vendors and independent software product producers,

- PC- and microcomputer-based products for the corporate and business marketplaces. The thrust here is towards the larger corporate user, who is interested in a comprehensive range of products across small, medium and large systems.

The geographic scope of the report covers:

- France
- West Germany
- United Kingdom
- Italy
- Scandinavia
- Benelux

Specific exclusions from the scope (although dealt with insofar as they might be impacted by developments in the software products sector outlined in later chapters) are:

- Tailored software systems developed under Professional Services contracts;

- Consumer or Home-computer based products.

Primary research which contributed to the analysis and conclusions in the report come from two main sources:

- Research Source A: Telephone interviews with 210 high-level managers in information systems departments in user companies across the European countries included in the scope;

- Research Source B: In-depth personal interviews with vendor managers in 28 companies including both equipment suppliers and independent software producers.

Exhibit I-1 gives the breakdown of user interviews across the industry and country market sectors used, showing the actual and targeted totals in each category.

EXHIBIT I-1

USER INTERVIEWS SAMPLING FRAME

NO. OF INTERVIEWS	INDUSTRY SECTOR	NO. OF INTERVIEWS	COUNTRY MARKET
53	Manufacturing (Process & Discrete)	40	United Kingdom
38	Finance & Banking	30	France
18	Insurance	40	West Germany
19	Retail Distribution	30	Italy
22	Transportation (Private Sector)	40	Scandinavia (Sweden, Finland & Norway)
26	Central/Local Government	30	Benelux (Belgium & Netherlands)
14	Health Care (Pharmaceuticals & Private Sector)		
20	Public Utilities		
210	TOTAL	210	TOTAL

The sample can also be analysed by the size of establishment being interviewed. The breakdown was:

- More than 1,000 employees in the establishment: 127
- More than 500 but less than or equal to 1,000 employees: 83
- All establishments 210

The example was thus skewed towards the needs of the larger corporate users.

Exhibit I-2 shows the breakdown of the vendor sample by the type of supplier and main markets covered. Sixteen of the 28 vendors offered products across the whole of Western Europe with pricing policies, which varied from country to country according to a function which was mainly geared to the prevailing currency exchange rates between its domestic and its overseas markets. The remaining 12 were essentially serving single-country markets.

EXHIBIT I-2

VENDOR INTERVIEW PROGRAMME

COUNTRY MARKETS SUPPLIED	NUMBER OF INTERVIEWS BY TYPE OF VENDOR		
	HARDWARE SUPPLIERS	INDEPENDENT SOFTWARE SUPPLIERS	ALL
France	-	5	5
United Kingdom	-	4	4
West Germany	-	3	3
Multi-National or All Europe	8	8	16
Total Europe	8	20	28

Vendors were asked to divulge confidential information concerning their pricing approaches and directions. As a result, vendors participating in the survey are not identified by name.

C

Report Structure

This report is organised as follows:

- Chapter II is an Executive Overview. A recap of the cardinal points of the entire report is provided in order to facilitate clients' internal briefing sessions;

- Chapter III addresses the current market status with respect to how users are charged for Mainframe and Minicomputer products. Both user attitudes and expectations, and vendor responses are dealt with. Differences between system and application software, and by type of vendor are discussed;

- Chapter IV addresses a similar task for PC and Micro-based products serving the corporate market for establishments with more than 500 employees;

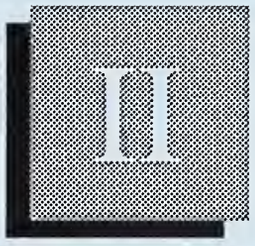
- Chapter V addresses the issues related to software product support. The subject is first defined and then discussed in terms of the user-perceived tasks in which some component of customer support is required;

- Chapter VI handles the issues and problems associated with the central maintenance of software products:

  - Patches and Fixes,
  - Upgrades and New Versions,
  - Documentation and Product Distribution;

- Chapter VII discusses the mutual impact between Software Product vendors and their solutions, and other players in the marketplace offering partial or total system solutions. Both pricing and support issues are covered;

- Chapter VIII gives a five-year forward look at product tariff trends and pricing structures, and forecasts pricing movements over the period. The report concludes with recommendations to vendors on the formulation of their pricing and support strategies.



Executive Overview

II

Executive Overview

A

Charging for Product Licences

Because of the "intellectual property" characteristics of software, when buying it as a product, the user purchases a licence to use the product and not the product itself. The main features of product licence charging are shown in Exhibit II-1.

EXHIBIT II-1

CHARGING FOR PRODUCT LICENCES

- Length of Licence Term
  - Short Term = 2 to 5 Years
  - Long-Term = Perpetual; 30 Years
- Method of Charging for "Right to Use"
  - Initial Fee - Most Favoured
  - Regular Fees - Annual, Quarterly, Monthly
  - A Combination, etc.

Licences issued in today's marketplace are principally of two kinds:

- Short-term licences are of a duration, typically between two and five years. They are most frequently used to licence system software programs, where the product upgrade life-cycle is short,
- Long-term licences are normally of indefinite duration, i.e. "in perpetuity" unless rescinded for one reason or another. Some vendors set an arbitrary time of expiring e.g. with a licence for 30 years "right to use".

A number of different methods of levying software product licence fees are current in the marketplace. In order of "popularity", as measured by user expenditure, the main options are:

- An initial or one-time fee paid on successful installation,
- Regular licence fees, paid annually, quarterly or monthly,
- An installment plan, essentially paying an initial fee over a number of months or years,
- Pricing by usage of machine resources over an agreed period,
- A combination of the first and second method, whereby the first year fee is larger than that for subsequent years.

B

Pricing by Processor Power

As software has become more important to the operational side of a user's business, it has seemed natural and fairer to charge for a software license by the number of transactions processed or the number of users supported, or some other suitable usage factor; Exhibit II-2 refers.

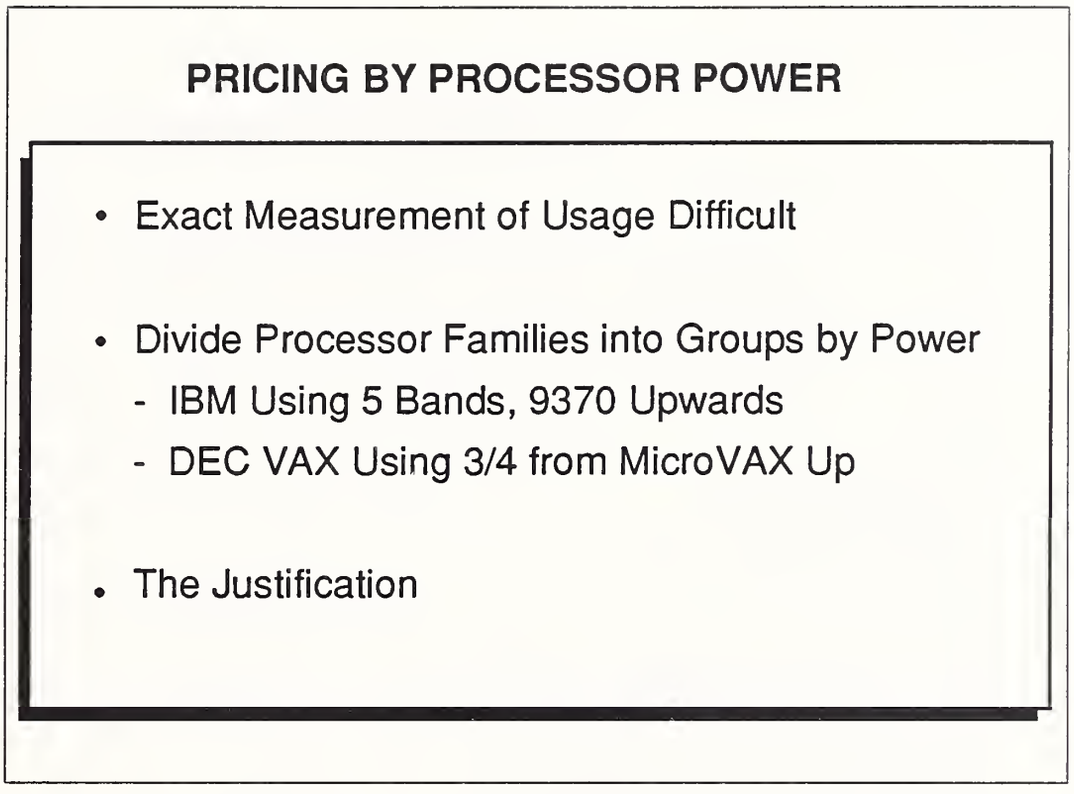
In practice, the vendor has little control over how users use their products, especially the large, well-educated users. Rating software according to the charge-band within which the host machine is placed, is a rough and ready way of including a usage factor in the product fee.

Traditionally, IBM has had two different charge bands according to operating system environment, DOS/VSE or MVS. With the 1986 launch of its 9370 distributed processors (the VAX killers), IBM switched over to the use of five charge bands:

- Two for 9370s,
- Three for 4300s and larger mainframes.

During 1987, independent vendors operating in the IBM software sector have been following suit—moving from two charge bands, usually to four or five to map fairly closely onto IBM's own tariff structure.

EXHIBIT II-2



Digital (DEC) has used a similar system for its VAX range for some time, but has included a fine structure to its tariff whereby licence fees are also linked to a maximum number of users connected to the host processor; e.g. from 1-8, 9-16, etc.

C

Product Pricing Levels

The West European software market supports many thousands of software products in the system software/utilities segment as well as in the application package segment. IBM alone has a product catalogue of 5,000 items of which 2,000 are in common use.

It would be hopeless to try to study prices in such a varied market except in a general manner. There are scores of specialist subsectors, each with its own set of pricing factors at work.

INPUT has selected a range of the most important revenue-earning products (their suppliers' flagship products) in order to establish some very broad sector guidelines and these are depicted in Exhibit II-3:

- Software for mainframe and minicomputer machines can vary in price by more than one order of magnitude. Important pieces of software cost five figures of dollars.

EXHIBIT II-3

PRODUCT PRICING LEVELS

TYPICAL 'FLAGSHIP' PRODUCT	EQUIVALENT ONE-TIME FEE ($ Thousands)			AVERAGE PRICE RISE 1986-87 (Percent)
	FROM	TO	AVERAGE	
MAINFRAME/ MINICOMPUTER				
System Software	7.5	300.0	83.7	+5.0
Application Software	12.0	300.0	84.0	+1.8
MICROCOMPUTER/PC				
System Software	0.6	15.0	5.6	+5.3
Application Software	0.8	3.6	2.0	+3.9

- Microcomputer software for business has a similar range of price; expensive items may be 25 times the cost of the cheaper ones. Four figures of dollars is a more likely ceiling price, however.

System software experienced 1987 price rises around 5% for both machine groups. Application software is more competitive and more price sensitive:

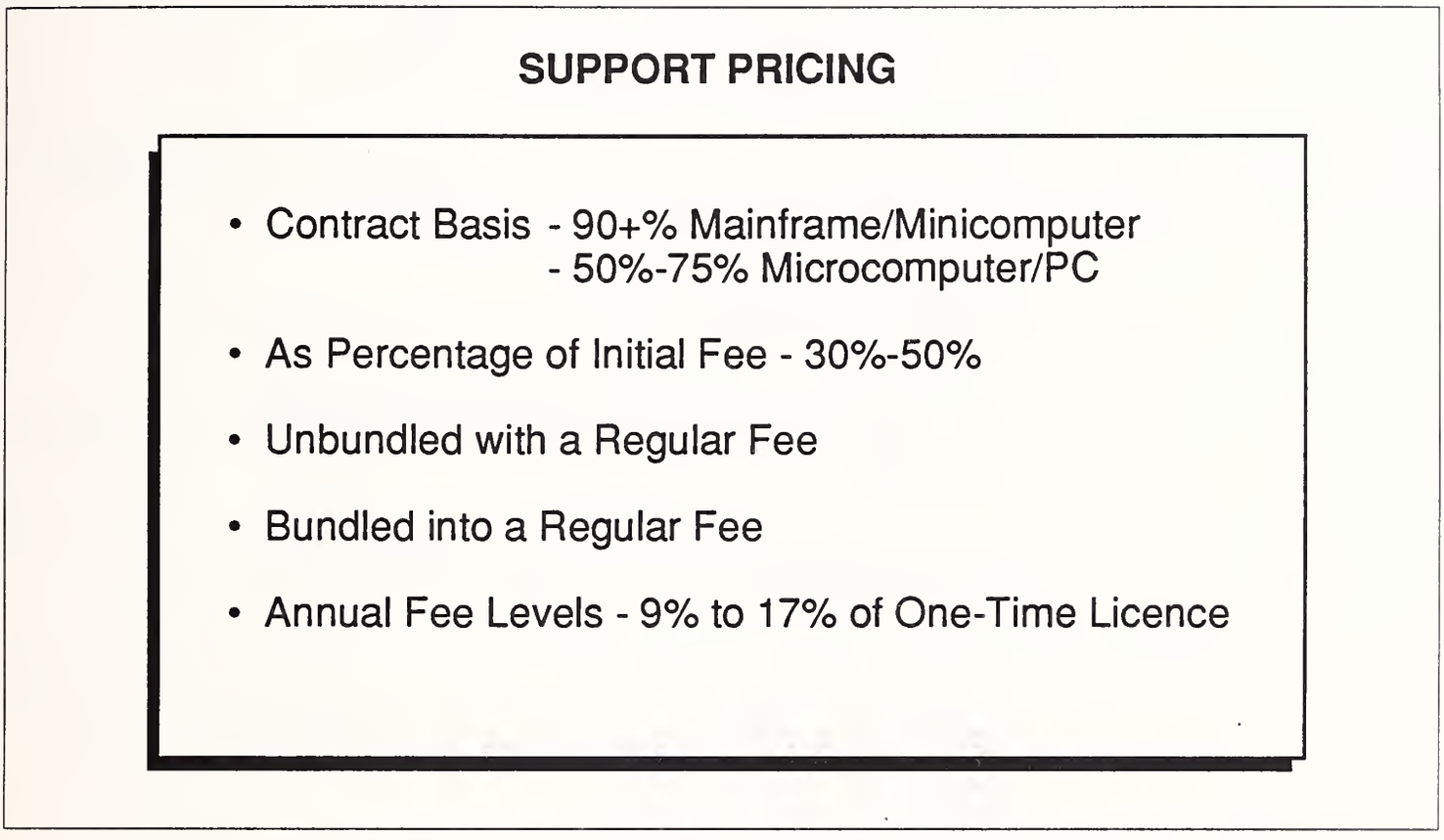
- Mainframe/minicomputer application products rose by under 2%,
- Microcomputer/PC applications managed just under 4% on average.

D

Support Pricing

Software support or maintenance contracts are common for all types of software, and are provided by hardware and software vendors alike. Exhibit II-4 refers.

EXHIBIT II-4



Over 90% of products are maintained under contract in the mainframe and minicomputer products sector, but this percentage falls to between 50% and 75% depending upon the type of software and the type of vendor, when dealing with products in the PC and business microcomputer field.

The commonest method of charging for a support contract is on a percentage of initial fee basis. Between 30% and 50% of products are supported this way.

Since the introduction of the 4300 series, IBM has followed a policy of unbundling software support. This has meant that users have been faced with two sets of regular fee per supported product. In the spring of 1987 IBM moved to tidy up this increasingly complex and user-unfriendly arrangement by putting many more products on a maintained free-of-charge basis.

Many independent software vendors prefer to bundle support into a single ongoing charge.

When calculated as a percentage of the initial license fee (or its equivalent in the case of a regular licence fee), support contract charges tend to lie in the range of from 9% to 17% per annum.

E

Support and Maintenance Issues

Support and Maintenance remain confused concepts in the understanding of many software customers. INPUT's definition disentangles the two, the main observations are listed in Exhibit II-5:

- Support covers all the help the user needs during the lifetime of his product 'ownership';
- Maintenance covers these activities of the vendor which correct, update, enhance, distribute, and redistribute the product over the course of its lifetime.

Vendor maintenance contracts include elements of both types of activities, chief among which are:

- 'Hotline' telephone support, now offered in almost 100% of contracts,
- Regular upgrades and enhancements to the product, offered to some level in two thirds of contracts.

Training is accepted by the user as a separately chargeable item. It is largely effective in getting users to understand the implementation and initial installation of their products.

More problematical is the business of how a user develops his applications in concert with his chosen vendors, who have general product enhancement programmes underway.

Information and application consultancy are the principal vendor tools in smoothing users' upgrade paths.

F

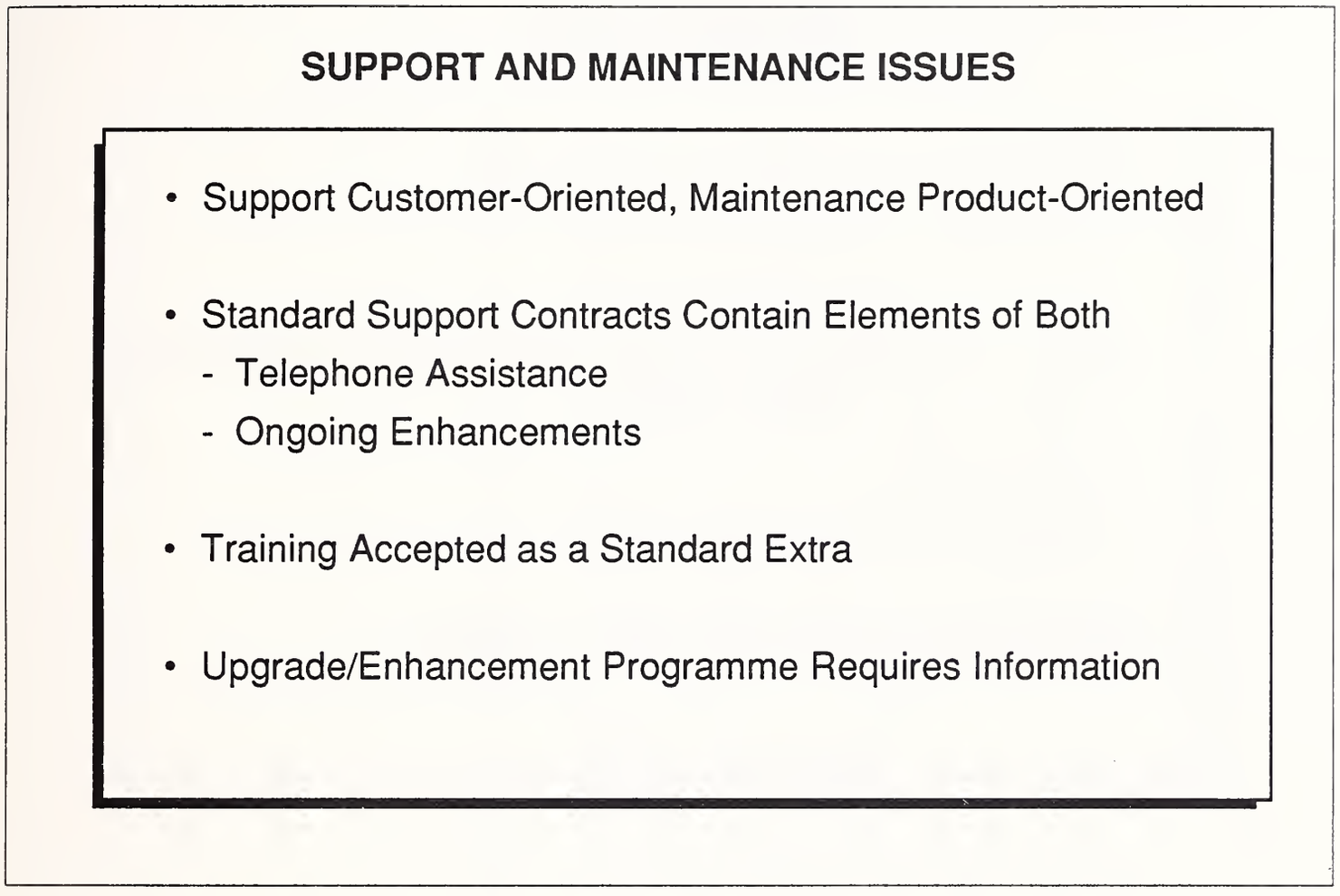
The User's View

Key points from the user's view are presented in Exhibit II-6. Nothing stands out in the user's mind as either very good or outstandingly bad in connection with his software products—a rather depressing situation. All ten product/service aspects surveyed came up with ratings between 6 and 7.25 on a 1 to 10 satisfaction rating scale, irrespective of the type of vendor:

- Documentation and Ease of modification had the lowest rating.

Users perceive their problems as more related to the quality of the vendor's service than to the product quality:

EXHIBIT II-5

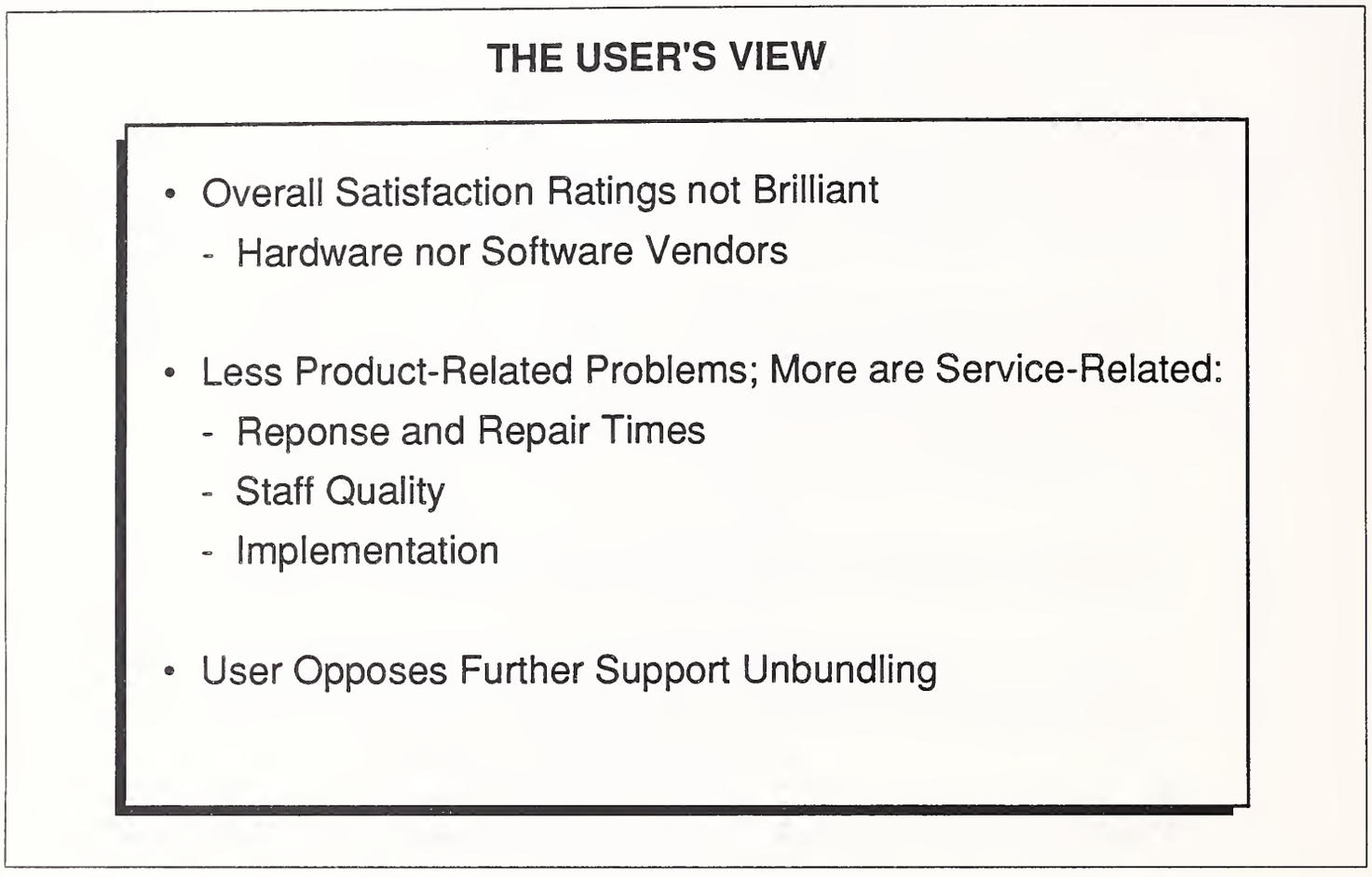


- Poor response and fix times,
- Poor calibre of support staff,
- Inadequate installation and commissioning.

The user does not readily volunteer new service areas for which he would be willing to pay further unbundled fees. Most acceptable are:

- Education to assist in understanding product upgrade plans,
- Application consulting.

EXHIBIT II-6



G

A Combined Pricing and Support Strategy Based on Simplicity

Finally, INPUT recommends a combined pricing and support strategy based on simplicity, see Exhibit II-7. Currently vendors are bundling, unbundling and rebundling support, service and product in a welter of tactical moves designed to enable them to remain competitive and continue to expand.

The complexity of the offerings confuses the users and blunts their appreciation of the products on offer.

The one-time initial fee approach and the regular fee approach both have short-comings as ways of packaging software:

- Use of the initial fee emphasises the chargeable nature of support activities some of which the user may feel should be free of charge,
- Use of a regular licence fee creates too complex and too expensive-looking a structure.

EXHIBIT II-7

A COMBINED PRICING AND SUPPORT STRATEGY BASED ON SIMPLICITY

- Bundling vs. Unbundling - Confusion
- Challenge to Vendors
  - Remove Confusion
  - Regain Initiative
- Adopt Combined Pricing Mechanism
  - First Year Funds Initial Implementation
  - Later Years Fund Ongoing Activites
- Adopt Twin Strategy
  - Unbundle Functionality
  - Bundle Support and Maintenance

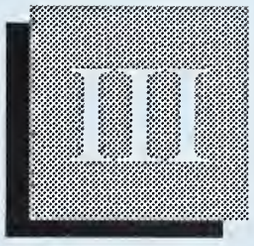
Adopt the First Year Fee with Lower Fees for Subsequent Years charging mechanism, and make the fee cover:

- Both 'Right to Use',
- And maintenance and support.

Then set the tariff to cover the software's functionality, module by module. Hence:

- Unbundle functionality,
- Bundle support.

This double-barrelled approach allows for greatest flexibility in tuning the tariff at price review time, but calls for a first-class costing system to monitor all development and service on a product-by-product basis.



Pricing of Mainframe/ Minicomputer Software Products

Pricing of Mainframe/ Minicomputer Software Products

A

Introduction

The objective of this chapter is to describe the major pricing practices current in the software industry. It has been contributed to from both the user and the vendor research undertaken by Input.

Software has traditionally been less uniform in its pricing practices than hardware, which has tended to be offered under one of three methods:

- Purchase,
- Rental,
- Leasing.

Software pricing methods on the other hand are characterized by the issuing of licences to use the software. This is a system whereby the ownership of the software is not transferred to the user, but is held in perpetuity by the producer or supplier of the software product. This means that the intellectual property rights in the software remain with the supplier or his principals.

In the early days of software product usage, source code for products might or might not be made available to users. Today this is no longer an issue except in the instances of major public domain software products, such as the IBM mainframe operating systems. In these areas the software source and design details are available publicly, although their ownership still remains with IBM.

In effect the method of supplying software amounts to a type of rental, a rental for the right to use the software in given circumstances and over an agreed period of time.

In the following section we will examine the different types of licences which are used by vendors and the extent to which users and vendors see these being used currently in the market place. We will deal with the different durations of contract and the different payment terms involved. These differences will all be summarized under the term of charging mechanisms.

Our emphasis in the report will be on the commercial aspects of issuing of licences as different ways of making software products available to the user market. We will not dwell unduly on the legal aspects of licensing. Therefore in the report the words 'bought' and 'sold' will be used to cover the acquisition of licences on some basis or other, irrespective of whether the terms are used correctly in the strict legal sense.

B

Vendor Charging Mechanisms in Use

Exhibit III-1 shows the breakdown of the software revenues obtained in 1986 by our vendor sample. This sample represents some 20% of the software products market for business users in Western Europe. We have shown a breakdown between two types of supplier:

The equipment manufacturers, who supply mainly system software but also increasingly application software to run on their own equipment.

The independent suppliers who would more likely offer products both in the system and in the application area across more than one type of equipment.

Points to note here are:

- The manufacturers account for around 60% of the sample revenues,
- The independents are biased towards those who major in the areas of mainframe and minicomputer software;
- System software in this sample accounts for twice as much of the revenues as application software,
- Software support and maintenance has not been broken down between the two types of software but accounts for 15% of the overall sample revenues.

It is necessary to distinguish between three aspects:

- The licencing methods, the contractual terms if you like for issuing licences,
- The basic charging mechanisms, how the commercial pricing makes

- The basic charging mechanisms, how the commercial pricing makes itself felt to the users, including any standard discounting facilities which may be current,
- The tariff structure, which determines the amounts which users with particular hardware configurations and equipment from different suppliers, will be charged by their software suppliers.

We will deal with each of these aspects in turn.

EXHIBIT III-1

1986 VENDOR REVENUES FROM SOFTWARE PRODUCTS

TYPE OF SUPPLIER	TYPE OF M/C	SOFTWARE PRODUCT REVENUES - 1986							
		SYSTEM SOFTWARE		APPLICATION SOFTWARE		SOFTWARE SUPPORT & MAINTENANCE		TOTALS	
		$Million	Percent	$Million	Percent	$Million	Percent	$Million	Percent
Manufacturers	Mini, M/F	537.3	60	110.5	12	111.5	12	759.3	85
	Micro	52.1	6	72.0	8	14.1	2	138.2	15
	All	589.4	66	182.5	20	125.6	14	897.5	100
Independents	Mini, M/F	127.0	34	155.3	42	59.3	16	341.6	92
	Micro	4.7	1	22.3	6	2.2	1	29.2	8
	All	131.7	35	177.6	48	61.5	17	370.8	100
All	Mini, M/F	664.3	52	265.8	21	170.8	13	1100.9	87
	Micro	56.8	4	94.3	7	16.3	1	167.4	13
	All	721.1	57	360.1	28	187.1	15	1268.3	100

1. Licencing Methods

Two licencing methods are found in the market place;

- The issuing of a short term licence, typically for anything between two and five years. This licence gives the right to use the software over the agreed licence period. This method is more commonly found in the cases of system software where changes to the machine environment may be occurring fairly rapidly and the user and the vendor will both want to review the situation at short intervals. The world leader in the independent software field, Computer Associates, uses this method for many of its well-known system software products for the IBM mainframe environment. Such licences are often charged for on an annual basis and the annual fee also covers support and maintenance of the product;

- The second type of licence which is common is for permanent use and may be called a perpetual licence. It is more frequently charged for with an initial fee when the licence is issued, and maintenance and support of the product may thereafter be purchased either optionally or in many cases on a mandatory basis over the ensuing period in which the user wishes to renew his licence.

Warranty on products is a sticky subject for the software field but in practice it amounts to knowing when the period on which chargeable maintenance would start. Of course, in those products where an annual fee includes support and maintenance, the subject of warranty is to an extent academic. This topic is discussed in more detail later in the report.

2. Charging Mechanisms

Exhibit III-2 lists the very varied comments encountered during vendor research, regarding the topic of licencing methods. It is clear that the levels at which the topic can be discussed are several:

- The overall method,

- How the licence is charged for,

- What price is actually charged and how the price is constructed.

In the market place there are a number of different charging mechanisms:

- The initial fee, sometimes described as a one time fee, acquires the right to use the product over the agreed licence period;

EXHIBIT III-2A

VENDOR LICENCING METHODS
(Vendor Comments)

- Two thirds of our system software products are sold on a fixed-term, short-term lease, coming up for renewal every 2-3 years. This type of licence fee is paid for by annual payments, which also cover the product maintenance and support.
- Permanent licence plans incorporate an initial fee plus an ongoing product maintenance charge.
- Our world famous spreadsheet product uses a 'network pricing' formula for the 9370. With a LAN pack it can be supported on a linked network of up to four PCs; each succeeding LAN pack can support up to 3 further PCs or terminals and so on.
- Over 95% of our products are sold for an initial licence fee. For companies who can't find the capital budget (under 5% of cases) we give a lease agreement over not more than 18 months.
- A non-time system is 25% of the first copy price of a full development system. Second and further development systems carry a 30% discount.
- Professional services contracts are separate. In them we look at aspects of strategic planning and development methodology.
- Our 2-tier pricing has meant that MVS users pay roughly 10 times what DOS/VSE users pay.
- A small percentage of the customers make leasing arrangements to overcome their capital budgeting constraints.
- A generally standard contract covers all modules purchased; further modules can be added to the schedule.

EXHIBIT III-2B

VENDOR LICENSING METHODS (CONT.)
(Vendor Comments)

- There are no free trial periods. We will allow a potential customer for a $300,000 contract, say, use of the products for 3 months for $100,000, after which he will pay up the difference.
- After the first year, a support contact is mandatory. During the first year "warranty" period the same level of support is offered as in subsequent years, when support is contracted.
- We have talked about site licensing for our micro products, but volume discounts seem to be a better bet.
- Some OEMs incorporate our major products into their systems. They enjoy a very much lower price, and we monitor and support their activities. These are not Third Party Distribution channels in the classical sense, because they don't handle the pure volume sales.
- We sell the majority of our micro products through 250 or so U.K. PC dealers.
- Site licencing is relatively new for us. It depends on the number of keyboards on the site. It should assure us of a future.
- Our basic method is to charge firstly for the applications modules according to what facilities are required and consequently which modules are purchased. The second part of the licencing agreement charges for the enabling software according to the number of workstations being supported.
- Each customer signs one contract to which are appended the relevant licences.
- There is an increasing tendancy for customers to roll our software licence fees in with an overall leasing plan.
- We will sell software in 3 different ways:
  - As a complete product on its own,
  - As part of a turnkey solution,
  - To run on our own bureau machines providing a solution.

  In all cases the user pays for the licenced right to use it.

EXHIBIT III-2C

VENDOR LICENCING METHODS (CONT.)
(Vendor Comments)

- We are going to follow DEC and charge for our products according to the VAX model supporting them. If the MicroVAX starts at 100%, the 8200s are on 150%, the 8500s on 200% and the higher are by negotiation.
- Graduated pricing has to take the place of usage pricing, as we cannot control how our software is used in-house.
- We are offering 2-3 month free trials.
- Our system development system is licenced annually (for a year at a time). Our horizontal application products are installed on a perpetual licence paid for with an initial lump sum which may be part of a total implementation contract, to include customisation, training, installation etc.
- As business development manager, I am responsible for setting the packaged price of sets of modules e.g. for entry-level customers.
- Our warranty ensures full support during year 1.
- The customer pays 30% on order, 40% on installation and 30% on acceptance (after standard/agreed acceptance testing).
- We are considering moving to monthly licence fees for our plant maintenance system.
- Many of our standard technical computing products get quoted as part of a total project, which is subject to stage payments instead of an up-front fee.
- We have base prices for rental or outright purchase of the right to use. Those prices are then multiplied by a machine group factor which runs from 0.25 for a low-end Apollo up to 2.0 for a Cray or a 3090. The same thing happens for maintenance but the factor runs from 0.7 to 2.5.

- The installment plan, whereby the one time fee may be spread over a number of years;

- The use of an initial charge during the first year of use acquiring a licence for the first year, coupled with annual charges at a lower rate for the second and subsequent years;

- The leasing arrangement, whereby the user pays regular monthly, annual or quarterly fees to some third party (this may be an equipment licensing company if the software is acquired as part of a complete turnkey system deal or from a financial services company involved in general leasing);

- Regular licence fees chargeable on any of three frequency periods, annually, quarterly, or monthly;

- The charge for a software product may be buried in a total project price, in those cases where one or more software products form the basis of a system developed by a systems house or supplied as part of a turnkey project. In this case the money paid for the licence may be masked by some form of stage payments for the overall project;

- Usage pricing is a method whereby the charge for a product is metered and calculated according to the amount of use made of that product by the individual user. This may fall into two categories:

  - Machine resource usage, calculated according to some algorithm, as is the method for charging on a processing or network services contract;

  - Or by some measure of the number of end-users actually benefiting by the product. This may take the form of a price calculated by the number of terminals, workstations or keyboards connected to the machine running the software, or some other measure of end-users.

Exhibits III-3 to III-6 show the breakdown of the European market according to these different charging mechanisms, as exhibited by our user and vendor samples.

Exhibit III-3 shows the charging methods reported by users and includes the breakdown by the six countries or country groups used as well as the overall European profile. Clearly the two major methods perceived by users are:

- A one-time or initial fee used in between 30% and 70% of cases according to country, and in just under 50% of cases in Europe as a whole:

- The regular licence fee on an annual, quarterly or monthly basis, which varies from 30% to under 47% of user expenditure according to country, and averages at approximately 30% of expenditure in Europe as a whole.

The overall user expenditure profile was calculated by weighting the individual country figures according to the size of the 1986 software products market given by INPUT in its annual report for 1986.

EXHIBIT III-3

SOFTWARE PRODUCT CHARGING METHODS AS REPORTED BY USERS

CHARGING METHOD	PERCENT OF USER EXPENDITURE ON PRODUCTS						
	West Germany	France	United Kingdom	Italy	Benelux	Scan-dinavia	All Europe
One-Time Fee	52.0	29.0	60.0	30.0	70.0	46.0	49.0
Installment Plan	-	35.0	0.3	28.0	6.0	-	9.0
1st Year Fee with Lower Fees for Subsequent Years	-	5.0	1.0	-	5.0	-	2.0
Regular Licence Fees (Annual, Quarterly or Monthly)	22.0	31.0	36.0	13.0	18.0	46.8	29.0
Usage Pricing	2.0	-	-	19.0	1.0	0.2	3.0
Other	24.0	-	2.7	10.0	-	7.0	8.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Exhibits III-4 and III-5 show similar but not identical breakdowns for the vendor perceptions. In the case of the vendors the analysis is based on the percentage of shipments which were charged by a given charging method. The shipment for this basis was defined as a new licence issued or an annual licence being renewed. In the vendor sample certain charging mechanisms were not encountered at all and are therefore not shown. The two charts in exhibits III-4 and III-5 show the breakdowns between:

- System and application software, in which it is clear that the one-time initial fee is very much more favoured than any other method for application software, although quarterly and monthly fees are charged for just under 50% of system software cases.

- The breakdown between manufacturers and independents shows a similar distinction between the independents going very largely for the one-time fee method while the manufacturers retain a strong penchant for quarterly or monthly fees. This bias could be accounted for by the fact that the monthly or quarterly fees methods has traditionally been IBM's most favoured method.

Exhibit III-6 shows the comparison between what we found from the two different types of research. Though not strictly comparable because of the different basis on which the figures were calculated, the tie-up between the two breakdowns is sufficient to establish confidence in our knowledge of the overall European breakdown. This shows that between 50% and 60% of the market uses the one-time fee method and between 30% and 35% of the market uses regular licence fee of one period or another. The remaining 10% to 20% of the market is accounted for by the range of other methods described.

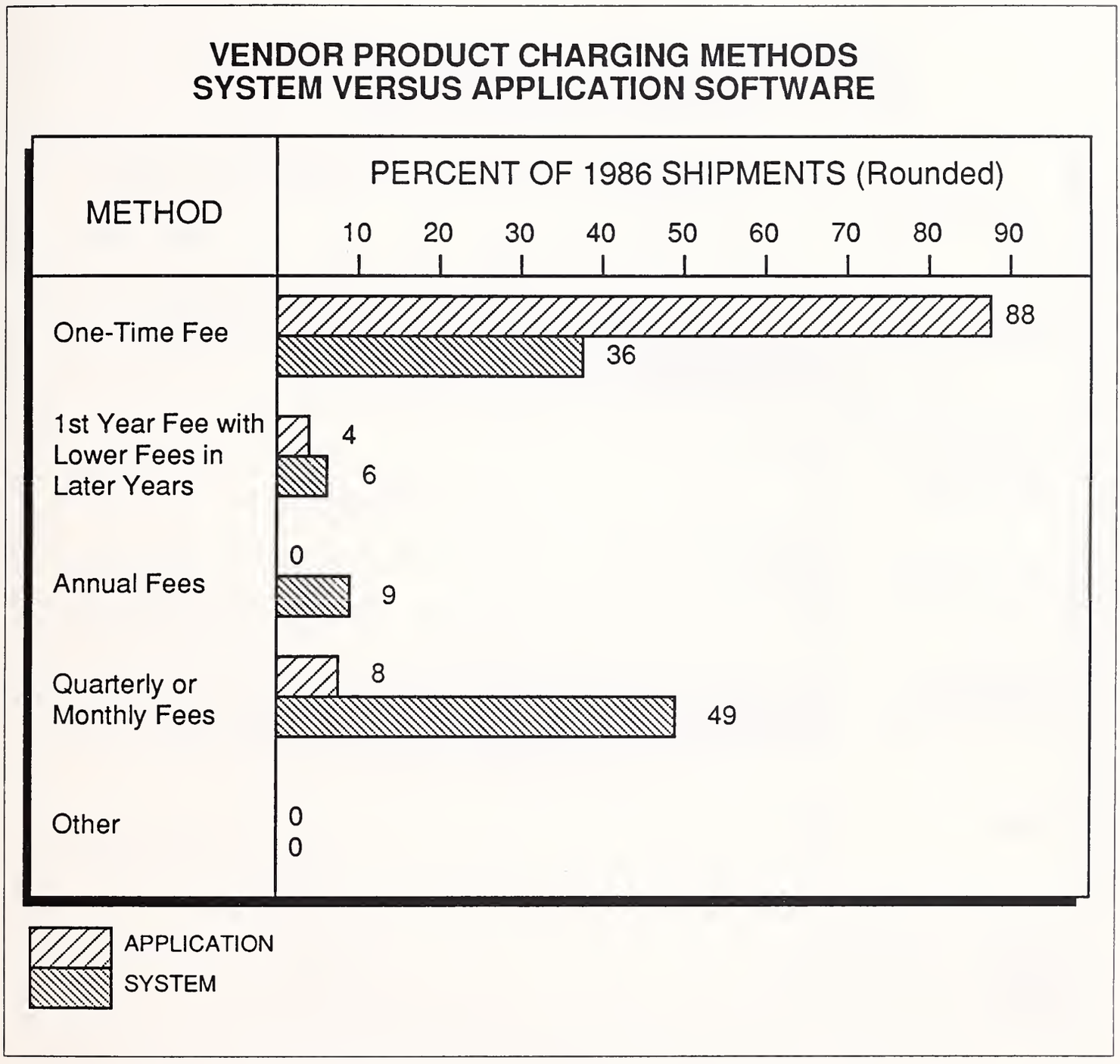
3. Tariff (or Price List) Structure

Having disposed of licencing and charging methods, we are now left with a discussion of those aspects which relate strictly to the structure of the vendor's tariff. There are three aspects to this:

- In the case of the independent, tariffs are structured according to the **manufacturer's equipment** upon which the products are made available. These are typically limited to between 3 to 5 sets or ranges of manufacturer's equipment. For example, a vendor might offer systems on IBM mainframes, Digital (DEC) VAX equipment, and one other mini computer supplier, e.g., Hewlett-Packard or Prime or Data General.

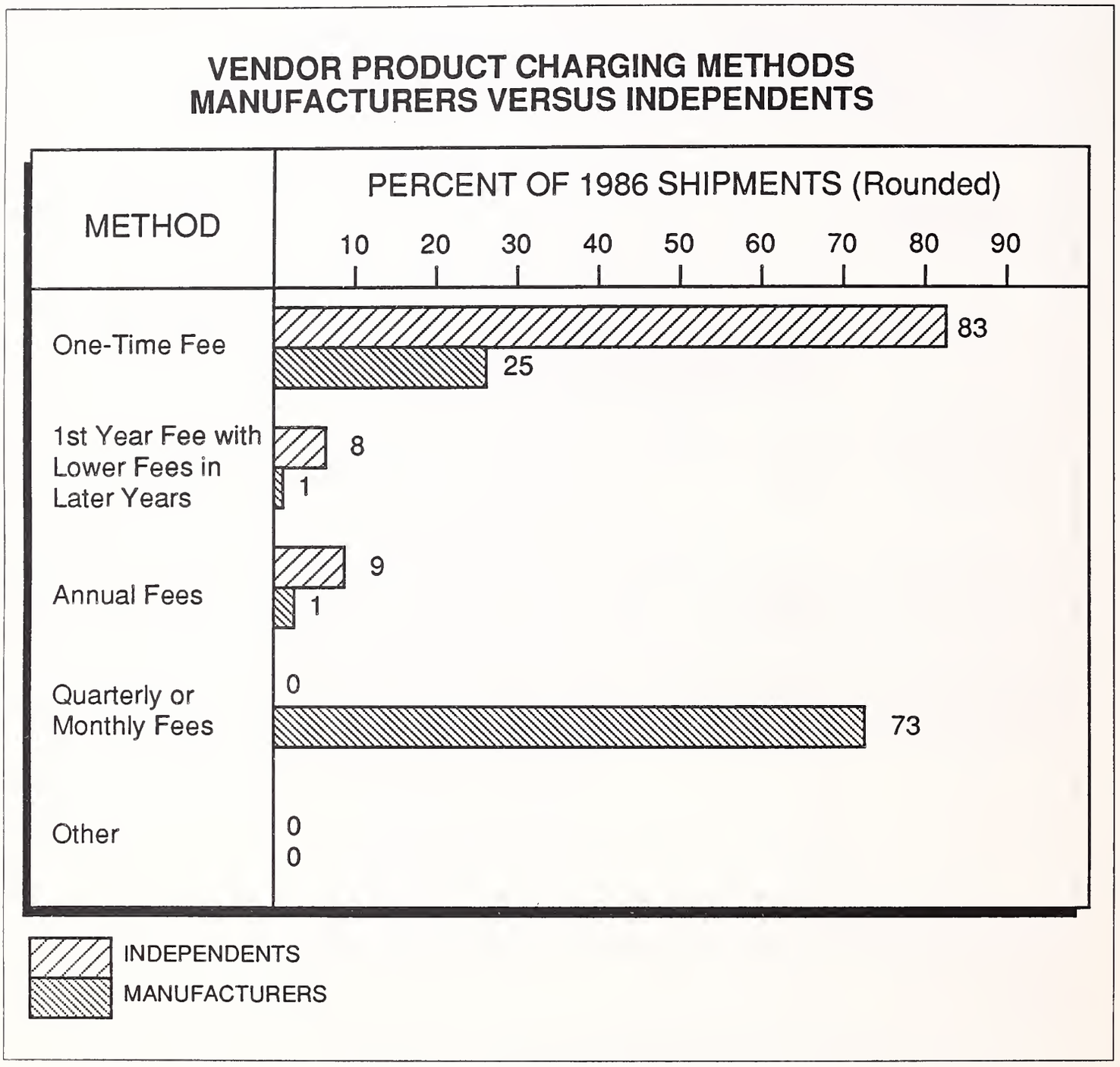
- A tariff may be structured by **machine group**. This is an attempt to measure the number of end-users who may be benefiting from the

EXHIBIT III-4



usage of the software licence. It follows from the premise that the larger the processor group being used the larger the potential number of users that could be connected. This is obviously a coarse method of assessing numbers of users and therefore represents a simplified form of usage pricing. The major milestone in a general market move towards use of this structure was IBM's announcement in October 1986 that it was going to introduce this type of structure along with the launch of the new 9370 range of distributed processors. Since that time the market as

EXHIBIT III-5

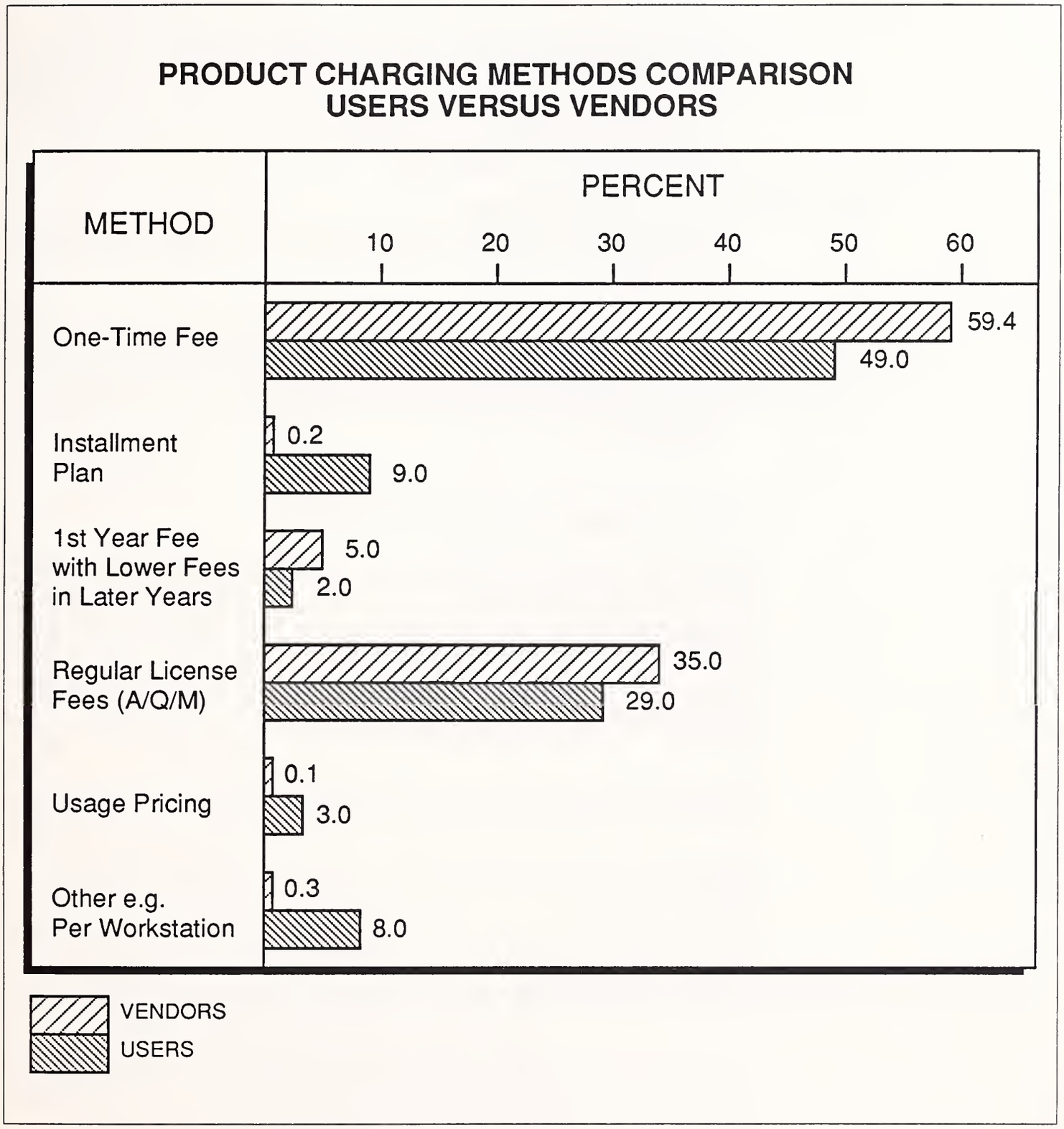


new 9370 range of distributed processors. Since that time the market as a whole has been falling into line with what IBM has proposed, a graduated scale of five different levels of machine group:

- Two levels of 9370 system,

- Low-end 4300 systems,

EXHIBIT III-6



- High-end 30xx series machines.

- Thirdly, by exact numbers of end-users. This is normally done by number of workstations or number of terminals attached to a system. Though obviously a more accurate method of calculation of end-user usage than can be achieved by using the coarse method of breakdown of machine group, this method is currently limited to certain more specific areas of the market-place:

  - By workstation numbers in the case of CADCAM/CAE systems where typically between 4 and 32 stations are attached to a central processor,

  - The microcomputer field where licences may be issued for up to a certain number of keyboards attached to a system or up to a maximum number of individual workstations which may be running a piece of software on a given site (the much publicised 'site licencing method').

4. User Satisfaction with Methods

Exhibit III-7 compares what users say they are currently experiencing with what they would prefer to have. Some three quarters of the user sample responded accurately to this question. Within the accuracy of the survey methods, the chart shows that users are in the main satisfied with their present charging method. However, there is a movement to prefer the initial one-time fee and to favour less the charging by a regular periodic fee.

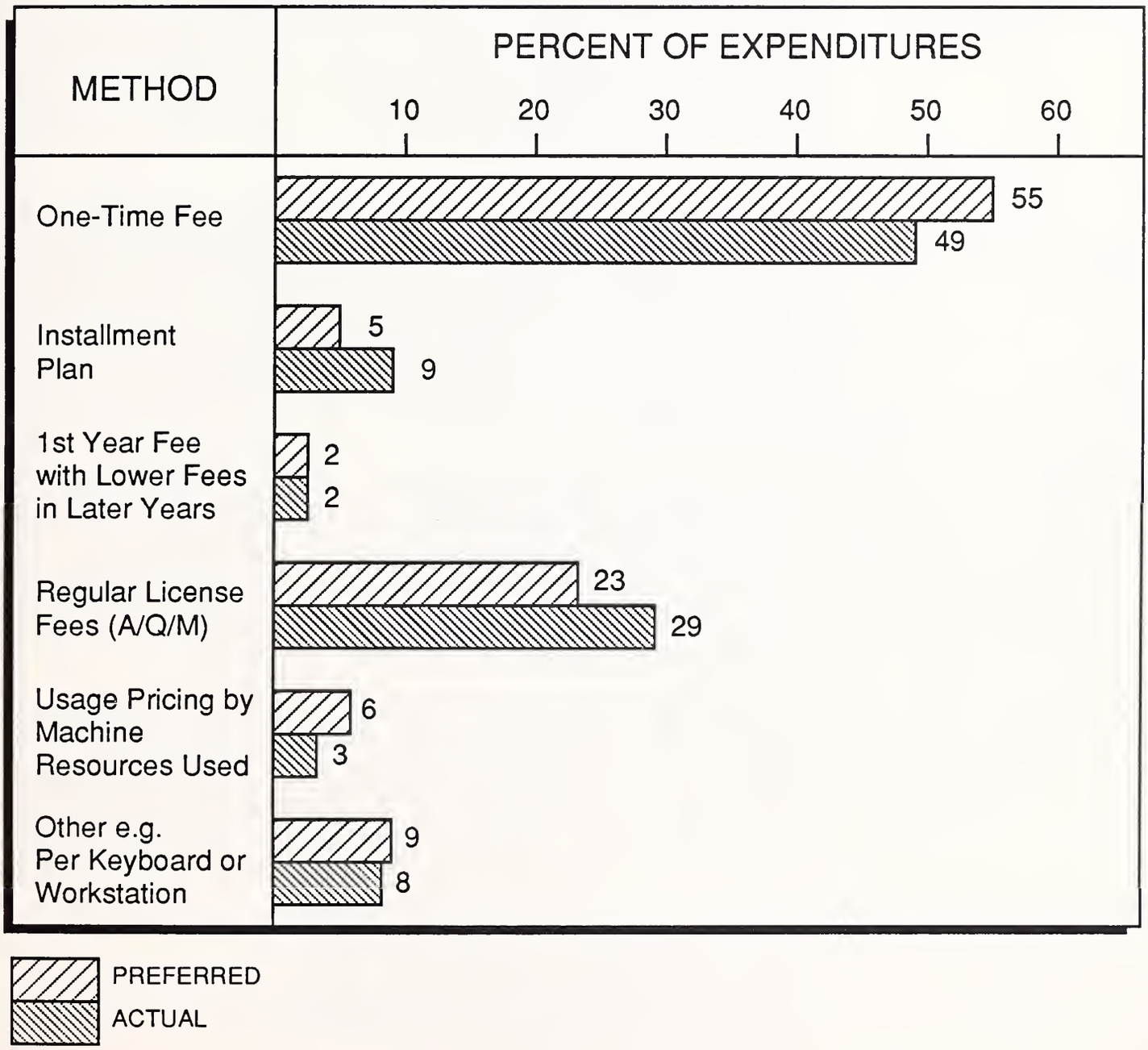
There is also an indication that more accurate methods of usage pricing are favoured where these have been put into practice.

Charging by machine group was not included as a separate charging method at this level. In fact, it can be used to establish the final level of fee in the case of each of the first four methods used on the chart. Though the same is also true of the more accurate method of calculating usage pricing, these have been shown separately because they were perceived as separate methods/separate mechanisms by the users responding.

At the same time that IBM announced the introduction of the graduated machine group charging mechanisms associated with the 9370 introduction, it also stated that the option to purchase on a one-time fee basis would be introduced progressively up the range of machine groups in the tariff. This meant that one-time charging would be an alternative user option immediately with the 9370's, and would proceed through the 4300 and larger systems, that is the old DOS/VSE and MVS environment

EXHIBIT III-7

PRODUCT CHARGING METHODS ACTUAL VERSUS PREFERRED (Out of 158 Responses)



progressively. To an extent this is IBM following in software terms what happened from the debut of the 4300 in 1979 for equipment. We refer to the move away from a regular rental base charging system and towards a system of outright purchase.

C

Ranges of Prices Encountered

There is enormous variability in the price range for software products sold for business use. It can range between the extreme of around 50 dollars up to a top-end price of 500,000 dollars. This range encompasses about four orders of magnitude and can reflect the difference between a small product sold for a single user on a microcomputer to a major piece of software sold for a mainframe application supporting up to 10,000 users.

The number of products being marketed by individual suppliers is also considerably variable. INPUT research discovered a range operating between approximately 10 for a small specialist microcomputer firm up to around 5,000 for IBM. This is a bracket of approximately 3 orders of magnitude. It indicates that in the market as it is today there is much scope for specialization, such that vendors could find themselves offering a manageable catalogue of products from the point of view of support and maintenance.

It is obviously impossible in a report of this kind to review all prices in all software sectors, since sectors can be segmented by type of software, by application and by target industry. What is more important is to investigate the interaction between the pricing and the support policy of vendors. This was found to revolve more around the charging mechanism used than the actual price levels in the individual tariffs.

Exhibit III-8 shows the numbers of licences ('shipments') reported by the vendors as issued during 1986. The breakdown shown is by type of charging mechanism for each software type and for each type of company. It is difficult to turn these shipment figures into average prices per segment because shipment levels were not given by all vendors in the sample. However it is possible to quote ranges for each type of software:

- For microcomputer software prices were found to range between $1,600 and $4,500 for typical products,
- For mainframe and minicomputer software the equivalent range was found to be from $5,500 to $16,000.

The crossover point between microcomputer software and mainframe and minicomputer software was found to exist at around the $5000 level, ie, over two orders up from the bottom end of the total range encountered.

EXHIBIT III-8

SOFTWARE PRODUCT SHIPMENTS REPORTED BY VENDORS FOR 1986

TYPE OF COMPANY	TYPE OF SOFTWARE	NUMBER OF LICENCES ISSUED 1986 BY PRICING BREAKDOWN					
		ONE-TIME FEE	FIRST YEAR FEE WITH LOWER FEES FOR LATER YEARS	ANNUAL FEES	QTLY/ MNTHLY FEES	OTHER	TOTALS
Manufacturers	System	12,400	800	400	37,900	0	51,500
	Application	2,650	0	0	4,950	0	7,600
	Total	15,050	800	400	42,850	0	59,100
Independents	System	15,372	3,560	6,945	0	48	25,925
	Application	52,600	2,800	226	0	49	55,675
	Total	67,972	6,360	7,171	0	97	81,600
All	System	27,772	4,360	7,345	37,900	48	77,425
	Application	55,250	2,800	226	4,950	49	63,275
	Total	83,022	7,160	7,571	42,850	97	140,700

The range of prices encountered for the largest revenue-earning product in each vendor's portfolio was researched for the mainframe and mini-computer software. Exhibit III-9 shows the price ranges encountered and calculates the average of the ranges both top and bottom and in the vendors perceived typical product range.

Application software exhibited a wider range of prices than system software and this reflects the fact that it is a less mature market.

Again products exhibited an enormous range between the lowest quoted and the highest quoted:

- For system software the ratio of 1:225 was the figure between the smallest quoted and the largest quoted price;
- The equivalent ratio for application software was 1:1250.

EXHIBIT III-9

PRICE RANGE OF LARGEST REVENUE-EARNING PRODUCTS MAINFRAME/MINICOMPUTER SOFTWARE

TYPE OF SOFTWARE AND POSITION IN RANGE	PRICE IN $ THOUSANDS		
	FROM	TO	AVERAGE
SYSTEM SOFTWARE			
Bottom End of Range	2.0	45.0	18.1
Top End of Range	8.0	450.0	137.6
Typical Product	7.5	300.0	83.7
APPLICATION SOFTWARE			
Bottom End of Range	0.8	250.0	43.8
Top End of Range	15.3	1,000.0	208.5
Typical Product	12.0	300.0	84.0

Average products encountered were priced at anything between $18,000 and over $200,000. On the other hand the average for the typical product in both systems software and application software could not be separated significantly in statistical terms. As shown in the exhibit it is very close to $84,000.

This fairly large figure for a piece of software must be interpreted as indicating the typical price of a set of software sold at a given time for a

particular installation. It does not indicate the lowest typical module price available in the catalogue. In this market sector therefore, we are not in any way dealing with a mass market, but are dealing with substantial software contracts in which the pre- and post-sales performance of the vendor is as significant as the measurable functionality of the product.

Exhibit III-10 shows the importance of these flagship products to their vendors' revenue streams. The percentage of annual revenue earned by a single product can range between 1% for a small microcomputer routine up to 100% indicating the presence of a single product company.

The variability of price as seen by the vendors themselves was often perceived in terms of comparison between their own pricing and that of their competitors. Exhibit III-11 lists some of the comments made by vendors during interviews and relating to this subject. Prices ranging by a factor of from 1 to 5 in a specialist software area appeared to be quite normal. On the other hand vendors were found who targeted their prices to be quite deliberately very close to their main competitors'.

EXHIBIT III-10

IMPORTANCE OF 'FLAGSHIP' PRODUCTS TO THEIR VENDORS' REVENUE STREAMS

TYPE OF SOFTWARE	ANNUAL REVENUE EARNED (Percent)	
	FROM	TO
SYSTEM SOFTWARE		
Mainframe/Minicomputer	2	100
Micro/PC	1	20
APPLICATION SOFTWARE		
Mainframe/Minicomputer	2	55
Micro/PC	2	50

EXHIBIT III-11

VENDOR PERCEPTIONS OF COMPETITORS' PRICING (Vendor Comments)

- In each product area, there is at least one competitor who is 2 to 5 times as expensive. Because we are cheaper, we have to watch that we are not under-charging.
- Our spreadsheet is $1 more than our arch-rival's.
- Our competitors may be cheaper than ourselves, but do they spend up to 25% of costs on R&D? That's something we can explain to prospects and customers.
- Retrospectively we follow one other competitor whose product is similar in status to ours.
- Cullinet software has fallen in price by almost an order of magnitude over the last 18 months.
- At the low-end we fight on good service and training, while at the top-end we try to have a price edge.
- There are no European PC products that we come up against.
- Our mainframe products for the retail systems market are unique and give us an edge over the competition.
- We prefer to be below Digital's prices.
- Some of the small software houses sell the same functionality as ourselves but with a 1:5 price ratio. We are operating in a volatile market.

D

The Pricing Process

We define the pricing process within an organisation to be the internal process whereby actual list or catalogue prices are set from year to year. Only nine companies in our vendor sample were found to issue published list prices for their products.

The structure of vendor catalogues indicated that they could be classified broadly between those whose structure included some variability by equipment type and those who were able to charge according to the number of end-users using the system.

The first of these two methods indicates the number of levels of machine group and these were commonly divided between two and five levels, with the old division, for instance between VSE and MVS products, giving way shortly to the new four- or five-level machine group method.

For independents the structure of the price list normally included provision for two or three manufacturers' sets of equipment. Four companies were in the business of offering prices according to the number of workstations, terminals or keyboards actually in a system. Five suppliers in the sample were prepared to offer more than one charging mechanism. Normally this would involve either a one-time initial fee or some means of spreading it either by leasing, installment plan or on a regular fee basis. In the sample there were three suppliers whose price lists did not come into any of these categories.

The process of drawing up the price catalogue involves a number of elements within a company's business:

- The organisation structure in place will effect the outcome;
- The ownership of the company, which normally means whether the ownership is North American or European. It must be noted in this context that the majority of the leading suppliers in the software products field are of North American origin. This is particularly true when one is talking about system software, as this is dominated by the major equipment suppliers, and also cross-industry application products for the mainframe and minicomputer markets, where economies of scale and maturity of sector have led to leadership positions being in the main held by US companies;
- The market actively engaged in will also influence the pricing process;
- Both commercial and legal aspects of software contracts will be involved in the process, the individual customer relationships leading to discussion of discounts from standard list prices and individually negotiated concessions.

Exhibit III-12 gives some of the vendor comments on how they perceive the price setting processes in their own companies. An important element to many of them is how they adjust from an already established US price and set the level for the different European countries. One comment to note from a major supplier showed the importance of being able to internationalise major software systems. The most important component here is being able to provide a product in different native European languages, instead of just making do with one standard English system to which all countries have to adapt by training and learning the lingua franca of the computer industry.

There was found to be little desire on the part of vendors to adopt innovative pricing mechanisms. The industry is traditional and procedures seem to be set up which allow for a 'follow my leader' approach, rather than to try anything at all outlandish. In the context of innovation most vendors merely repeated the major constituent determining the different pricing levels within their portfolio, which might be pricing by grade of machine or capacity pricing by workstation number or site licensing by number of keyboards.

One vendor, in the knowledge-based systems (KBS) market, pointed to the accelerating number of products being sold as "run-time" systems. These are usually sold separately in multiples after an initial development system had been sold in lower quantities. This trend has significance for the longer term.

Examination of the vendor management levels at which the major decisions in the pricing process take place was possible but only for the independent suppliers who were prepared to reveal the inner workings of their processes.

Looking at Exhibit III-13, it is clear that pricing is in the main a top management function in which, on the European scale, individual national management has a major role but subsidiary important minor roles are also played in a joint method between national and international management.

Single person decision-making is the most favoured method for both setting individual list price levels and the determining of legal terms and conditions. National management is the most likely level at which the sole decision maker will reside.

Although international management plays a large part either on its own or in conjunction with national management in setting prices and setting terms and conditions, it is only in pricing concessions to individual customers that international management takes a subsidiary role.

EXHIBIT III-12

SOME VENDOR PERCEPTIONS OF THEIR OWN PRICE SETTING MECHANISMS (Vendor Comments)

- We start with current pricing from the U.S. and uplift it for Europe to take into account the more expensive sales costs of Europe.
- We are looking ahead one year and expect the dollar functions to even out over that period.
- We are careful not to undercharge; hence we watch IBM's prices.
- Dollar prices are converted to local costs which include support, sales and, not to be forgotten, translation.
- Some of our products are pretty unique, e.g., some of the graphics routines; they command their own 'high' price. Otherwise we like to be competitive.
- International management recommends prices; national management establishes the actual prices in each country.
- Too much discretion at local levels is introducing distortion.
- It starts in the U.S. and is then set to the European level, which gets adjusted for each country in conjunction with national management.
- Essentially, we price to the market level. Some competitive pressure comes in, but we don't consider we have many rivals.
- There are some constraints due to not being able to deviate too far from U.S. pricing.
- Pricing is quite a challenge, because our products are pretty unique. There are therefore few indicators as to a fair market level. Where we can get market information, we use it.

VENDOR AUTHORITY LEVELS FOR THE PRICING PROCESS
INDEPENDENTS ONLY

MANAGEMENT LEVELS INVOLVED	PERCENT OF RESPONDENTS WITH AUTHORITY SPREAD AS SHOWN											
	SETTING PRICE LEVELS				SETTING TERMS AND CONDITIONS				PRICING CONCESSIONS TO CUSTOMERS AND PROSPECTS			
	SOLE DECISION -TAKER	+ NEXT LEVEL DOWN	+ SECOND LEVEL DOWN	+ 2 LOWER LEVELS	SOLE DECISION -TAKER	+ NEXT LEVEL DOWN	+ SECOND LEVEL DOWN	+ 2 LOWER LEVELS	SOLE DECISION -TAKER	+ NEXT LEVEL DOWN	+ SECOND LEVEL DOWN	+ 2 LOWER LEVELS
International	5	20	-	10	10	30	-	5	-	-	-	20
National	25	10	10	5	45	5	-	-	21	5	11	5
Branch/District	5	5	-	-	-	-	-	-	-	11	-	-
Sales	5	-			5*	-			16	11		
Field Sales Executive	-				-				-			

* In conjunction with government sponsors.

Not Applicable

In none of the three sub-functions of the process does the individual field sales executive have much say and it is only to a very minor extent that sales management has an important role and this most largely in pricing concessions to individual prospects and customers.

There is a warning here that should be issued regarding the complacency of vendor management as hardware prices continue to decline and the temptation exists to continue loading price changes into the software element of systems. The manufacturing community and the hardware suppliers are most prone to succumb to this temptation.

Examining which element vendors consider most important when considering price reviews, INPUT found that market levels were perceived as being the most important determining factor in the final price setting. Exhibit III-14 tabulates the aspects considered by vendors under six different headings and ranks them by weighted mention rating.

Market levels (claimed to be the most important factor) are weighted as twice as important as the next two following elements.

The cost plus aspects, including consideration of R and D costs and price mark-ups as taken into account by sales organisations, if taken together, would still not be as important as the market level setting factor.

The medium ratings given to specific competitor rates and historical price levels point up the relatively highly volatile state of pricing within the software market.

Functionality is particularly low on the mention list. INPUT interprets this as indicating that the overall market, which consists of many close knit segments in which vendors know or think they know the functionality of their major rival systems, can only be considered as a homogeneous market for the purposes of software support and maintenance and not at the level of individual pricing.

Vendors were found to be relatively evenly split between those who believed that they were operating in an extremely price-sensitive sector and those who considered that their products could stand on their own as market leaders and that their owners could therefore price up to the market level which large or medium-sized organisations would be prepared to pay.

Vendors reported a high degree of comfort with the pricing process which their company had in place. An average on a scale from 1 to 10 was established at 8.5 for the sample, with only four suppliers rating their current comfort level at less than 8.

EXHIBIT III-14

VENDOR PERCEPTIONS OF THE ASPECTS MAKING UP THEIR PRICING MECHANISMS

CONSIDERATION OF:	NUMBER OF MENTIONS			
	1ST MENTION	2ND MENTION	3RD ETC. MENTION	OVERALL WEIGHTED RATING
Market Levels	6	6	1	31
Specific Competitor Rates	1	5	2	15
Historical Price Levels	5	-	-	15
Recouping R&D Costs	4	-	-	12
Marking-up Internal or External Prices	3	1	-	11
Other e.g. Analysis of Bid Success Rate, Fluctuating $ Rate, Inflation, Functionality, Premia	1	6	3	18
TOTAL	20	18	6	-

E

Support and Maintenance Issues

Discounts are a standard feature of the software pricing arena.However, it is important to distinguish two different types of discount:

- The first category are standard discounts from list price, i.e., discounts applying to all customers fulfilling certain criteria;
- Individually negotiated deals where the percentage discount for sys-

tems licensed will depend purely upon the parameters of the user in question. These are very often very large users who are going to purchase a number of products over a period of time.

A number of different discount methods were discovered in practice in use in the market-place:

- Discounts may be offered for products run on separate sites, sites for this purpose being defined as physically separate locations with establishments all from the same organisation;

- Alternatively, discounts may be offered for products to be run on more than one processor irrespective of the siting of those processors in one or more establishments. Additional processor discounts, like site discounts, involve the copying of software modules by the user himself, although it is more common for the multiple copies to be produced in the software suppliers' premises and issued as separate units on a standard medium, such as magnetic tape or diskette;

- A more common type of discounting is by total volume of fees spent with the supplier over the course of a period, normally over one year;

- Discounts for additional modules are normally applied when a total system may be configured from a whole range of modules, some of which may be mandatory, others totally optional;

- Discounts for additional products is another example of a method somewhat akin to the method using volume fees but in this case identified against a total number of products picked from a catalogue;

- Educational users have traditionally been able to establish good discounting concessions from software suppliers;

- Other methods of discounting encountered included:

  - A discount by number of staff employed, a method often used by payroll product suppliers, in which a number of different price graduations could be set. For example, a programme could command one price for up to 500 employees, another price from 500 to 5000 and a third more expensive price for establishments or companies with over 5000 employees.

Exhibit III-15 summarizes the findings of INPUT's research on standard discounts in current use. The chart shows three types of figure:

- The percent of vendor respondents using each type of discounting is shown in the left hand column;

- The range of discounts used are shown on two levels, firstly the minimum and maximum for each type of method and secondly the averages over the minima and maxima across all vendors.

EXHIBIT III-15

USAGE OF STANDARD DISCOUNTS BY VENDORS

DISCOUNT METHOD	PERCENT OF RESPONDENTS USING	RANGE OF PERCENTAGE DISCOUNT			
		EXTREME		AVERAGE	
		MIN	MAX	MIN	MAX
For Additional Sites	46	0	80	8	45
For Additional Processors	64	0	100	7	53
By Volume of Fees	32	0	35	0	32
For Additional Modules	29	0	60	8	33
For Additional Products	36	0	100	15	53
Educational Users	39	20	80	44	61
Other*	21	13	40	17	33
No Discounts Offered	4	-	-	-	-

* By number of staff, by number of keyboards, special for OEMs or for stock clearance.

There is considerable variability across the different methods used with over 60% favouring the additional processor as the criteria for allowance of some form of discount.

Discounts offered range from 0 - 100%, meaning that in some cases software will be given away free on second or subsequent processors.

We have used the average of the minima and maxima quoted as a means of establishing typical ranges of discount that would be more likely in an individual catalogue. The widest range shown using this measure is for

the 'additional processor' method with a range between 7% and 53%. The individual minima and maxima shown on this method are 0 for a minimum against the "by volume of fees" method and the maximum of 61% for educational users.

Only a small percent of the vendor sample claimed to offer no form of standard discount whatsoever, though remember that even in these cases some form of individual concession could be negotiable for large users.

Though the most popular method of discounting is by the use of the additional processor, the method using additional sites is also strongly favoured at 46% of the response. The former method gets over the difficulty of where the processor is sited, and how closely coupled processors may be.

The highest range of concessions is for the educational market. There is a loss leader element in vendor policies here; the benefit must be to get a new generation of computing professionals acquainted with the vendor's name and equipment.

It was found that among the independent vendors who were willing to give this information, 32% of their customer base was involved in discounting of one form or another. In revenue terms this amounted to some 27% of annual revenues in 1986 and the proportion showed no sign of diminishing in the short term, i.e. in the 87/88 time-frame.

Exhibit III-16 lists 20 comments on discounting methods voiced by the vendor sample. It is clear from the reading of this list that a very variable approach to discounting problems is taken. In many cases the vendor feels that he has to give a discount in some form or other but the attempt is to hide the concession as part of a standard list price. This confused picture reflects the competitiveness of the software sector and also the squeeze which is traditional on software budgets, consequent upon hardware taking the first and more significant slice of user expenditure.

This situation is ripe for rationalisation. INPUT believes that correct management of the support and maintenance function will enable suppliers to feel more comfortable in discount pricing policy.

F

Support Pricing

This section deals only with the pricing of support. Later chapters will deal with the policy issues surrounding support and maintenance.

Support pricing is found to be handled by a range of methods:

- A user may opt to take out no support contract, confident either in the software or in his own abilities as an organisation to support it should problems arise;

EXHIBIT III-16A

VENDOR COMMENTS ON DISCOUNTING

- The feeling is we are cheap. So we don't need to discount beyond the 2nd etc. copy mechanism. This way it's less worry on the sales people.
- Discretion to offer discounted deals to our large reference sites is being passed down the hierarchy to the senior sales exec.
- Our educational discounts vary from division to division.
- The networked pricing is a form of discounting by number of processors or number of users, whichever way you care to look at it.
- Product discounting applies to pretty big customers who take more than 6 products.
- One of our large customers will take 100 products over 2 years. Naturally, they can command a discount!
- Multi-site discounting is always by negotiation.
- Maintenance charges are nearer 7% for run-time systems.
- Very little flexible pricing from the price book. Standard discounts apply to the same product on more than one processor on the same site.
- It is rare to get a product at more than one site in the U.K.
- Dealer margins were recently increased.
- Per workstation pricing means that effectively our whole user base gets a discount. The only other way is via periodic stock-clearing of older devices, a 'summer sale', advertised through our user group.
- A discount of 30% is given on subsequent copies, and the customer is responsible for making his copies.
- Application software is discounted by volume of fees/expenditure over a year or over an installation programme.

EXHIBIT III-16B

VENDOR COMMENTS ON DISCOUNTING (CONT.)

- There are two types of concession. Either you can add in extra service or product for the same price, or you can discount a deal for the same functionality. Ours split 50:50 on this basis.
- Discounts are offered on packages of modules.
- We are starting a new site licencing system in which the user buys the right to copy up to 20 copies for PCs.
- Customer expects a discount. So we use starter packages which are based on list plus a discount, and maybe include a computer too.
- Discounts by negotiation. Training credits are one way we use.
- The only type of standard discounting envisaged is on packages of modules.

- If the licence has been granted on payment of a one-time fee, the user may opt for a regular normally annual fee which is calculated as a percentage of the initial product charged. It is normal for this percentage fee to be calculated on the basis of the current one-time licence fee list price. This gives the vendor the ability to increase support prices along with the increase in labour costs;
- A regular support fee may be raised in those cases where a regular product licence fee is in force. Again, this may be either annual or quarterly or monthly to fit in with the normal charging mechanism of each vendor. In many cases it would be considered by the user on the basis of being a percentage levy over the corresponding licence fee;
- There is also the case in which the support facilities are offered free of charge, that is to say they are bundled into a regular licence fee. This normally takes place in the situation where a regular fee is being charged. Were it to be bundled into a one-time original fee it would amount to a lifetime warranty on the product, but this case was not

encountered other than in the situation of bundled 'core' system software provided by a manufacturer;

- A fixed fee may be raised for support irrespective of the original price of the product. Such a fee would normally be charged on a annual basis. This situation is found at the lower end of the market in the support of certain microcomputer products. This method is used for the sake of simplicity in a sector where the overhead associated with calculating an individual price would not be worth incurring;

- Support may be charged for at a daily rate, i.e., on a time and materials basis. This option would normally be encountered in a situation where a user has had the foresight to opt for product cover and thinks that paying for it as required would be his 'best buy' method. Obviously, those users who opt for no contract will also have to have recourse to this method if an emergency occurs. However the survey only included under this heading those people who had formally opted for this method;

- Other methods found included a fixed annual fee which was calculated as a function of each product. In one case this was calculated on a cost plus basis, cost plus being evaluated each year according to the experience of the previous and earlier years. This method is being used by vendors to try and move away from support pricing being tied to the produce licence fee on some sort of percentage basis. Users, however, cannot easily separate the support fee from the licence fee in their minds except in the basis of some notional percentage calculation.

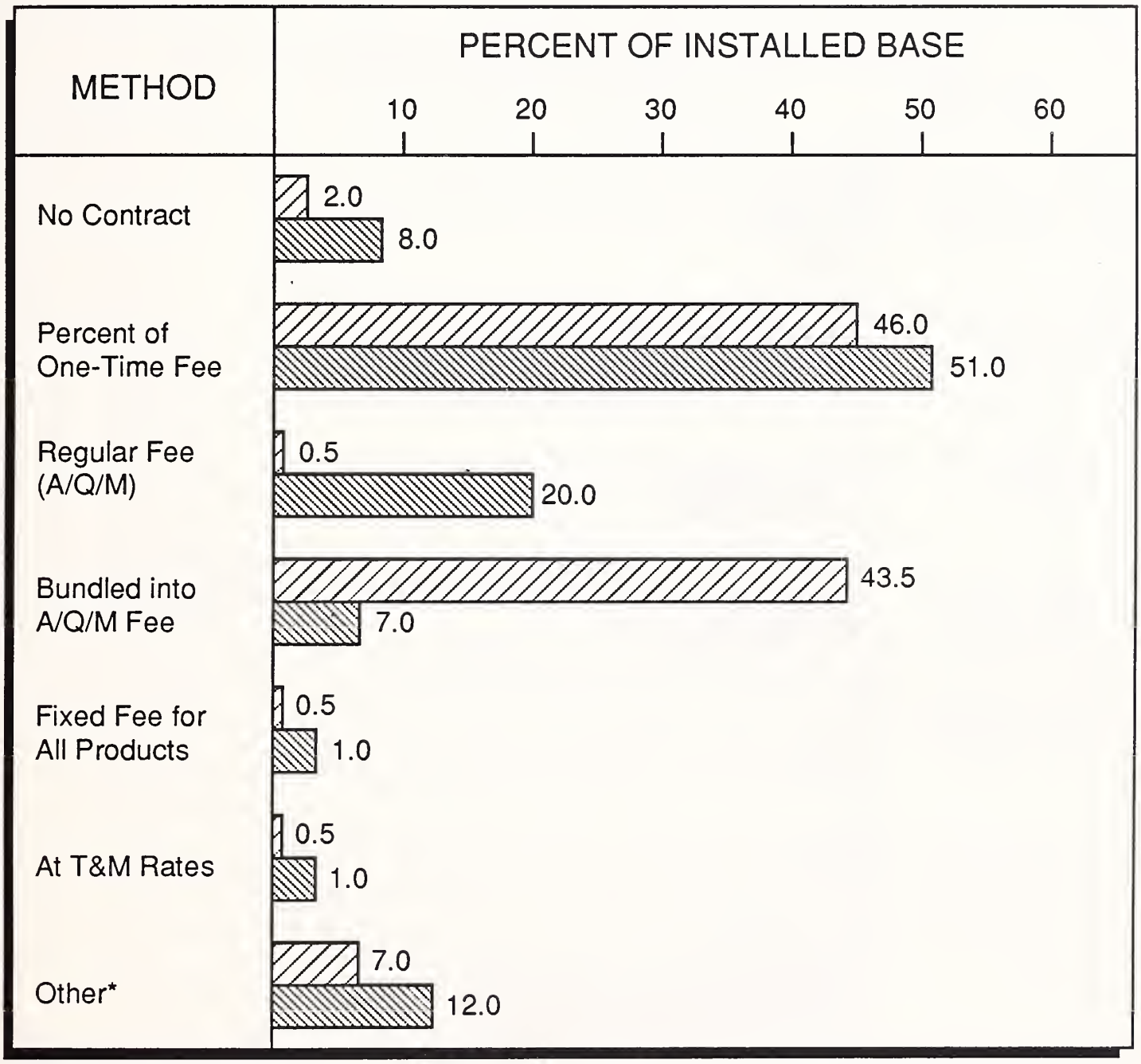
Exhibit III-17 shows the breakdown for system software across these different methods. The installed base of products at the end of 1986 was used as a basis for the calculation. This method is necessary because certain of the options (for example, not having a contract or bundling the support into a regular fee) involve no user expenditure and therefore using a percentage of user expenditure would give a distorted picture.

The major difference between the manufacturers and the independents is found to lie in the bundling of support into the regular licence fee. The survey was conducted over the period in which IBM in mid-1987 made the decision to offer central support free of charge on more products. This policy change came about under market pressure from third-party maintenance suppliers who were able to support system software through already resident on-site engineers.

Exhibit III-18 shows the equivalent position for mainframe and minicomputer application software, again comparing the differences between the methods favoured by the independents.

EXHIBIT III-17

SUPPORT PRICING METHODS
MAINFRAME/MINI SYSTEM SOFTWARE

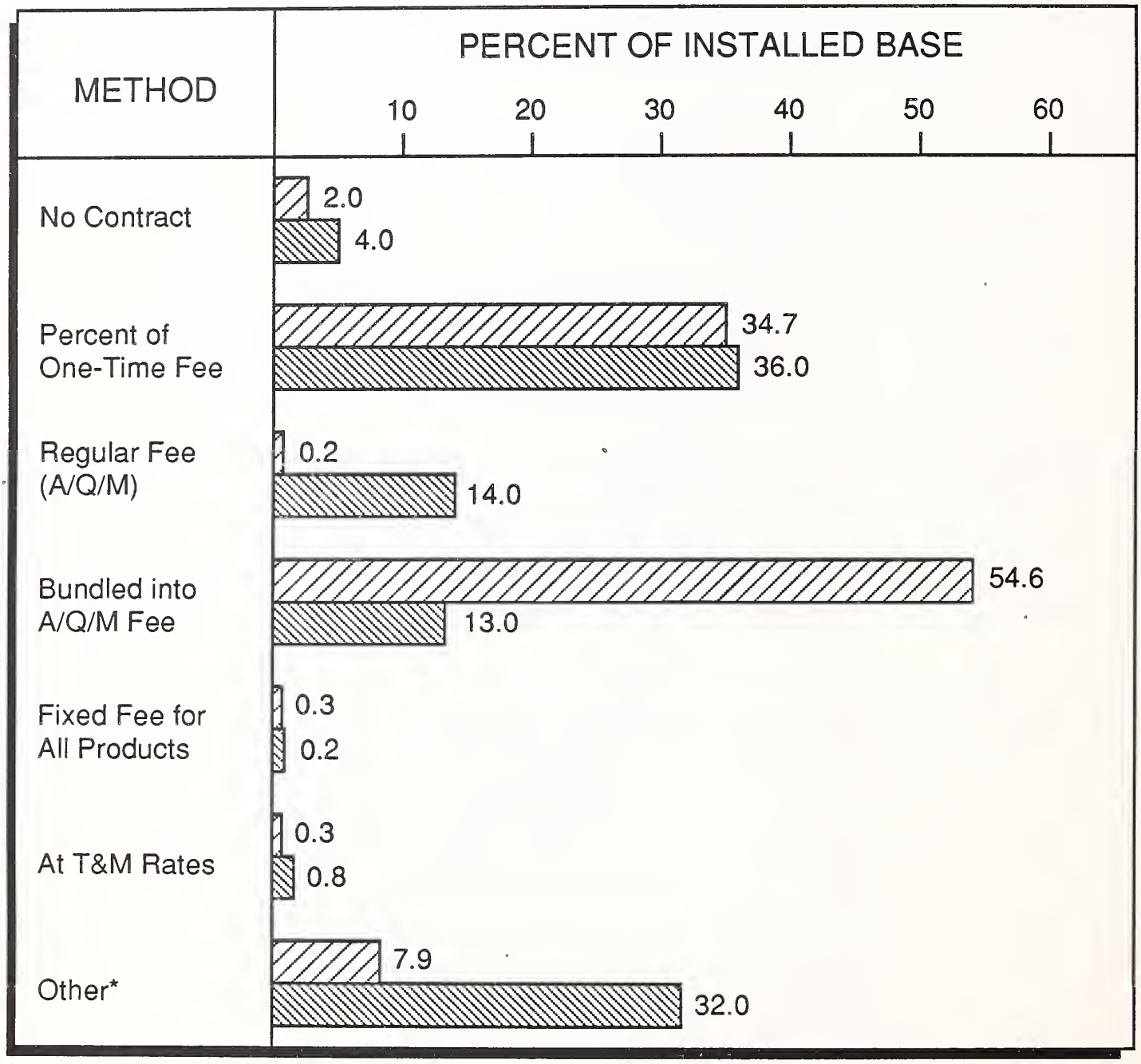


* Includes: Fixed Fee Per Product

INDEPENDENTS
MANUFACTURERS

EXHIBIT III-18

SUPPORT PRICING METHODS
MAINFRAME/MINI APPLICATION SOFTWARE



* Includes: Fixed Fee Per Product, and by Individual Negotiation According to Size of Installed Equipment.

INDPENEDENTS
MANUFACTURERS

For purposes of simplifying their offerings, the independent vendors favour bundling support into regular fees. For application software the manufacturers gain a significant contribution from other types of pricing in which the fixed fee per product is the most favoured method, but also for the larger users by individual negotiation according to the size of the installed base of equipment in an organisation.

In Exhibit III-19 we compare the perceptions of support pricing (again calculated on an installed base method) between what the users see and what the vendors feel they are offering.

A major finding is that users replied from the basis of their 1986 experience when most regular fees were on a percentage basis, while vendors were replying from a standpoint of new bundling policies initiated in 1987.

In summary, it is important to note that the user may receive four items of charge from vendors for his computing systems:

- Hardware and equipment costs;
- Equipment maintenance and support;
- Software licence fees;
- Software support fees.

At the end of the line there is an inevitable tendency to find that budget has run out by the time the software support charges are being considered. For this reason they will incur most odium from the user community. This situation is essentially a messy one in which vendors must consider their overall image and marketing stance.

There is particular need to simplify the whole situation and vendors must ensure that they do not incur the displeasure of users if software with bugs in it needs to be debugged during the course of a support contract since the user will then consider that the product is being debugged for a fee, when this service should be included free of charge if the product has any claim to being marketable.

G

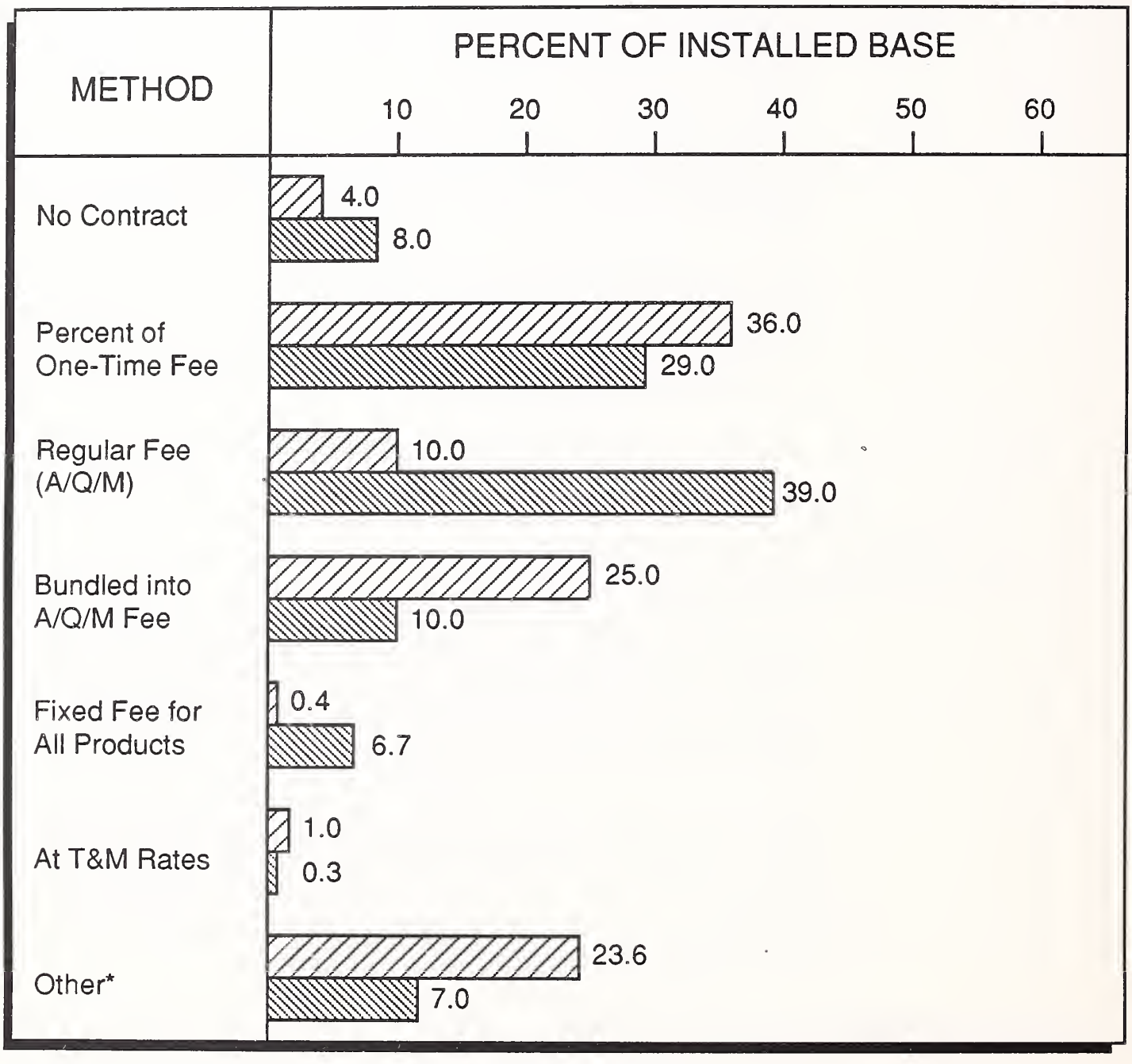
Short-Term Trends

Exhibit III-20 lists the vendor plans quoted for tariff changes over the six months following the research period of this survey (during the summer of 1987).

These comments emphasize the prevailing vendor preoccupations with the consequences of IBM's graduated pricing policy and the introduction

EXHIBIT III-19

SUPPORT PRICING METHODS
MAINFRAME/MINI APPLICATION SOFTWARE
User versus Vendor Perceptions



* Includes: Fixed Fee Per Product, and by Individual Negotiation.

VENDORS
USERS

EXHIBIT III-20A

VENDOR PLANS FOR TARIFF CHANGES IN THE NEXT SIX MONTHS (Vendor Comments)

- There will be more levels in the mainframe tariff, to accommodate the 9370s.
- The rises will be in the nature of tuning i.e. ≠ $450 - 850.
- We will move from a two-tier (VSE or MVS) to a four-tier price structure, following IBM's example.
- Modules will be arranged in price groups according to the target machine. This will remove some current subjectivity.
- No guarantee we won't put up maintenance fees in the next 12 months. We go by the IBM Index, which is linked to the RPI.
- We can't afford to sell for less. Sales costs are of the order of 50% of all costs.
- We are about to introduce 9370-linked pricing, i.e., we will extend the number of price bands in the tariff. At the end of the year, there may well be a 5+% price rise.
- We are changing our per workstation prices so that entrants with small numbers of workstations pay less on their earlier purchases but progressively more on their later ones.
- The introduction of pricing by maximum number of concurrent users of a module will start for one of our software lines.
- Only introducing new products, no tariff changes.

EXHIBIT III-20B

VENDOR PLANS FOR TARIFF CHANGES IN THE NEXT SIX MONTHS (CONT.) (Vendor Comments)

- We are continually tuning our price list, adding new groups of computers or rebundling functions, for example.
- We may introduce graduated pricing i.e. two price bands on IBM equipment, one for 9370s and another for 4300s upwards.
- Prices will reduce over the next round.
- As a manufacturer we review software pricing annually, but the process does not command as much as does hardware pricing.
- We might unbundle our software support this year.
- Introduce a graduated tariff for DEC VAX products.
- Only promotions of limited duration, i.e., 1-2 months.
- The IBM PS/2 has made an always price-sensitive sector worse.

of the 9370. Though vendors are not responding in a uniform way to this policy there is an overwhelming trend to introduce new bands of pricing into the tariff structures already in place, if not, to totally restructure the tariff to follow IBM.

A similar layering of the pricing structure according to machine size is now current in the DEC VAX field. The independent vendors selling products to run on the VAX range currently structure tariffs with up to four bands from the MicroVAX upwards.

Apart from the influence of graduated pricing, several vendors are reporting that they are merely tuning their catalogue prices making minor increases or reductions to fit the market requirements. Only one vendor reported an overall price reduction to his catalogue.

Two innovative pricing mechanisms were cited by different vendors:

- A company using a combined tariff mechanism, whereby system software is priced per workstation and application software per application module, is now introducing entry level pricing whereby the effects of the two factors making up the tariff can be altered to make entry level systems more attractive, without overall loss to vendor revenues.

- The other innovative method involves the use of pricing by the maximum number of concurrent users operating on a piece of software at one time. This implies that a software counter mechanism is in place embedded in the software and, like 'site licences' for PC products, involves a ceiling of use. This is effectively another form of graduated pricing.

Turning to the user perceptions of trends, as shown in Exhibit III-21; INPUT surveyed what respondents were experiencing in each of the six countries or country blocs in Europe:

- Except in France, a majority were feeling the trend to one-time charging;

- In France, site discounting and more bundling of product and service were the leading two trends;

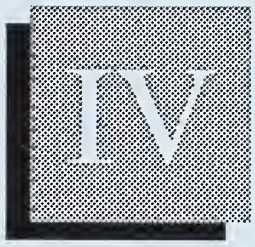
- Bundling was being experienced more than unbundling in four out of the six countries, and overall in Europe by 17% more of users;

- Extension to warranty has a relatively low impact as yet.

EXHIBIT III-21

USER PERCEPTIONS OF PREVAILING PRICING TRENDS

TREND	PERCENT OF RESPONDENTS EXPERIENCING EACH TREND						
	West Germany	France	United Kingdom	Italy	Benelux	Scan-dinavia	All Europe
More Lump Sum/One Time Charging	64	50	67	67	92	63	66
Site Discounting	36	75	22	58	42	22	39
Other Discounting	36	67	11	17	50	44	39
Extended Warranty	14	8	22	33	41	30	23
More "Bundling"	58	75	22	42	75	56	56
More "Unbundling"	31	42	22	58	50	41	39
Other e.g. Pricing per Workstation, Leasing, Renting	6	-	11	-	8	-	4



Pricing of PC/Business Microcomputer Software Products

Pricing of PC/Business Microcomputer Software Products

A

Introduction

The objective of this chapter is to give the current status of pricing in the PC and microcomputer software sector. This sector can be thought of as divided into three subsectors:

- The large to medium-sized corporate user market sector;
- The small business user sector;
- The consumer market for home computer users.

Describing each of these three in turn but in reverse order we have:

- The consumer market, after initial attempts to broaden its appeal with more varied products, has settled down to being largely a single application market—the application being computer games;
- The small business computer market for software can be thought of in two sub-segments:
  - **Horizontal** products, for example-accounting packages, of which there must be several thousand contenders in Western Europe, caused by the national differences in accounting practices;
  - An increasing requirement for **vertical** or industry-specific products in which the value-added reseller (VAR) community is likely to be providing hardware and software solutions together.
- The corporate user in which a range of different product types can be discerned:
  - System software products of which there will typically be one per single user system;

- The major subsector exploited to date is that for cross-industry products such as spreadsheet, word processing, data management, business graphics. These products along with the hardware experienced the big explosion in the early 1980's and have subsequently become more integrated and more seasoned in their performance;

- Increasingly, with PCs and micros being linked either on LAN networks or directly into mainframe systems, there is a requirement for modules to realise this connectivity and modules for local processing carried out outside the large mainframe- or minicomputer-based central products.

Thus the traditional mainframe-based suppliers have been led to supply PC-based products to allow for a combination of local and central processing, while on the other hand the software product vendors who began their lives as suppliers of single user stand-alone products are equally strongly being drawn into the large central site environment.

Three companies in the worldwide top ten ratings for software product revenues come from this second background, i.e., they were not in existence earlier than the PC boom in the early 1980s:

- Lotus Development Corporation, with its world renowned spreadsheet;

- Microsoft, with its system software and word processing capability;

- Ashton-Tate, whose d-Base family of products has leadership in the data management product sector.

The question which both types of supplier are currently addressing is where they should be positioning themselves as the market moves towards a desire for a strong departmental system capability. The important aspect of this new sector of the data processing market place, positioned as it is between the old central mainframe environment and the small end-user single system, is that, in numbers of systems it has a very much higher multiplier than the mainframe market, as Digital Equipment (DEC) with its thrust to distributed processing has found to its benefit. On the other hand it has a much lower multiplier than some companies have grown accustomed to when dealing with single-user system products.

If one is thinking in terms of tens of millions of single-user systems as the total software licence potential universe, this must be scaled down by one order of magnitude for the whole of Europe, to the low millions of systems. This approach can be continued with smaller numbers. Where there could be hundreds of thousands of single-user systems, there would only be tens of thousands of departmental systems, and so on.

The thrust of this report is to address this burgeoning departmental systems market in the large and medium corporate user. It is possible to price departmental systems by actual number of terminals or workstations attached or, more simply, by a ceiling number of workstations attached to each system. Such a method of pricing for software licences would be less crude than the coarse machine group necessary in the mainframe area where the numbers of users likely to be attached is less easily determined.

Pricing by actual workstation is simpler for the user to understand and can be seen to be fairer to both user and supplier, in terms of:

- Simple budgeting for the user;
- Resource and revenue problems being eased for the vendor.

B

Vendor Pricing and Charging Mechanisms

Exhibit IV-1 lists vendor perceptions of their own price setting mechanisms. A variety of emphases were expressed in these comments, depending on the vendor's background:

- Some expressed comments on the aims of their pricing policy;
- Others were more concerned with the procedures for arriving at their standard price;
- The influence of external factors is discussed by others.

One manufacturer was concerned with how software fitted into his overall marketing objectives, while another hardware supplier was concerned with the way trends were making obsolete his previous software product sales policy which was geared to selling mainly into his own captive customer base.

A software supplier perceives his pricing mechanism as purely determined by the targeted numbers of system sales.

This chapter does not contain a separate breakdown by charging method for microcomputer products. The breakdown is in the exhibits shown in the previous chapter, ie Exhibits III-3 to III-6.

The PC/microcomputer, because of the size of licence fees involved, is generally more adapted to the initial fee method than to the use of ongoing regular fees. This is one of the major driving forces affecting pricing throughout the business market. It is propelling a change to bring the mainframe and minicomputer product sector into line with the microcomputer field, because the former can adapt to the latter while the reverse is not easily possible.

EXHIBIT IV-1

VENDOR PERCEPTIONS OF THEIR OWN PRICE-SETTING MECHANISMS

- Prices are generally set on a return on investment basis (ROI) and this is calculated at the national level.
- Our price-setting procedure is not as disciplined as it should be. This will improve with time.
- Three criteria are used (the first is the most important and so on):
  - Achieving marketing policy objectives;
  - Achieving planned margins;
  - Taking into account the competitive situation.
- Individual support contracts are flexibly priced.
- If a product is to be embedded in a total system, its supportability in that environment must effect its initial and its ongoing support charges.
- In the past, the bulk of our products have been sold to the existing customer base. So historical cost has played a major part, but we are now looking more at the general market levels which we can charge.
- To move from monthly fees to a one-time charge is an industry trend:
  - Partly, driven by the high cost of money, and
  - Partly, by a desire to simplify.
- The AI market is intensely competitive. That determines our price levels. Educational software products are marked up over the software producers' prices.
- It helps our sales people to know when to have to refer a possible discount situation to management. We only allow concessions on sets of packaged application modules.
- We gauge how many times we will sell a product to establish our initial price, and also to establish budgets for R&D.
- We charge what we can get.
- It tends to follow our investment policy and is reviewed at budget time.

One specialist PC product vendor sees the low-end market for business software as segmented in a fairly straightforward way into three bands by price:

- Products retailing for less than $400; these are either system software products, small application products or aimed at the consumer market;
- The second band lies between $400 and $1000 - here we are talking about application products for the single-user business system and also utilities such as data communications enabling products, aimed at realising connectivity between mainframe and the single-user systems;
- A sector for products priced at $1000 or over - these products are all for corporate users and would typically be for a vertical market system if to be supported on a single user system, or alternatively utilities and system products geared for the multi-user UNIX or BOS operating environments.

The majority of products are either sold on a one-time initial fee per product sale, or sold under the site licencing arrangement whereby the user can purchase the licence to copy and/or run up to a maximum number of products of a given type at each site. This system is dealt with more fully under discounting in section D below.

C

Ranges of Prices Encountered

INPUT research yielded data on the range of prices used by vendors with their largest revenue-earning products in the PC sector. These 'flagship' products are analysed in Exhibit IV-2 and give some indication of a wide band of pricing available, i.e., more than two orders of magnitude between prices starting at under $200 and going up to prices of $20,000. It is significant that all the averages in the table are greater than $1,000, indicating a difference between PC products for mass use and PC modules essentially for connection within the corporate environment.

The typical product average ranged from $2,000 to under $6,000 between application and system software, with system software showing typically higher price changes on average than the application product area. This is the reverse of what INPUT found in the mainframe/minicomputer area.

All products at this price level must be sold with some form of support, whether it is direct support from the producer or supplied on an agency basis by a value added reseller or other OEM. Gone are the days when the weak dealer with no support can sustain a business in this competitive environment.

Below the market being focused in this report is what we could call the 'Amstrad' sector for the first time small business user. It is normal in this sector for some basic software product to be bundled into the hardware

EXHIBIT IV-2

PRICE RANGE OF LARGEST REVENUE-EARNING PRODUCTS MICROCOMPUTER/PC SOFTWARE

TYPE OF SOFTWARE AND POSITION IN RANGE	PRICE IN $ THOUSANDS		
	FROM	TO	AVERAGE
SYSTEM SOFTWARE			
Bottom End of Range	0.16	12.00	4.40
Top End of Range	0.60	20.00	8.10
Typical Product	0.60	15.00	5.60
APPLICATION SOFTWARE			
Bottom End of Range	0.50	2.80	1.60
Top End of Range	2.00	4.30	3.40
Typical Product	0.80	3.60	2.00

price. Other software can then be purchased by the user from third party producers and would normally be sold via advertisements in the trade press at prices of less than $200. There is no fat in the sales margin either on hardware or software to allow for individualised support in this end of the market.

The chief problems here are:

- The lack of education of first time users;
- The commercial viability even of central telephone support.

Even being able to afford to delimit user errors from true product bugs is an expensive exercise. On the other hand the numbers of systems sold

will ensure that quick flushing out of bugs will follow.

Operating in this end of the market are:

- Educational users;
- Home users, essentially a product commodity market;
- First time low-end business systems served by the larger and more reputable micro distributors;
- Some microcomputer-based KBS (Knowledge-Based Systems) run-time versions of application products, usually sold in multiples of at least ten to corporate users, where the volume of product to a single sale can justify standard support.

Vendor perceptions of their competitors' pricing in this sector are listed in comment form in Exhibit IV-3. Two competing trends can be noticed:

- A second generation of micro product with an increasing amount of functionality will command a fair market price. This trend will continue and accelerate once the 80386 chip power has been unlocked by new operating software;
- A counter trend is the continual arrival of new, competitively priced products pushing down the floor level in individual sub-sectors. An example of this is the Borland announcement in 1986 of a PROLOG development system, which, although announced with serious deficiencies against a standard PROLOG offering, nevertheless set a new floor from which its rivals had to justify their price premia.

D

Discount Levels

Compared with the mini and mainframe sectors, discounting for personal computers and microcomputers is easier. Standard discounting against list price comes easier because the volumes likely to be sold will be high in the case of corporate users. In recent years central purchasing by data processing (ostensibly in order to achieve cost savings) has also been used as a weapon to regain some measure of central control over the variety of purchasing points within an organisation.

Allied to discounting, there is a major problem for a vendor supplying to the PC market place; we refer to piracy of software by illegal copying. The main culprits have been of two types:

- Large corporate users - in many cases of sales to corporate users the vendor may not easily know how many hardware systems his or her software could be run on, because he or she is only supplying the software requirement.

EXHIBIT IV-3

SOME VENDOR PERCEPTIONS OF COMPETITORS' PRICING

- Our French distributor said prices were too high. We have disproved him by helping him to sell off-list. Now we sell directly and are being told our prices are too low.
- We are in the mid-range for price with not much competition. The competitors are mostly low-end or top-end.
- It is difficult to compare the prices of different packages, because there are so many pricing variables and the market is always changing.
- We found we were pricing one new product too low and it was only when we raised the fee to over $1,000 that corporate users took it seriously.
- Four or five majors (we are one) plus a shoal of smaller-fry are active in our market. These last always price below our levels.
- We like to be a little above our competitors' prices.
- The market is suffering from an avalanche of new products. No, I can't be happy at the price levels we have to match.
- Our 'competitor watch' function helps us especially with the pricing of new modules.
- We are seeing an increase in the number of serious micro offerings.

- Educational users - Universities and Technical Colleges are the other source of pirated copies becoming available; this stems from their technical ability to get around any 'lock-out' devices which the vendors may have installed.

There are a number of remedies open to vendors in combatting these practices. All these remedies are essentially partial in nature. Therefore, they need to be thought of as being used in conjunction with one another:

- Use of international copyright law and its application to software. Moves are in hand among the international product vendor community; these must be thought of as long-term measures to get agreement over a wide international spectrum to the application of existing copyright law to make it apply to software also. Like trade sanctions in the political arena, such measures require agreement among all nations in order for them to be affected. Together with an agreed application of copyright law, import checks will need to be included.

- Product vendors should consider selling increasingly through both manufacturers and turnkey value added resellers (VARs) as their agents; in this way the sale of the software will be more easily associated with the numbers of hardware systems installed.

- Another possible method is to adopt some form of copying licence. There are two means whereby this might be achieved:

  - IBM has introduced a Right to Copy (RTC) facility. This was launched in April 1987. It means that for a fee a user can make up to a certain number of copies of a piece of IBM-supported software, at the same time registering the number of copies he or she has made with IBM;

  - Have a ceiling of workstation numbers up to which a user is allowed to run a given piece of software before his licence charge increases. Thus bands of software pricing are created in the standard tariff, eg there could be a price for 1 - 8 users, 9 - 16 users, 17 - 32, etc. or 1 - 50, 51+. Different bands of price can be constructed according to the type of system and the market sector being addressed.

The importance of discounting to corporate users is illustrated in Exhibit IV-4, which mentions different methods which are used by different suppliers:

- By numbers of processor,

- By numbers of different modules,

- By number of different products,

- By number of transactions processed, e.g., in payroll systems.

These are the main methods used for the PC end of the market. Site licencing is not really a discount method but is seen as a copy technique excusing the user and at the same time saving the vendor the cost of policing any more rigorous multi-usage pricing mechanism.

EXHIBIT IV-4

VENDOR COMMENTS ON DISCOUNTING IN THE PC SOFTWARE PRODUCTS SECTOR

- We had a major review of software pricing 18 months ago and this affected discounts. In fact, we had to increase these to meet the competition and to lock-in our customers.
- Support charges are based upon a software update service. If a customer taking the service has multiple copies of different products, second and subsequent copies are supported at 20% of the initial copy and this is built into his overall annual charge.
- Discounts are given on the basis of the volume of products purchased.
- As a distributor we can gain (and to an extent pass on) up to 35% discounts on our desktop publishing software products.
- It is usual to negotiate initially on a 5-7 year lease. To help get the price somewhere near the opposition, we have introduced discounts on packages of modules.
- Discounts on products are given per workstation (PC or micro).
- There are special discounts for up to 4 extra workstations working off a LAN.
- Our sales engineers have a habit of giving discounts.
- Maintenance is also discounted by number of products being supported.
- Discounts are decided by country management.
- We've just produced our first standard discount list.
- Discounts by site go progressively down, i.e., 100% of list for the first, 70% for the second, 60% for the third, levelling off at 50%.
- 95% of our customers are multi-site. They include central and local government bodies with a geographical spread of activities.

However, site licensing mechanisms affect the ability of the vendor to allow discounts in other situations. For this reason we detect a trend away from their use.

One vendor, however, saw site licencing important to his business because it was likely to change its nature from being a pure product commodity vendor towards being much more of a systems house with an account selling emphasis centering around the individual establishments of large users in his customer base.

E

Support Pricing

Exhibit IV-5 shows the breakdown of support pricing methods in the PC system software sector. As in the equivalent diagram for mainframe and minicomputer system software the methods of pricing have been broken out against the different percentages of the installed base which are covered by each method.

The largest percentage is for the option of having no contract cover for system software, regardless of whether the product is purchased from a manufacturer or from an independent.

For the manufacturers, 70% of those with a contract have it calculated on the basis of it being some percentage of the current one-time fee for the product. The next most popular method is the fixed fee per product method and this accounts for another 5% of the installed base, or around 10% of those with contracts from the supplying equipment vendor.

For the independent suppliers the most favoured method is the fixed fee over all products. This reflects these vendors' dislike of carrying the overhead of calculating a more complex tariff. This is a healthy move towards restoring some form of simplicity to the tariff structure.

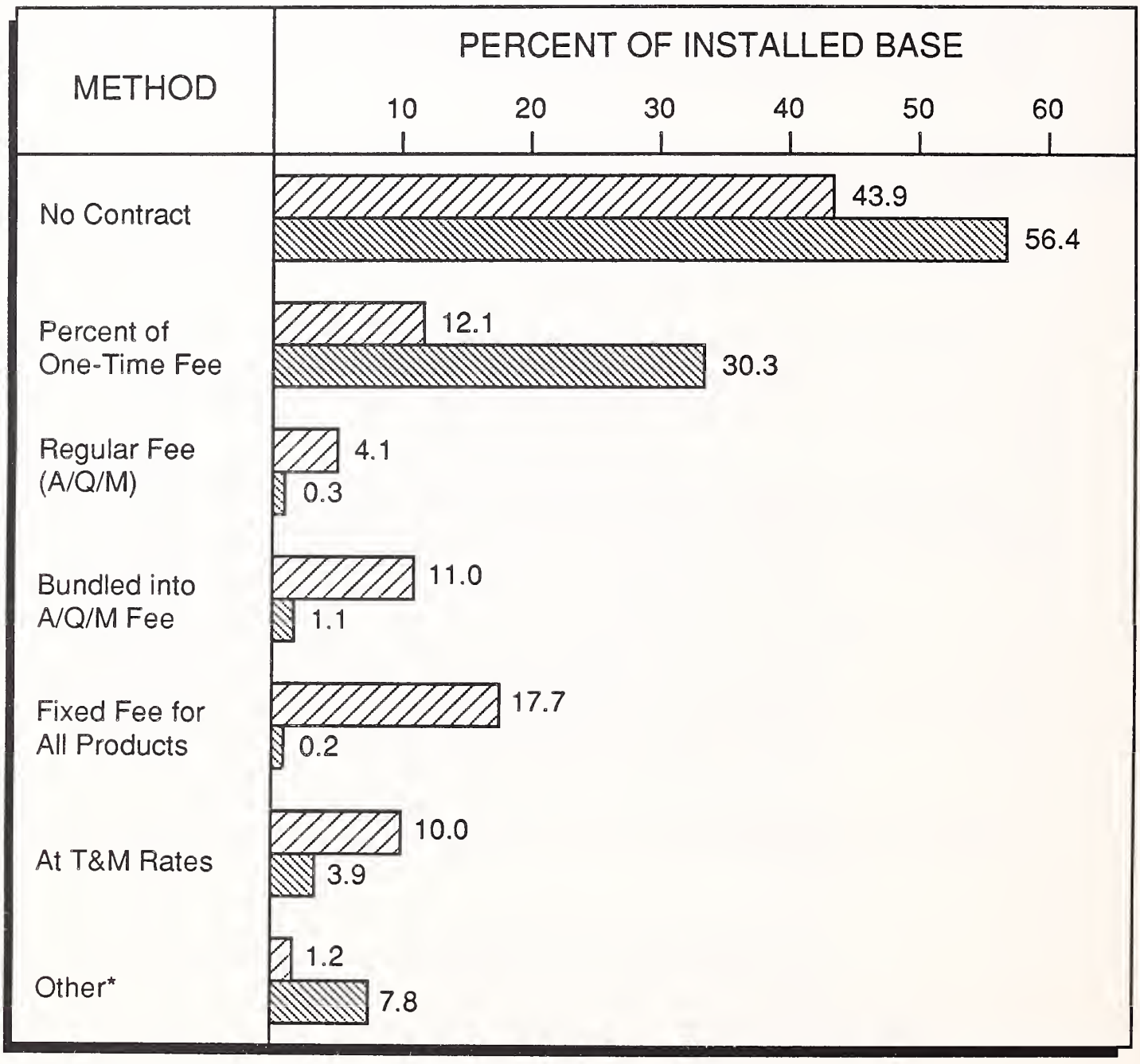
An equivalent chart for the breakdown over application software, again showing manufacturers compared with independents, is given in Exhibit IV-6.

The independents here have the larger number of unsupported products, in contrast to the systems software case in which it is the manufacturers who are less likely to have established an ongoing support contract with their users. The independents are also likely to have bundled the support into a regular annual, quarterly, or monthly fee.

In the case of the manufacturers, after subtracting for the non-revenue earning options, i.e., no contract or a bundled approach (accounting together for 28% of the installed base), the fee-earning methods can be split 50% to 40% between having a percentage of a one-time fee and using the fixed fee per product method. This latter technique usually

EXHIBIT IV-5

SUPPORT PRICING METHODS
MICRO/PC SYSTEM SOFTWARE

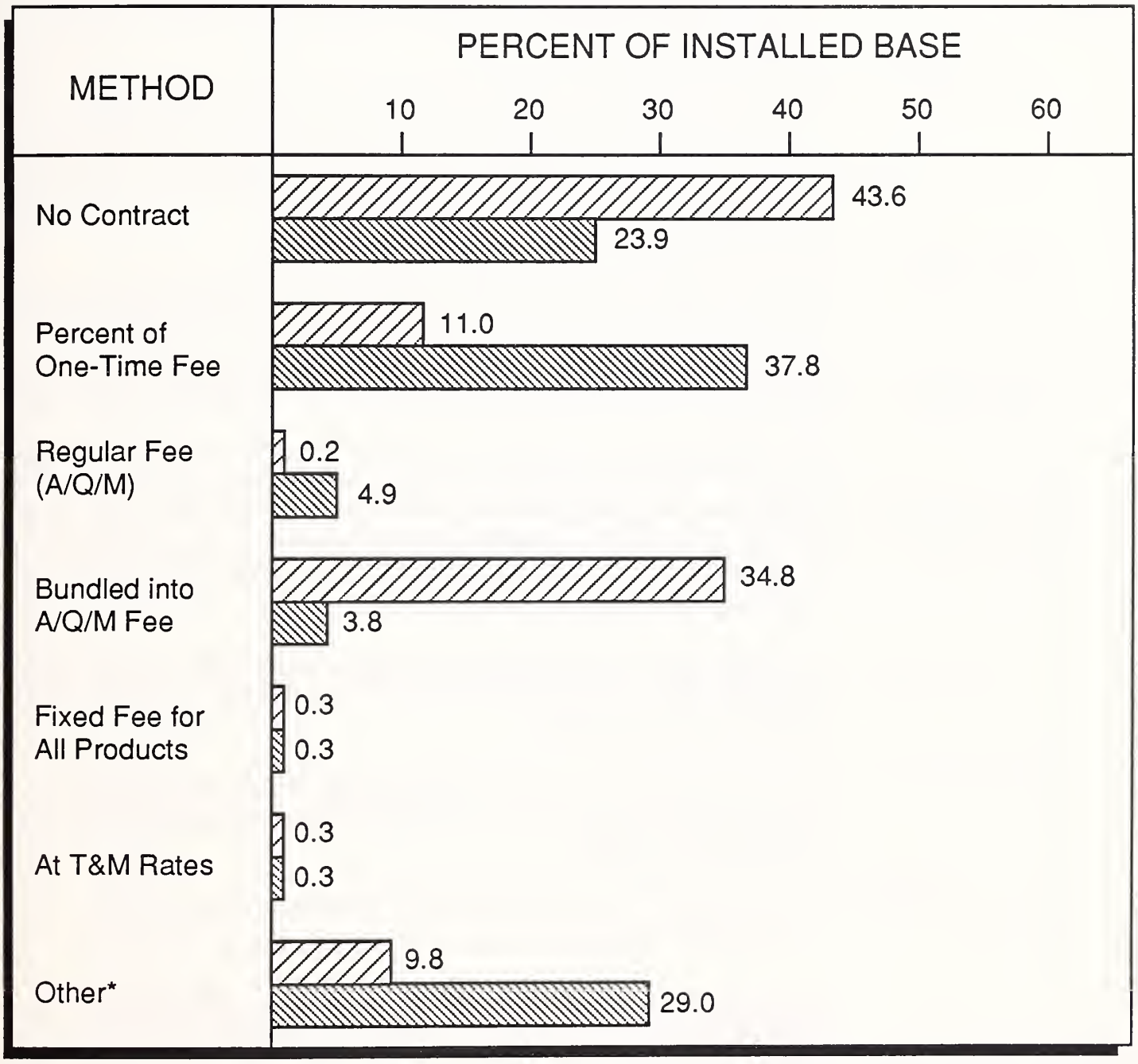


* Includes: Fixed Fee Per Product, Individual Negotiation, Site-Based.

INDEPENDENTS
MANUFACTURERS

EXHIBIT IV-6

SUPPORT PRICING METHODS
MICRO/PC APPLICATION SOFTWARE



* Includes: Fixed Fee Per Product, Individual Negotiation, Site-Based.

INDEPENDENTS
MANUFACTURERS

involves setting an annual price based on an historical cost plus calculation. Another 10% of fee-earning expenditure is covered by other methods.

F

Trends

In this section we take both the vendor and user view points and highlight specifically the principle short-term trends picking these out from the longer term.

The main short-term trend is that IBM has increased the uncertainty factor in the PC market by its pre-announcement of the OS 2 operating system for the PS/2 series of next generation PC products. The particular requirement for knowledge of the new OS relates to the high-end 80386-based modules.

IBM's rivals selling compatible machines have wasted no time, however, in getting earlier to market with products which can exploit the full 80386 - chip facilities. These products are attracting price levels well above $1000 and therefore will command a requirement for user support.

West Germany is seen to be the country most affected by IBM's tactical move. As IBM's most deeply entrenched stronghold in Europe, dealers without a sound strategy for survival by product diversification, i.e. those who have become too dependent on the IBM product line, can be expected to fall by the wayside during the order pause which IBM's announcement has started.

It was found that this order pause, while users waited to see what IBM would finally come up with, was having repercussions into even the PC hardware add-ons market.

The UK and France were more protected against these IBM moves because most low-end dealers or distributors had spread their risk across more than one vendor.

1. Vendor Perceptions

Exhibit IV-7 shows vendors grappling with a whole swathe of issues affecting pricing at the low-end (where incidentally the majority of developments are taking place):

- IBM's dominance and its attempt to shake off the compatible vendors who have made considerable inroads into its market share;
- The emergence of bottom-end business PCs led by the Amstrad PC 1512 and leading to the need for lower function to meet lower software budgets available to small businesses;

EXHIBIT IV-7A

VENDOR COMMENTS ON PRICING TRENDS AS THEY AFFECT THE PC PRODUCT SECTOR

- By the time the 9370s are delivered in any quantity the customer base will expect processor power rating to be linked to price.
- We want long-term (10 year +) relationships with our customers.
- Treating the PC similarly to other systems makes life simpler for the vendor. We deal with the corporate user anyway, and the PC is just another piece in his tool-kit.
- The imponderable in seeing the trend is what the dollar will do. Multi-nationals sometimes try to buy direct from U.S. but they will be always referred back.
- At the micro end, the previous generation of software will appear on the new generation of cheap PCs (e.g. the Amstrad). As hardware prices decrease this could become a general practice to give user a priced choice of functionality.
- We think the trend will be away from pure site licencing.
- At the micro end, pure dealers (of 'tin' only) are losing out to VARs and distributors.
- We are concerned about IBM's software marketing policies. And are looking for a fair trading situation.
- Up to now software has been waiting for hardware to reach a price/ performance threshold before it can realise its potential. From now on people will be able to justify the overall cost.
- Solid revenue comes from our older, established products.

EXHIBIT IV-7B

VENDOR COMMENTS ON PRICING TRENDS AS THEY AFFECT THE PC PRODUCT SECTOR (CONT.)

- We sell micro products to end-users but some of our newer products will be bought up by DP management, e.g., an on-line training product.
- We are not in the general software market-place. Our main pressures are the commercial ones of selling to a rich, but specialist industry sector, where competition is hot.
- For a manufacturer, it is important to know all the contributions to ROI, and software and support are just two among many.
- You can 'subcontract' hardware maintenance to the user, by designing in user-maintainability, which we do. But, as software skills are more precious, more scarce, all you can do is make your software as proprietary and as 'brand'-specific as possible.
- Prices in general were going up, but the advent of PCs has pulled them down.
- Micro products have a 2-3 year lifetime in Europe. Price changes over that time scale are relatively unimportant. It is more important to keep renewing your product catalogue.
- Prefer to lower price initially, recoup on a well-costed maintenance contract and gain reference site.
- Packaging modules is a way of effectively lowering prices.
- More functionality for the same price.
- Inflationary pressures in France will decrease.
- The specialist AI sector is subject to normal market laws, i.e., price depends on target market maximum penetration.
- The payback period needs to be between 12 and 15 months.

- The increasing market strength of the true value-added resellers who can bring industry or application expertise to bear in a particular area;

- The embryonic KBS market which is trying to get established by low-end pricing to encourage volume growth but is suffering from a credibility factor and the enforced ceilings on functionality imposed by operating in constrained configurations;

- The continuing see-saw of control over corporate data processing between the end-user and MIS management;

- The overall need to simplify in an otherwise bafflingly complex environment.

2. User Perceptions

Exhibit IV-8 shows some examples of users' comments on pricing trends in the PC Product Sector. From the user end the following trends were observed:

- The use of more one-time initial fees was accepted as a trend which users could not, in effect buck.

- A majority had the feeling that prices were increasing overall and in some cases the overall software spend was getting out of hand.

- A minority saw increased flexibility and increased discounting to counterbalance the above trend.

INPUT emphasizes the need to consider offering a range of payment methods to suit the individual budgeting preferences of users. This is especially necessary at the level of the new departmental systems because a variety of different budgeting points and purchasing points are going to be encountered with different people involved, ranging from technical vetting through to the deal signing:

- Central MIS,

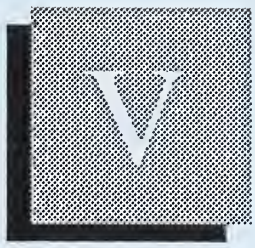
- Financial Directors in subsidiary companies,

- Departmental end-user managers.

EXHIBIT IV-8

USER COMMENTS ON PRICING TRENDS IN THE PC PRODUCT SECTOR

- We only buy products if we get a warranty covering two years.
- We cannot obtain 'local' discounts. Prices are negotiated through the Federal Government's contract.
- One trend is to charge even for telephone support.
- It varies too much from product to product and from supplier to supplier. Our preferences are governed by each individual situation.
- Suppliers are becoming more flexible. They will offer 'free' software during trial periods.
- It is getting more expensive, being pegged to the number of users a system is expected to support.
- Discounts are more available. More flexible leasing can be arranged.
- One-time charging (after installation) would be ideal.
- Our company has adopted the trend to initial lump sum payments. A discount is always negotiated.
- As an OEM, we pay 4 or 5 times end-user list price, which gives us the right to modify and resell the software.
- We get less for free every year.
- Products are getting more and more expensive. The only commercially attractive trend would be to pay less.
- Prices are increasing dramatically.



Software Support Issues

Software Support Issues

A

Definition of Support

It is necessary to try and disentangle the support issues from the maintenance issues in dealing with software.

INPUT's definition of the two, separates support (which is customer orientated) from maintenance (which is product orientated). A vendor must support his customers and maintain his products.

Exhibit V-1 illustrates the tasks which lie on each side of the interface.

Support is tied to the sale and ongoing customer relationship. It includes three periods of this relationship:

- Pre-sales, when demonstrations, application analysis, product evaluation and training are required;
- Installation time, when a range of tasks are required, depending upon the degree of customisation and "hand holding" for each client;
- Post-sales, when problem-solving assistance of an ad hoc nature by telephone and in person, and information on vendor developments are the main requirements.

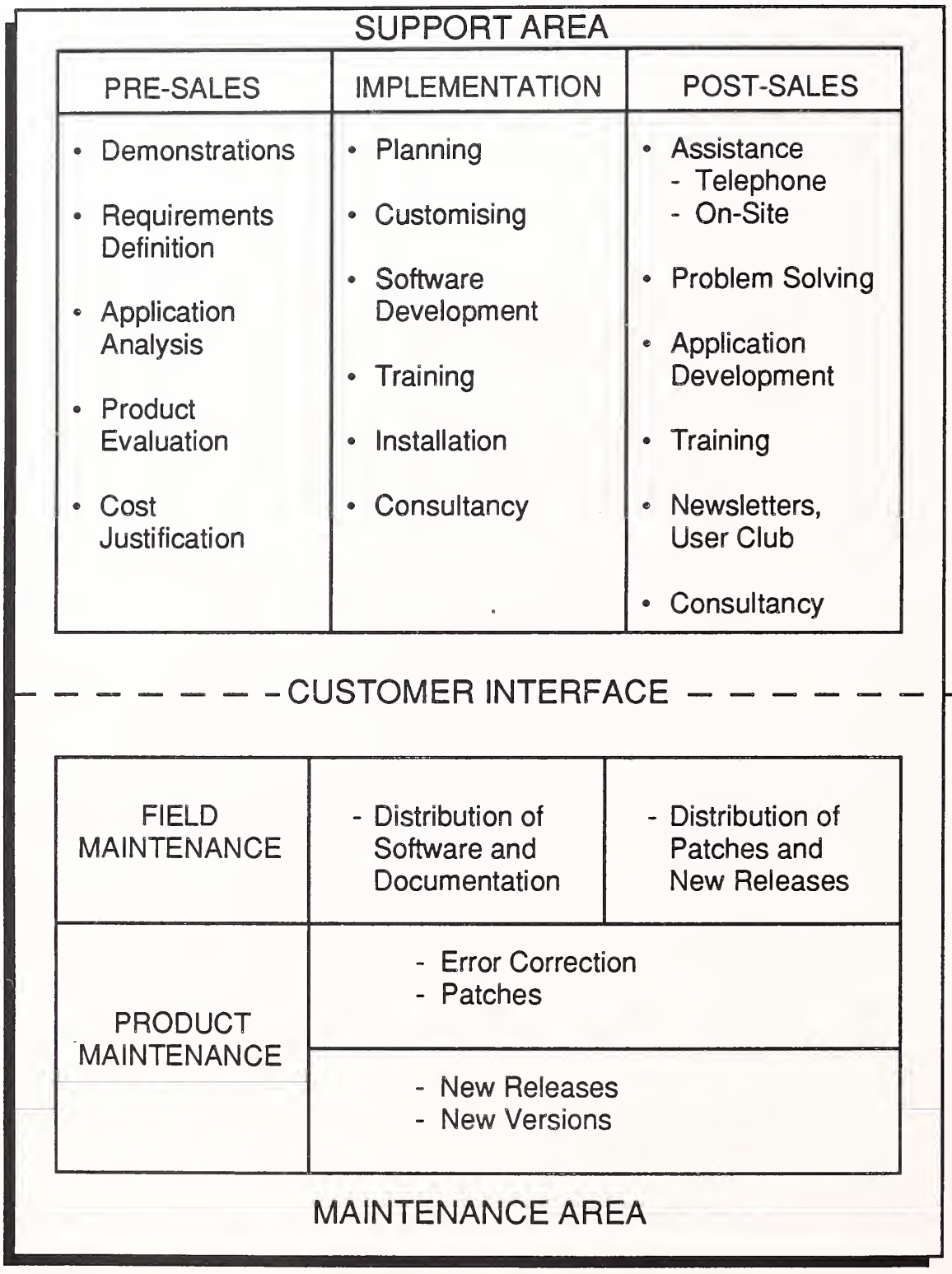
The centre of gravity of support inevitably lies close to the installation period.

Maintenance, on the other hand, is connected to a range of product orientated tasks:

- Distribution of software copies and the associated documentation;
- Problem identification and correction which is of two types:

EXHIBIT V-1

FUNCTIONS ASSOCIATED WITH SOFTWARE SUPPORT AND MAINTENANCE



- Temporary fixes required to keep a user on the air,
- Permanent patches distributed throughout the installed customer base;

- New releases, their production and phasing in;
- New versions of the software, usually associated with a change in the leading digit in the release number of each product.

There are inevitably grey areas between the two. Though it is theoretically possible to disentangle the two concepts (support and maintenance), it is also necessary, as it helps to focus the service which can be delivered:

- The difference between a fix and a patch can be hard to distinguish;
- Identification of errors involves disentangling user operator errors from product bugs;
- New releases may contain both corrections to previously reported errors and new functionality, the latter built in as an analysis of user requirements is fed back to central software production.

Maintenance involves changes to a software product at three levels:

- Enhancements, for example changes to tax rules brought about by Government legislation;
- Intermediate software releases, covering mainly corrections to reported errors and modifications to achieve good performance levels;
- New versions in which the main emphasis is on either new amounts of functionality in the product of a new design to encompass both new function and its integration with higher performance overall.

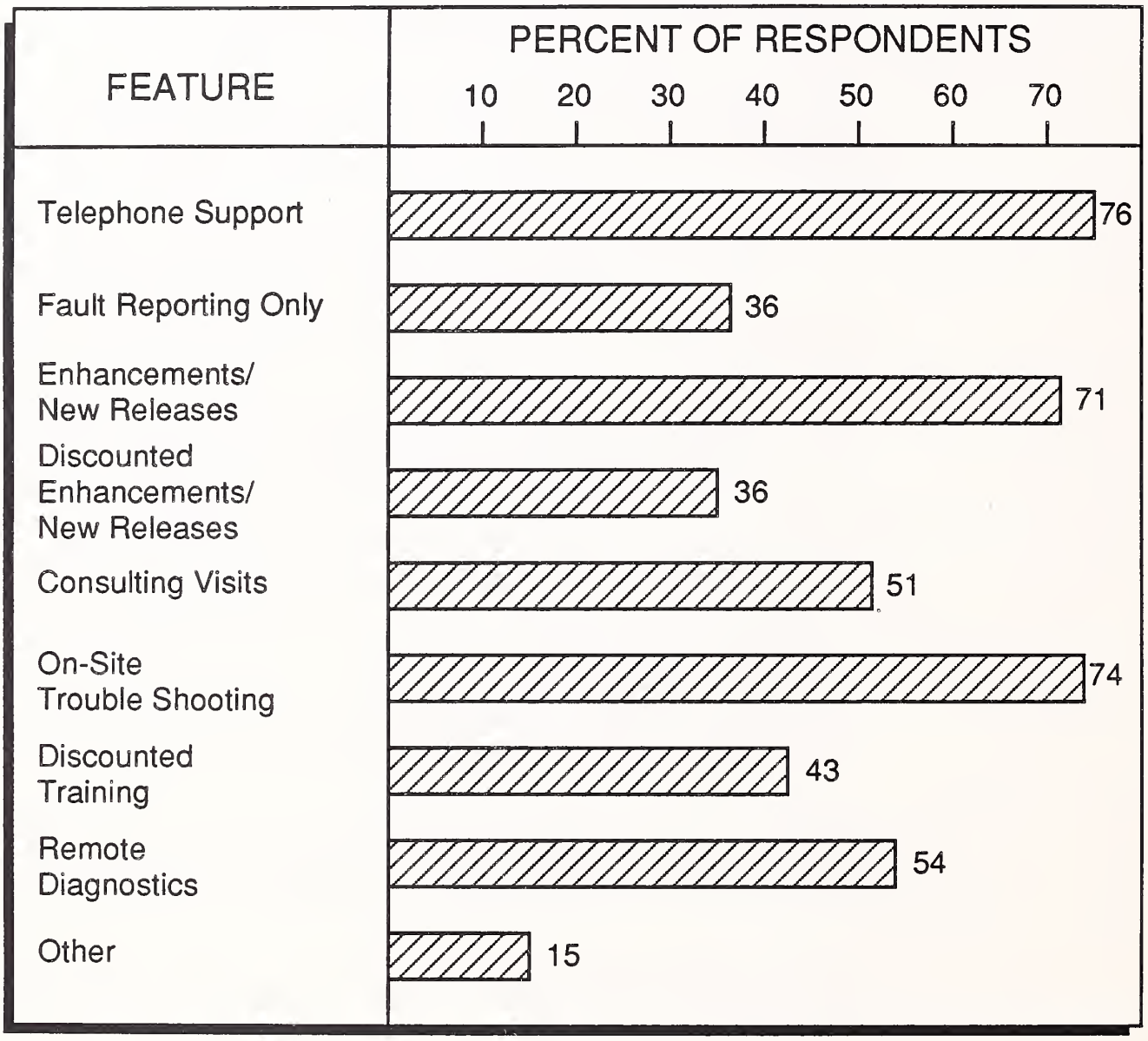
There is a constant, time-honoured need for the support contract, primarily to define the obligations on both sides in this otherwise confusing commercial area.

Exhibit V-2 illustrates the user view of product support contracts as applied currently to application software..

Over two thirds of contracts include telephone support, free product enhancements at some level, and on-site trouble shooting when necessary. The use of remote diagnostics and error logging is reported to have exceeded the 50% level, as also has the use of consulting visits under the aegis of the contract.

EXHIBIT V-2

APPLICATION PRODUCT SUPPORT FEATURES IN USERS' CONTRACTS (Out of 174 Responses)



Certain contracts include higher levels of support than others and this accounts for the figures of what would appear to be mutually exclusive items aggregating to more than 100%, e.g., few enhancements and discounted enhancements can coincide in one user's contract, if one level of support is taken for some of his products and a lower level for others.

B

Support Contract Pricing

The breakdown by the different charging methods for the support of application products by contract is shown in Exhibit V-3, according to the experiences of users across Europe:

- The principle methods reported are those where a fee is raised calculated upon a percentage of the licence fee, whether it is an initial licence or one paid for with a periodic charge. The percentage of the installed base maintained by these two methods is around 30% and 40% respectively;

- A significant percentage at 10% have their software support bundled into the licence fee, of whatever type.

There are noticeable country differences in this analysis:

- West Germany has the least use of fees of an initial nature and most are of a periodic type. This reflects the strength of IBM and its imitators in this country, and it operates to such an extent that it seriously influences the overall European mean;

- Italy has many individually negotiated support contracts;

- France, UK and Benelux countries all use the percentage of a one-time fee to a greater extent than the regular fee.

The UK has the least number of unsupported products; France and Italy have the most. This reflects the greater degree of customisation in these last two countries.

Exhibits V-4 and V-5 tabulate the range and the average support contract price levels recorded by users and vendors respectively:

- The charts have only analysed prices recorded as a percentage of the licence fee method, although it was noted that the market as a whole was moving away from a pure percentage pricing basis and towards the use of a fixed fee per product calculated on a cost plus basis;

- It was not possible to make an exactly similar breakdown in both cases of user and vendor.

Exhibit V-4 gives a breakdown by country and compares the range of one-time fee percentages versus the range of regular fee percentages. These second type were standardised such that the percentage quoted was estimated to be a percentage of the one-time or equivalent one-time fee.

Overall, we see that support is costing between 9% and 14% per annum of the current one-time equivalent licence fee.

EXHIBIT V-3

APPLICATION PRODUCT MAINTENANCE CHARGING METHODS AS REPORTED BY USERS

CHARGING METHOD	PERCENT OF APPLICATION PRODUCTS MAINTAINED						
	West Germany	France	United Kingdom	Italy	Benelux	Scan-dinavia	All Europe
Not Maintained Under Contract	6	15	1	15	4	12	8
As a % of a One-Time Fee	10	33	34	23	40	38	29
As a % of Periodic Fee (A/Q/M)	67	32	29	3	38	42	39
At Fixed Price Irrespective of Product	5	2	19	5	5	2	7
Bundled into Licence Fee	6	18	16	18	-	5	10
Other*	6	-	1	36 +	13	1	7
TOTAL	100	100	100	100	100	100	100

* By use of product, on demand, budgeted as an accessory.
\+ Individually negotiated contracts.

Exhibit V-5 is a two-by-two table tabulating a breakdown by the manufacturers and the independents against system and application software:

- The manufacturers charge somewhat less than the independents for support;
- There is no significant difference between the charge for system and application software.

EXHIBIT V-4

PRODUCT SUPPORT/MAINTENANCE PRICE LEVELS REPORTED BY USERS

COUNTRY MARKET	LEVEL AS PERCENT OF LICENCE FEES			
	ONE-TIME FEES		REGULAR FEES	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
West Germany	5.0	10.0	10.0	15.0
France	10.0	15.0	10.0	30.0
United Kingdom	5.0	20.0	8.0	30.0
Italy	10.0	30.0	10.0	20.0
Benelux	10.0	12.0	2.0	14.0
Scandinavia	5.0	20.0	3.0	20.0
All - Range	5.0	30.0	2.0	30.0
- Average	8.9	13.3	9.5	14.0

The vendor figures correlate well with the user findings lying between 10% and 17% per annum of equivalent licence charge. This slight increase over the users' quoted percentages reflects the fact that they are the asking prices as opposed to user figures which are more likely to relate to final amounts of expenditure.

C

Installation and Warranty

The software commissioning phase is the most critical period for the user. The vendor (both manufacturer and independent alike) must cover his activity costs for this phase out of a) the licence fee and b) any additional training charges levied.

INPUT notes the long-term trend to use training as a form of cost externalisation during this phase. It has the effect of putting the onus on the user to use the purchased product effectively, thus limiting the degree of questions likely to be raised with the supplier, or at least allowing those questions to be accurately phrased and focused.

EXHIBIT V-5

PRODUCT SUPPORT/MAINTENANCE PRICE LEVELS REPORTED BY VENDORS

TYPE OF VENDOR	LEVEL AS PERCENT OF LICENCE FEES			
	SYSTEM SOFTWARE		APPLICATION SOFTWARE	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
Manufacturers	1.0	22.0	5.0	20.0
Independents	7.0	40.0	9.0	40.0
All - Range	1.0	40.0	5.0	40.0
- Average	9.6	16.8	9.9	15.6

Most system software is user-installable and it is also possible to have an independent supplier support it if the product is in the public domain.

- Installation support required for application software will depend upon:
- The size and complexity of the product,
- The complexity of the user's application requirements.

Warranty on software is a thorny subject because software differs from hardware in that bugs appear at the start of its life to a greater extent than at the end, the exact opposite of what happens with hardware. Current usage is to offer commonly one year on major products. This means that the licence fee must include cost cover for vendor first-year call-out activities. This explains the market move to the use of more up-front initial charging as the complexity of user systems increases with time.

Extended warranty as a user "lock-in" mechanism can act against, rather than for the vendor, since it makes the vendor less able to justify an

ongoing support charge which is customer- rather than product-orientated. Vendors should thus carefully examine any proposals to increase the warranty period offered rather than blindly follow current trends to extend warranty cover, as is happening on hardware systems.

D

Ongoing Support

After successful product commissioning the user needs are:

- Good documentation (documentation is the Cinderella of the software field),
- Assistance in developing the operational use of products within an overall system,
- Information to help the user understand the vendor's product enhancement programme,
- Regular visits to allow the user to co-ordinate application and system thinking,
- Possibly, also help with new release installations.

The vendor needs a contract to cover the majority of these activities but must also have in place a 'floor' level of support free of charge to cover the following:

- Fault reporting,
- Provision of fixes, even up to on-site trouble-shooting level,
- The ability to satisfy customers who only want to receive fixes and not enhancements,
- No penalty for having no support contract, but possibly a penalty for upgrading to full support after the end of the warranty period,
- A level of support during the warranty period which is geared to the contract support level taken out at commissioning time. This in effect means that there will be continuity of support level across the end of the warranty period, and the level of support will be continuous, i.e., a function of the level of support contract actually taken out by an individual user, if there are more than one contract support levels on offer from the vendor.

The last two aspects recommended above mean that selling of the support/maintenance contract must go hand in hand with the selling of the product. It is advisable not to have more than two levels of chargeable support.

E

Training

Exhibit V-6 shows the main extra services chargeable on an ad hoc basis by the vendor community. It has become an industry standard, as demonstrated by this analysis, to have education and product training charged separately, and this is to an extent an industry issue, although many vendors still like to offer a certain amount of training bundled as a form of credit, e.g., a number of days, a number of hours, or a number of course places.

The overall vendor image can be very highly influenced by the level and professionalism of training courses offered.

The other services charged mainly relate to the initial installation and commissioning period and show how Professional Services inevitably follows in the wake of good software product installation.

F

Other Chargeable Services

Exhibit V-7 lists some vendor comments on the type of extra services they see it necessary to offer. Key points in their comments are:

- Increasing use of joint venturing with professional services and consulting companies,
- Use of different levels of support service contractable,
- Increasing trend to blur the distinction between software houses and software product companies; this trend is likely to be felt on both sides of the barrier.

The fact that the majority of extras are associated with the initial installation period highlights the difficulty of being able to charge later for ad hoc bits of work which might exceed the definition of free support and maintenance. This reinforces our belief in the need for on-going support contracts.

INPUT recommends that, if possible, only one level of user support contract is on offer, and certainly not more than two levels.

With one chargeable support contract level, the user is given four choices:

- A basic bug fixing service (i.e., no support contract and no ongoing enhancements);
- A support contract, in which the user can get bugs fixed and be sure of keeping up to date with the latest version of the software;
- Either of these two above situations can be combined with the use of ad

EXHIBIT V-6

OTHER CHARGEABLE SERVICES OFFERED BY VENDORS

SERVICE CATEGORY	NUMBER OF MENTIONS			OVERALL WEIGHTED RATING (Percent)
	1ST MENTION	2ND MENTION	3RD ETC. MENTION	
Education & Training	15	2	1	39
Consultancy	2	4	3	13
Systems Development	2	4	1	12
Installation & Start-up Services	2	1	1	7
Customisation	1	3	-	7
All Professional Services (including Turnkey)	1	3	-	7
Others* and Not Known	5	2	-	15
TOTAL	28	19	6	100

* Includes: Trouble-shooting, hardware integration, interfacing, specials for OEMs, technical audits and assistance, performance analysis and documentation.

EXHIBIT V-7

VENDOR COMMENTS ON SERVICES THEY OFFER EXTRA TO STANDARD SUPPORT CONTRACTS

- We don't offer any. The demand (it's there) is met by specialist software houses. This policy is stable.
- We intend to launch a family of micro-based accounting modules later this year. The Ernst & Whinney accounting group has helped us to 'anglicise' the software for U.K. accounting standards. They will be involved in second-line support.
- We can do bespoke development, but it's too early for us to sense any user trends.
- Some branches offer a higher level of support.
- Installation, which may take several weeks if it includes training and hand holding, is bundled into the one-time initial fee.
- We want to see more Professional Services assignments, for such things as strategic planning and adoption of methodologies to customer sites. This will become a separate business.
- The vendor must offer a complete raft of products and services. We do and this gives us greater scope as suppliers.
- Systems integration, e.g. CAD/CAM linked to MRP, is a growing segment in our overall business.
- We are currently engaged in consulting contracts with large organisations.
- Support is offered on two tiers: basic and 'with services'.
- Extra services can be contracted as part of an annual support agreement at a premium over the price of basic support. More likely they will be at T&M rates or on a fixed price quotation.
- We offer a full customisation service including:
  - Site Management,
  - Software Development,
  - Contingency planning.

hoc professional service assistance at the vendor's current daily rates, or from a third-party software house.

Exhibit V-8 shows the analysis of European users' suggestions for inclusion of further chargeable services. As might be expected, users do not easily come forward with such ideas, the majority in fact report to be looking more to improve present service or to leave the content of what they receive "well alone".

The rating of the suggestions illustrated demonstrates the difficulties attendant upon the issue of New Releases and Enhancements. In emphasis this is followed by Application Support, and Improvement to Client Contact and Communication, running each other equal second.

Recommended techniques for improving vendor support image are:

- Increased use of consulting visits,
- Arrangements with third-party suppliers to achieve this if the vendor is resource bound,
- Use of a very high level of consultant to establish 'a caring image' in cases where the vendor believes that he or she has a whole series of poor relationships with individual users.

EXHIBIT V-8

USERS' SUGGESTIONS FOR FURTHER CHARGEABLE SERVICES

TYPE OF SERVICE	PERCENT OF RESPONDENTS						
	West Germany	France	United Kingdom	Italy	Benelux	Scan-dinavia	All Europe
Application Support and Consultancy	5	0	4	0	8	13	6
Better Response and Repair Times	5	-	4	-	14	-	5
Education and Support Relating to New Releases/ Enhancements	5	-	3	50	21	7	8
Closer Communication Client to Contractor	10	-	7	-	7	-	6
Other*	-	-	7	-	-	7	3
No Suggestions +	75	100	75	50	50	73	72
TOTAL	100	100	100	100	100	100	100

* Improvement in contractor staff quality, out-of-hours cover, nearer service base, better training.
\+ Includes users who report satisfaction with their supplier's support services and those who would not purchase further services until the existing ones are improved.

Software Maintenance

Software Maintenance

A User Satisfaction

Users were asked to compare their experience of the support offering supplied by the hardware manufacturers and the independent vendors. The result of this analysis is shown in Exhibit VI-1, in which a set of moderate satisfaction ratings have been recorded against both types of supplier.

A satisfaction level of 7, on a scale from 0 - 10, is very closely reached in all cases. Occasionally the rating falls close to 6 but in no case does it fall below that level and in only a few cases is it measurably above 7.

It is difficult to separate the two types of supplier on the basis of these findings, although the independents are marginally better than the manufacturers, having 6 wins over them as opposed to the manufacturers' 4 wins out of 10 the other way.

The conclusion that nothing is outstandingly good or bad in this area must be compared with the equivalent user ratings for Hardware Service as shown in INPUT's service programme reports. Software vendors have a long way to go and must work hard to improve this state of affairs.

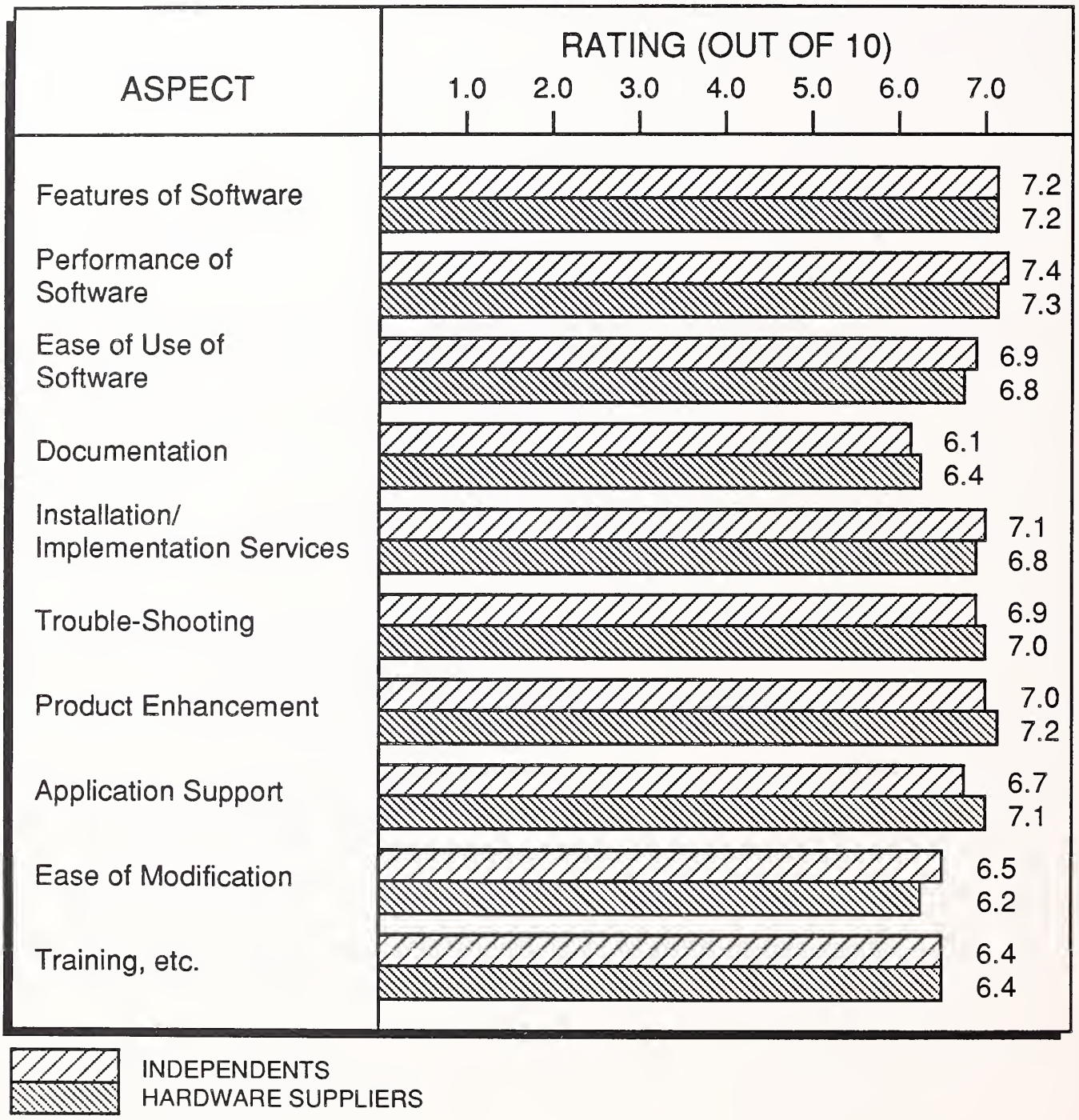
Documentation has the lowest rating of any aspect, followed by Ease of Modification. The best ratings are related to the functionality and performance of the software.

Exhibit VI-2 shows what users feel to be their major support problem. INPUT's analysis separates the problem areas quoted into two categories:

- Those that are product-orientated, such as the performance of the software or the documentation quality;
- Those that are service-orientated and therefore more easily cured with improvements to perceived service quality.

EXHIBIT VI-1

SATISFACTION RATINGS
HARDWARE VERSUS INDEPENDENT VENDORS



Range of Standard Error: 0.1-0.2

EXHIBIT VI-2

USERS' PERCEPTIONS OF THEIR MAJOR SUPORT PROBLEM

PROBLEM AREA	PERCENT OF RESPONDENTS MENTIONING						
	West Germany	France	United Kingdom	Italy	Benelux	Scan-dinavia	All Europe
PRODUCT ORIENTED Software Performance, Reliability, Complexity	5	-	7	-	-	-	3
Poor Documentation, Difficulty of Modification	-	6	-	18	-	-	3
New Versions/ Enhancements	4	11	19	9	7	-	9
SERVICE ORIENTED Initial Implementation, Installation	10	11	4	9	7	5	7
Engineer Response Times	5	39	11	27	29	9	18
'Repair'/Fix Times	4	-	15	-	7	9	7
Application Advice	-	-	-	19	-	-	2
Inadequate Training	5	-	4	-	-	5	3
Staff Quality - Own Staff	10	-	-	-	-	4	2
- Software Contractor's	5	22	-	18	-	4	7
LITTLE OR NO PROBLEMS	52	11	40	-	50	64	39
TOTAL	100	100	100	100	100	100	100

40% of users reported no major problem. Among the 60% who had perceived major problem 45% reported a problem which lay within the service-orientated category, with the other 15% reporting a product-orientated fault.

Among the service-orientated problems, the ranking of problems by seriousness was as follows:

- Response times of software engineers ranked highest;
- Equal second were three problem areas:
  - Initial implementation,
  - Repair and fix times,
  - Software contractors' staff quality.

Among the product-oriented problems the major category was associated with the Implementation of New Versions and Enhancements of software products, again emphasizing the need to improve the whole service function associated with this element of support.

With the sole exception of the improvement to product maintenance associated with the issue of new versions and new enhancements, the main accent to be placed on the whole support contract is to emphasise and re-emphasise the need for the **service** image to be improved.

The information requirements associated with new enhancements and new versions requires a completely new approach on the part of vendors.

This area is on the border line between the product maintenance function and the customer support function. The user will be committed at this stage to the vendor product and will feel to that degree vulnerable, but the requirement for support is nevertheless customer-oriented since it will involve potentially new procedures and new application functions.

B

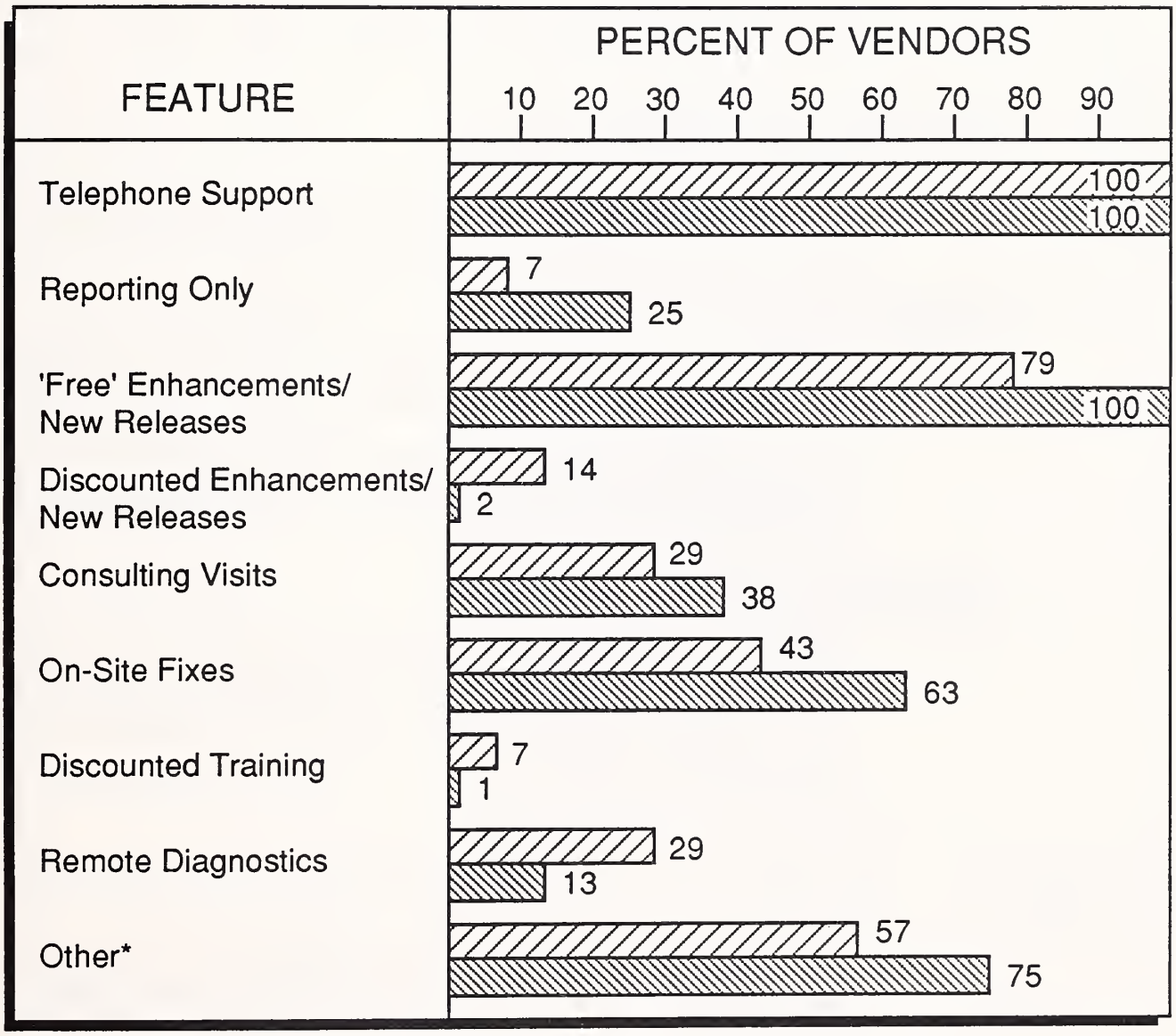
Differences in Maintaining System and Application Products

1. System Software

Exhibit VI-3 shows the breakdown between manufacturers and independents of the features incorporated in software support contracts for system software products. Among the nine features rated by usage we find that in most cases manufacturers come out better than the independents in terms of the facilities provided, one notable exception being the use of remote diagnostics in software debugging, where the independents have over twice the penetration of the manufacturers.

EXHIBIT VI-3

SYSTEM SOFTWARE SUPPORT FEATURES BY TYPE OF VENDOR (By User View)



* Documentation Updates, Warranty Support, Support Levels Linked to Contract, Guarantees against Impact of Hardware Evolution.

INDEPENDENTS
MANUFACTURERS

In some cases where the manufacturers score better than the independents, for example with the provision of free enhancements and new releases, the independents are matching this by offering discounted fee levels for the new releases and enhancements.

The generally better rating of the major equipment suppliers in this area is taken to reflect the greater commercial backing which the larger organisations can provide, but independents must read these findings and recognise the benefits brought by economies of scale in such a relatively mature market as that of system software.

2. Application Software

Exhibit VI-4 shows a similar support contract feature breakdown for application software, but this time the comparison is between the user and the vendor perceptions of the quality of service implied. Some significant differences of perception are revealed:

- Telephone support is to some extent seen by the users as, although provided, in fact merely a reporting facility and not a debugging one;
- Free enhancements and new releases claimed by the vendor community would appear to be in practice realised to a greater extent as mere discounts over the new fee charges raised for new versions of equivalent products.
- Certain of the reputable vendors are now offering discounts on training and also remote diagnostics. Because these vendors command a reasonably large market share, they can swamp the user sample and thus these two features appear heavily to outweigh the vendors' perception by percentage of sample.

C

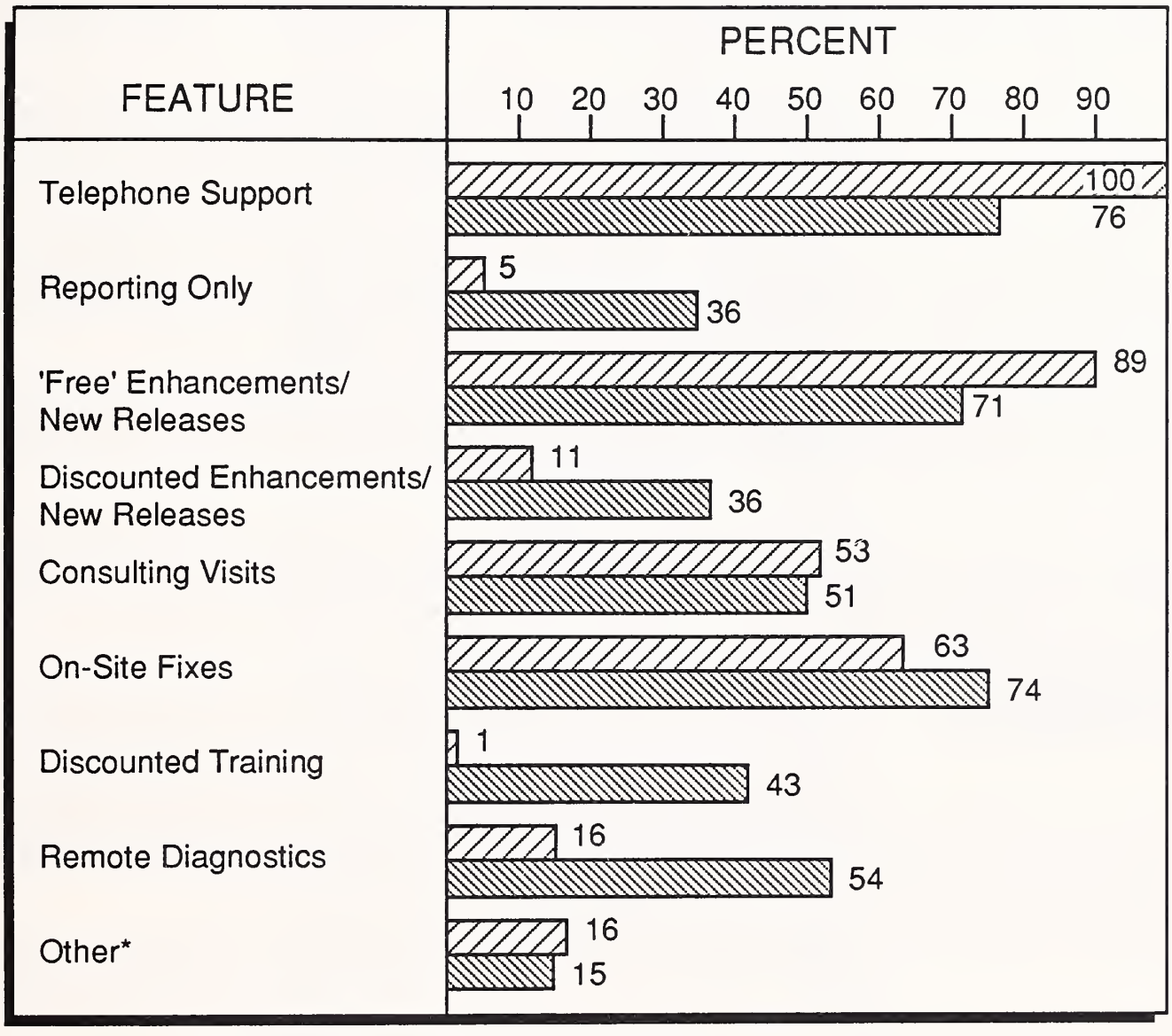
New Releases and Product Upgrades

Essentially this is a complex area and its complexity is caused by the three levels at which new versions of software may be required:

- Periodical issues of software will require sweeping up the bugs which have appeared, been reported and corrected during the period since the last revision;
- Certain corrections to the system will involve re-programming to achieve performance improvements requested by users where the actual performance achieved fell below the desirable level;
- Non-major but new functions may need to be implemented at intermediate level release stages.

EXHIBIT VI-4

APPLICATION SOFTWARE SUPPORT CONTRACTS USER VERSUS VENDOR



* Documentation Updates, Newsletters, Bundled Training

VENDORS
USERS

These three different types of change to the software vary with the degree of vendor responsibility for their correction. Bugs must be cured free of charge by the issue of patches; new functions should strictly speaking be chargeable as they increment the software's content, while performance improvements lie in the grey area, where the responsibility between user and vendor falls in bearing their cost, and which might become a matter of dispute.

It is because of the complexity and interaction between problems lying in these three areas that there is essentially no substitute for the need to be able to support users with consulting help on a chargeable basis. For this reason support contracts need to be taken out and they need to be adequately costed for both vendor and user to arrive at a mutually satisfactory solution. INPUT therefore recommends that consulting help to cover areas which are in the grey area between user and vendor responsibility should be covered within the standard support contract.

Users, who want help with patch installation only but without requiring updates, should be able to purchase this extra facility at daily time and materials rate from their vendors.

The difficulty is in handling users without a support contract. This in INPUT's view proves the need for some ongoing fee revenue stream. This matter is taken out in more detail in the next chapter.

D

Documentation and Field Distribution

It has been known for users to be let down in this basic area. This is a matter of logistics. Faults have been found with certain vendors, for example, in correctly matching software revisions to their customer base. A customer obtains an update which does not apply to his release situation, or alternatively the pack of updates sent to him has been badly packaged and is received in an unimplementable form.

INPUT recommends that vendors examine new technologies and their possibilities for improving the software and documentation distribution function:

- Network services allow software to be downloaded directly to users who have a connection, e.g., for remote diagnostics;
- Optical media allow for the distribution of text and image information in documentation, as well as the latest software revisions.

The advantages of using on-line transmission media for updates are the speed and accuracy with which the information can be transmitted to the user. Optical media, while offering slower update facilities, are superior in that they permit the user to employ some form of selection between those facilities which are required and those facilities which are not

thought to be worth installation at that time. They also are superior in providing for cross-border information flow without invoking the problems of networking across countries.

E

Image of the Software Maintenance Task

Both users with their in-house development teams and vendors with a field maintenance function to keep running, must suffer from the same dreary routine nature of the software maintenance task. Most software professionals prefer to be in the front line of new developments, but it is well-researched that 60% of the total workload of systems teams lies in the day-to-day maintenance of existing systems.

It is necessary for all vendors with a software maintenance function to revive the flagging motivation of these internal teams and thereby increase their profit margins by exploiting any new technology which may be applied to this area. The whole problem will become that much more difficult with the advent of the KBS (Knowledge-Based Systems). Techniques tracing a fault in the design of the actual system becomes more difficult in fifth generation systems because the capability of handling general designs has been increased, and most programs will contain instances of generalised facilities.

Product vendors must stress the ease of maintenance of their products and must sell to this strength as early as possible in the sales cycle. CASE (Computer Aided Software Engineering) offers a potential solution to this pressing problem with the software development and maintenance task. See INPUT's report **Computer Aided Software Engineering in Europe, 1987-1992.**

F

Software Renewal

This is a relatively new technique and has relatively few practitioners at this time. It involves the transformation of old and messy software into "as new" structured programs. This is achieved by the use of sophisticated conversion software which incorporates some artificial intelligence techniques.

The benefits of using these techniques to produce revitalised software programs sometimes produced by early versions of development techniques, (e.g., straight COBOL programming of the third generation), are that:

- Maintainability is improved;
- The expertise of the users trained personnel can be preserved or extended;
- User staff can be released to be trained on new products instead of being tied down to maintaining old;

- Existing staff can get on with the work of installing new systems and new products parallel with extending the life of the old.

This all goes to make the software personnel budget go further and the software team's motivation that much higher. Product vendors should examine the compatibility of their own products with tools of this type. They should even build them into their new product environment. This may involve making arrangements with the vendors of such complementary tools, or the purchase by acquisition of companies with this capability.

Facing the Future

Facing the Future

A

Growth of Products Market in Europe

The growth of the software products market affects all computing services vendors operating in the European market, and not only those producing/selling/distributing the products themselves, since:

- Products are now integral to any system at three levels:
  - Traditional systems software for all general-purpose applications,
  - Utility products and the range of tools specially DBMS, 4GLs and 5th generation products,
  - Application products, popularised by the spread of the PC.

All this software product growth will impact:

- In-house development, where it is increasingly hard to justify the long lead times which go with 3rd generation development methods,
- System and Software House work, where it is hard to justify totally tailored software development.

Systems houses must now resort to:

- Use of better parameterised products,
- Use of proprietary kernel software to build up to integrated systems,
- In future, use of expert system shells, AI toolkits and engineering workbenches.

Exhibit VII-1 summarises the users' experience in growth in real terms across the Western European countries researched. Differences which are illustrated are:

- Italy and France exhibit the fastest product growth, since these are the least mature markets at present,
- Scandinavia, West Germany and the Benelux countries also show healthy growth figures,
- Only in the U.K. does there appear to be a pause in growth, caused by the intense interest in 4GL tools to assist in-house work, in a market already undergoing intense competitive pressures.

The expenditure curve for software maintenance contracts registers in the application area a slower growth than the application products themselves. Except in Scandinavia where a rate of 10% is expected, other countries are not likely to exceed a growth rate much above the 5% registered last year.

EXHIBIT VII-1

SOFTWARE PRODUCT EXPENDITURE GROWTH RATES REPORTED BY USERS

SECTOR	PERCENT OF ANNUAL GROWTH 1986-1987						
	West Germany	France	United Kingdom	Italy	Benelux	Scan-dinavia.	All + Europe
Application Software Products	15	26	7	39	13	25	20
Application Software Maintenance	5	-	6	5	7	10	5

+ Weighted according to size of each country market.

B

Forecast Pricing Trends

The software products market is competitive. Many hundreds of vendors are present in it. These range in size from the largest hardware vendors down to specialist companies employing no more than ten persons.

All can co-exist in the market because there are many sub-sectors and specialist niche segments. INPUT anticipates the number of companies operating in the market to be reduced over the next five years.

Price trends will be affected by price sensitivity in the different sectors of the market. The issues of price are discussed by the vendors in their comments shown in Exhibit VII-2. In the main, vendors do not perceive that great a degree of price sensitivity is needed, or else they think it can be compensated for by other factors in their favour.

1. Mainframe/Minicomputer-Based Products

Exhibit VII-3 shows the price movements which have taken place in this sector over the last 12 months and anticipated to occur in the next 12 months and through to 1990.

This is shown against the three major sub-segments of the market:

- Systems software,
- Industry-specific application software,
- Cross-industry application software.

The application software segments appear to be more price-sensitive than the system software because of the higher competitive nature of the market-place for applications and the relative maturity of system software.

Cross-industry software is more mature than industry-specific and a smaller number of large vendors have captured that sector. Anticipated price rises have been calculated by INPUT taking into account vendor reports and previous price movements recorded. Overall the price rises anticipated per annum through to 1990 are of the order of 5% in the large machine area. It must be recognised that this level of price increase is an overall one and there will be significant variations on each side depending upon the different sectors involved.

2. PC/Business Microcomputer Products

There is a similar chart for the smaller machine product sector as shown in Exhibit VII-4.

EXHIBIT VII-2

VENDOR COMMENTS ON PRICE SENSITIVITY

- Industry-specific software is now price sensitive in our sector. However, costs could be more than doubled before our customers looked on it as a significant reason for not buying.
- With our system software, it is buried in large contracts and so its price is not sensitive.
- Sensitivity is low as the bulk of the cost is on the hardware.
- We have been also in the consumer end of the business for a year now. It is a jungle.
- In the mini area, price sensitivity is reduced since software is still the minority revenue stream.
- Quality and security come first. Price is only an issue if you have crossed a certain threshold of credibility.
- The Unix market is moderately price-sensitive; there are specialist niches in it becoming available.
- Our top-end products are more expensive than rival North American products. We believe we have the edge, however, in the area of Human Resources systems, whereas MSA, MMS and McCormack & Dodge are strongest in accounting and financial applications.
- Overall prices will rise between now and 1990.
- Though our sector is price-sensitive with respect to low-end products, users soon learn they are up a cul-de-sac with micro-based systems.
- Functionality is the main buying criteria in the West German NASTRAN market, but budgets are limited.
- There is no direct competitor to our network management software. Therefore price is not an issue.

EXHIBIT VII-3

PREVIOUS AND ANTICIPATED PRICE MOVEMENTS IN EACH SECTOR MAINFRAME/MINICOMPUTER SOFTWARE

SOFTWARE SECTOR	AVERAGE ANNUAL PRICE RISES (Percent)		
	PREVIOUS 12 MONTHS	NEXT 12 MONTHS	THROUGH 1990
System Software	5.0	4.5	4.8
Application Software Industry-Specific	1.9	3.6	5.3
Application Software Cross-Industry	1.8	3.3	4.8

In general, microcomputer software is more price-sensitive than large machine software.

Except for the system software segment, all three sectors expect greater price rises through 1990 than the equivalents in the mainframe/minicomputer area. This is due to:

- The increasing penetration of multi-user systems,
- The additional functionality which will accompany the introduction of 80386 chip-based systems.

3. Software Support Contracts

Software support is rated to become increasingly important to all vendors although users anticipated smaller growth rates. Exhibit VII-1 showed the

EXHIBIT VII-4

PREVIOUS AND ANTICIPATED PRICE MOVEMENTS IN EACH SECTOR MICROCOMPUTER/PC SOFTWARE

SOFTWARE SECTOR	AVERAGE ANNUAL PRICE RISES (Percent)		
	PREVIOUS 12 MONTHS	NEXT 12 MONTHS	THROUGH 1990
System Software	5.3	4.5	4.3
Application Software Industry-Specific	3.3	5.6	8.5
Application Software Cross-Industry	4.5	4.0	6.5

anticipated 5% or more short-term trend. As the installed base of products grows the contribution to revenue from support will also increase, but in Western Europe it is not expected to exceed 20% of all product revenue until the early 1990's.

C

Formulating a Pricing and Support Strategy

The interaction between pricing and software support was not easily perceived by the vendors interviewed for this study. In Exhibit VII-5 we list the vendor reactions recorded, when asked to comment on the need for a combined marketing strategy, covering both pricing and support aspects.

A range of conflicting forces can be seen at work in this area. The need for a combined marketing strategy is that:

- Support must be given to justify the price level asked;

- The price must be such to maintain the revenue stream to fund support and ongoing enhancements.

The key to overcoming this dilemma is in vendors adopting a simplified charging mechanism. The key to success lies with the charging mechanism, more than the actual tariff levels requested. Vendors are currently operating with great effort at the tactical level in setting pricing levels, but are neglecting the strategic re-think of how their charging mechanisms are viewed by the user community.

INPUT believes that vendors must maintain an ongoing annual revenue stream to fund their service-orientated, people-based support activities.

The ideal and simple solution is practised by only a handful of vendors, see Exhibits III-3, III-4 and III-5. The option referred to is that where a vendor charged a first-year fee in year one plus lower fees for second and subsequent years, these fees to include both the right to use licence fee and the support.

The advantages of this charging mechanism, which is still in a tiny minority in the market place, are as follows:

- It allows for a reasonably sized up-front lump sum **and** a continuing ongoing annual revenue stream - INPUT's first and major criterion for success;

- Pricing can be tuned between the two elements in the mechanism to achieve profitability;

- Most importantly it avoids the user perceiving extra charges for support, which he may dislike;

- It makes no distinction between supported and unsupported customers, thus removing at a stroke, many administrative and operational headaches;

- It can be combined with other elements of charging, e.g., by processor power rating or by numbers of workstations or terminals or keyboards.

On the other hand, the majority of today's software vendors are placed at one or other end of the spectrum, far from the ideal situation:

- Either they have gone solidly for a large initial fee, and an ongoing maintenance contract;

- Or they prefer some form of regular ongoing fee covering the licence and maybe another fee to cover support also.

EXHIBIT VII-5A

THE IMPACT OF A SUPPORT STATEGY (Vendor Comments)

- Lower the initial price; gain a good ongoing revenue stream.
- We've intrduced a guaranteed system buy-back option (if not more than three years old).
- Put your documents fully on-line and make it accessible via 'windows'.
- Maintenance and support for critical or sensitive applications may become a legal necessity like car insurance.
- An annual user get-together is useful. We hold two a year. We also keep in touch with a technical newsletter.
- We see things the other way around. The products help us to operate in the professional services market. With useful products we are able to make effective bids for a total solution.
- By investing $3 million a year in product enhancement we can show that the improvements to its value are of the order of 20-25% each year.
- Good support commands a price to justify its cost, but it must include ongoing enhancements.
- Support helps to evolve the product line for software as well as hardware.
- Good support is what we are known for on all three of our product areas. 45% of our staff are engaged in either pre- or post-sales activity.
- We sell on having West German products with local support and local reference sites.
- We are establishing links with third-party software houses, both small and large, who can maintain and support our products.

EXHIBIT VII-5B

THE IMPACT OF A SUPPORT STRATEGY (CONT.)

- The way to contain costs is to make good products; it will keep support levels within bounds.
- The annual licence means that everyone is supported. There is no distinction in the customer base between 'contracted' and 'non-contracted' users.
- The user needs to be offered options, such that his decision can reflect a balance between discount (price, if you like) and support.
- In our Applications Division, the ratio of support to sales personnel is 3:1, and its certainly greater than 1:1 in all divisions.
- We spend 15% of revenues on support and ongoing enhancements.
- We have an enormous commitment to client satisfaction, but regard pricing as a separate issue.
- Support is vital. All our dealers look to us, since it's going to affect their sales if our support diminishes user satisfaction.
- The percentage of our revenue earned in service and support is expected to almost double between now and 1990.
- Customers feel comfortable with our technical guys.
- A balanced hardware/software capability is the key.
- In my mind support is not coupled to pricing. Both I and my competitors must charge for specific items of support.
- Good support is key to winning orders or repeat business. However you need well-paid staff to be able to provide it and this must be reflected in its cost to the user.
- Give a good service and that will act as a disincentive to 'piracy'.
- In young, growing markets we strive to maintain a hold on the distribution channels.

Both these prime methods used in today's market place leave support pricing as a separate issue, which is full of potential pitfalls associated with the 'three-cornered stool' of:

- Licence fee,
- Support,
- Maintenance.

All vendors should restructure their tariffs to embody the first-year fee plus lower subsequent year fee principal outlined above.

Then all problem areas of pricing, support and maintenance fall into place as cost management problems, soluble by the use of effective activity costing systems.

Problems thus become removed from the marketing area and placed firmly into the production cost management area.

D

Bundling vs.Unbundling

INPUT has searched very closely for the overall trend in the market place between bundling of products and services or on the other hand their unbundling. INPUT has been unable to detect any clearly measurable trend one way or the other.

Exhibit VII-6 lists 28 vendor comments describing their own plans and their perceptions of market movements for or against bundling. A totally confused picture emerges. Vendors are clearly acting on ad hoc sector-based hunches, with no real feel for overall strategy trends. They do not therefore understand how the market place is affecting and will affect their business styles.

This is the face of the software market also perceived by users. You could hardly blame them for thinking it is a jungle - a phrase constantly quoted to INPUT consultants over the previous months and years.

For vendors to extricate themselves and their industry from this morass, two cardinal points and only two points should be borne in mind:

- Unbundle functionality and set a price within a tariff so that the user can have and pay for the functions he requires at the market rates established at the time;

- Bundle in the support to the licence fee.

Therefore:

- The first-year fee will cover the cost of the major development, the

installation costs if any, the warranty period costs for the front-end period of heavy debugging;

- The second and subsequent year fees pay for customer support and ongoing product enhancements.

The corollary of being able to come to market with this simplified charging structure is the ability to institute first-rate costing systems giving management information on all aspects of their software product development:

- Initial development costs,
- Ongoing enhancement costs,
- Software documentation and distribution costs,
- Pre-sales support costs,
- Customisation, installation, and warranty costs,
- Post-sales customer support costs.

EXHIBIT VII-6A

VENDOR PLANS FOR BUNDLING AND THEIR MARKET PERCEPTIONS

- Our support formula is stable, nor do I see a trend to further bundling.
- We have introduced bundled on-line support (already two years ago in the U.S.) for corporations using strategic products.
- The trend is for more bundling, since 'value-added' is the principal purchasing motive. We are thinking about how we should respond.
- Education is the only aspect undergoing increasing bundling.
- IBM is trying to bundle in its software with the PS/2, but may fall foul of the EEC's anti-monopoly rules.
- In the long-term I see the bundling/unbundling at an overall static level.
- There is a trend to simplify pricing. The name of the game is value-added. Therefore the user pays for what he receives and this means unbundling as much as possible.
- We shall offer optional amounts of consulting days as part of our support in the first year.
- Our competitors do not seem to be bundling in any more support to their product.
- The motivation is crude—to simplify negotiations. Customers don't understand what they are getting. Again 'what the eye doesn't see, the heart doesn't grieve over' and bundling tends to cause fewer questions.
- Bundling is done on an individual product or individual customer basis, since we run our software side as a business. Other manufacturers do likewise.

EXHIBIT VII-6B

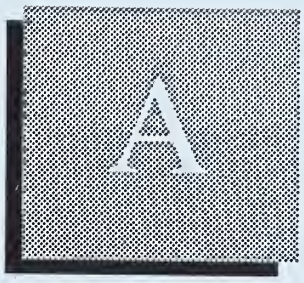
VENDOR PLANS FOR BUNDLING AND THEIR MARKET PERCEPTIONS (CONT.)

- We see more unbundling happening generally. For example, we have a clause in our contracts which allows us the right to charge for new functions or for latent functions which may be made available to the user.
- The move to a one-time fee is a partial rebundling as patches, fixes and updates are included.
- We hope to sell more product rather than push prices up.
- It is hard to see an overall market trend either way—for unbundling or for more bundling.
- There will be more bundling of effort into the maintenance function.
- Unbundling shows the customer what he is getting. It helps the relationship to be able to list the tasks. It also assists the selling process by raising more possibilities of 'gifts'.
- We are the first supplier to offer a bundled, but itemised, offering covering hardware, software, maintenance, and service for the small business user.
- We shall build in new modules to the system, reprice the whole thing but in total offer the user more function per unit price.
- The trend for bundling or unbundling is not clear.
- We are not so much bundling services into a general support and maintenance function as bundling options and functionality into new product. This goes hand-in-hand with unbundling and repackaging of modules into new products.

EXHIBIT VII-6C

VENDOR PLANS FOR BUNDLING AND THEIR MARKET PERCEPTIONS (CONT.)

- Our standard application product support offering will include a telemaintenance capability. A database of faults and incidents for interrogation by a PC is technically available, but we are holding back from releasing it just at the moment.
- There is a trend in France to prepackage software products. This involves selling standard sets of modules with less parameterisation.
- Recent IBM announcements suggest that more 'extras' will be given away, but the overall trend is still not clear.
- We are constantly unbundling. The user pays for functionality. That is a first principle of marketing.
- The market is basically static at an unbundled position.
- Our trend is to unbundle. Both trends are visible in our sector. The large equipment suppliers are still unbundling as they have been doing for 15 years. Some workstation suppliers are starting to rebundle and offer turnkey prices.
- For our educational sales, there will be more 'goodies' for the same money.



Definitions

Definitions

Information Services—The provision of:

- Data Processing functions using vendor computers (processing Services).
- The provision of database access where computers perform an essential role in the processing or conveyance of data.
- Services that assist users to perform functions on their own computers (software products and/or professional services).
- A combination of hardware and software, integrated into a total system (integrated systems).

A

Revenue

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

- NONCAPTIVE INFORMATION SERVICES REVENUE - Revenue received for information services provided within the four Western European country markets of France, Italy, the U.K., and West Germany from users who are not part of the same parent corporation as the vendor.
- CAPTIVE INFORMATION SERVICES REVENUE - Revenue received from users who are part of the same parent corporation as the vendors.
- OTHER REVENUE - Revenue derived from lines of business other than those defined above.

B

Service Modes

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

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

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

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

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

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

    - Access to a communications network.
    - Access through the network to the RCS vendor's larger computers.
    - Significant software as part of the service.

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

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

Processing services are further differentiated as follows:

- FUNCTION-SPECIFIC services are the processing of applications that are targeted to specific user departments (e.g., finance, personnel, sales) but cut across industry lines. Most general ledger, accounts receivable, payroll, and personnel applications fall into this category. General-purpose tools such as financial planning systems, linear regression packages, and other statistical routines are also included. However, when the application, tool, or data base is designed for specific industry use, then the service is industry-specific.

- INDUSTRY-SPECIFIC services provide processing for particular functions or problems unique to an industry or industry group. The software is provided by the vendor either as a complete package or as an applications 'tool' that the user employs to produce a unique solution. Specialty applications can be either business or scientific in orientation. Industry-specific database services, where the vendor supplies the database and controls access to it (although it may be owned by a third party), are also included under this category. Examples of industry-specific applications are seismic data processing, numerically controlled machine tool software development, and demand deposit accounting.

- UTILITY services are those wherein the vendor provides access to a computer and/or communications network with basic software that enables users to develop their own problem solutions or processing systems. These basic tools include terminal-handling software, sorts, language compilers, database management systems, information retrieval software, scientific library routines; and other systems software.

SOFTWARE PRODUCTS - This category includes users' purchases of applications and systems packages for use on in-house computer systems. Included are lease and purchase expenditures, as well as fees for work performed by the vendor to implement and maintain the package at the users' sites. Fees for work performed by organisations other than the package vendor are counted in professional services. There are several subcategories of software products.

- APPLICATIONS PRODUCTS - Software that performs processing to service user functions. They consist of:

  - CROSS-INDUSTRY PRODUCTS - Used in multiple-user industry sectors. Examples are payroll, inventory control, and financial planning.

  - INDUSTRY-SPECIFIC PRODUCTS - Used in a specific industry sector such as banking and finance, transportation, or discrete manufacturing. Examples are demand deposit accounting and airline scheduling.

- SYSTEMS PRODUCTS - Software that enables the computer/communications systems to perform basic functions. They consist of:

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

  - DATA CENTER MANAGEMENT PRODUCTS - Used by operations personnel to manage the computer system resources and personnel more effectively. Examples include performance measurement, job accounting, computer operations scheduling, and utilities.

  - APPLICATION DEVELOPMENT PRODUCTS - Used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Examples include languages, sorts, productivity aids, data dictionaries, data base management systems, report writers, project control systems, and retrieval systems.

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

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

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

- CONTRACT STAFF - User-managed temporary EDP staff supplied by service organisation.

- CUSTOM SOFTWARE DEVELOPMENT - Including system design, programming, testing, documentation, and project development.

- FACILITIES MANAGEMENT (FM) - The computers are owned by the client, not the vendor; the vendor provides people to operate and manage the facility and communications links, if appropriate.

STANDARD TURNKEY SYSTEMS - An integration of systems and applications software with hardware, packaged as a single entity. The value added by the vendor is primarily in the software. Most CAD/CAM systems and many small business systems are standard turnkey systems. This does not include specialised hardware systems such as word processors, cash registers, and process control systems.

Standard turnkey systems revenue in this report is divided into two categories.

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

- CROSS-INDUSTRY systems; i.e., systems that provide a specific function that is applicable to a wide range of industry sectors such as financial planning systems, payroll systems, personnel management systems, etc.

Revenue includes hardware, software, and support functions.

SYSTEMS INTEGRATION - Services associated with systems design, integration of computing components, installation, and acceptance of computer/communications systems. Systems integration can include on or more of the major information services delivery modes—professional services, turnkey systems, and software products. System components may be furnished by separate vendors (not as an integrated system by one vendor, called prime contractor); services may be furnished by a vendor or by a not-for-profit organisation. Integration services may be provided with related engineering activities, such as SE&I (Systems Engineering and Integration), or SETA (Systems Engineering and Technical Assistance).

C

Hardware/Hardware Systems

HARDWARE - Includes all computer communications equipment that can be separately acquired, with or without installation by the vendor, and not acquired as part of a system.

- PERIPHERALS - Includes all input, output, communications, and storage devices, other than main memory, that can be locally connected to the main processor and generally cannot be included in other categories, such as terminals.

- INPUT DEVICES - Includes keyboards, numeric pads, card records, barcode readers, lightpens and trackballs, tape readers, position and motion sensors, and A-to-D (analog-to-dialog) converters.

- OUTPUT DEVICES - Includes printers, CRTs, projection television screens, microfilm processors, digital graphics, and plotters.

- COMMUNICATION DEVICES - Modems, encryption equipment, special interfaces, and error control.

- STORAGE DEVICES - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), and bubble and optical memories.

TERMINALS - There are three types of terminals:

- USER PROGRAMMABLE (Also called 'intelligent terminals'):

  - Single-station or standalone.
  - Multistation-shared processor.
  - Teleprinter.
  - Remote batch.

- USER NONPROGRAMMABLE:

  - Single-station.
  - Multistation-shared processor.
  - Teleprinter.

- LIMITED FUNCTION - Originally developed for specific needs, such as POS (point of sale), inventory data collection, controlled access, etc.

HARDWARE SYSTEMS - Includes all processors, from microcomputers to super (scientific) computers. Hardware systems require type- or model-unique operating software to be functional, but the category excludes applications software and peripheral devices, other than main memory and processor or CPUs, not provided as part of an integrated (turnkey) system.

- MICROCOMPUTER (or personal computer or PC) - Combines all of the CPU, memory, and peripheral functions of an 8- or 16-bit computer on a chip, in the form of:

  - Integrated circuit package.
  - Plug-in board with more memory and peripheral circuits.
  - Console—including keyboard and interfacing connectors.
  - Personal computer with at least one external storage device directly addressable by CPU.

- MINICOMPUTER - Usually a 12-, 16-, or 32-bit computer which may be provided with limited applications software and support and may represent a portion of a complete large system.

  - Personal business computer.
  - Small laboratory computer.
  - Nodal computer in a distributed data network, remote data collection network, connected to remote microcomputers.

- MAINFRAME - Typically a 32- or 64-bit computer, with extensive applications software and a number of peripherals in standalone or multiple CPU configurations for business (administrative, personnel, and logistics) applications; also called a general-purpose computer.

- Large computer mainframes are presently centered around storage controllers but likely to become bus-oriented and to consist of multiple processors (CPUs) or parallel processors; they are intended for structured mathematical and signal processing von-Newmann-type processors for system control.

- Supercomputer mainframes are high-powered processors with numerical processing throughout that is significantly greater than the largest general-purpose computers, with capacities in the 10-50 MFLOPS (million floating point operations per second) range, in two categories:

• REAL TIME - Generally used for signal processing.

• NONREAL TIME - For scientific use, with maximum burst-mode (but sustained speed) capacities of up to 100 MFLOPS, in one of three configurations:

  - Parallel processors.
  - Pipeline processors.
  - Vector processors.

• Newer supercomputers—with burst modes approaching 300 MFLOPS, main storage size up to 10 million words, and on-line storage in the one-to-three gigabyte class—are also becoming more common.

• EMBEDDED COMPUTER - Dedicated computer system designed and implemented as an integral part of weapon or weapon system, or platform that is critical to a military or intelligence mission, such as command and control, cryptological activities, or intelligence activities. Characterised by MIL SPEC (military specifications) appearance and operation, limited but reprogrammable applications software, and permanent or semipermanent interfaces. May vary in capacity from microcomputers to parallel-processor computer systems. Information services forecasts in this report do not include applications for this type of computer.

D

Telecommunications

NETWORKS - Interconnection services between computing resources, provided on a leased basis by a vendor to move data and/or textual information from one or more locations to one or more locations.

• COMMON CARRIER NETWORK (CCN) - Provided via conventional voice-grade circuits and through regular switching facilities (dial-up calling) with leased or user-owned modems (to convert digital information to voice-grade tones) for transfer rates between 150 and 1,200 baud.

- LOCAL AREA NETWORK (LAN) - Restricted limited-access network between computing resources in a relatively small (but not necessarily contiguous) area, such as a building, complex of buildings, or buildings distributed within a metropolitan area. One of the two types:

  - BASEBAND - Voice bandwidth at voice frequencies (same as telephone, teletype system) limited to a single sender at any given moment and limited to speeds of 75 to 1,200 baud, in serial mode.

  - BROADBAND - Employs multiplexing techniques to increase carrier frequency between terminals, to provide:

    - Multiple (simultaneous) channels via FDM (Frequency Division Multiplexing).

    - Multiple (time-sequenced) channels via TDM (Time Division Multiplexing).

  - High-speed data transfer rate via parallel mode at rates of up to 96,000 baud (or higher, depending on media).

TRANSMISSION MEDIA - Varies with the supplier (vendor) and with the distribution of the network and its access mode to the individual computing resource location.

- MODE - may be either:

  - ANALOG - Typified by the predominantly voice-graded network of AT&T's DDD (Direct Distance Dialing) and by operating telephone company distribution systems.

  - DIGITAL - Where voice, data, and/or text are digitised into a binary stream.

- MEDIA varies with distance, availability, and connectivity:

  - WIRE - Varies from earlier single-line teletype networks to two-wire standard telephone (twisted pair) and balanced line four-wire full-duplex balanced lines.

  - CARRIER - Multiplexed signals on two-wire and four-wire networks to increase capacity by FDM.

  - COAXIAL CABLE - HF (High Frequency) and VHF (Very High Frequency), single frequency, or carrier-based system that requires frequent reamplification (repeaters) to carry the signal any distance.

- MICROWAVE - UHF (Ultra High Frequency) multi-channel, point-to-point, repeated radio transmission, also capable of wide frequency channels.

- OPTICAL FIBER - Local signal distribution systems employed in limited areas, using light-transmitting glass fibers and with TDM for multichannel applications.

- SATELLITES - Synchronous earth-orbiting systems that provide point-to-point, two-way service over significant distances without intermediate amplification (repeaters), but require suitable groundstation facilities for up- and down-link operation.

- CELLULAR RADIO - Network of fixed, low-powered, two-way radios that are linked by a computer system to track mobile phone/data set units; each radio serves a small area called a cell. The computer switches service connection to the mobile unit from cell to cell as the unit moves among the cells.

E

Other Considerations

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

Comparative Economic Statistics

Comparative Economic Statistics, 1986 and 1987

EXHIBIT B-1A

COMPARATIVE ECONOMIC STATISTICS, 1986

	France	U.K.	West Germany	Italy	Holland	Belgium
Gross Domestic Product ($ Billions)	589	519	719	418	143	91
1986 GDP Growth (Percent)	+2.2	+2.5	+2.6	+2.8	+2.2	+2.5
Size of Information Services Business ($ Billions)	6.67	4.35	4.78	2.82	1.39	0.84
Percent of GDP Information Services	1.14	0.83	0.67	0.67	0.97	0.92
Percent of GDP Market Services	45	42	41	40	47	49
U.S. Dollar Exchange Rates-Average Calendar 1986	6.86	0.68	2.14	1473.5	2.43	45.3
1986 Inflation Rate (Percent)	+2.5	+3.4	-0.2	+6.0	+0.3	+1.4

Source: OECD
Swiss Bank
National Westminster Bank

EXHIBIT B-1B

COMPARATIVE ECONOMIC STATISTICS, 1986 (CONT.)

	Sweden	Denmark	Norway	Finland	Switzer-land	Spain
Gross Domestic Product ($ Billions)	105	67	60	71	108	197
1986 GDP Growth (Percent)	+1.8	+2.4	+3.0	+1.8	+2.0	+2.8
Size of Information Services Business ($ Billions)	0.91	0.67	0.59	0.51	1.00	0.60
Percent of GDP Information Services	0.86	0.99	0.98	0.71	0.93	0.30
Percent of GDP Market Services	36	43	40	37	45	43
U.S. Dollar Exchange Rates-Average Calendar 1986	7.08	7.76	7.40	4.85	1.81	141.0
1986 Inflation Rate (Percent)	+4.0	+3.8	+6.9	+2.6	+1.0	+8.9

Source: OECD
Swiss Bank
National Westminister Bank

EXHIBIT B-1C

COMPARATIVE ECONOMIC STATISTICS, 1986 (CONT.)

	Portugal	Ireland	Austria	Total	U.S.A.
Gross Domestic Product ($ Billions)	24	21	75	3,207	3,970
1986 GDP Growth (Percent)	+3.0	+2.5	+2.3	+2.5	+2.3
Size of Information Services Business ($ Billions)	0.06	0.14	0.37	25.71	54.60
Percent of GDP Information Services	0.25	0.67	0.50	0.80	1.38
Percent of GDP Market Services	41	48	43	42	43
U.S. Dollar Exchange Rates-Average Calendar 1986	171.0	0.71	15.1	-	-
1986 Inflation Rate (Percent)	+12.0	+4.0	+1.8	+3.3	+3.0

EXHIBIT B-2A

COMPARATIVE ECONOMIC STATISTICS, 1987

	France	U.K.	West Germany	Italy	Holland	Belgium
Gross Domestic Product ($ Billions)	602	532	738	430	146	93
1987 GDP Growth (Percent)	+1.3	+3.0	+1.5	+2.3	+1.7	+2.3
Size of Information Services Business ($ Billions)	7.98	5.29	5.71	3.56	1.65	1.00
Percent of GDP Information Services	1.32	1.00	0.77	0.83	1.13	1.07
U.S. Dollar Exchange Rates-Average Calendar 1987	6.12	0.63	1.84	1,316.4	2.07	38.4
1987 Inflation Rate (Percent)	+3.5	+4.4	+1.0	+6.2	+2.0	+1.7

EXHIBIT B-2B

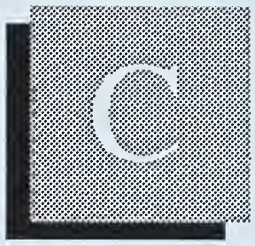
COMPARATIVE ECONOMIC STATISTICS, 1987 (CONT.)

	Sweden	Denmark	Norway	Finland	Switzer-land	Spain
Gross Domestic Product ($ Billions)	107	69	762	72	110	203
1987 GDP Growth (Percent)	+2.0	+1.8	+1.5	+2.0	+2.0	+3.0
Size of Information Services Business ($ Billions)	1.07	0.79	0.69	0.60	1.22	0.75
Percent of GDP Information Services	1.00	1.14	1.11	0.83	1.11	0.37
U.S. Dollar Exchange Rates-Average Calendar 1987	6.85	4.49	6.85	4.49	153.0	126.9
1987 Inflation Rate (Percent)	+5.6	+4.5	+7.3	+4.0	+1.5	+6.5

EXHIBIT B-2C

COMPARATIVE ECONOMIC STATISTICS, 1987 (CONT.)

	Portugal	Ireland	Austria	Total	U.S.A.
Gross Domestic Product ($ Billions)	25	21	76	3,286	4,062
1987 GDP Growth (Percent)	+3.6	+2.5	+2.4	+2.6	+2.5
Size of Information Services Business ($ Billions)	0.07	0.16	0.45	31.02	64.10
Percent of GDP Information Services	0.28	0.76	0.59	0.94	1.58
U.S. Dollar Exchange Rates-Average Calendar 1987	154.2	0.69	12.65	-	-
1987 Inflation Rate (Percent)	+10.5	+3.5	+2.5	+3.9	+3.8



User Questionnaire

User Questionnaire

(Relevant Questions to Software Pricing, Maintenance and Support Only)

SOFTWARE PRICING AND SUPPORT

QU: 6 a) How are you charged for your **application software products**? Please give the approximate percentage of product expenditure applicable to each method.

b) Which charging method do you prefer? Please give a rating for your preferences on a scale of 0 to 10, where 0 = Unacceptable and 10 = Ideal.

Charging Method		a Percentage of Product Expenditure	b Preference Rating
a.	One-time fee		
b.	Installment plan		
c.	First-year fee with lower fees for subsequent years		
d.	Regular licence fees (annual, quarterly or monthly)		
e.	Usage pricing		
f.	Others (specify)		
		100%	

QU: 7 a) What percentage of your application products are maintained or supported under each of the following charging methods?

Charging Method		Percentage of Products
a.	Not maintained or supported under a contract	%
b.	Charged as a percentage of a one-time initial fee	%
c.	As a percentage of the annual/quarterly etc. fee	%
d.	At a fixed price, irrespective of product	%
e.	Support is bundled into licence fee	%
f.	Other (specify)	%

100%

b) What range of percentages do you experience in options b. and c. above, i.e., when charged as a percentage of the license fee.

MINIMUM % MAXIMUM % NOT APPLICABLE %

QU: 8 a) What features are included in your application software maintenance contracts? (Please give approximate percentage of inclusion)

Maintenance Service		Percentage of your Contracts Featuring this Service
a.	Telephone support ('hotline')	
b.	Fault reporting only	
c.	Enhancements and new releases free	
d.	Discounts on enhancements/new releases	

e. Consulting visits

f. On-site trouble-shooting/ patch installation

g. Discounts on training

h. Remote diagnostics

i. Other

b) What is your major support problem with application products?

c) What other support services would you be prepared to pay for, either as part of an enhanced maintenance offering or as separate support services?

i)
ii)
iii)

QU: 9 How do you rate your current suppliers of application products on a scale of 0 to 10. (Award a **top rating** of 10, down to a zero rating for **appalling**, for each ofthe aspects listed.)

Aspects of the Products/Suppliers	**Your Hardware Suppliers**	**Third Party SW Suppliers**
a. Features of the software		
b. Performance of the software		
c. Ease of use		
d. Documentation		
e. Installation/implementation services		
f. Trouble-shooting		
g. Ongoing product enhancement		

h. Ongoing application support

i. Ease of modification

j. Training

k. Other

QU:10 a) What trends in software product and support pricing are you experiencing?

b) Please also tell me for each whether they are 'very attrac tive', fairly attractive' or 'unattractive', commercially speaking.

Trend	Q10a Tick if Affects You	Q10b Commercial Attraction Very	Fairly	Not
a. More lump sum/ one-time charging				
b. Site discounting				
c. Other discounting methods				
d. Extending warranty periods				
e. Bundling service and products				
f. Unbundling products or services				
g. Other (specify)				

Comment (Probe)

FINANCIAL INFORMATION

QU:11 At this stage I would now like you to give me some brief details covering your expenditure on computer services.

a) Are you anticipating an increase in your total data process ing expenditure during 1987?

YES NO DON'T KNOW

if YES, by what percentage in comparison with your spend in 1986?

_____%

b) Are you anticipating an increase in your expenditure on external computer services (excluding hardware) during 1987?

YES NO DON'T KNOW

if YES, by what percentage in comparison with your spend in 1986?

_____%

QU:12 For the following items that are potentially purchased externally would you please indicate how much your 1987 expenditure is anticipated to increase in comparisonwith your spend in 1986?

Application Software Packages %

Application Software Maintenance %

NB: Only ask if response to QU: 11b was YES.

QU:13 a) Could you please tell me how much you anticipate spending on software productivity tools and systems in 1987?

_____ Amount _____ Local Currency

DON'T KNOW

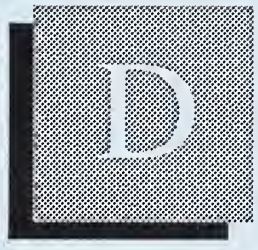
b) Will this expenditure increase during the next couple of years?

YES NO DON'T KNOW

If YES -

c) By what percentage in comparison with your spend in 1987?
_____ %

We appreciate your co-operation in our survey and will send you a copy of the executive summary of our research findings.



Vendor Questionnaire

Vendor Questionnaire Confidential

STUDY TITLE
CODE

CODE

CODE

CODE

CODE

STUDY

SIC.

SIZE

AREA

CODE

TYPE OF INTERVIEW: VENDOR
USER

TELEPHONE DATE
ON-SITE
MAIL

NAME OF COMPANY

RESPONDENT(S)

TITLE(S)

ADDRESS

INTERVIEWED BY

DATE

TELEPHONE NO.

COMPANY DETAILS

Worldwide Revenues
All Activities
( ): / /LIT/DM/FF/£ _____ ($ _____)

Revenues in Europe/UK £_____ ($_____)

GENERAL

QU:1 Which of the following best describes your role in the pricing of your firm's software products? (Please tick one only)

Decision-maker _____ Recommender _____ Other _____

QU: 2 What were your firm's software product revenues for 1986?

_____

(Financial Year Ends _____)

QU: 3 What percentage change over 1985 revenues did that represent?

_____ %

PRODUCT PROFILE

QU: 4 What percentages of your 1986 software product revenues came from each of the following?

	Mini/Mainframe	**Micro/PC**
Applications Software		
System Software		
Software Maintenance		

QU: 5 How can we obtain a copy of your software product price list?

QU: 6 Which product is the largest revenue earner in each of the categories given? Please furnish brief details.

	SYSTEM SOFTWARE		APPLICATION SOFTWARE	
	Mini/Mframe	Micro/PC	Mini/Mframe	Micro/PC
Name of Product/ Module				
Price Range				
Annual Sales (1986)				
Size of Target CPU				

PRICING STRUCTURES

QU: 7 What percentages of your firm's software products were licenced in 1986 under each of the following charging methods? Please also rank your preference for each method. (1 = Most Preferred, 2 = Second Preference etc.)

	System Software	Application Software	Preference Ranking
a. One-time initial fee			
b. First year licence fee with lower fees for subsequent years			
c. Equal annual license fees			
d. Equal quarterly or monthly fees			
e. Other (e.g. Installment plan, Usage pricing - please specify)			
TOTAL NUMBER OF LICENCES ISSUED			

QU: 8 Please give details of 'usage' or any other innovative pricing plan which you use (e.g. formula, when plan began, success/ failure, will extend).

THE PRICE SETTING PROCESS

QU: 9 Which of the following staff levels are involved in your firm's price setting?

	Setting Price Levels	Setting Terms & Conditions	Pricing Concessions to Customers/ Prospects
a. Field Salesperson			
b. Sales Management			
c. Branch Management			
d. National Management			
e. International Management			
f. Other (please specify)			

Comment

QU:10 Will these authority levels change over the next 12 months?

YES NO And if so, how?

QU:11 How would you best describe your current price-setting mechanism? (General market levels, specific competitor, his torical, cost)

QU:12 How comfortable are you with your company's pricing strategy and methods? (Please rate on a scale of 1-10, 10 = Very Comfortable)
Comment

QU:13 Have you changed your pricing levels of tariff structure within the past 6 months?Or will you in the next 6?

(In what ways? How often?)

DISCOUNTING

QU: 14 What standard discount percentages from list prices do you offer?

	PERCENTAGES DISCOUNT OF CUSTOMERS Min	Max	WITH IN 1986	COMMENT ON APPLICABLE TYPE OF SOFTWARE: System/Application, Mini/Mainframe, Micro/PC
a. For additional sites				
b. For additional processors				
c. By volume of fees				
d. For additional modules				
e. For additional products				
f. Educational				
g. Other (specify)				

QU:15 Have any of your discount levels changed in the past 6 months? If so, how?

QU:16 a) What percentage of your software products revenues in 1986 was from customers who received one or more discounts?

_____ % (1986)

b) Was this a change over 1985? _____ % (1985)
_____ % (1987 forecast)

Comment

QU: 17 How does your company charge for software support and maintenance?

CHARGING METHOD	PERCENTAGE OF INSTALLED BASE
a. As a percentage of on-time initial price	
b. As a percentage of annual/quarterly/monthly fee	
c. Bundled into the annual/quarterly/monthly fee	
d. As a fixed price irrespective of product	
e. At T&M rates	
f. Other (specify)	
g. Not applicable - no maintenance needed/taken	
	100%

QU: 18 What services are included as part of your support contracts?

SERVICE	SYSTEM SOFTWARE	APPLICATION SOFTWARE
a. Telephone Support		
b. Fault reporting only		
c. Enhancements/New releases		
d. Enhancements/New releases discounted		

e. Consulting visits

f. On-site trouble-shooting

g. Discounts on training

h. Other

QU:19 What other services are offered? (Training, software development, etc.)

QU:20 What percentage of the equivalent purchase price is your maintenance and support fee?
From _____ % to _____ % System Software

From _____ % to _____ % Application Software

QU:21 a) How have these percentages changed over the past 12 months?

b) Do you anticipate them changing in the next 12 months?

QU:22 a) Do you plan to bundle more support services into your future offerings?

Yes, in the next 12 months Yes, later

No plans

b) Give details of positive bundling plans

QU:23 a) Do you expect to see more, the same, or less bundling of software services and products in the market place during the next 12 months?

More Same Less

b) Please explain your perception of the trend

QU:24 What other software pricing trends are in your view important?

Mainframe

Mini

Micro/PC

Application Software

System Software

PRICE CHANGES

QU: 25 How have your firm's prices changed/how will they change? Please indicate relevant annual percentage differences for each class of product.

	Annual Percentage Change		
Product	**Past 12 month**	**Next 12 months**	**Trend to 1990**
Mini/mainframe			
- System Software			
- Application Software			
Industry-Specific			
Cross-Industry			
Micro/PC			
- System Software			
- Application Software			
Industry-Specific			
Cross-Industry			
All Classes			

QU:26 a) Does your company have a conscious policy of maintaining your prices in a consistent relationship to a competitor or group of competitors?

YES NO

b) If yes, what is the relationship?

c) .... and with whom?

QU:27 How is this relationship expected to change in the next 12 months?

QU:28 Which market segments do you consider to be most or least price sensitive? Please rate on a scale of 1 to 5, where 1 = Least Sensitive, and give reasons.

SEGMENT	RATING	COMMENT
Mini/Mainframe		
- System Software		
- Application Software		
Industry-Specific		
Cross-Industry		
Micro/PC		
- System Software		
- Application Software		
Industry-Specific		
Cross-Industry		

QU:29 a) What do you consider to be your toughest pricing problem?

b) How can your support strategy help? And how do the two interact?

QU:30 Are there any other aspects of pricing and support which have not been covered?

THANK YOU FOR YOUR TIME