# SOFTWARE SUPPORT REQUIREMENTS

# LARGE - SCALE SYSTEMS

INPUT

# About INPUT

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

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

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

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# LARGE-SCALE SYSTEMS

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## CONTENTS

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## EXHIBITS

# 1 INTRODUCTION

# I INTRODUCTION

## A. BACKGROUND

- This report has been prepared for INPUT'S customer service program (CSP).

- Software support is being focused on because of:

  - The increasing importance of software support to both vendors and customers.

  - The increasing integration of hardware and software support organizations (and in many cases the underlying products as well).

  - Increasing interest among CSP clients in this area.

- This report focuses on the issues raised by CSP clients in a client poll conducted in spring of 1984. INPUT has also included issues of importance that have been brought to its attention in a number of other ways, such as:

  - Through custom consulting assignments for both vendors and customers.

  - In the course of discussions with leading vendors and experts.

- By queries INPUT receives from its clients in the CSP and in other programs.

- The orientation of this report is to identify customer needs, satisfaction, and plans from the customer perspective. Major areas covered include:

  - Spending patterns.

  - Key support needs.

  - The extent to which needs are met.

  - Unmet requirements.

  - Future requirements.

## B. METHODOLOGY

- Information for the report was obtained primarily through telephone interviews conducted in August and September 1984. These have been supplemented by other INPUT studies and materials.

- Interviews were conducted with 241 respondents in leading companies in the U.S., covering a range of company sizes and industries.

- Respondents represent a wide variety of job titles (see Appendix A), reflecting the fact that responsibilites for software support functions are not viewed in a common way and, in fact, are often addressed quite differently from company to company.

- An extensive questionnaire (see Appendix C) was developed to collect a range of quantitative and qualitative material, with both specific-response and open-ended questions.

  - Open-ended questions were classified and coded after the completion of all interviews.

  - Questionnaires were computer processed, with additional tabulations on key variables. When additional breakdowns by respondent size or industry, for example, are not provided, it is because such variations were not appreciably different from overall respondent data.

- Throughout the text and exhibits, there are references to companies by size category. Category 1 refers to medium-sized companies having overall revenues of less than $1 billion. Category 2 includes medium- and large-sized companies having revenues of between $1-5 billion. Category 3 includes large companies having revenues of more than $5 billion.

# II EXECUTIVE SUMMARY

## II EXECUTIVE SUMMARY

- This executive summary is designed in a presentation format in order to:
  - Help the busy reader quickly review key research findings.
  - Provide an executive presentation and script that facilitates group communications.
- The key points of the entire report are summarized in Exhibits II-1 through II-8. On the left-hand page facing each exhibit is a script explaining the exhibit's contents.

## A. SOFTWARE PRODUCTS MAINTENANCE AND SUPPORT

- Respondents in medium- and large-sized corporations report that software support costs are equal to 22% of their total software product costs. This figure is fairly stable across different industries and different size companies but can vary greatly from company to company and from year to year, depending on software package acquisitions and the method of payment.

- One-fifth of support costs come from services that are not part of standard support contracts. (These services consist mainly of consulting and training.) This represents an interesting business expansion area for many vendors.

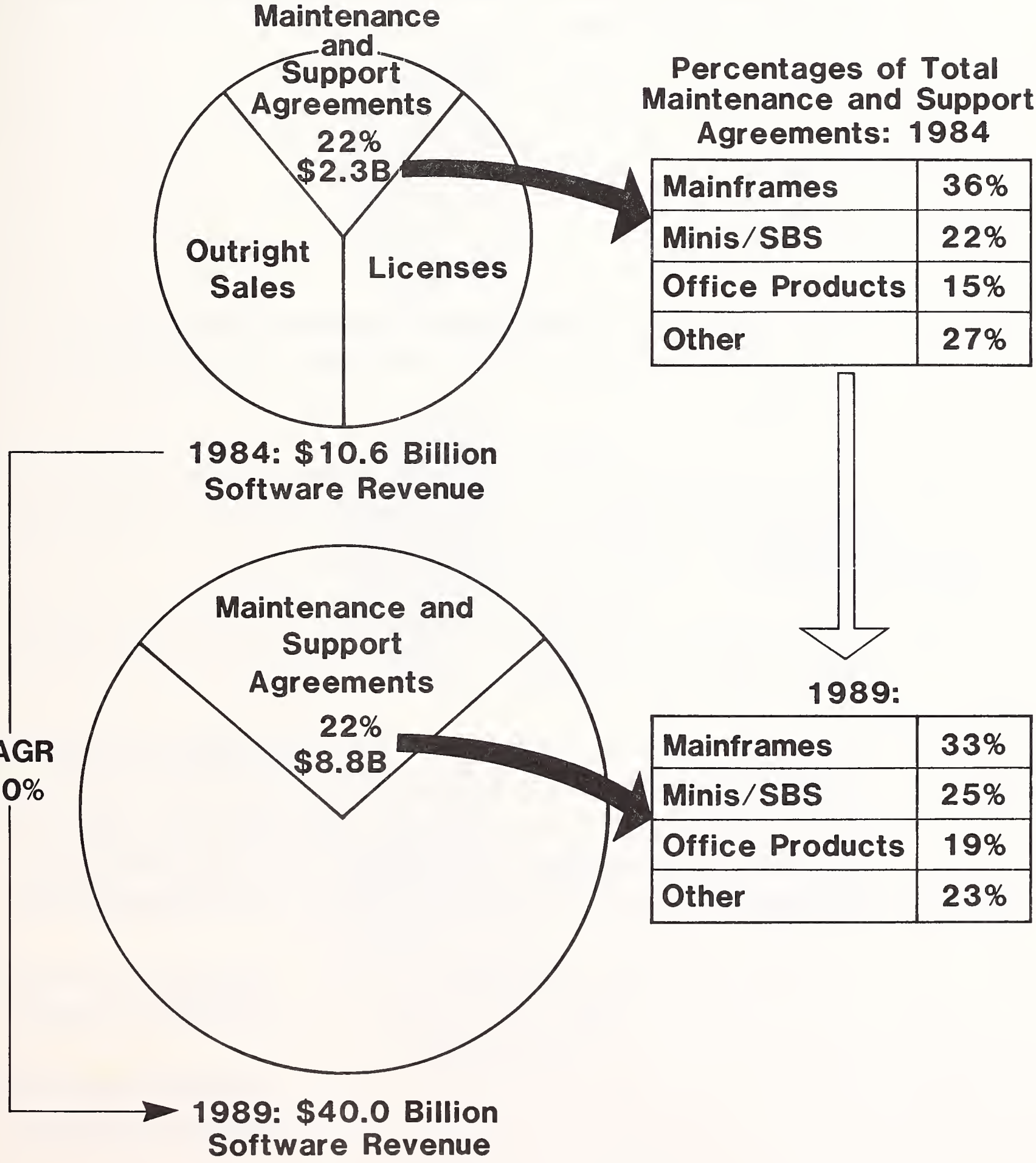
- Customers expect to see their software support costs increase at the same rate as their spending on software packages. The main forces behind this increased spending are:

  - An increased number of packages needing support.

  - Vendor price increases.

- Maintenance and support of software products is expected to increase at an average annual rate of 30% between 1984 and 1989. Office products and minicomputer software will grow the fastest, while support of mainframe software will actually decline slightly.

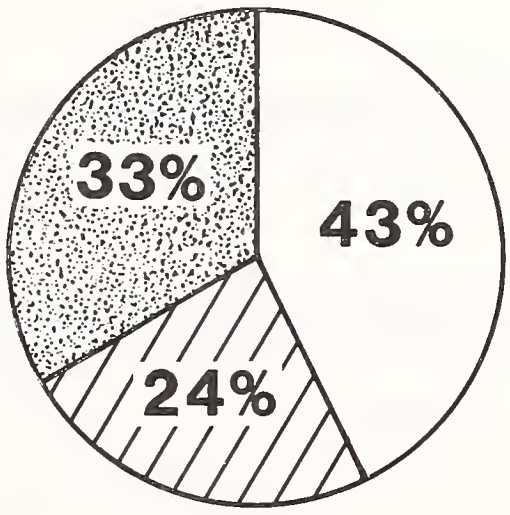
# SOFTWARE PRODUCTS MAINTENANCE AND SUPPORT



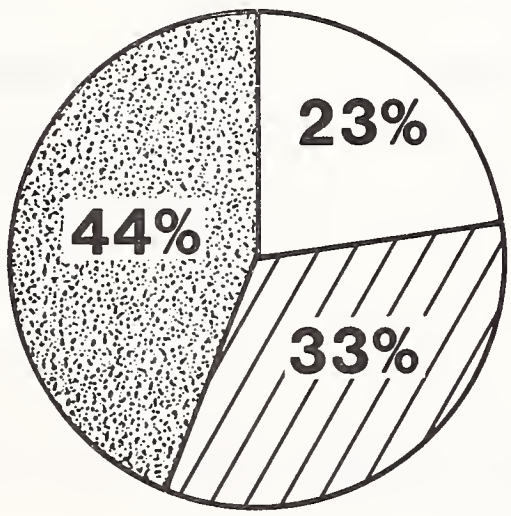
## B. CUSTOMER BENEFITS FROM REMOTE SUPPORT SERVICES ARE UNCLEAR

- There is considerable interest by vendors of "electronic support" in planning and some in implementing:
  - Automatic downloading.
  - Remote diagnostics.
  - Remote fixes.
- Vendors believe that electronic support will improve customer service and reduce their own costs. About a third of respondents report using electronic distribution.
- On the other hand, customers see either few benefits to themselves or only general benefits. Obviously, the word is not getting through to customers (or else there are in fact few tangible benefits to customers).
- Vendors that have not yet offered electronic support should examine expected customer benefits very closely.
- Large-system vendors should remember the hard lesson taught when they introduced remote diagnostics in the late 1970s and early 1980s: without a proper understanding of the benefits, users are reluctant to assist in the promotion of remote support services (RSS). However, once the benefits of RSS are perceived, users frequently require and even demand these services.

# CUSTOMER BENEFITS FROM REMOTE SUPPORT SERVICES ARE UNCLEAR



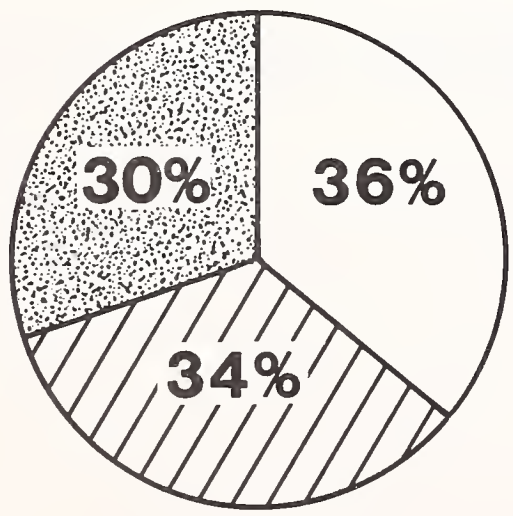

**Automatic Downloading**




**Remote Diagnostics**

**Percent of Customers:**

- **Percent Seeing Few or No Benefits to Themselves**
- **Percent Seeing General Benefits**
- **Percent Seeing Specific Benefits**




**Remote Fixes**

## C. THE ERROR CORRECTION GAP

- The core of the software support service is fixing errors; in effect, software maintenance is narrowly defined. Error correction is the one function that customers perceive as by far the most important component of software support.

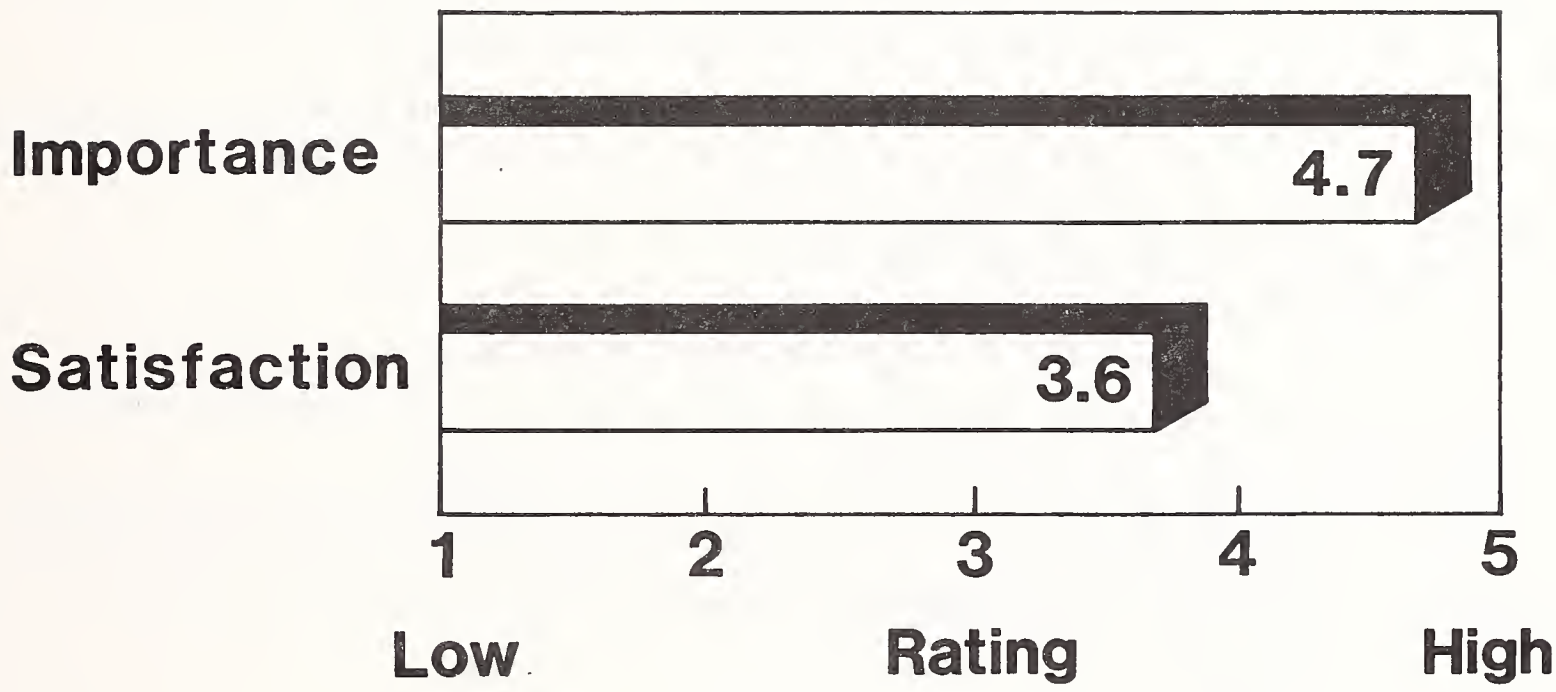
- The error correction function is also the one in which customers express the most satisfaction.

- Some of the other important components in user attitudes toward software support are training, consulting, and enhancements. Users reported being dissatisfied with every one of these components, although in areas such as consulting and enhancements, the dissatisfaction rate is relatively low.

- Users were almost unanimous in reporting a high level of variance between the importance of software support functions (such as fixing errors, training, and improving existing features) and the vendor's performance in supplying this support.

- It is true that user satisfaction is high in some areas, but it still is not as high as user expectations for software support. This will result ultimately in an eroded customer base.

# THE ERROR CORRECTION GAP

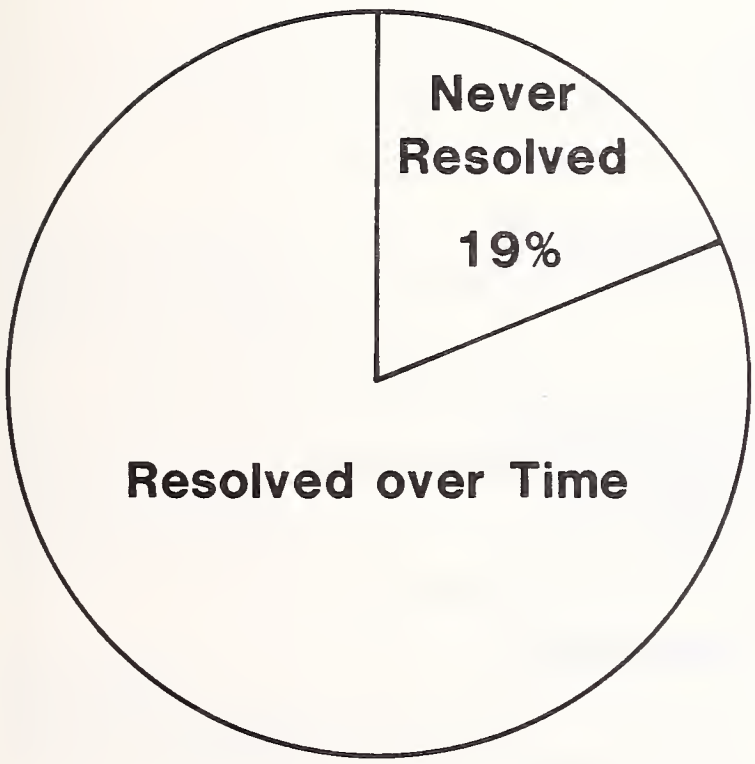



- Error Correction: Core of Support
- Performance Lags behind Importance

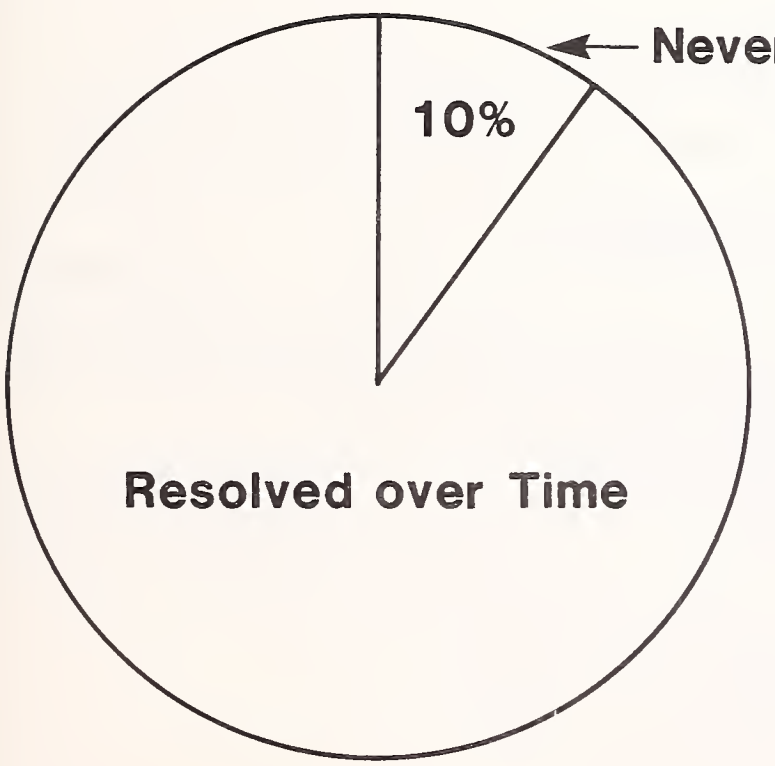
## D. OPERATING SYSTEMS PROBLEM RESOLUTION GAP

- Operating system problems are very serious because:
  - Operating systems problems can affect the performance of hardware as well as other systems software and applications.
  - The complexity of operating systems makes self-maintenance difficult, if not impossible.
  - Generally, there are few alternatives to the current operating system; even when alternatives exist, the conversion problems are daunting.
- This gives operating system vendors (generally hardware vendors) a lock on the market, which they have been exploiting via unbundling and/or increased changes.
- There is a suggestion that vendors have taken advantage of this situation to skimp on maintenance. Another parallel hypothesis, especially in the cases of IBM and MVS, is that operating systems have become so complete that they are in a sense almost impossible to maintain.
- The fact is that, on the average, almost a fifth of the major operating systems problems that are reported are not resolved, according to customers. The record for minor problems is somewhat better but not significantly so. (By comparison, the record for "other systems software" is 9% unresolved major problems and 3% for minor problems.)

# OPERATING SYSTEMS PROBLEM RESOLUTION GAP




| Major Functional/Operational Problems/Errors |
| --- |
| Interfere with Day-To-Day Operations |

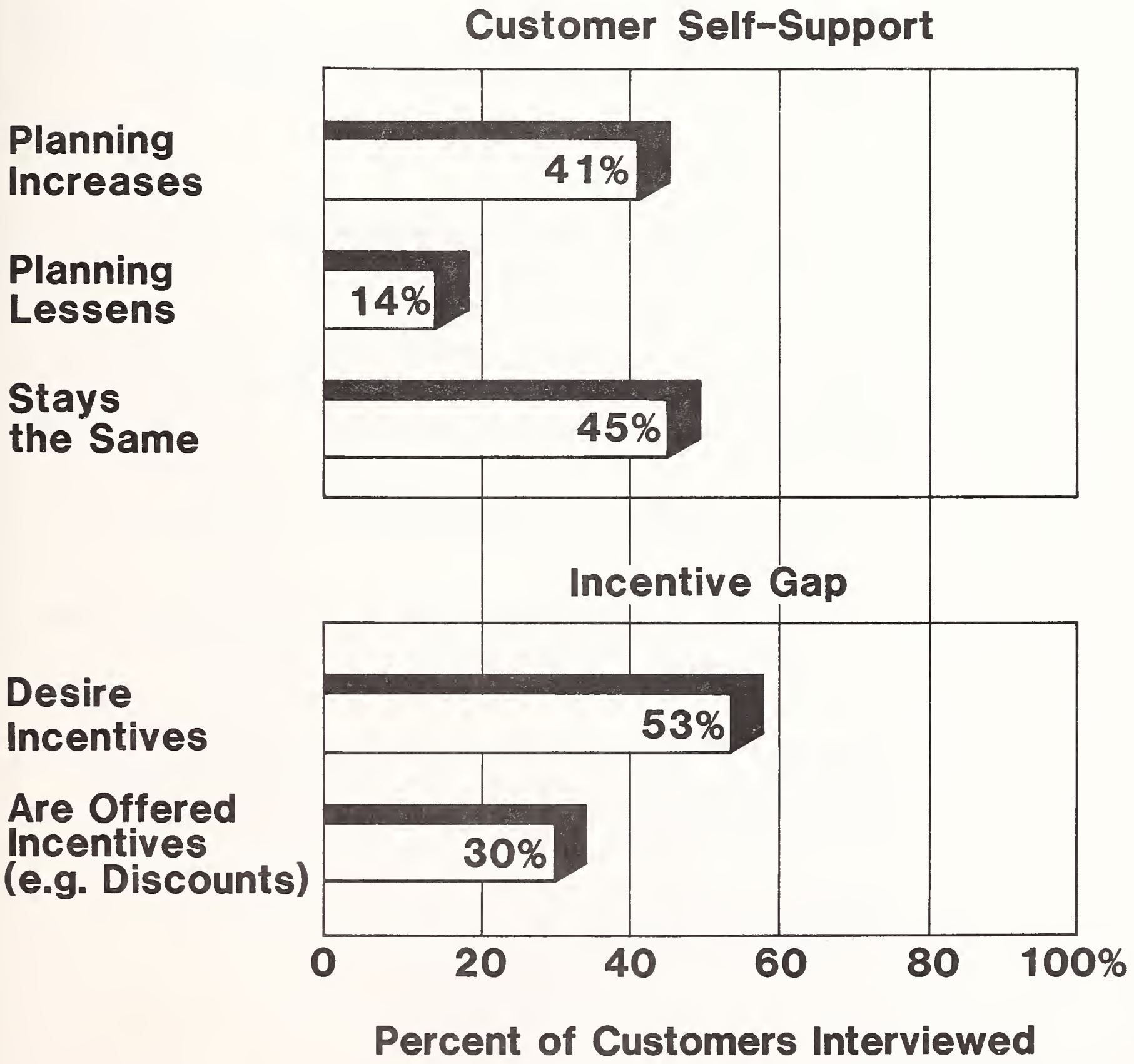



| Minor Functional/Operational Problems/Errors |
| --- |
| Can Be Worked Around |

## E. CUSTOMER INVOLVEMENT IN SELF-SUPPORT

- Forty-one percent of the customers surveyed see more self-support occurring in the future. Already, customers are very active in performing functions they see as self-support. For example:
  - Four out of five customers usually install initial releases, and even more install subsequent releases.
  - Two-thirds modify packages or fix errors, at least sometimes.
  - About half the customers interviewed currently have internal "help desks" to buffer internal queries and potential problems.
- These types of activities are expected to increase modestly.
- Over half the customers interviewed would like to be offered incentives to perform more self-support. However, many more customers desire incentives than are currently being offered them.
- The most frequently mentioned incentives are in the pricing area; however, INPUT believes that other types of incentives would prove equally, compelling or more so.
- It is certainly in the interest of vendors to have customers take over as much of the semiskilled, time-consuming support work as is feasible.

# CUSTOMER INVOLVEMENT IN SELF-SUPPORT



## F. TERMS AND CONDITIONS ARE INEFFICIENTLY CONSTRUCTED AND COMMUNICATED

- Many vendors spend a great deal of time constructing lengthy and complex terms and conditions.

- In spite of most customers being generally satisfied with the overall terms and conditions process, four out of five customers wish to modify them:

  - Over half do so often or always.

  - Over 80% report that their proposed modifications are generally accepted.

- This record of extensive, generally successful changes in standard terms strongly suggests that something is wrong or, at the least, is misdirected in the way in which terms and conditions are designed.

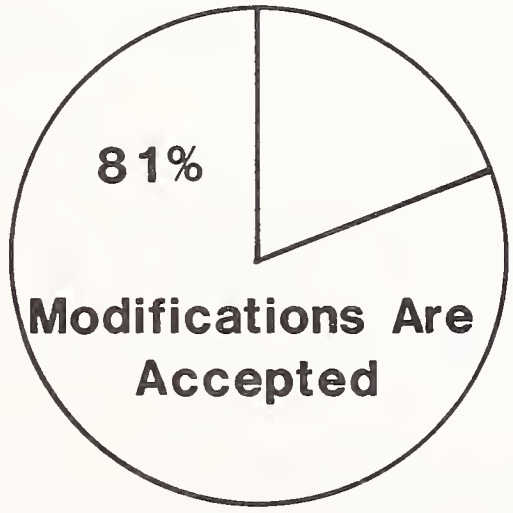
  - If contracts are meant to protect vendor interests, they are not succeeding.

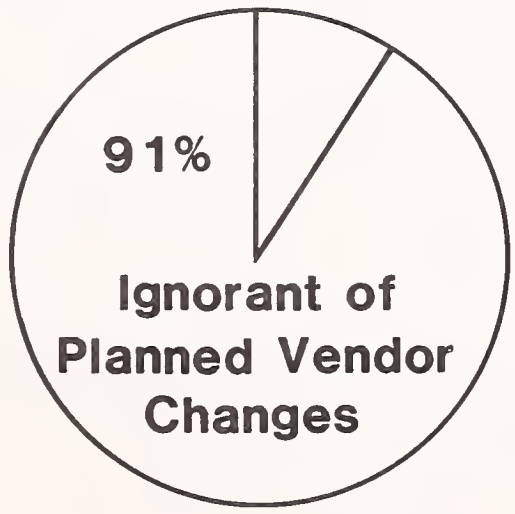
  - At the least, contracts are causing vendors (and customers) to waste valuable time.

- One symptom of the problem is that customers are almost totally ignorant of planned vendor contract changes. This lack of communication certainly hinders vendors' attempts to balance their own needs and those of customers.

- Simplified contracts, perhaps in combination with a limited "menu" approach, could better meet the needs of both parties.

# TERMS AND CONDITIONS ARE INEFFICIENTLY CONSTRUCTED AND COMMUNICATED

## G. PRICING: AN AREA OF OPPORTUNITY

- INPUT has highlighted several problem areas, but pricing per se does not appear to be one of them.

- First of all, pricing is largely invisible:

  - Sixty percent of software support is included (or some might say, buried) in the license fee.

  - To open-ended questions, few respondents volunteered pricing as an important issue or a significant future trend.

- In the extensive changes attempted in terms and conditions, pricing is an issue only about one-fifth of the time.

- About two-thirds of the customers expect continued increases in software support. Importantly, the reasons for these increases are not seen primarily as simple price increases, but as increases caused by a greater volume of software products and technical changes to products.

- Customers largely accept the fact that more and more products will be brought out in a new version for which they will have to pay again. Customers are reasonably happy with vendor pricing practices in this area, even though half the time they receive no credit for the replacement and no discount on the new version.

- Finally, customers do not seem to expect significant price breaks as a result of electronic distribution. (This must, however, be balanced against customer ignorance in this area.)

- The overall picture is one of concern for technical and service standards and reflects an insensitivity to price.

# PRICING: AN AREA OF OPPORTUNITY

- Largely Invisible

- One-Fifth of Customers Seek Contract Changes

- Continued Increases Expected

- Reissued Products Are Acceptable

- Price Breaks Are Not Expected for Remote Support Services

## H. REMOTE SERVICES SHOULD BETTER SERVE CUSTOMER NEEDS

- Although pricing conditions are positive (from the vendor's standpoint), service must improve, or seem to improve, for vendors to take advantage of customer attitudes toward pricing. INPUT believes that remote support in revised form is the key to increasing customer perceptions of value.

- Current electronic support methods are, in reality, an automation of past vendor practices.

  - They represent a one-way flow of information (e.g., releases) or action (e.g., remote fixes).

  - Even remote diagnostics, which might seem to be an exception, is still one-way. The customer is not really sending data to the vendor; the vendor is taking control of the customer's system and sending data back to itself.

- Future electronic support should be customer oriented and should allow customers to take action. In doing so, customers often resolve their own problems on the spot. This would save vendor resources and increase customer satisfaction.

- One means of achieving customer-oriented remote support services is through a combination of:

  - A vendor problem/fix data base, which many vendors are already constructing for their own use.

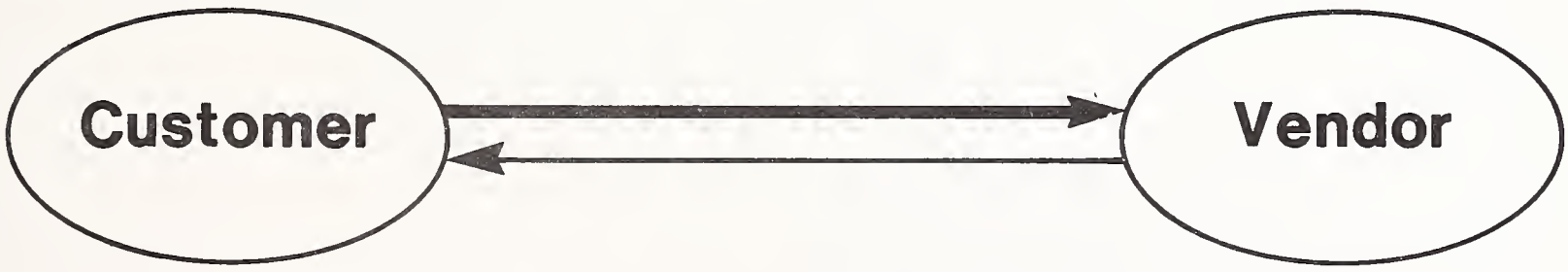
  - A natural language query interface to the data base so that customers can access the data base in a valid and predictable manner.

# REMOTE SERVICES SHOULD BETTER SERVE CUSTOMER NEEDS

**Up to 1984**


**Customer perceives the value of RSS as principally one-way in favor of vendor.**

**By 1989**




**Vendors should present RSS so that customer perceives value. Customer must understand that RSS was designed to assist the user rather than vendor.**

# III THE SOFTWARE SUPPORT ENVIRONMENT

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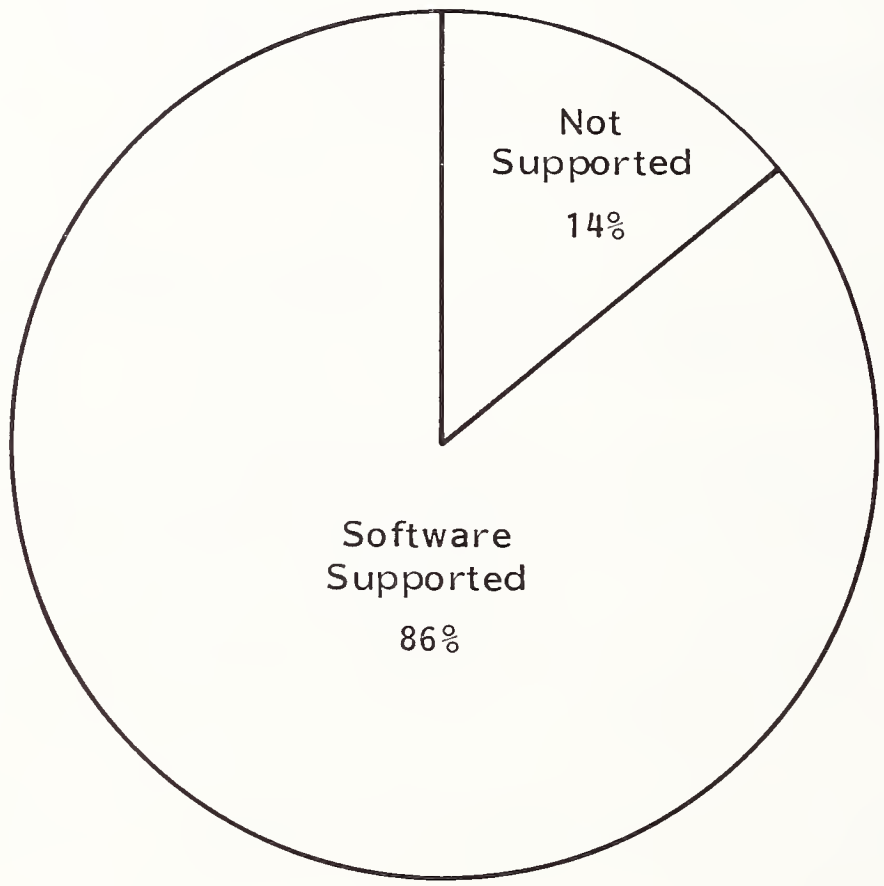
## A. EXTENT OF SOFTWARE SUPPORT

- The great majority of packaged software used by customers is supported by vendors, as shown in Exhibit III-1.
  - Process manufacturing and insurance both show a greater-than-average tendency to rely on vendor support, as shown in Exhibit III-2.
  - The proportion not supported does not vary greatly by customer characteristics.
- However, there is a great deal of self-support by customers, as shown in Exhibit III-3.
  - Almost all customers install their own release updates (subsequent releases).
  - Four out of five customers usually install initial releases as well.
  - As expected, a much lower percentage modify packages or fix errors themselves.

EXHIBIT III-1

PROPORTION OF SOFTWARE SUPPORTED BY VENDORS
(As Reported by Customers in 1984)




- Unsupported software should gradually increase as packages age.

EXHIBIT III-2

PROPORTION OF ALL PACKAGED SOFTWARE
NOT SUPPORTED BY VENDOR

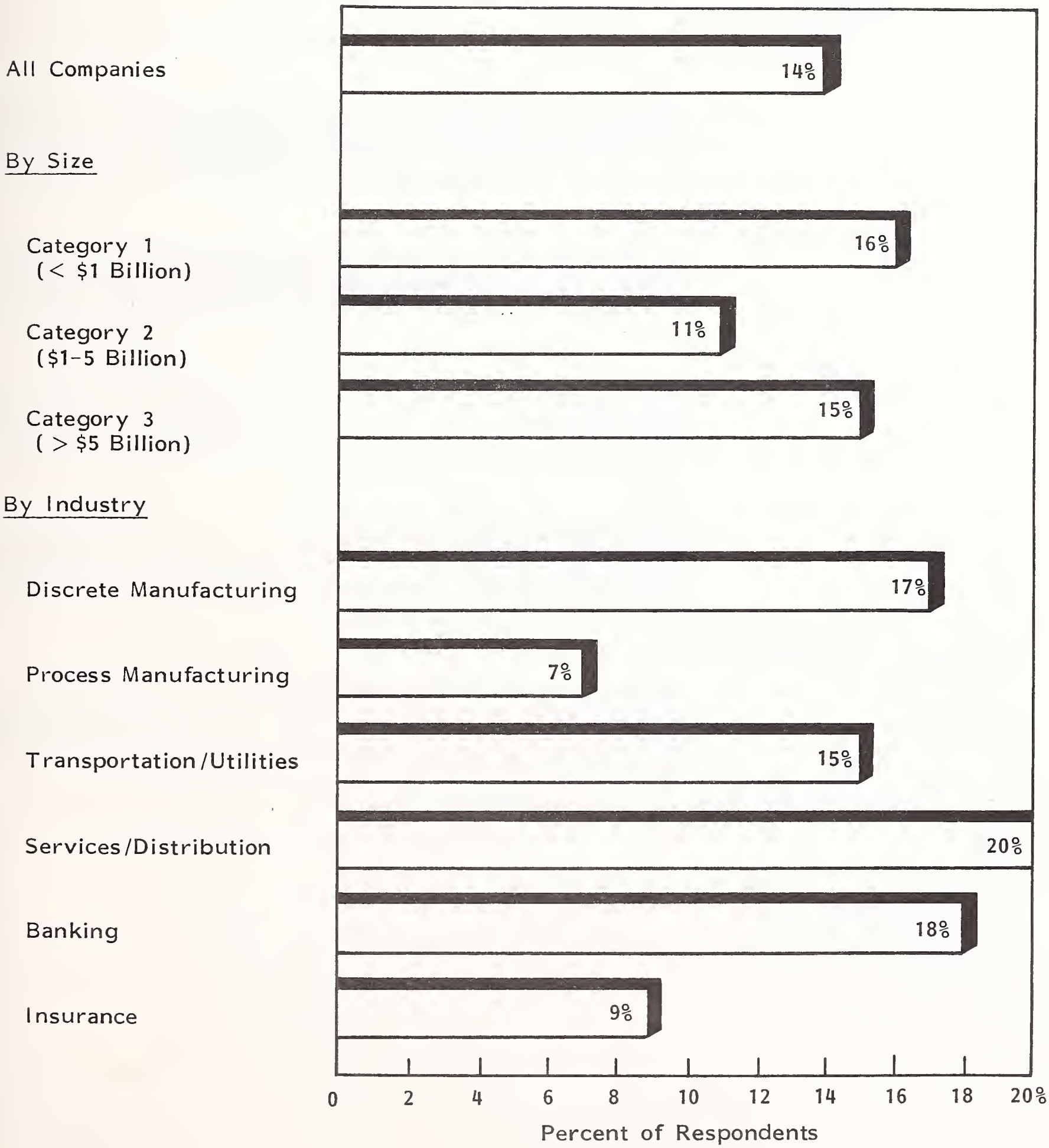
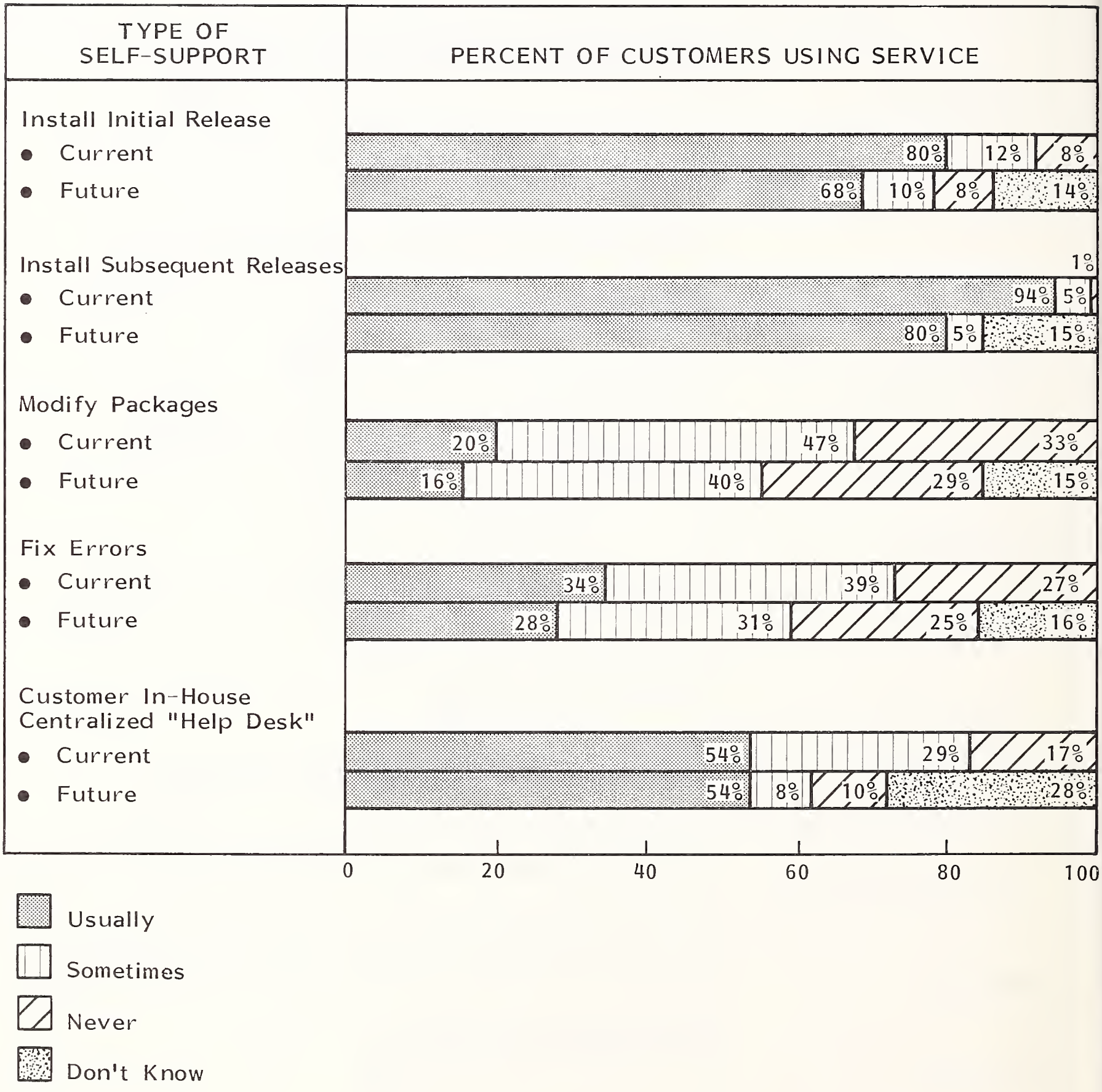


EXHIBIT III-3

# EXTENT OF CUSTOMER SELF-SUPPORT



- A help desk is a form of self-support that is very important to customers and vendors alike.

  - Previous INPUT studies show that about half of customer support consists of supplying answers already contained in documentation or in the software itself. Consequently, customer "help desks" are a critical component of improving service and potentially reducing costs.

  - More than half the customers surveyed usually use in-house "help desks." If respondents claiming they "don't know" about future "help desk" use are assumed to be future "usual" users, this proportion should increase to nearly 75%.

    . However, if the "don't knows" become "don't use," there will be no improvement in the extent of customer use of "help desks."

    . This issue should be one of vital concern to all vendors that sell or hope to sell significant quantities of software (in dollars or units) to large, diverse organizations.

  - The percentages for installation of releases, modification of packages, and fixes should remain reasonably stable in the future.

    . Disregarding "don't knows," the proportion of firms that "usually" modify packages will stay about the same, and the proportion of customers performing their own fixes will increase about five percent.

    . On the other hand, the proportion of customers that "never" modify software will remain about the same, but the proportion for those that "never" fix software errors will actually go up slightly.

- This intimates that fixing errors is an activity for which a greater commitment is necessary: as software becomes both more complex and more important, customers will have to decide whether they will (and can) make that kind of commitment.

- About four in ten customers see more self-support occurring; one in seven sees less self-support, as shown in Exhibit III-4. No single reason is predominant for those seeing an increase.

  - Self-sufficiency, better quality support, and vendor unreliability all play a role.

  - Underlying customer growth is also a factor but is of less importance than one might think initially. However, it should be kept in mind that software growth often does not correlate with business or even hardware growth, since software is often highly leveraged.

- As Exhibit III-5 depicts, there is a significant gap between the incentives desired and these currently offered for customers to take over some of their software support.

  - Over two-thirds of the respondents receive no incentives; a third of these respondents desire some type of incentive.

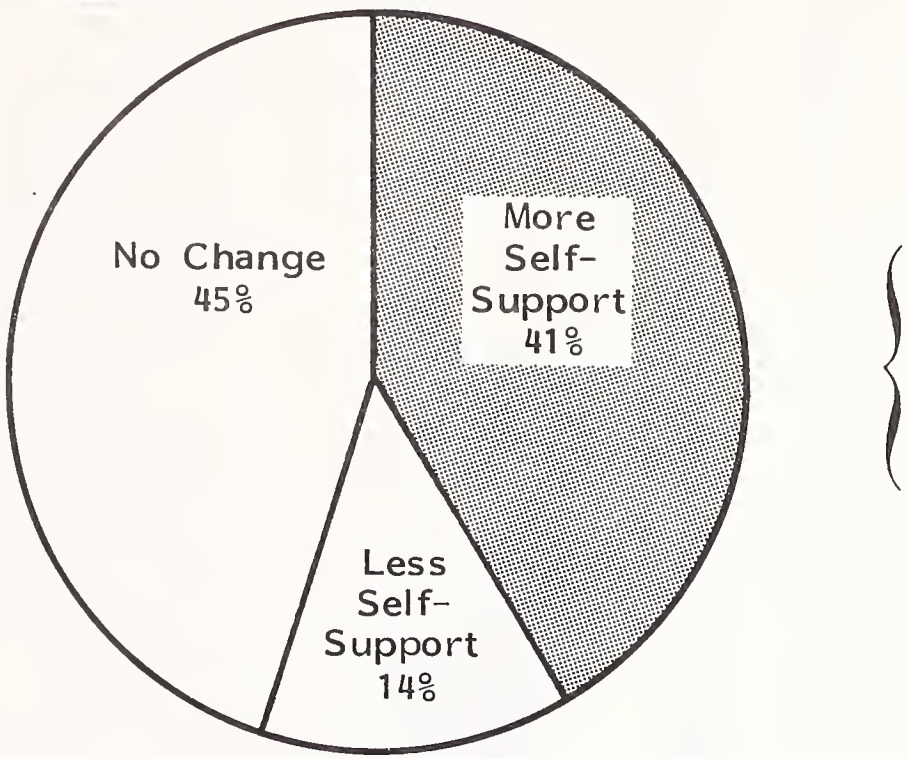
  - Price is currently the incentive offered most frequently, but it is offered to only one in eight customers: three times this number would like price incentives.

  - Vendor backup and documentation are distant seconds as self-support incentives.

EXHIBIT III-4

TRENDS IN CUSTOMER SELF-SUPPORT

Customer Perception of Trends




Reasons for Increased Self-Support

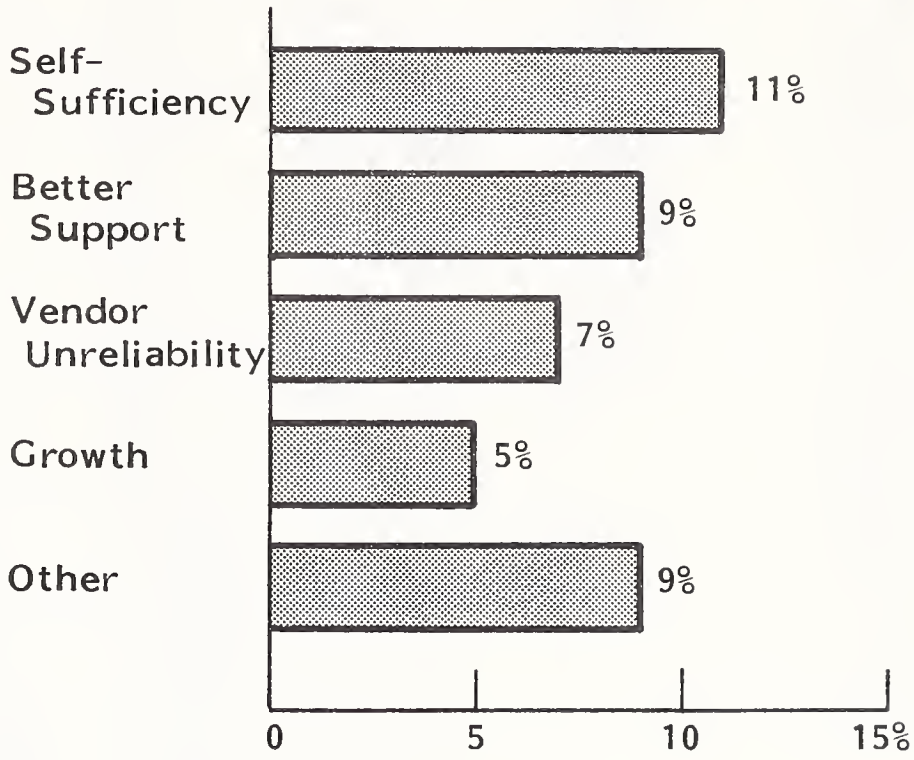
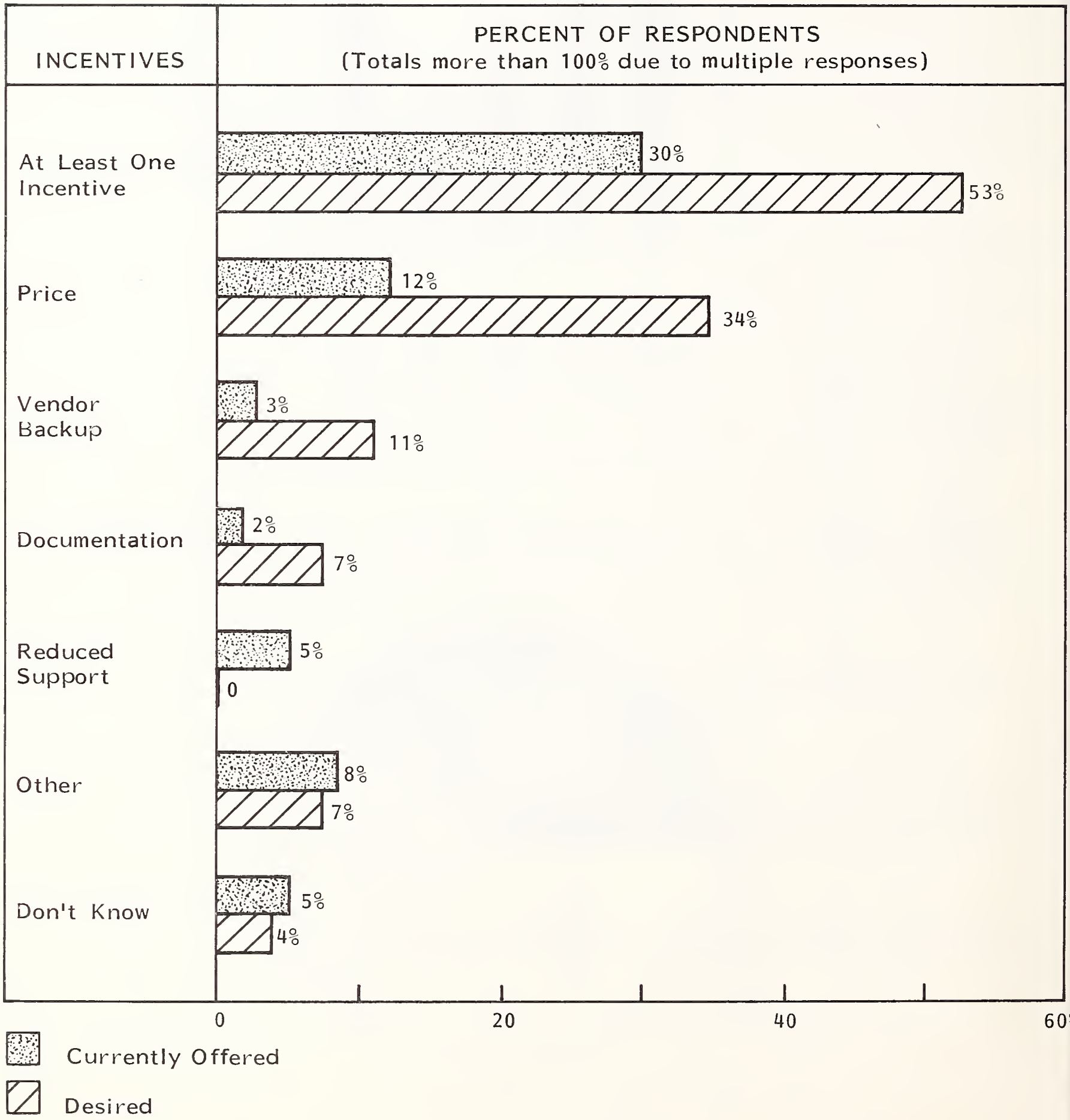


EXHIBIT III-5

## CURRENT AND DESIRED INCENTIVES OFFERED TO PROMOTE SELF-SUPPORT



- Inadequate support is a perversely negative incentive that no customer wants.

## B. VENDOR SUPPORT PERFORMANCE

### 1. CONSTITUENTS OF SOFTWARE SUPPORT

- The most important software support function is that of fixing errors, as shown in Exhibit III-6. Feature modification (improving, adding, extending) and training are viewed as important, but much less so than fixing errors. Consulting is also considered fairly important.

- As far as satisfaction with vendor performance is concerned there is both good news and bad news:

  - The good news is that there is a one-to-one correlation between the importance of a function and customer satisfaction; the most important functions have the most satisfaction.

  - The bad news is that satisfaction with error correction is not nearly so high as its importance.

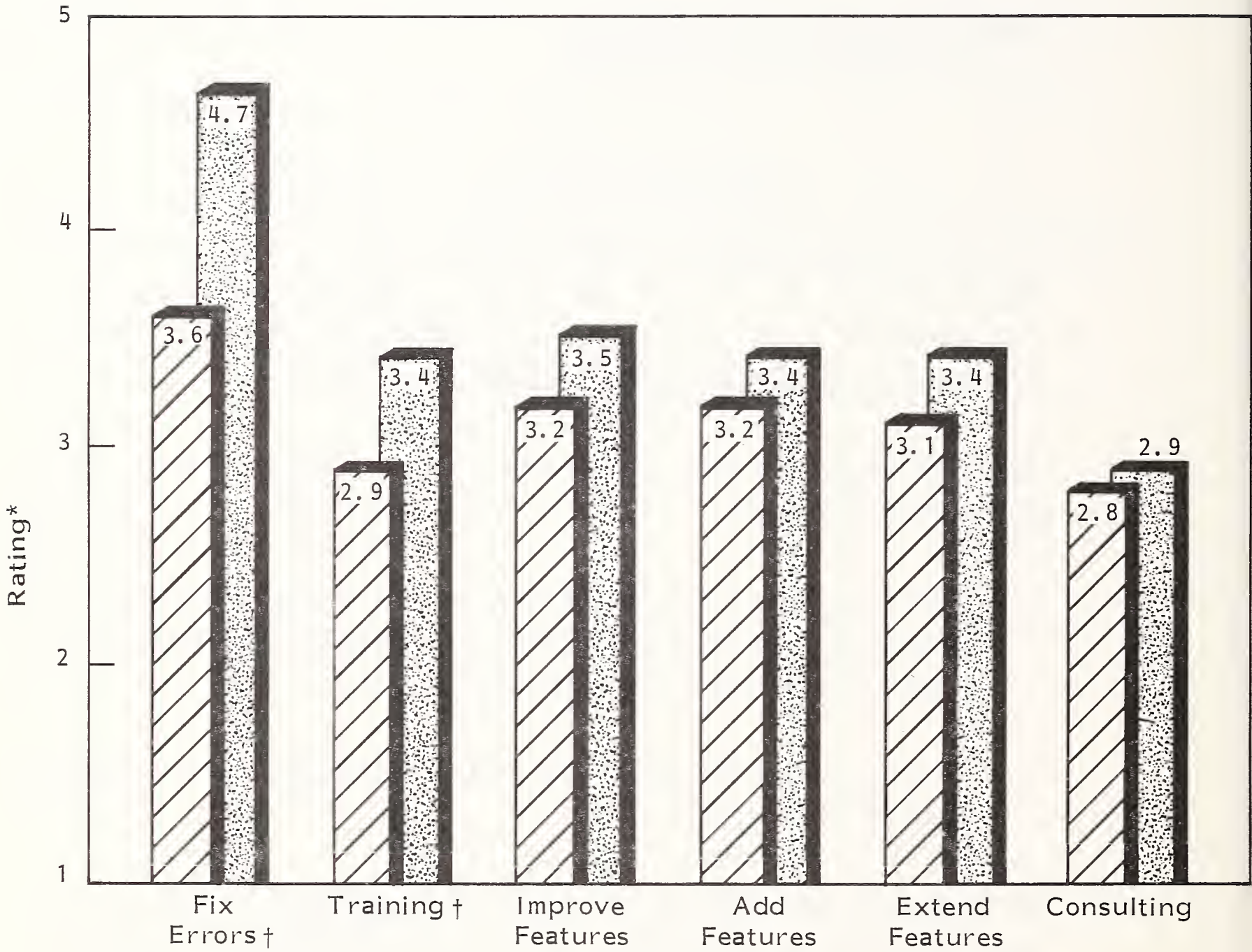
- In the real world, this is a difficult gap to close, since error identification is out of the control of the vendor and, unfortunately, often impacts important customer work. Section C of this chapter analyzes this and related issues at greater length.

- On the average, customers spend a substantial amount on additional support services, an amount equivalent to a quarter of their standard contractual commitments, shown in Exhibit III-7. These are generally the "soft" services of training and consulting, shown in Exhibit III-8.

EXHIBIT III-6

## IMPORTANCE OF AND SATISFACTION WITH SUPPORT FUNCTIONS

(As Reported by Customers)




*Rating: 1 = Low, 5 = High.

†Software fixes and training are the areas most in need of attention.

EXHIBIT III-7

## EXTENDED SUPPORT SERVICES SPENDING AS A PERCENTAGE OF STANDARD SUPPORT SERVICE CONTRACTS
(As Reported by Customers)

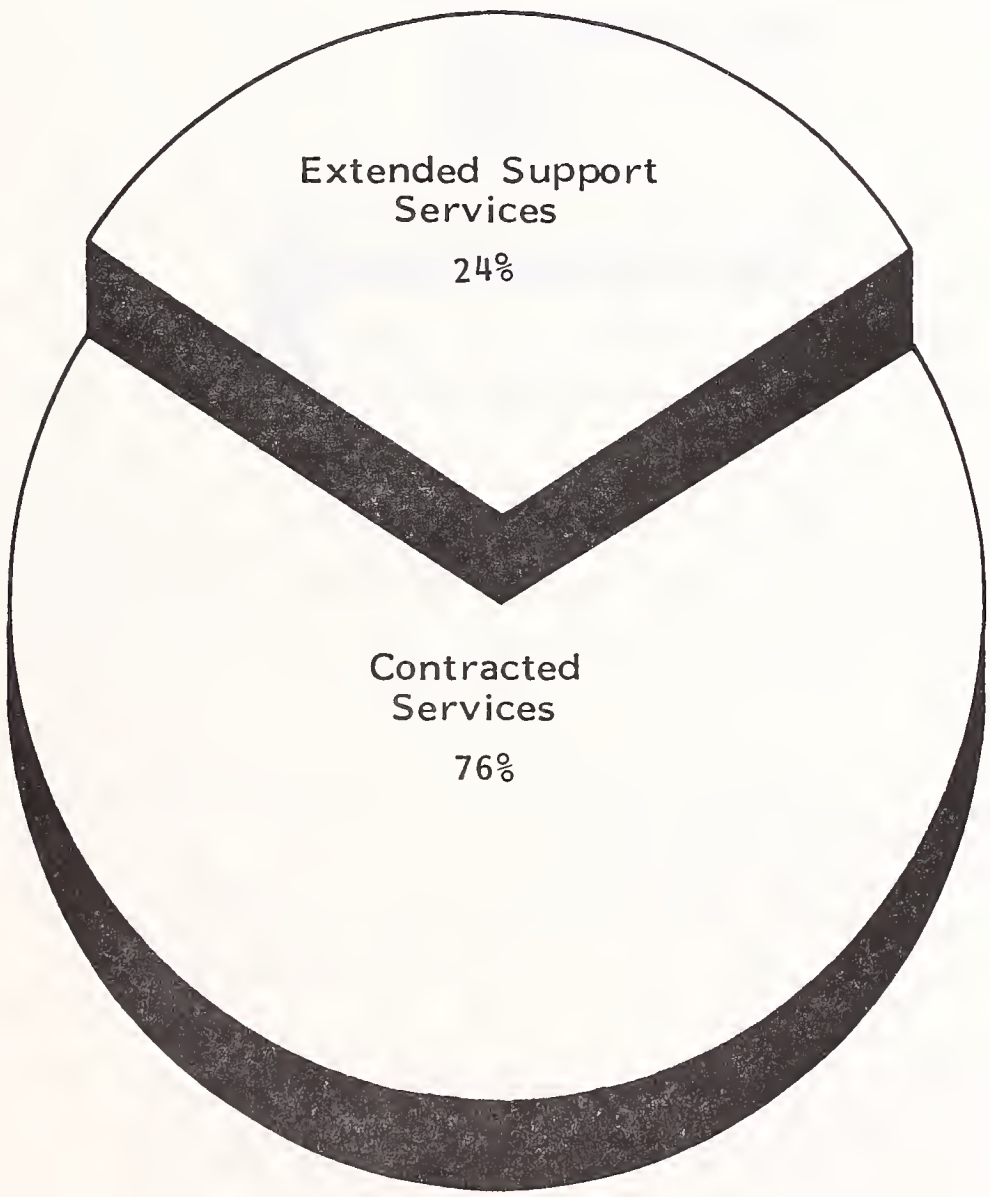
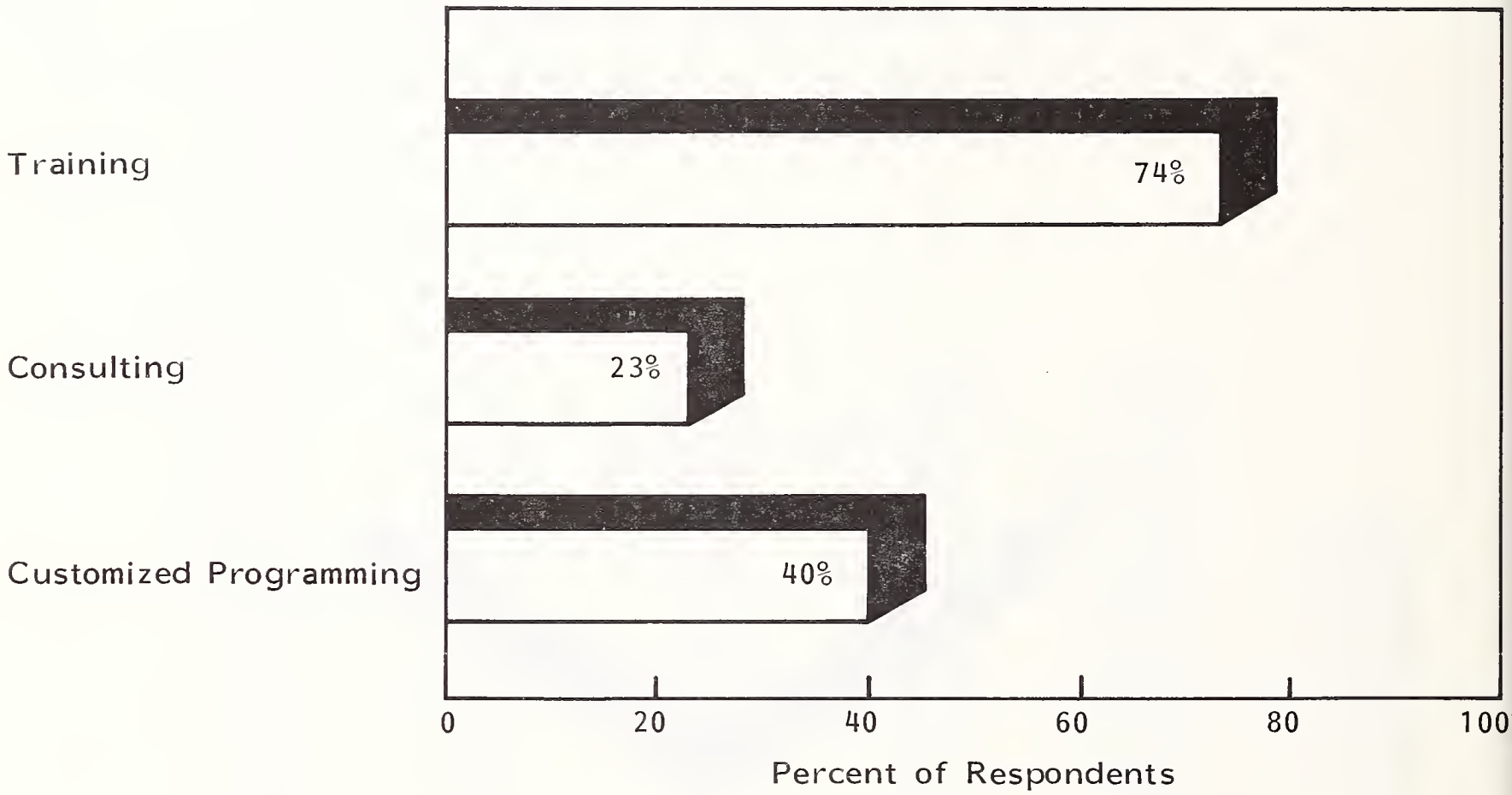


EXHIBIT III-8

## ADDITIONAL VENDOR SERVICES OFFERED




Note: Totals more than 100% due to multiple responses.

- For many vendors this should represent an untapped source of revenue.

- In some cases, vendors are providing such services for a nominal fee, or even free of charge.

2. PROBLEM RESPONSE

- Since error correction is very important but falls short of customer requirements, it is important to understand the issue of problem response. Most customers keep logs of software problems, as shown in Exhibit III-9.

  - Larger firms are more likely to keep logs than smaller firms, as shown in Exhibit III-10.

  - There is a wide variation by industry, with process manufacturing and insurance somewhat less likely to keep logs.

- About one problem in five is classified by customers as a "major" problem, with major problems equally divided between operating systems, other systems software and applications, as shown in Exhibit III-11.

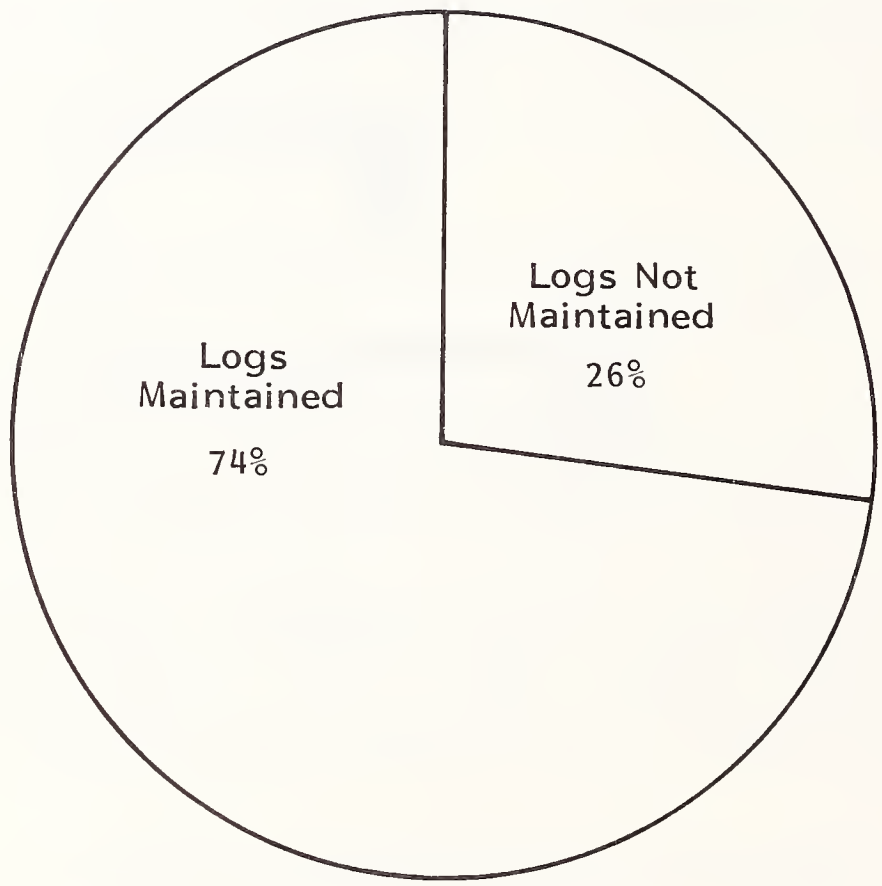
  - The picture is different for minor problems:

    . Operating system problems account for more than the other two categories combined.

    . Application software accounts for a very small proportion of this category of problem. In part this is due to the ability of customers to work around such problems, e.g., writing a special module or report program to deal with a problem. Working around systems software problems is much more difficult.

EXHIBIT III-9

## CUSTOMER LOGS OF SOFTWARE PROBLEMS
(Reported by Customers)




- Customers Increasingly View Logs as a Valuable Vendor Management Tool

EXHIBIT III-10

## SOFTWARE PROBLEM LOGS MAINTAINED

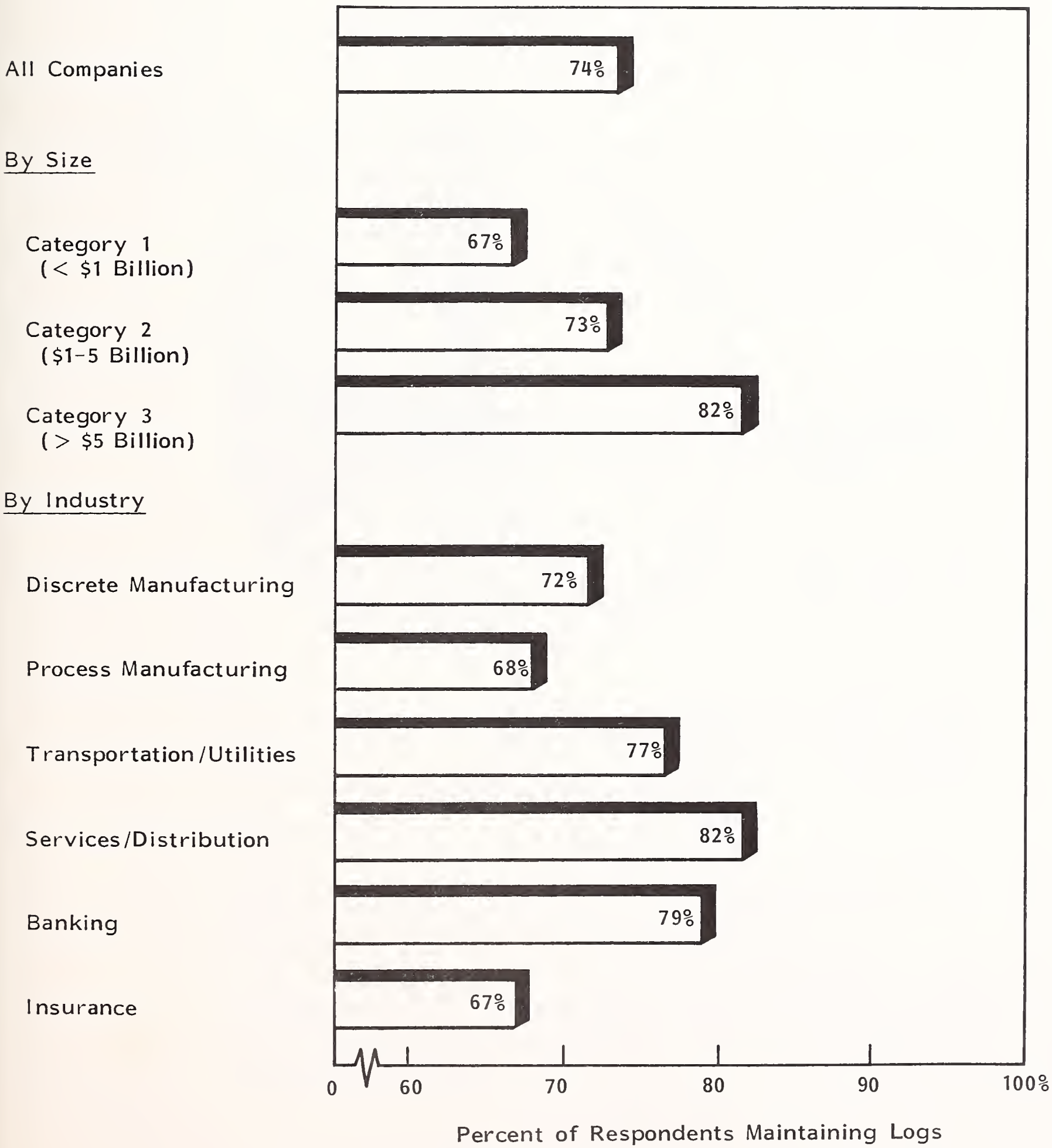
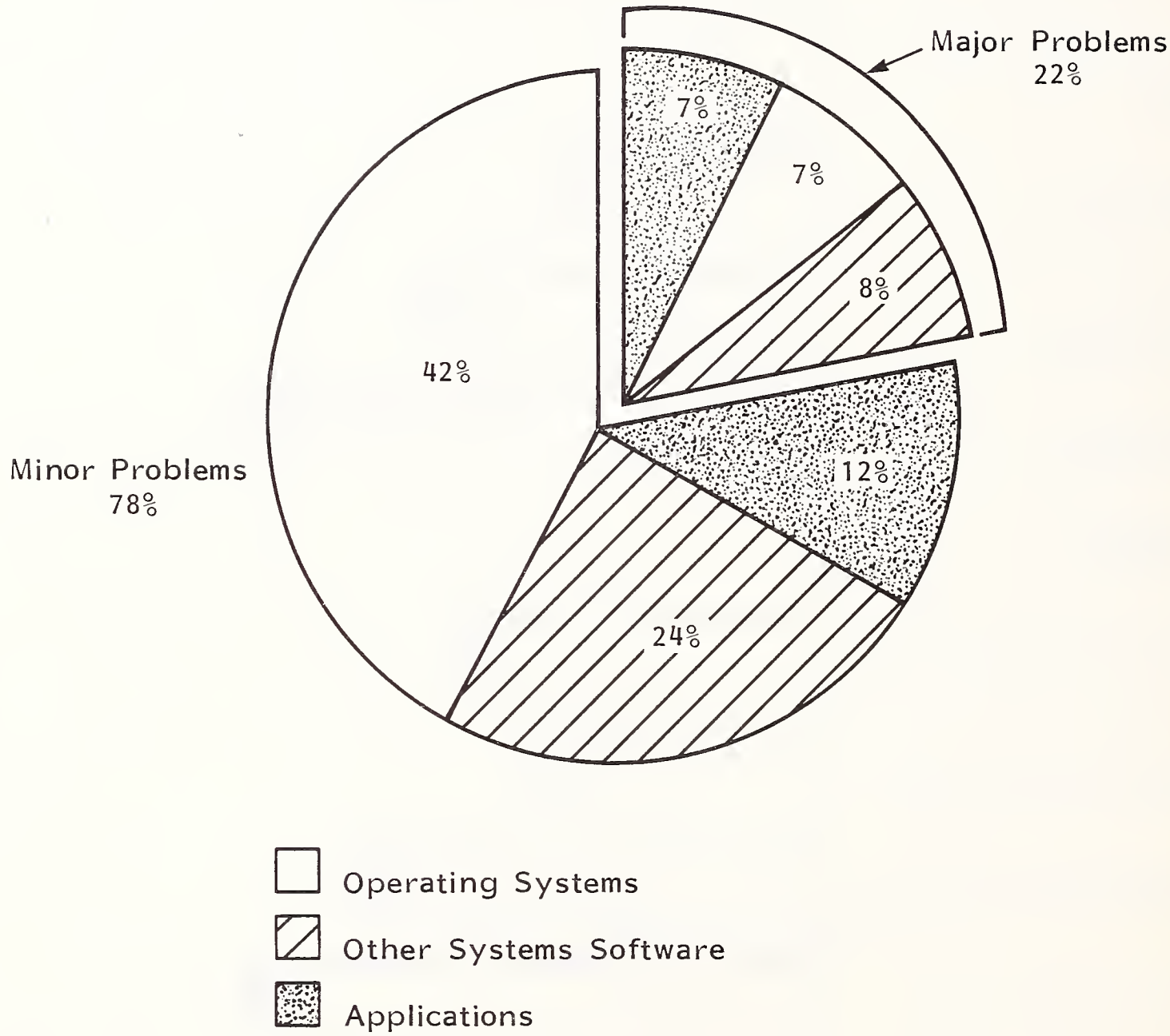


EXHIBIT III-11

SOFTWARE PROBLEM OCCURRENCE
(As Reported by Customers)



- Operating system problems account for about half of all problems. As noted above, most customers are virtually forced to turn to the vendor for any solutions to these problems.

- Problem resolution performance is reasonably good, as reported by customers: three-quarters are satisfied, as shown in Exhibit III-12. A minority want faster response and better quality performance.

- The actual quantified performance, as reported by customers, is spotty.

  - Applications software has both the best and the worst performance, with virtually all major problems resolved, as opposed to only about two-thirds of the minor problems, as shown in Exhibit III-13.

    . The poor performance with minor problems is due in large part to the open-ended qualities of application software problems--many of these are really requests for enhancements that may not be acted on for several releases, if ever.

    . There is often less pressure on vendors to solve these minor problems since users can usually take care of the problem themselves.

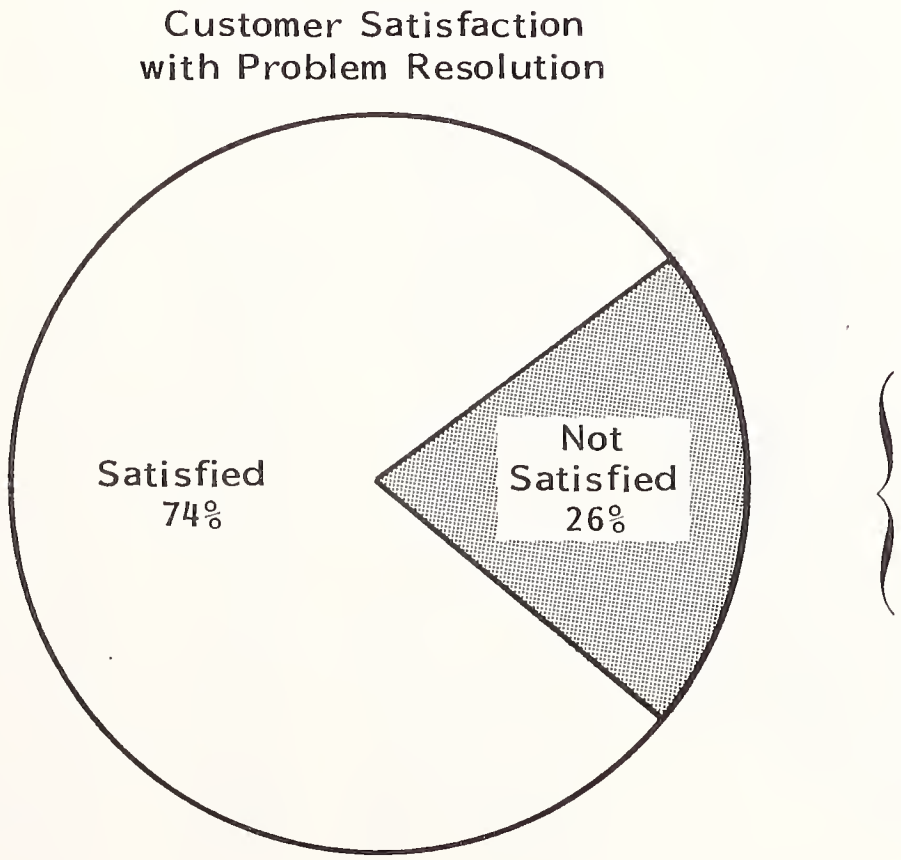
  - The resolution of major problems in operating systems does not have a good record--not much better than the resolution of minor problems. For customers who are at a vendor's mercy this is a very uncomfortable position to be in.

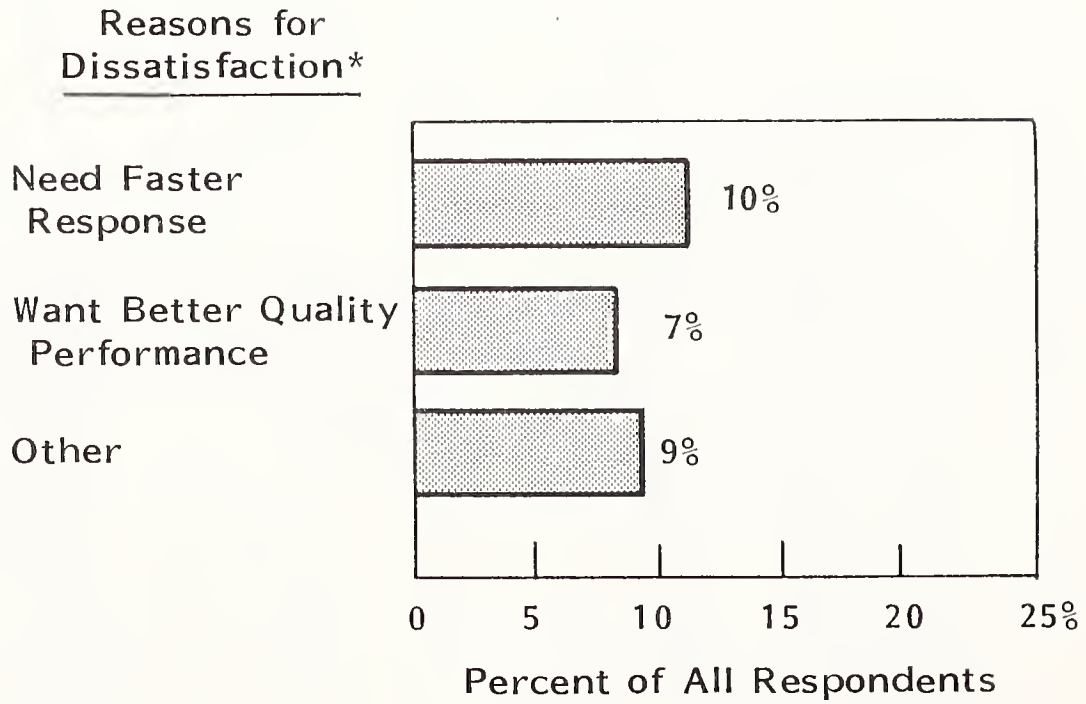
  - Problem resolution for other systems software is much better, although even here one in ten major problems are not resolved.

  - It is understandable that the major systems software problems would be harder to resolve than minor problems. However, customers find the situation unsupportable.

EXHIBIT III-12

PROBLEM RESOLUTION PERFORMANCE

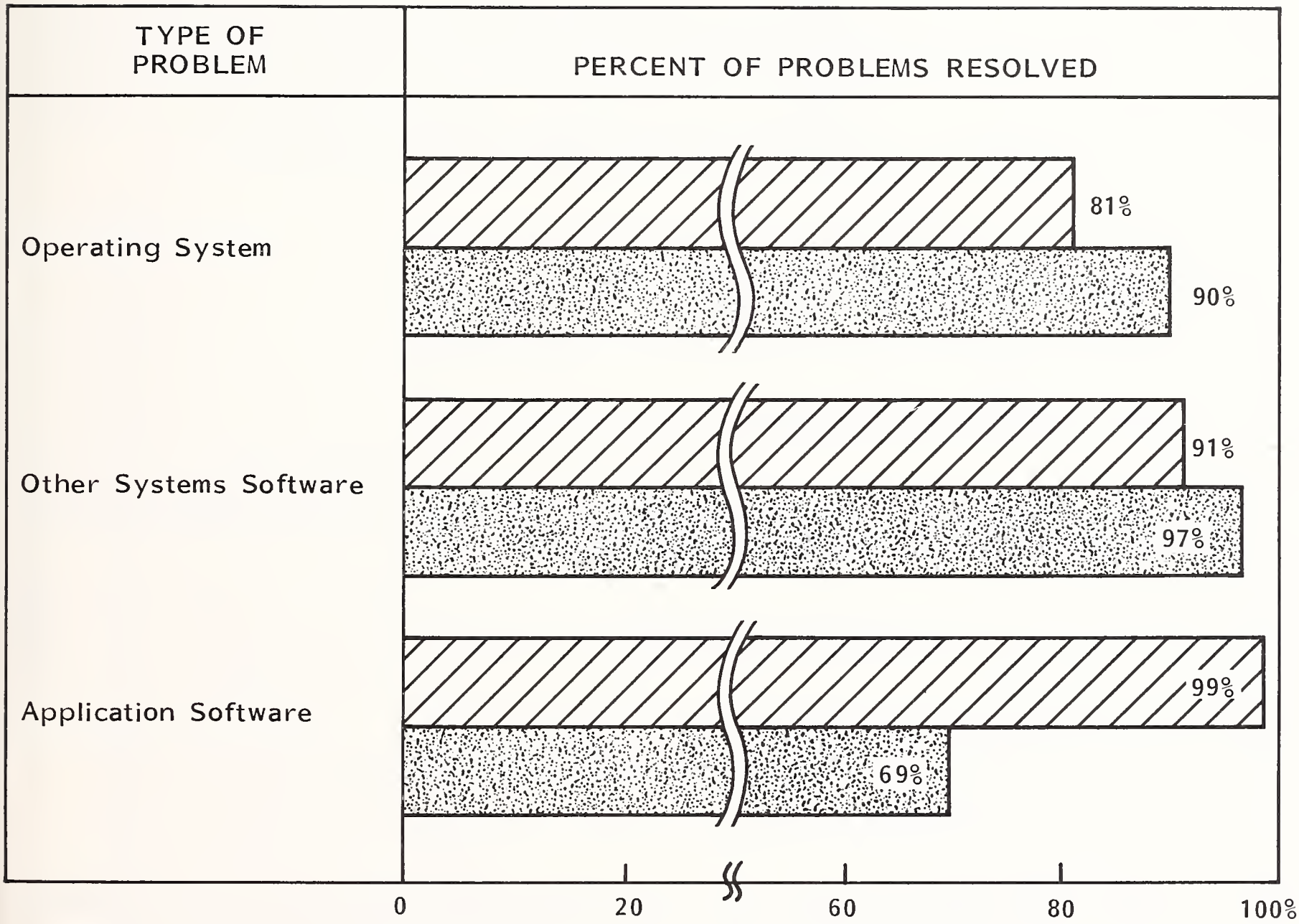



* Open-Ended, Responses Coded.

EXHIBIT III-13

## SOFTWARE PROBLEM RESOLUTION



- Unfortunately, there are no easy answers except quality assurance and quality improvement.

- To be realistic, however, this is a situation that customers have learned to live with. Options are extremely limited, usually not feasible (it would involve changing hardware and/or operating system) and not guaranteed to be an improvement.

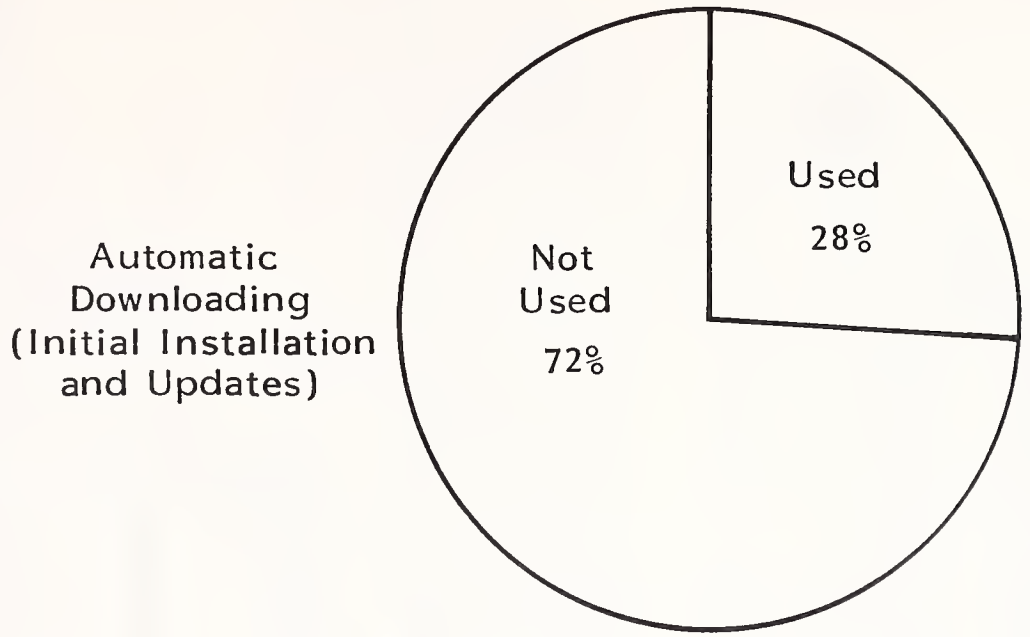
## C. ELECTRONIC SUPPORT

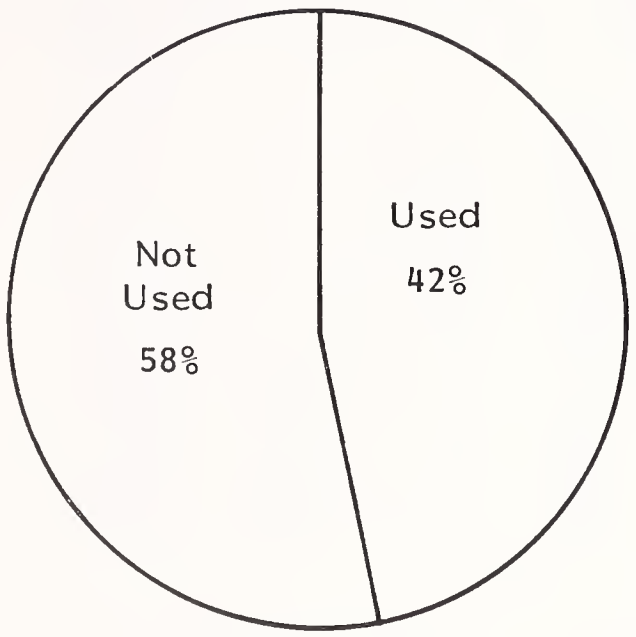
### 1. CURRENT SITUATION

- There has been much discussion by vendors as to the advantages likely to accrue from electronic support, i.e.:
  - Automatic downloading.
  - Remote diagnostics.
  - Remote fixes.
- As shown in Exhibit III-14, these approaches are used in only about one-third of the companies interviewed; since this includes even the smallest amount of use, overall use is well under 10%, probably nearer 5%.
- The use of automatic downloading does not vary a great deal by company size, although process manufacturing and banking are somewhat more likely to use it, as shown in Exhibit III-15.

EXHIBIT III-14

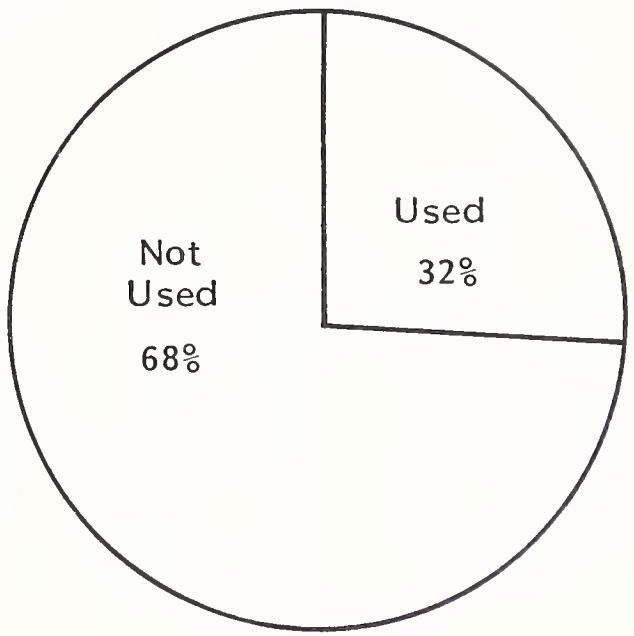
EXTENT OF USE OF REMOTE SOFTWARE SERVICING




Remote Diagnostics

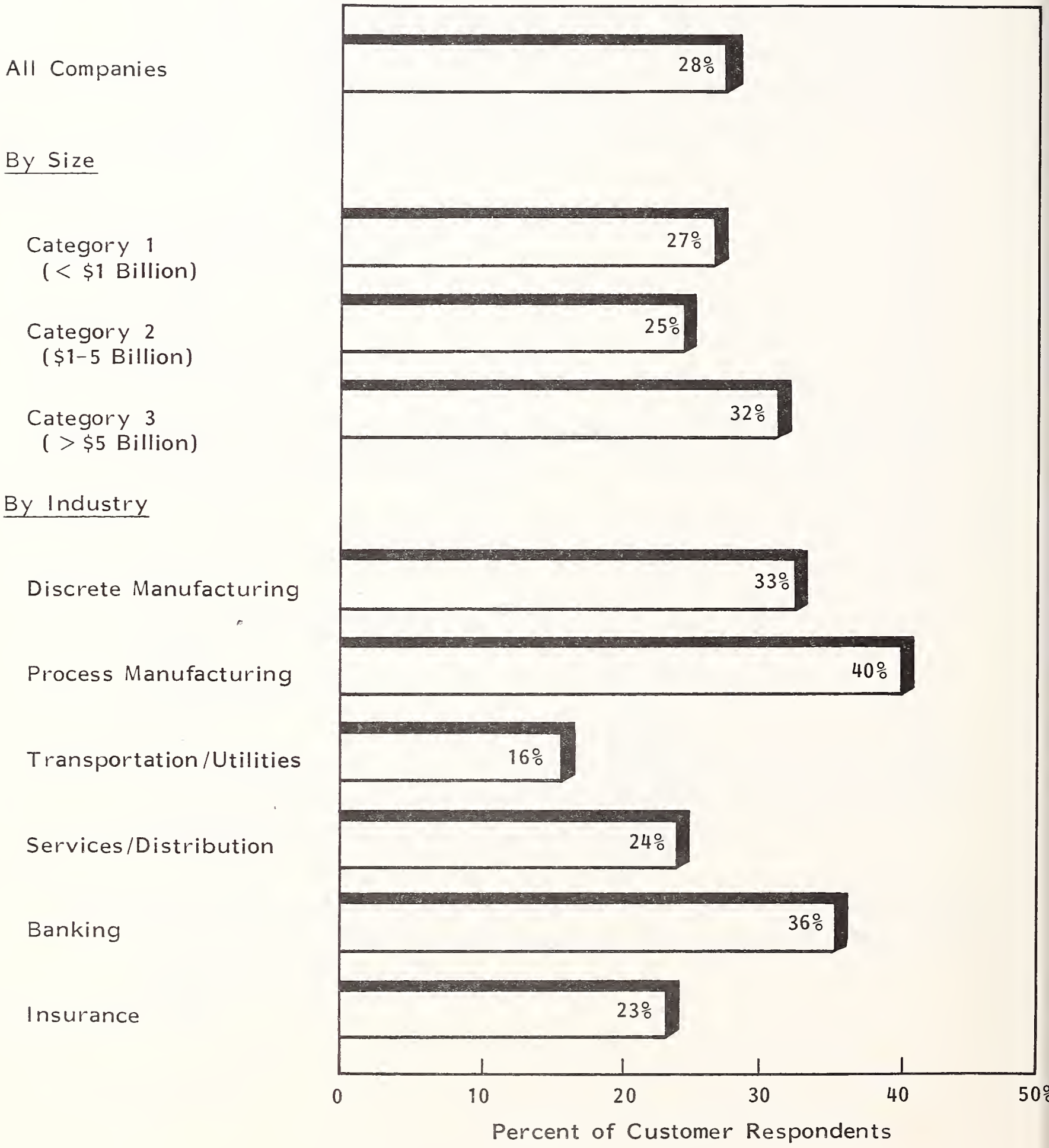
Remote Fixes




Note: Systems and application software are combined.

EXHIBIT III-15

## USE OF AUTOMATIC DOWNLOADING



- The striking thing about automatic downloading is that almost half of respondents see little improvement occurring because of automatic downloading, as shown in Exhibit III-16. One-quarter see general improvements occurring and about one-tenth see benefits from improved quality or faster problem resolution.

- Use of remote diagnostics, on the other hand, does seem to be related to company size, as shown in Exhibit III-17. There are few differences between industries.

  - Only a quarter of respondents see few benefits arising from the use of remote diagnostics, as shown in Exhibit III-18.

  - One-third see a general improvement or benefits occurring in the future.

  - Specific improvements to quality or resolution speed are both close to the 10% level.

- The use of remote fixes occupies an intermediate position between remote installation and diagnosis, with about one-third of companies using this, as shown in Exhibit III-19. Company size does not appear to be a factor, and there are large variations between industries. The high use in the transportation/utilities sector appears to reflect its operating characteristics, i.e.:

  - Central organization.

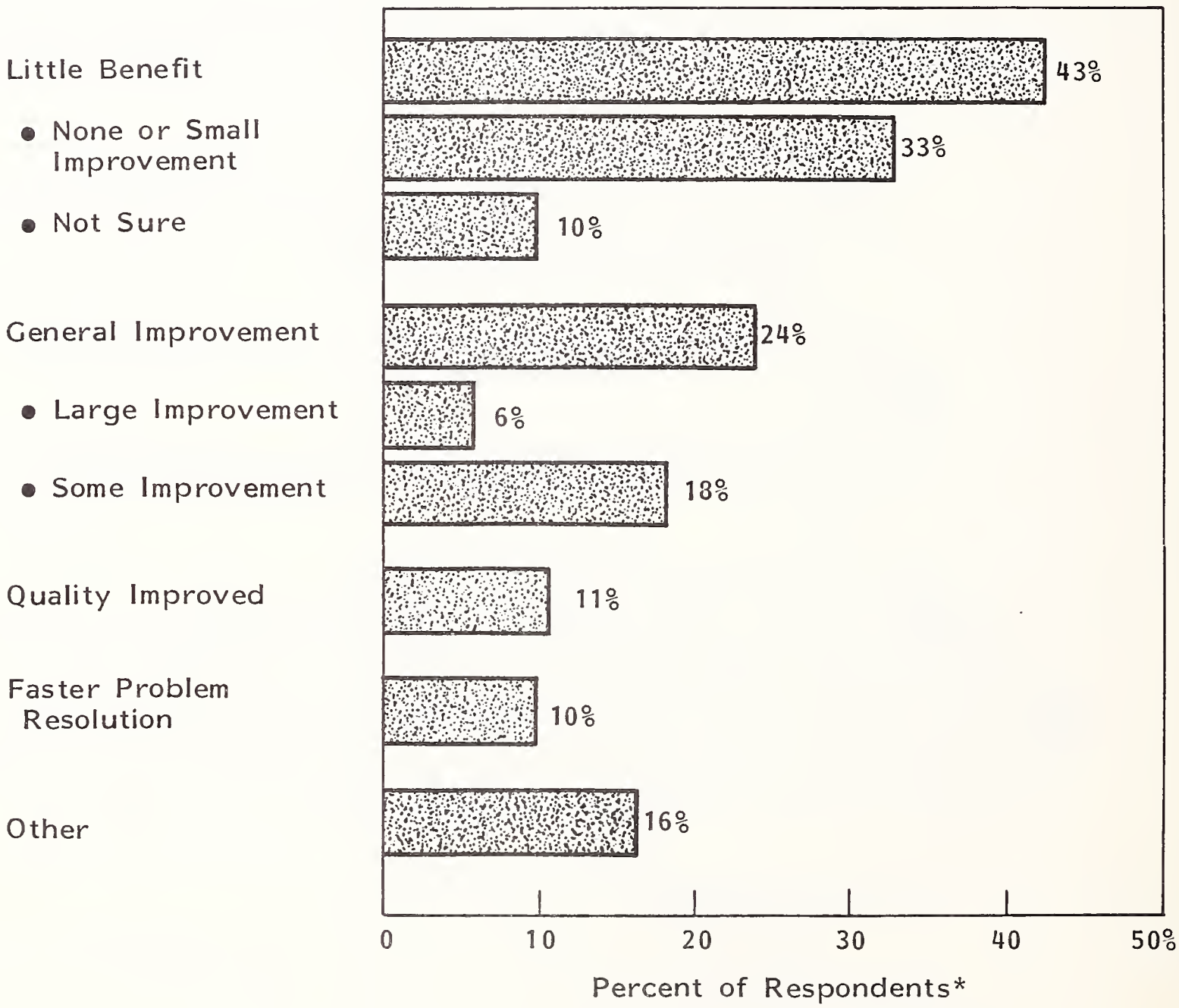
  - Physically dispersed.

  - Very time-sensitive.

- The benefits expected from the use of remote fixes also occupies an intermediate spot between remote installation and diagnosis, with more than one-

EXHIBIT III-16

## BENEFITS EXPECTED BY CUSTOMERS FROM AUTOMATIC DOWNLOADING




*Totals more than 100% due to multiple responses.

Note: Open-ended, coded question.

EXHIBIT III-17

## USE OF REMOTE DIAGNOSTICS

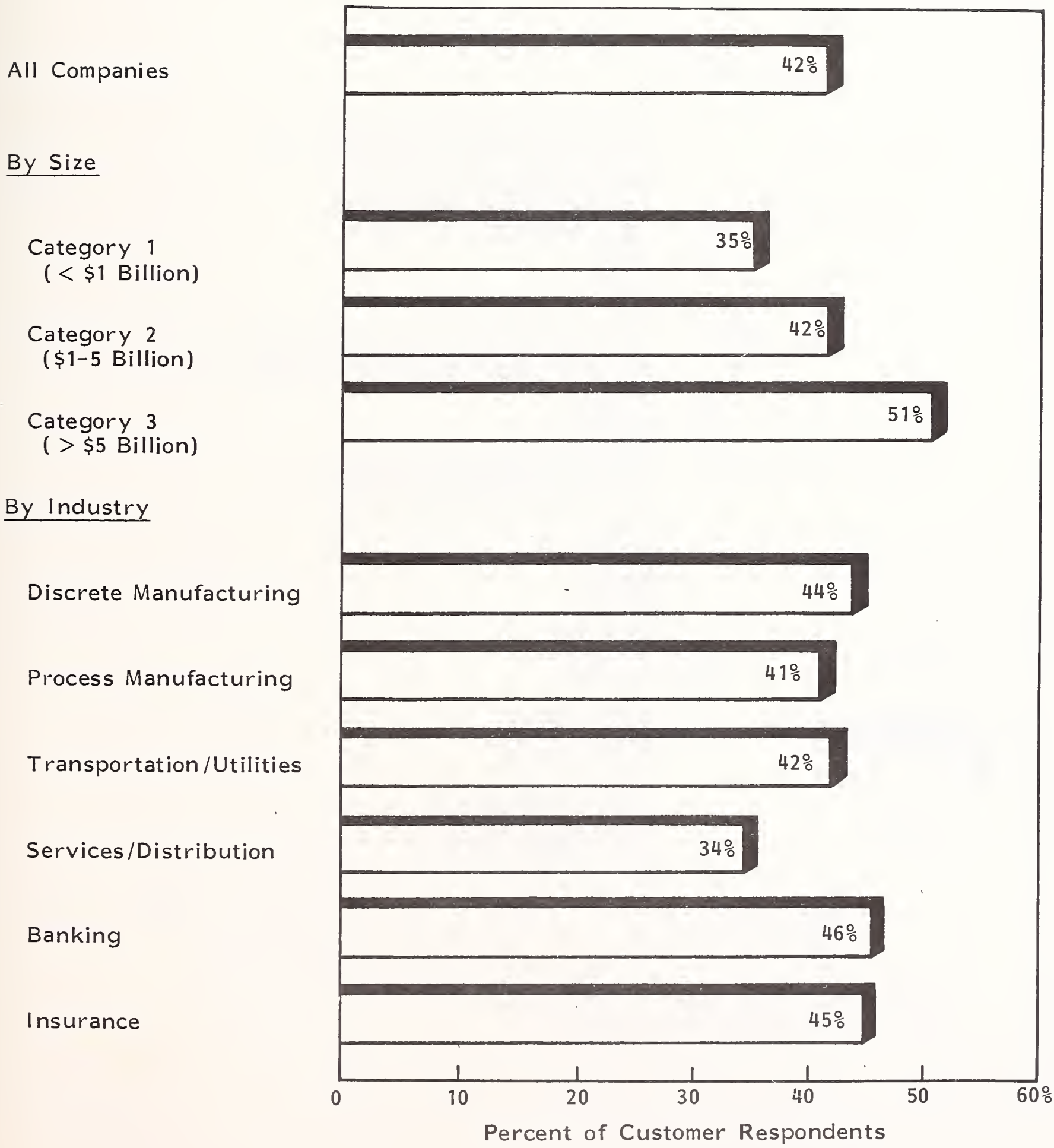
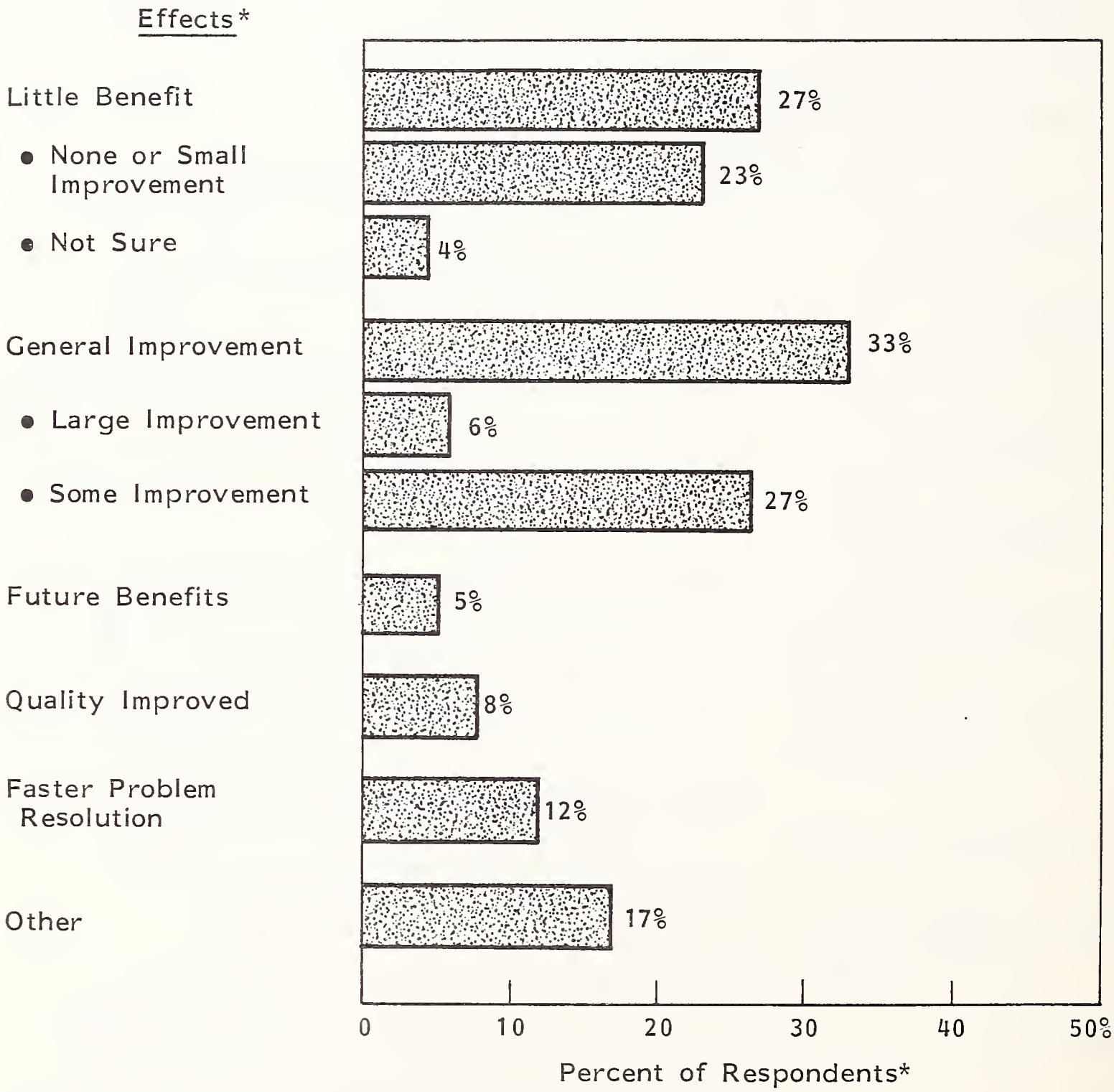


EXHIBIT III-18

## BENEFITS EXPECTED BY CUSTOMERS FROM REMOTE DIAGNOSTICS

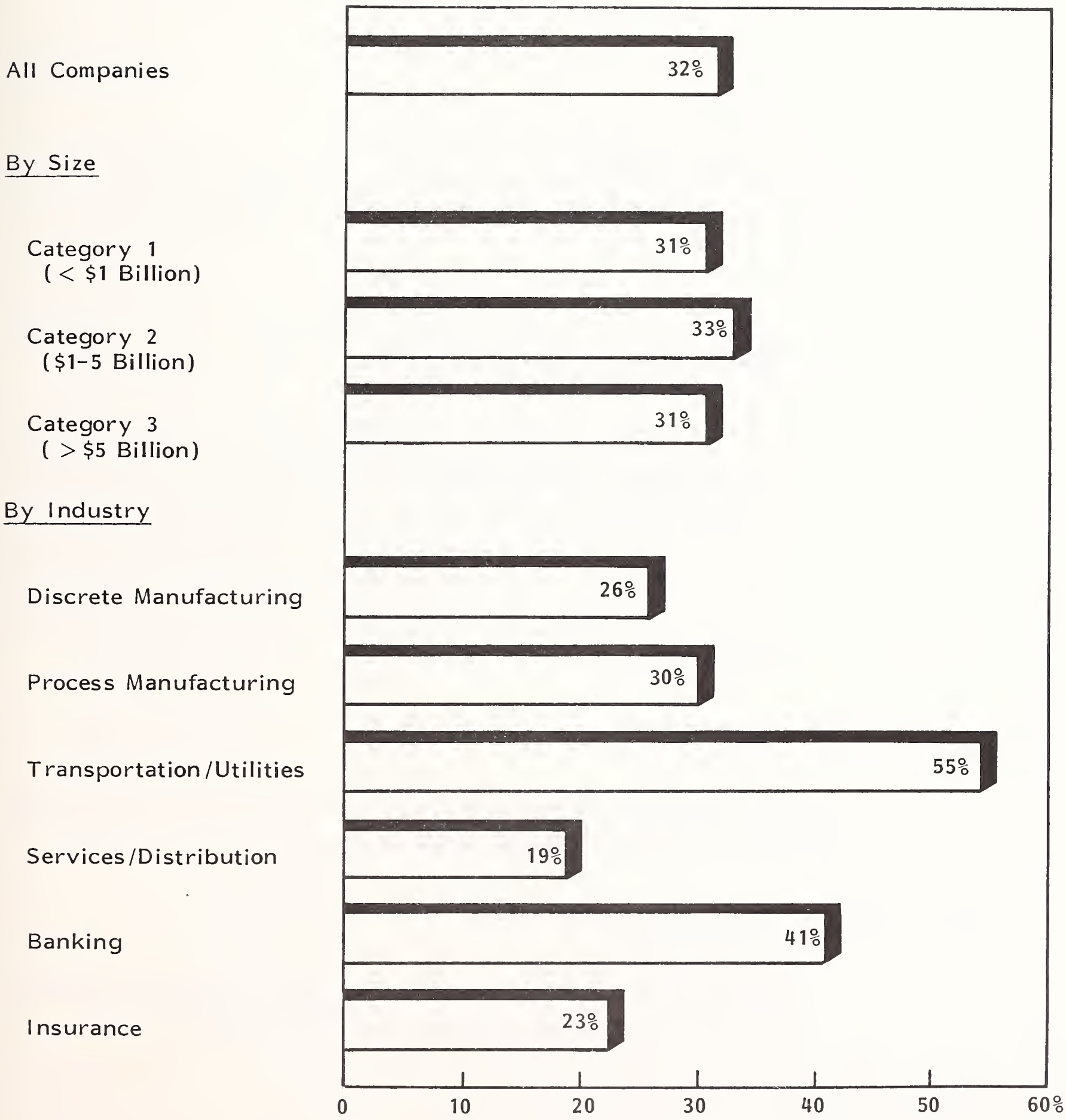



*Totals more than 100% due to multiple responses.

Note: Open-ended, coded question.

EXHIBIT III-19

USE OF REMOTE FIXES



third of companies seeing small benefits accruing to themselves, as shown in Exhibit III-20.

- Almost 40% see general improvements or future benefits.

- Quite a small number of respondents can point to concrete benefits expected.

- All in all the response to electronic support must be described as tepid, with some variations depending on the type of support and company characteristics.

  - One interesting and useful finding is the absence of concern regarding costs or pricing.

  - This could be very beneficial to vendors who believe in or can demonstrate significant cost savings to themselves using electronic distribution. Customers do not expect to see price declines or expect to share in any savings. Of course, customers may not believe there will be any significant savings, which indicates that vendors should focus on the benefits to customers when they discuss the benefits of electronic distribution.

## 2. VENDOR INITIATIVES

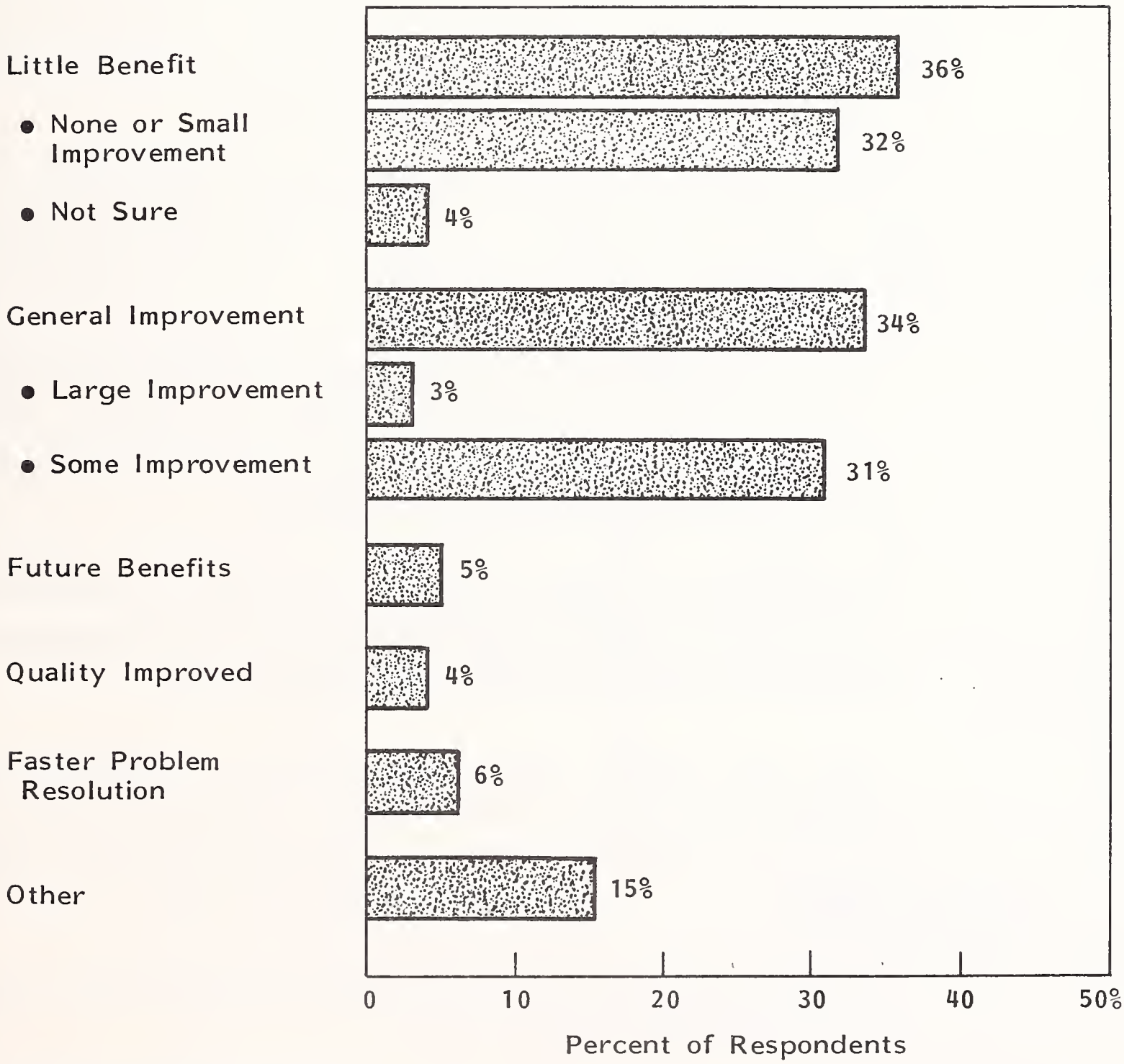
- Of concern to vendors should be the relatively low value that customers place on electronic distribution. There are two dangers:

  - Usage levels may remain low.

  - Perceived benefits may remain nonconcrete and pressure to receive some tangible benefit, e.g., a price reduction, could build.

EXHIBIT III-20

## BENEFITS EXPECTED BY CUSTOMERS FROM REMOTE FIXES




Note: Open-ended, coded question.

- The problem arises from the fact that most vendors have not progressed beyond seeing electronic distribution as a replacement for human intervention or hard copy documentation. Electronic support is often nothing more than a transmission medium.

- Ironically, software vendors have made the same mistake as software developers generally: they have been content to automate a manual system rather than use computers to break new ground. It is doubtful, under these circumstances, whether support systems can be of much benefit.

- Exhibit III-21 shows a conceptual view of an electronic support system of the future. To INPUT's knowledge no vendor is yet taking this comprehensive a view toward support.

  - The natural language interface/expert-system front-end is only feasible for products where a significant investment is warranted. Exhibit III-22 shows the factors involved and the need to have most of these determinants close to the high end of the scale.

  - While it might not always be cost effective to have a computer-driven expert system, the natural language interface can assist customers in putting their problems into commonly understood terms.

  - This would alleviate some of the problems of electronic mail: ambiguity and misunderstanding. Customers would be far more likely to use the "electronic mailbox" aspects of an electronic support system.

  - Eliminating initial person-to-person contact would help vendor support operations in several ways:

    . Smoothing time of day/week peaks.

EXHIBIT III-21

## REMOTE SUPPORT SERVICES, 1989

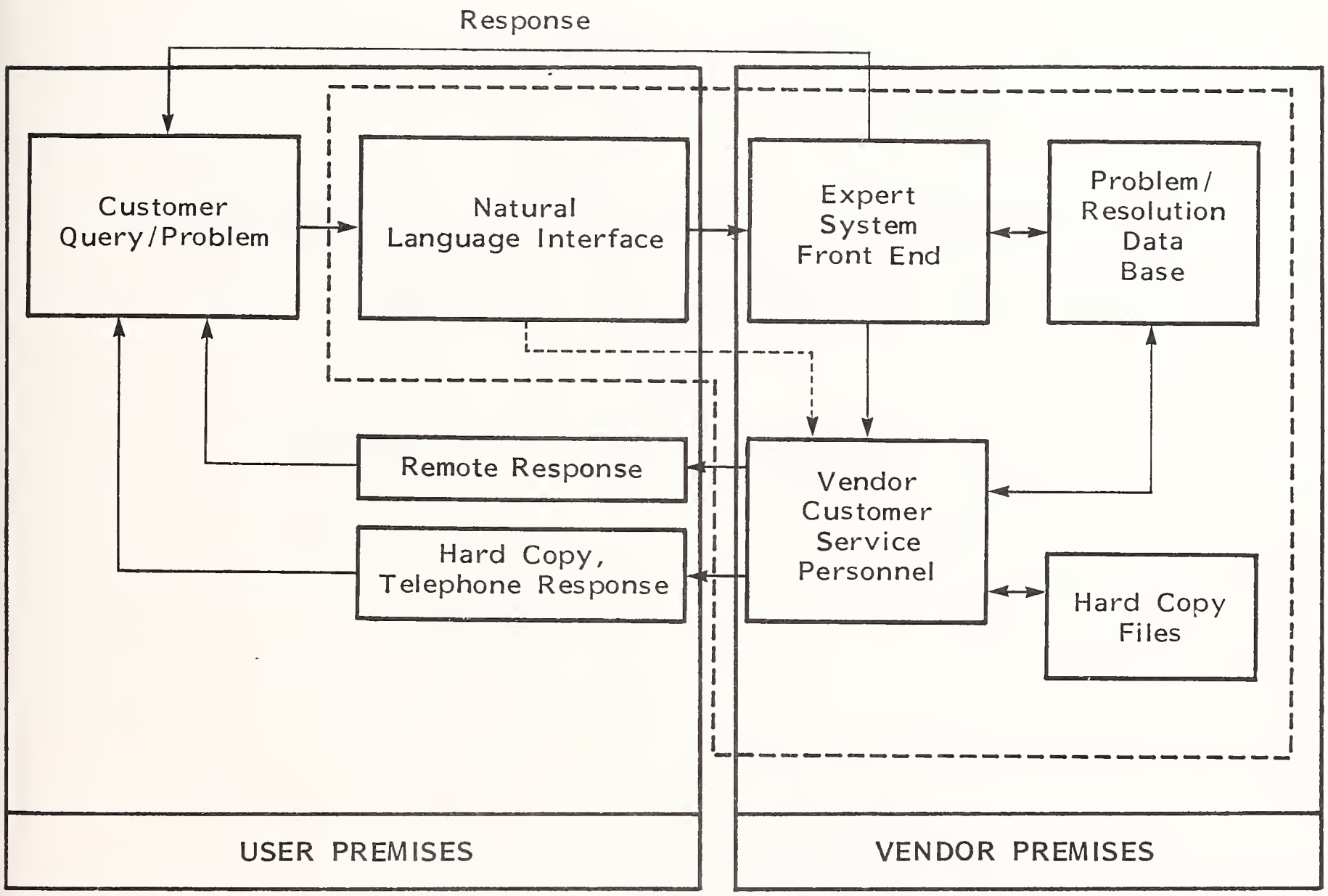
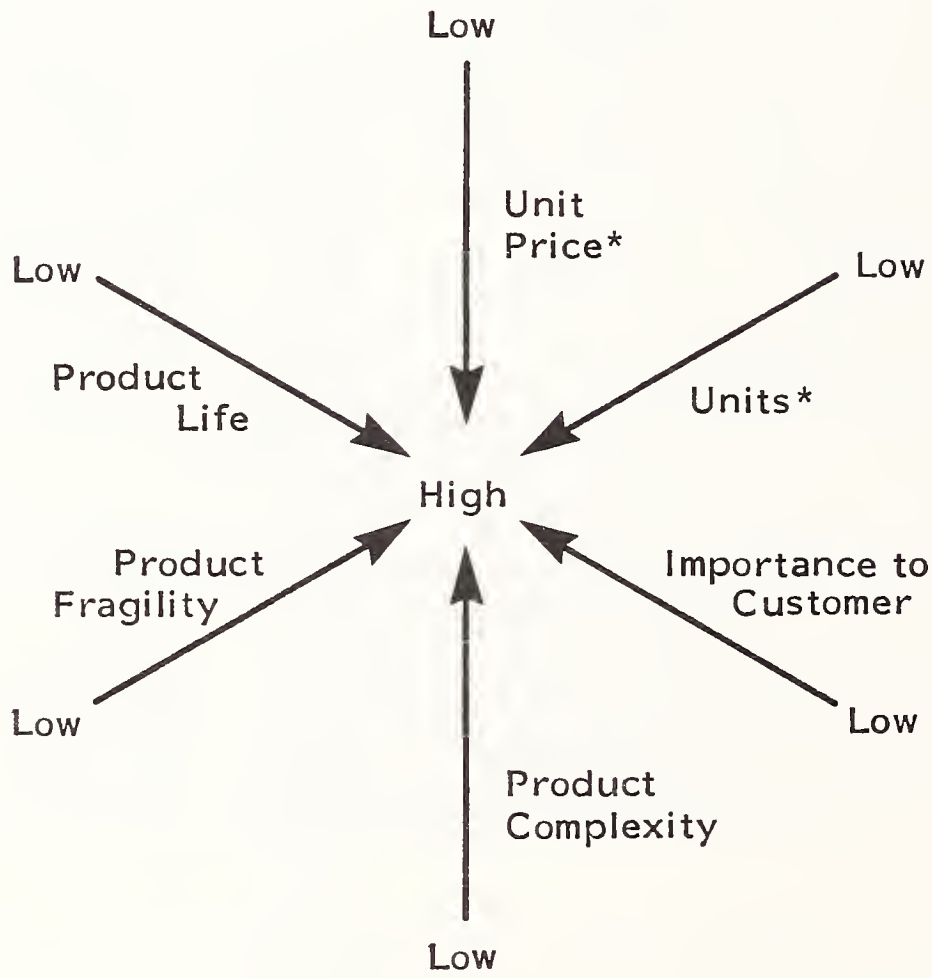


EXHIBIT III-22

REMOTE SUPPORT SYSTEM: INVESTMENT DETERMINANTS




*Critical determinant.

  - . Ranking and assigning problems to the correct specialist.

  - . Documentation.

- The perceived benefits would include:

  - Much faster response to known problems (especially if the expert-system interface was used.)

  - Much less vendor involvement in problems/queries that turn out to be in customer documentation.

- These two benefits, taken together, could then allow support organizations to focus on the major operating system problems, i.e., the area of highest importance and worst performance.

# IV PRICING

# IV PRICING

## A. CURRENT SPENDING

- Overall software support costs now account for over one-quarter of software license costs, as shown in Exhibit IV-1.

  - This proportion does not vary greatly by customer size, but shows significant variation by industry.

  - These industry differences include support outlays as well as the amount of ongoing software license expense, e.g.:

    . A one-time license fee with ongoing support costs.

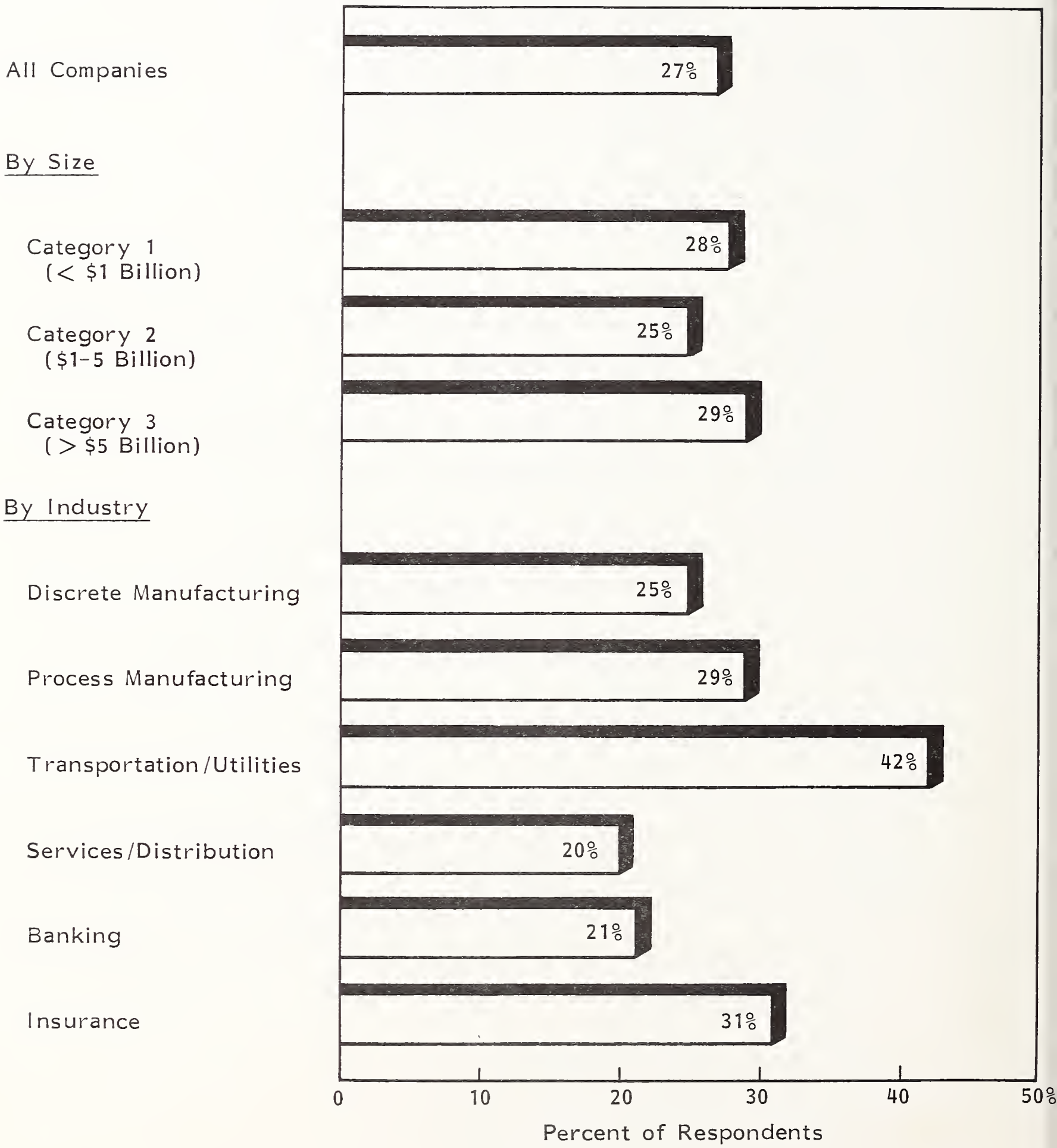
    . Purchasing a package to use as a "shell," with no planned support.

    . A package purchased from the end-user's budget with support costs from MIS (or vice versa).

  - There are enormous variations from firm to firm within industries for these same reasons.

EXHIBIT IV-1

SOFTWARE SUPPORT COSTS AS PROPORTION OF LICENSE COSTS



- In many cases support is a nearly invisible expense, with over half of support expenses being part of the license fee, as shown in Exhibit IV-2. With few exceptions, this does not vary appreciably by company characteristics, as shown in Exhibit IV-3.

## B. FUTURE SPENDING

- Generally, customers expect the current rate of increase in software support costs to continue, as shown in Exhibit IV-4.

- As it turns out, customers expect, on the average, to have their software support spending increase at nearly the same rate as their spending on software licenses, as shown in Exhibit IV-5.

  - A word of caution: while these overall rates are stable, there is significant variation between companies and in the same company from year to year.

  - These changes reflect the "lumpy" nature of major software acquisitions. The rate of growth for support is more stable.

  - The primary reason is the acquisition of additional software, as shown in Exhibit IV-6.

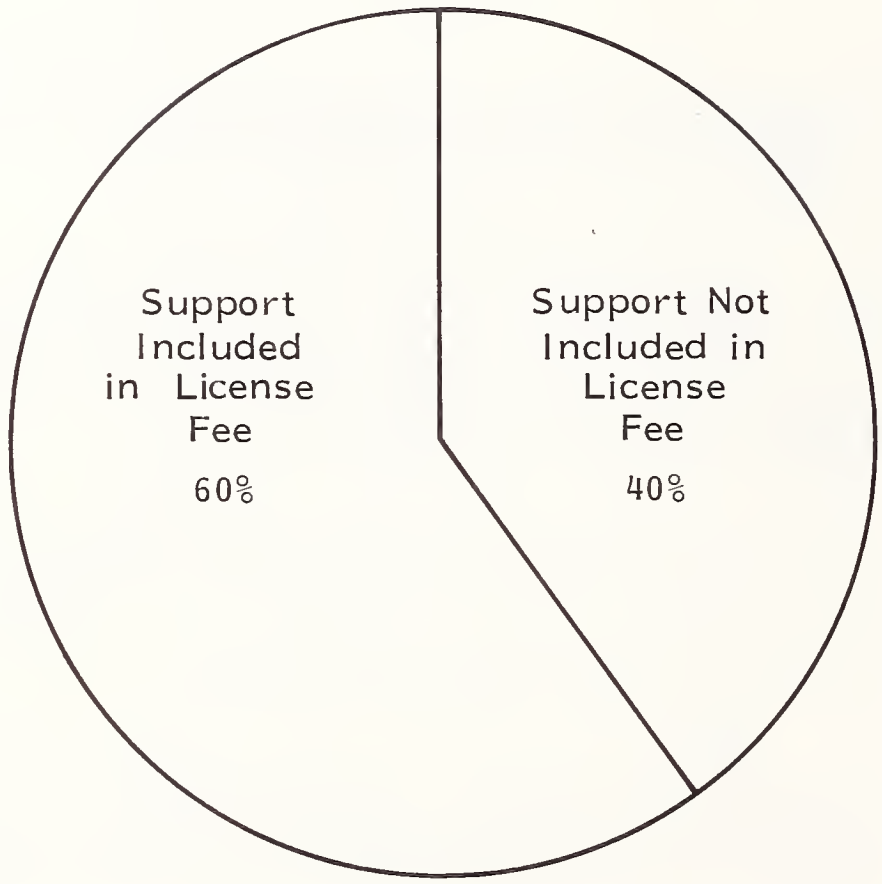
  - Price increases, especially those not related to inflation, are important factors in the customer's mind.

  - Hardware growth is less of a factor.

  - The acquisition of additional software is of more importance to smaller organizations than to larger ones and very important to insurance companies, as shown in Exhibit IV-7.

EXHIBIT IV-2

## PROPORTION OF SUPPORT INCLUDED IN LICENSE FEE




- Support Usually Is Separately Quoted
- "Bundled" in License Fee for Administrative Convenience

EXHIBIT IV-3

PROPORTION OF SOFTWARE SUPPORT COSTS COLLECTED
AS PART OF SINGLE LICENSE FEE

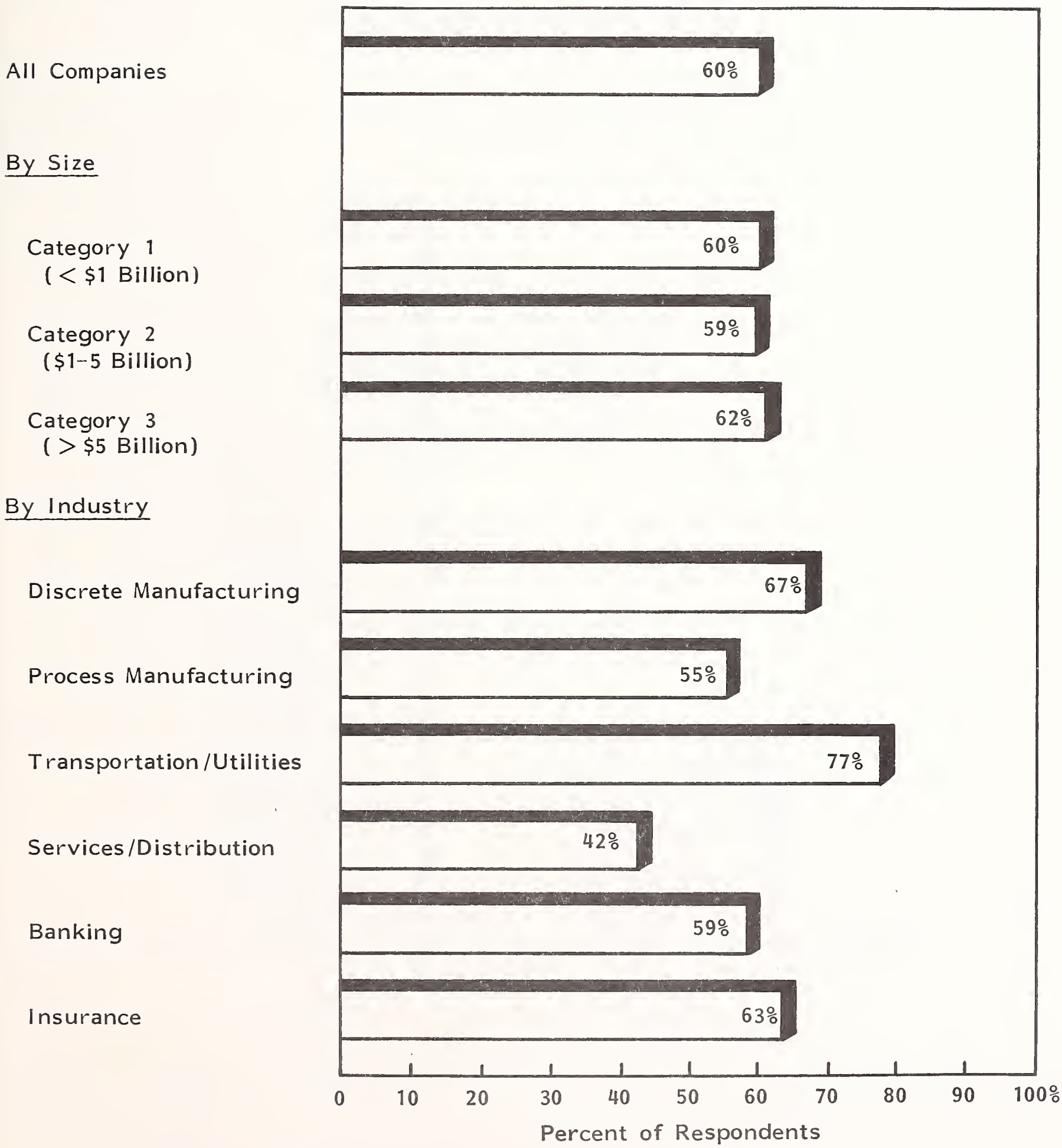
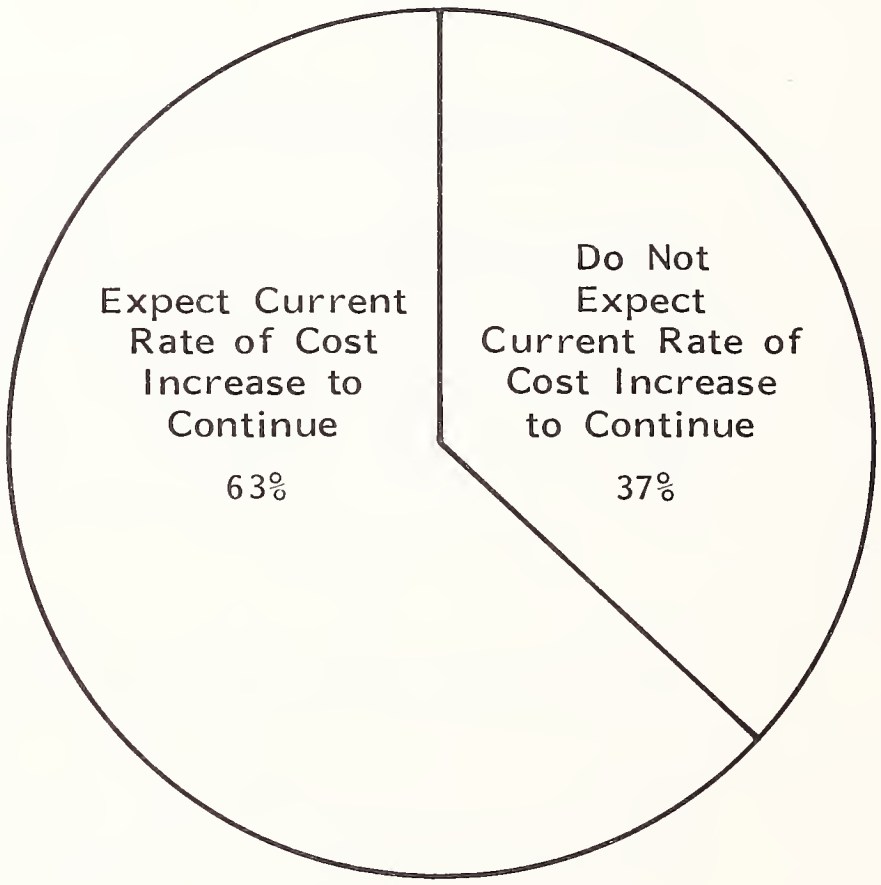


EXHIBIT IV-4

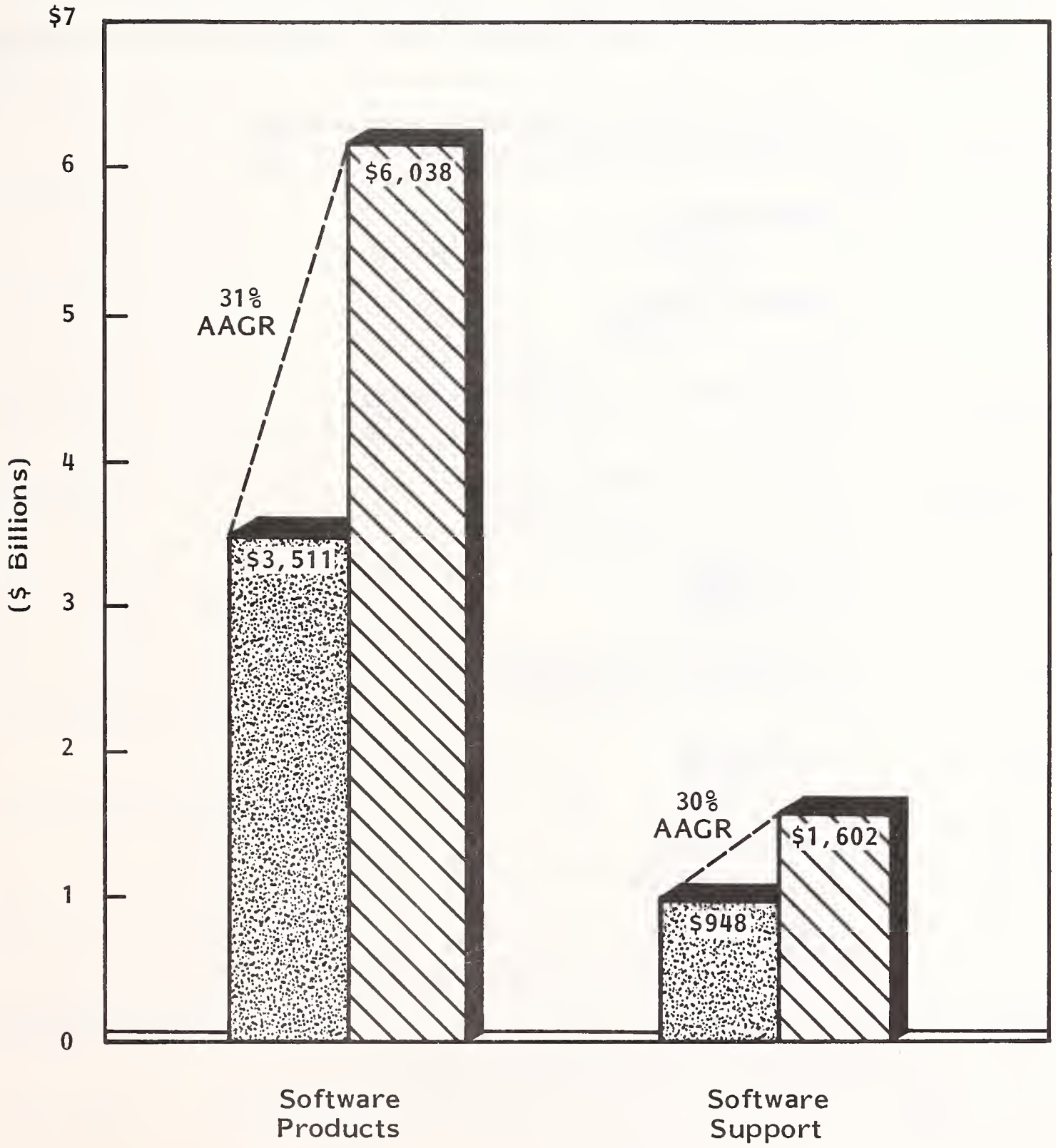
## CUSTOMER EXPECTATIONS OF SOFTWARE SUPPORT COST INCREASES




- Customer Expectations Are of Critical Importance to Vendor Planning
- Will Have Only Minimal Resistance to Ongoing Price Changes

EXHIBIT IV-5

## CHANGES IN SOFTWARE SUPPORT SPENDING
1983-1985




AAGR = Average Annual Growth Rate

EXHIBIT IV-6

## CUSTOMER PERCEPTIONS OF REASONS FOR SOFTWARE SUPPORT FEES INCREASING

| REASON | PERCENT OF RESPONDENTS (Total More Than 100% Due to Multiple Responses.) |
|---|---|
| Additional Software | 66% |
| • Not Identified | 42% |
| • Applications | 10% |
| • System | 14% |
| Price Changes | 34% |
| • Price Increases | 26% |
| • Inflation | 8% |
| Hardware Growth | 22% |
| • Mainframe | 10% |
| • PC-Related | 12% |
| Other | 3% |

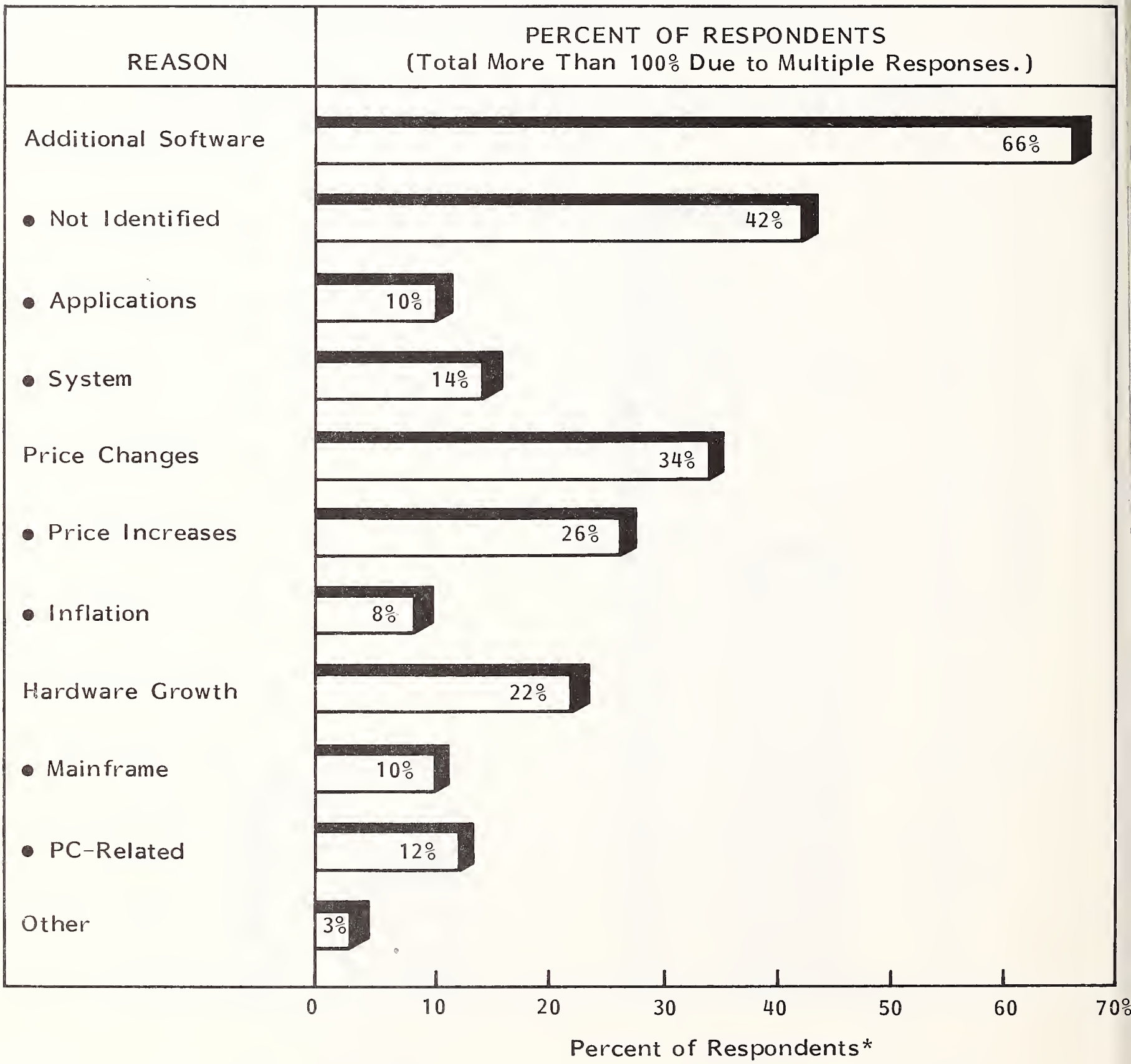
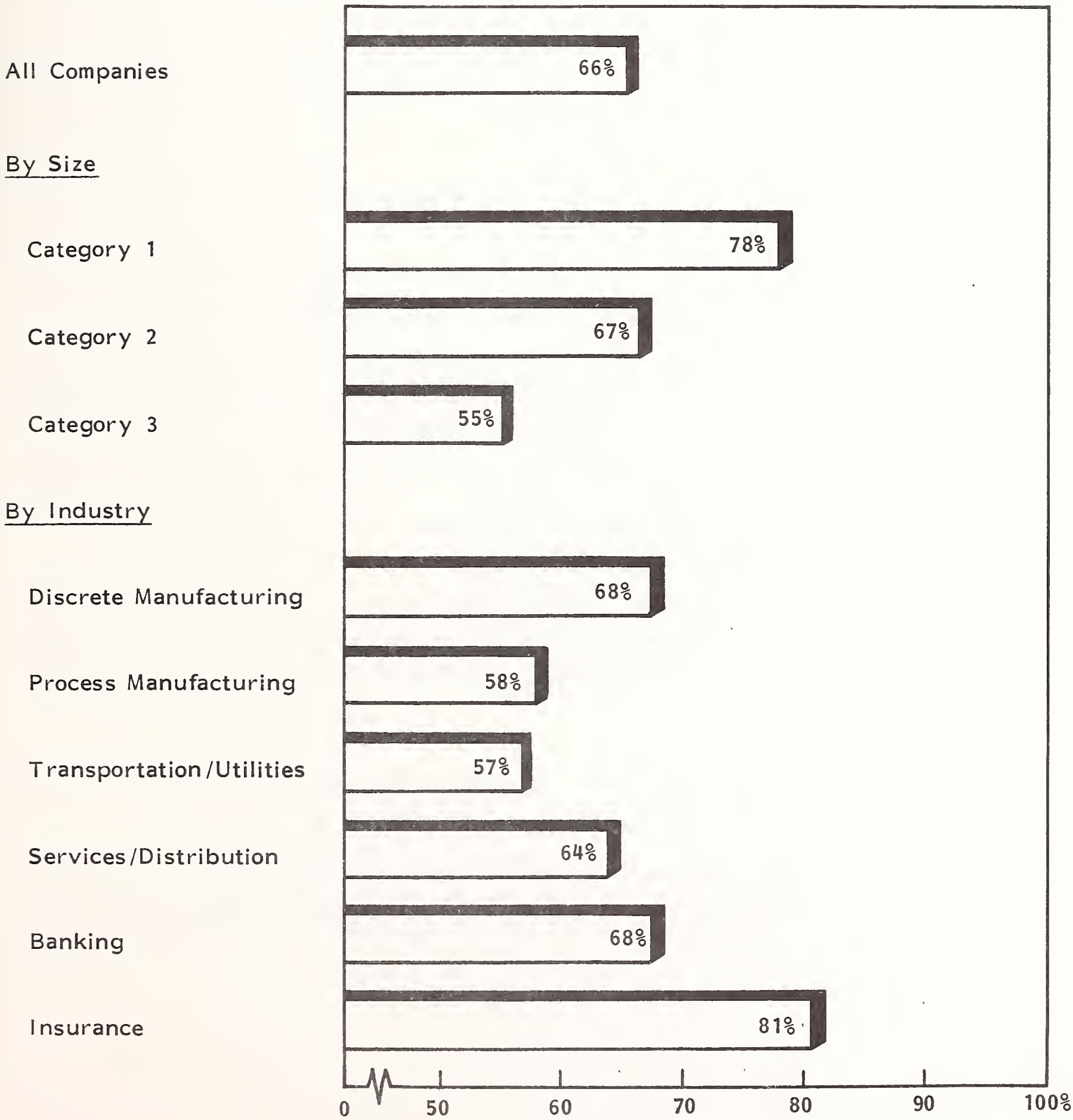


EXHIBIT IV-7

ADDITIONAL SOFTWARE AS REASON FOR FEE INCREASES



## C. REPLACEMENT VERSUS UPGRADED PRODUCTS

- The issue of enhancement versus upgrade is of continuing importance to vendors:

  - Upgraded software can be more attractive to new customers and can potentially increase revenues.

  - No additional revenue can be obtained from an enhancement.

  - Where most units of an existing product have been purchased, an upgrade represents an additional revenue opportunity.

  - On the other hand, an upgrade that is badly managed can create significant problems within the current customer base.

  - Because of these issues, INPUT explored this question at some length with the companies interviewed.

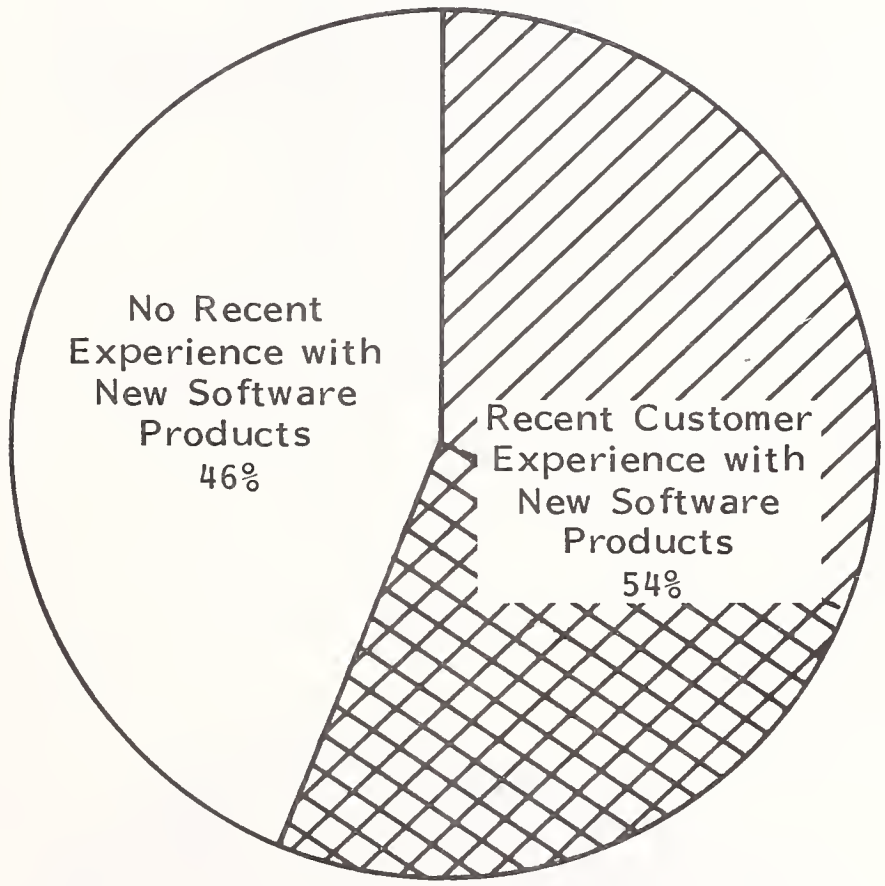
- Over half the companies interviewed had had a recent experience of being offered a "new" product rather than an upgrade. Three out of five of such companies felt that the vendors handled the situation well, as shown in Exhibit IV-8.

  - Where things were not handled well, cost was a minor problem, as shown in Exhibit IV-9, compared with technical mishandling.

  - This is in spite of the fact that half the time no discount at all was received and the upgrade was free in only about one-tenth of all cases, as shown in Exhibit IV-10.

EXHIBIT IV-8

CUSTOMER ATTITUDES ON BEING OFFERED A NEW PRODUCT INSTEAD OF AN UPGRADE

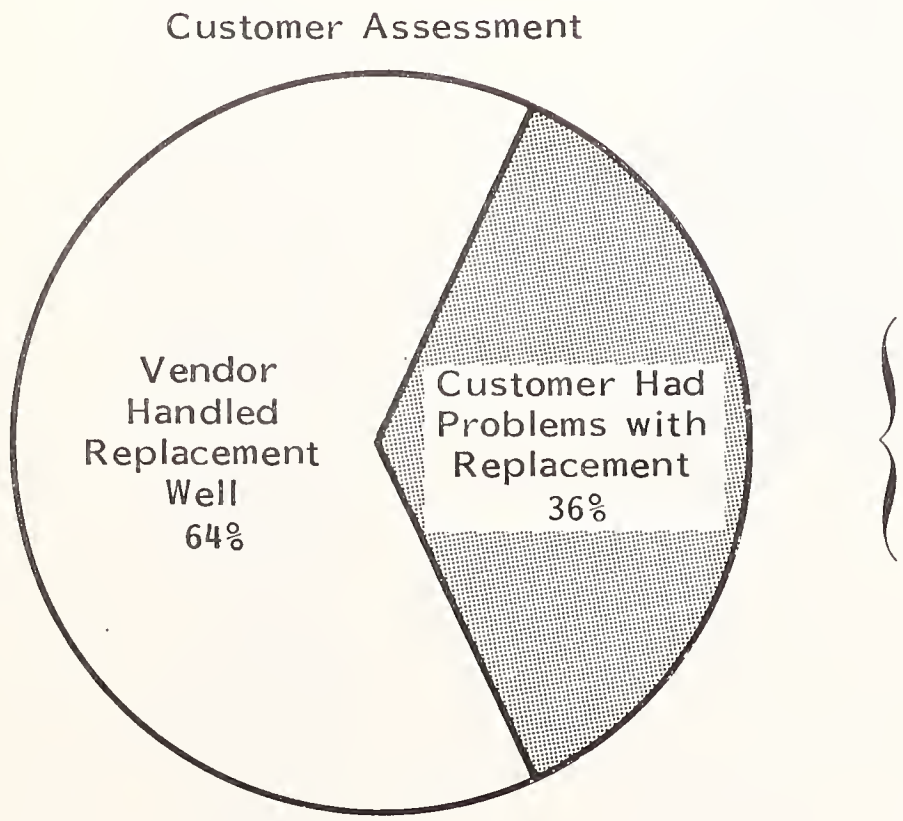



Customer believes vendor was justified - 32%

Customer believes vendor was NOT justified - 22%

EXHIBIT IV-9

VENDOR REPLACEMENT OF EXISTING PRODUCT
WITH NEW PRODUCT



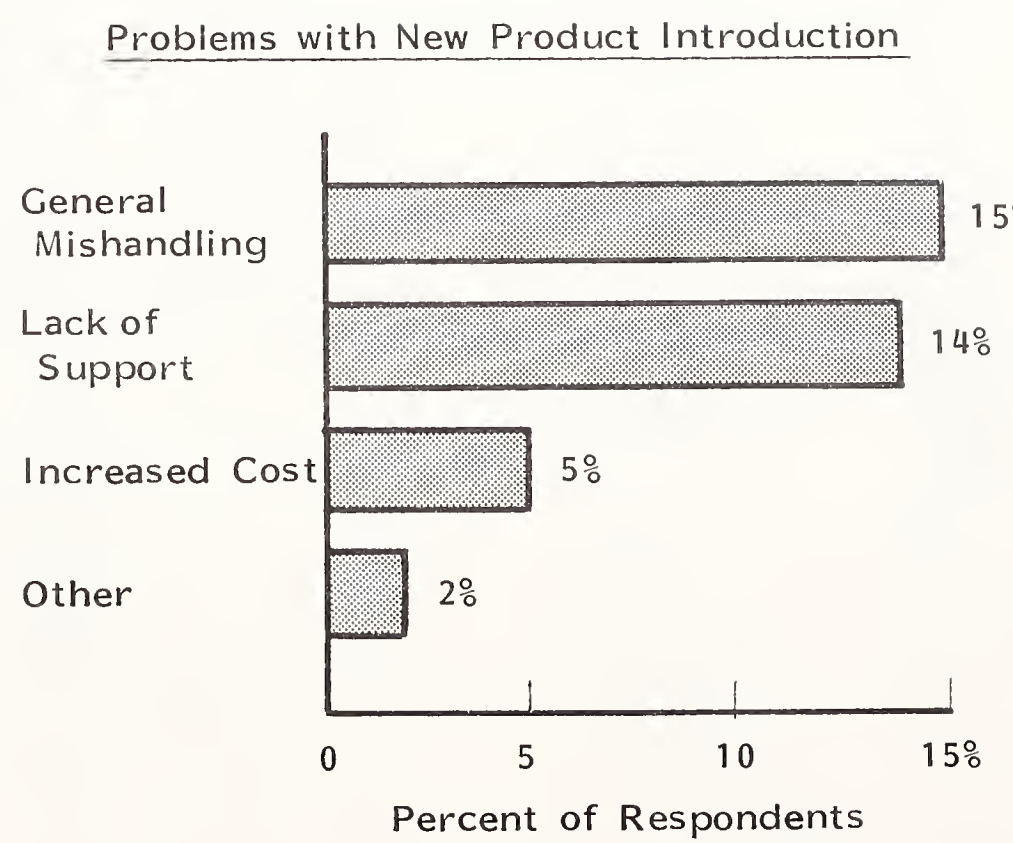
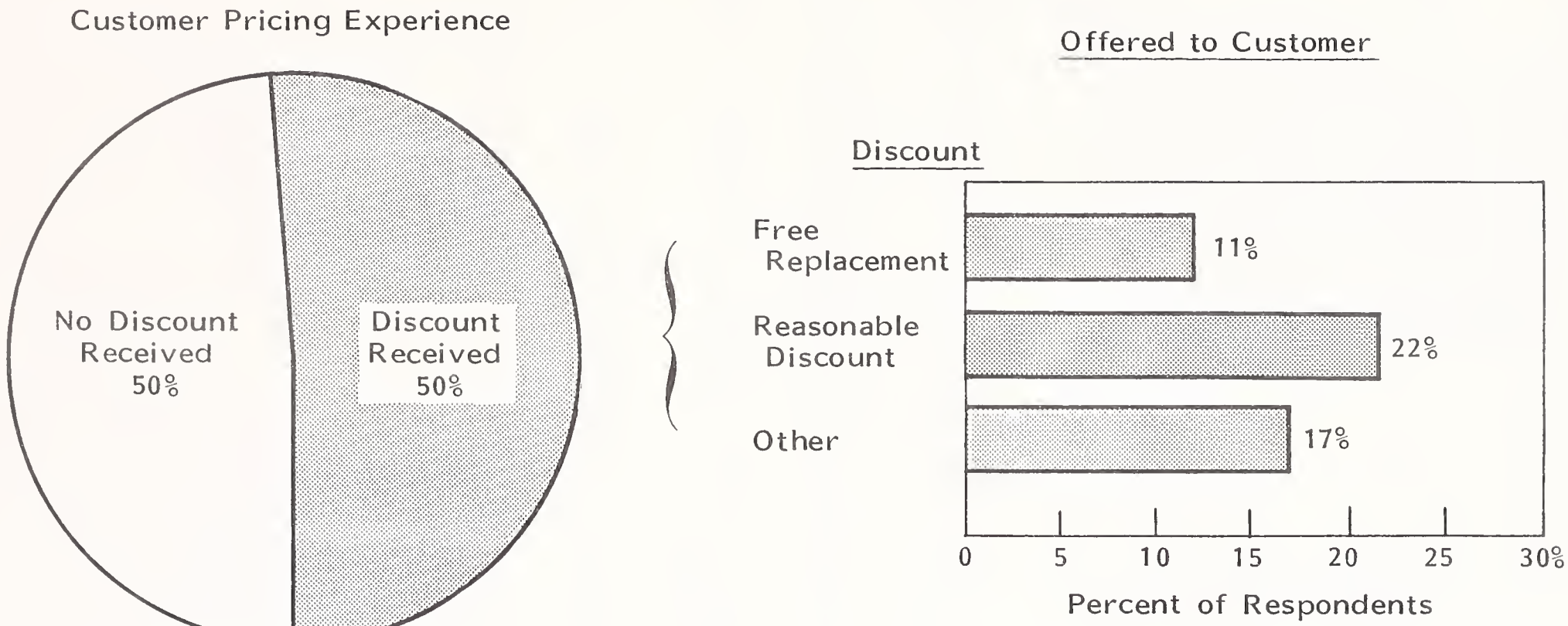



EXHIBIT IV-10

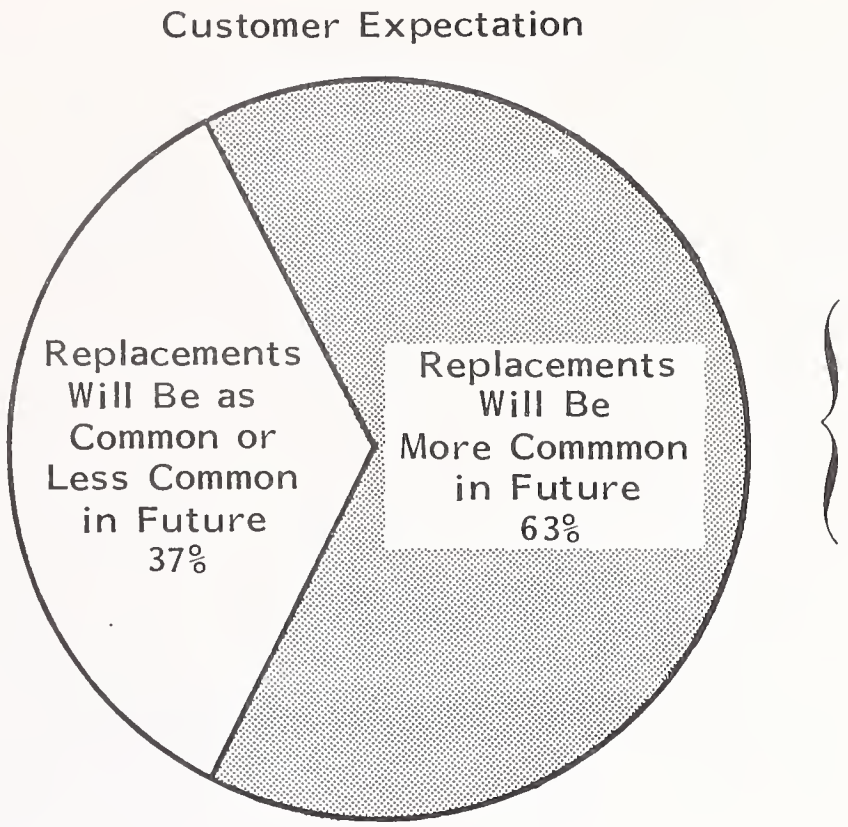
PRICING IN VENDOR REPLACEMENT
RATHER THAN UPGRADE OF SOFTWARE PRODUCTS

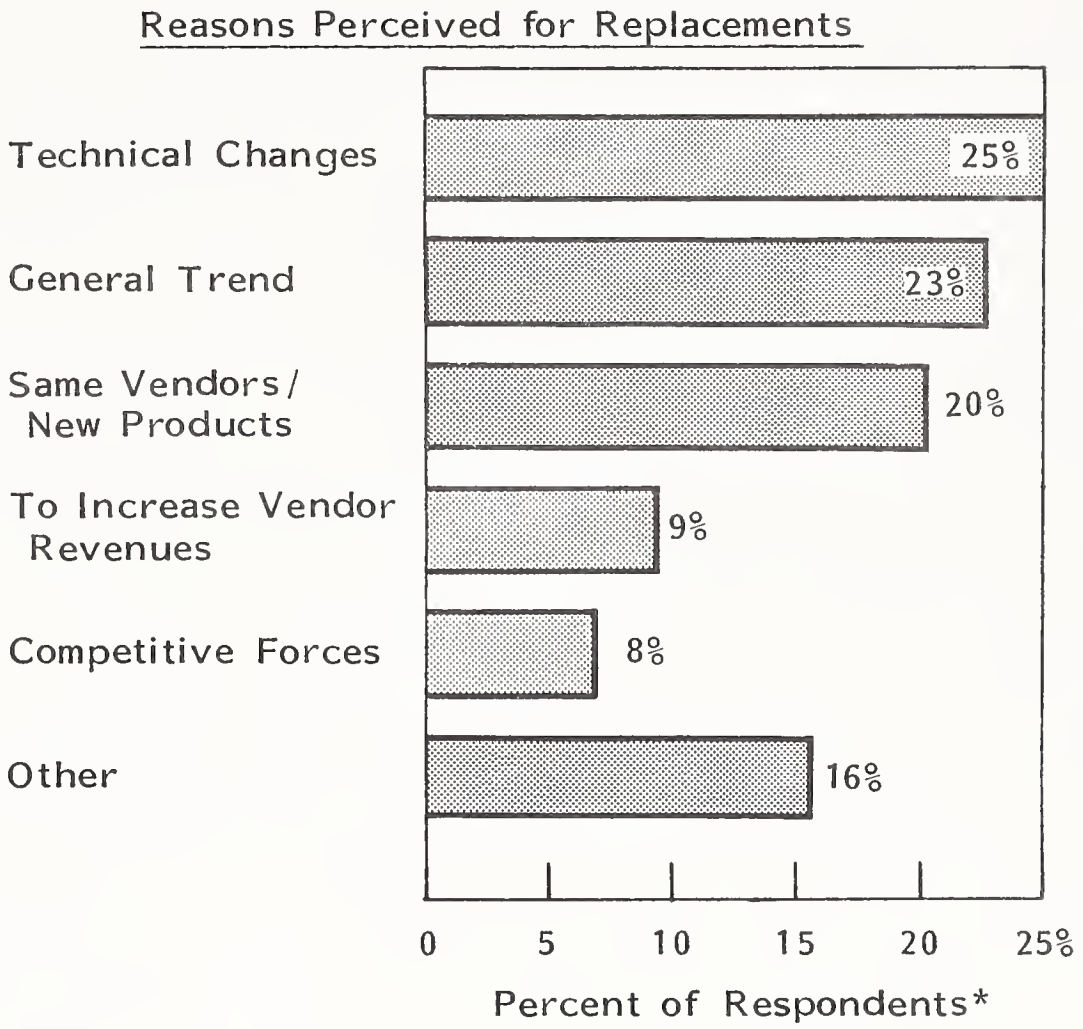


- Two out of three customers see such replacements becoming more common in the future, as shown in Exhibit IV-11.
  - Technical changes and general trends are seen as the most important motivating forces.
  - Increased revenues are given much less weight, being seen by fewer than one-fifth of respondents.
- Consequently, INPUT sees replacement products as having considerable scope for revenue enhancement, given several key assumptions:
  - The replacement product delivers additional, needed functionality (with emphasis on "needed".)
  - The replacement product required nontrivial development resources.
  - Some, but not extensive, conversion is needed between the two products.
  - The technical transition is handled well.
  - The price (if any) to current customers takes the preceding factors into consideration.

EXHIBIT IV-11

TRENDS IN VENDOR REPLACEMENT
RATHER THAN UPGRADE OF SOFTWARE PRODUCTS




*Multiple responses given.

# V VENDOR-CUSTOMER RELATIONSHIPS

# V VENDOR-CUSTOMER RELATIONSHIPS

- This chapter examines two of the key areas concerning vendor-customer software support relationships:

  - General terms and conditions.

  - Customer tracking of terms and conditions.

    . This could be an increasingly important area in the future in that it places buyers and sellers on an equal footing, or even, in some cases, allows customers to gain special leverage against vendors.

## A. TERMS AND CONDITIONS

- Generally speaking, customers express satisfaction with current terms and conditions, as shown in Exhibit V-1.

- Where there is dissatisfaction, it is because the terms are imprecise or generally favor the vendor. Cost problems are relatively unimportant, as shown in Exhibit V-2.

EXHIBIT V-1

## CUSTOMER ATTITUDES TOWARD CONTRACT TERMS

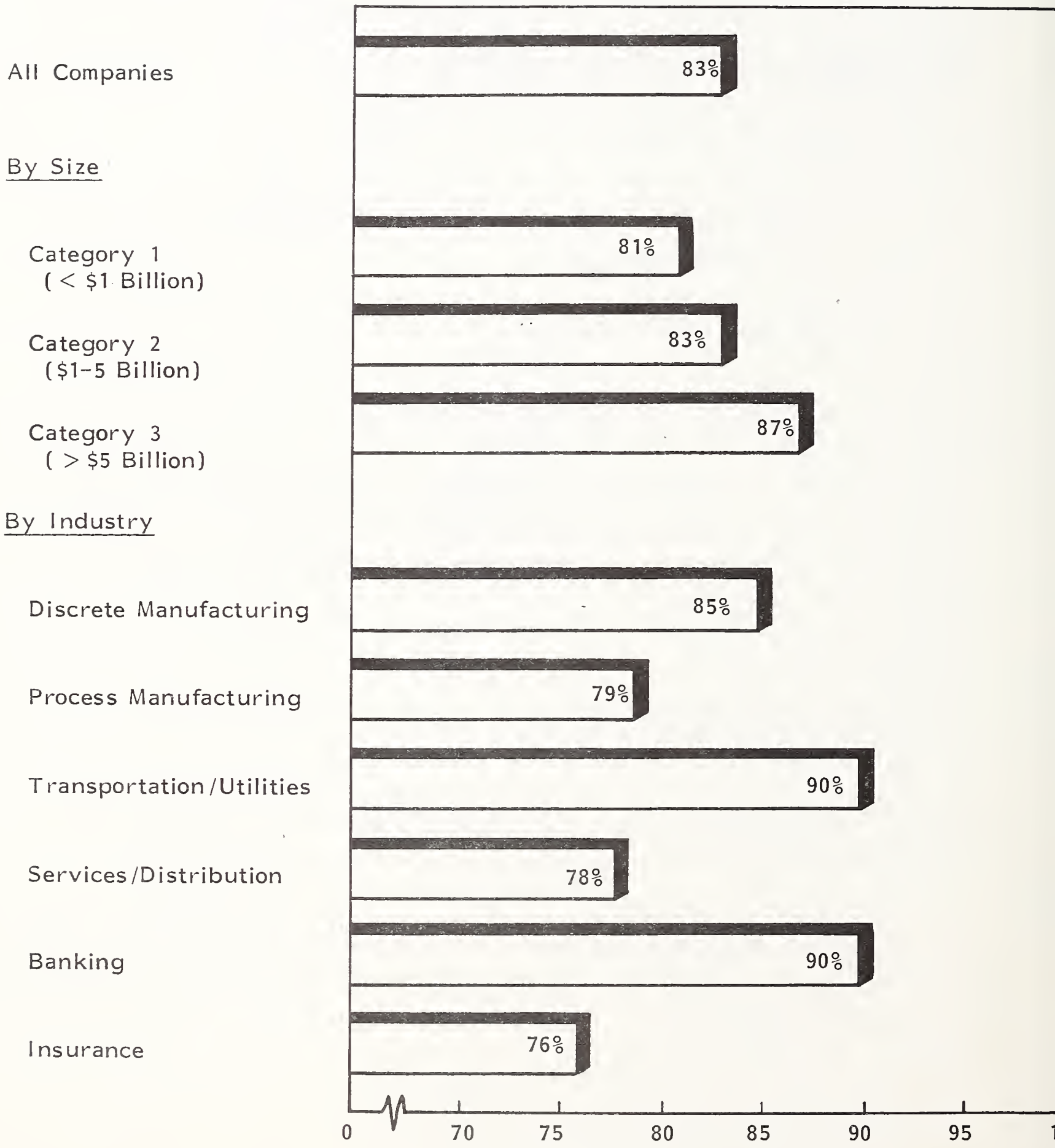
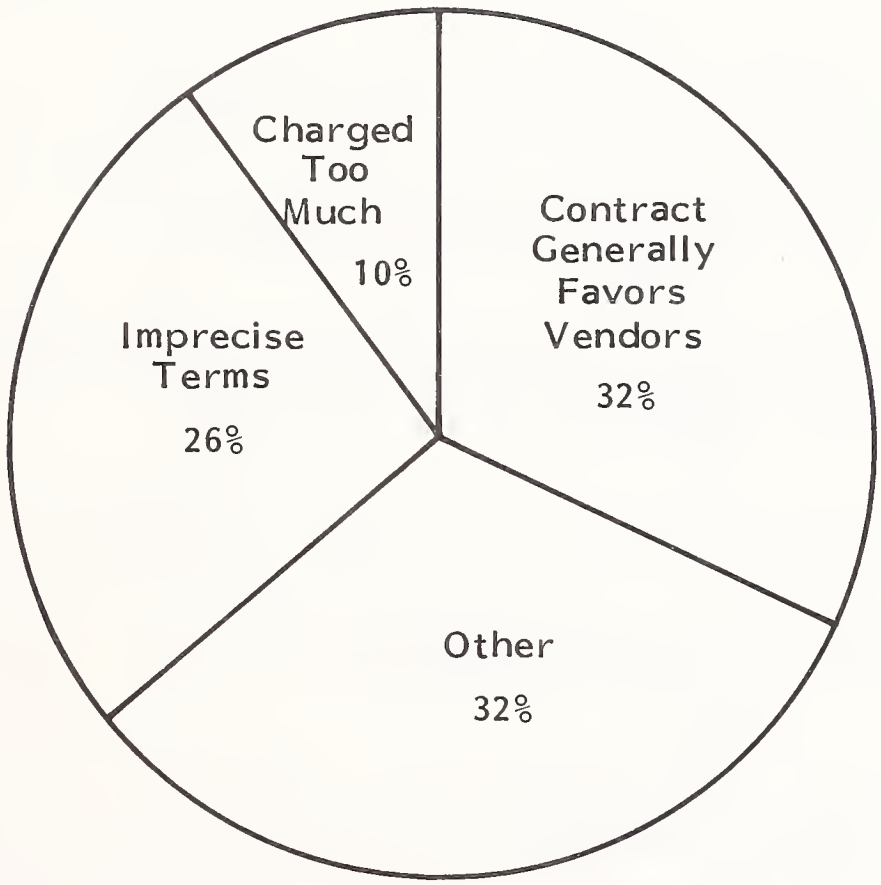


EXHIBIT V-2

## USER REASONS FOR DISSATISFACTION WITH CONTRACT TERMS




Percent of Customer Respondents

- There are significant differences by industry sector in companies expressing a desire for changes in terms and conditions, as shown in Exhibit V-3.

- Lower prices, tighter maintenance and guaranteed resolution times are the three major desired areas of improvement, as shown in Exhibit V-4.

  - Process manufacturing companies show a very high desire for lower prices, while transportation/utilities and insurance have little interest in pricing, as shown in Exhibit V-5.

  - On the other hand, the desire for tighter warranties is linked to industry size, as shown in Exhibit V-6.

  - Guaranteed resolution is of high importance to discrete manufacturing and insurance, as shown in Exhibit V-7.

- It is interesting to contrast the general satisfaction with contractual terms, shown in Exhibit V-1, with the fact that most firms attempt to modify terms and conditions, as shown in Exhibit V-8.

  - This is to a large extent a question of company size, as shown in Exhibit V-9, although the process manufacturing and services/distribution sector are also more likely to seek such modification.

- The terms that customers seek to modify cover a very wide range, as shown in Exhibit V-10:

  - Taken together the related areas of warranty/liability and legal/ownership are the most important areas, reflecting the legal/administrative nature of such documents.

  - The level of support is considered next in importance, followed by cost issues (cited by 21% of respondents).

EXHIBIT V-3

## CUSTOMER DEMAND FOR CONTRACT CHANGES

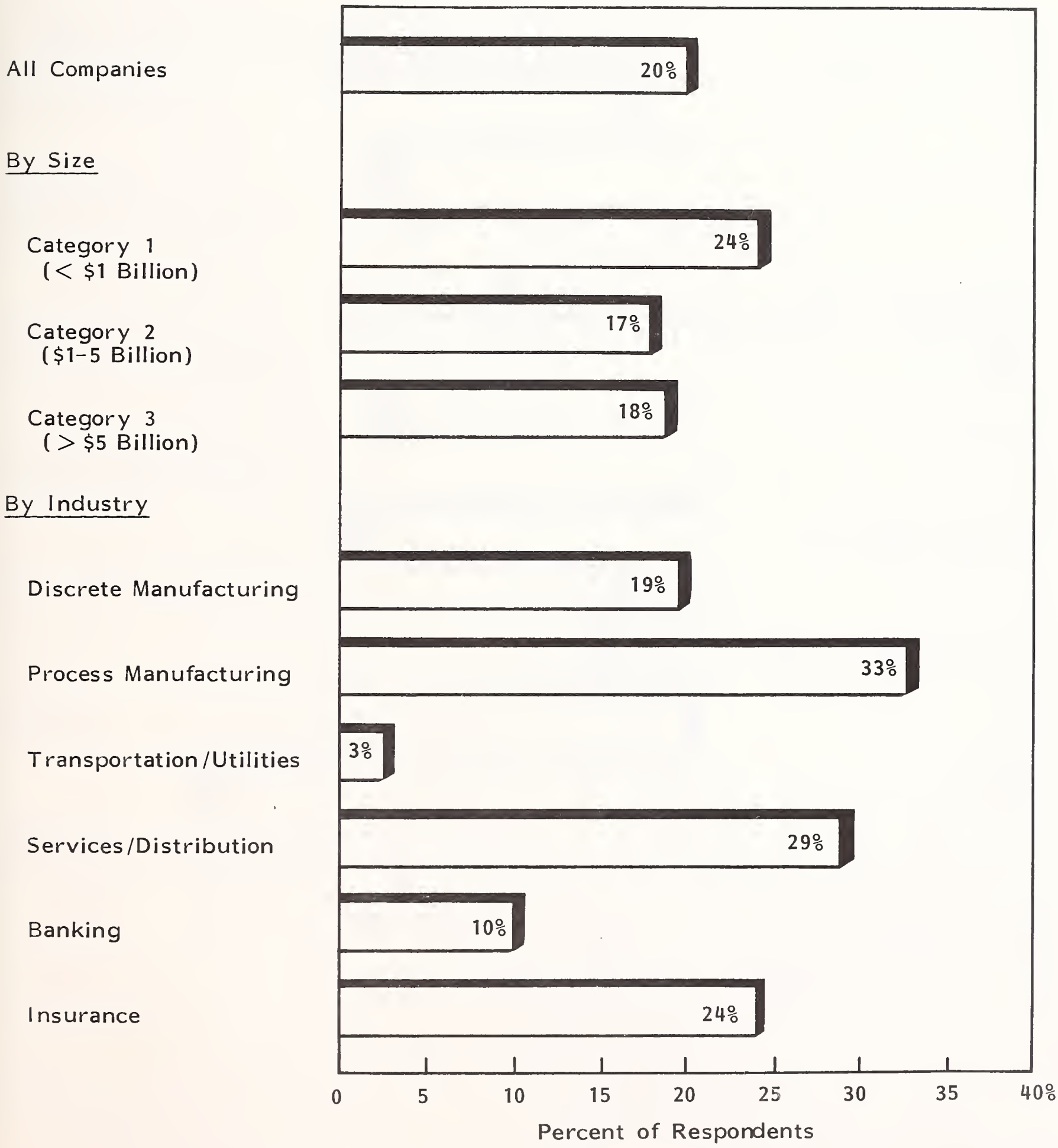


EXHIBIT V-4

## DESIRED CHANGES IN CONTRACTUAL TERMS

| CHANGES | PERCENT OF RESPONDENTS SPECIFYING CHANGES (Totals More Than 100% Due to Multiple Responses) |
|---|---|
| Lower Prices | 21% |
| More Maintenance Available | 13% |
| Tighter Warranties | 21% |
| Guaranteed Response/ Repair Times | 23% |
| Quality Performance | 6% |
| Other | 33% |

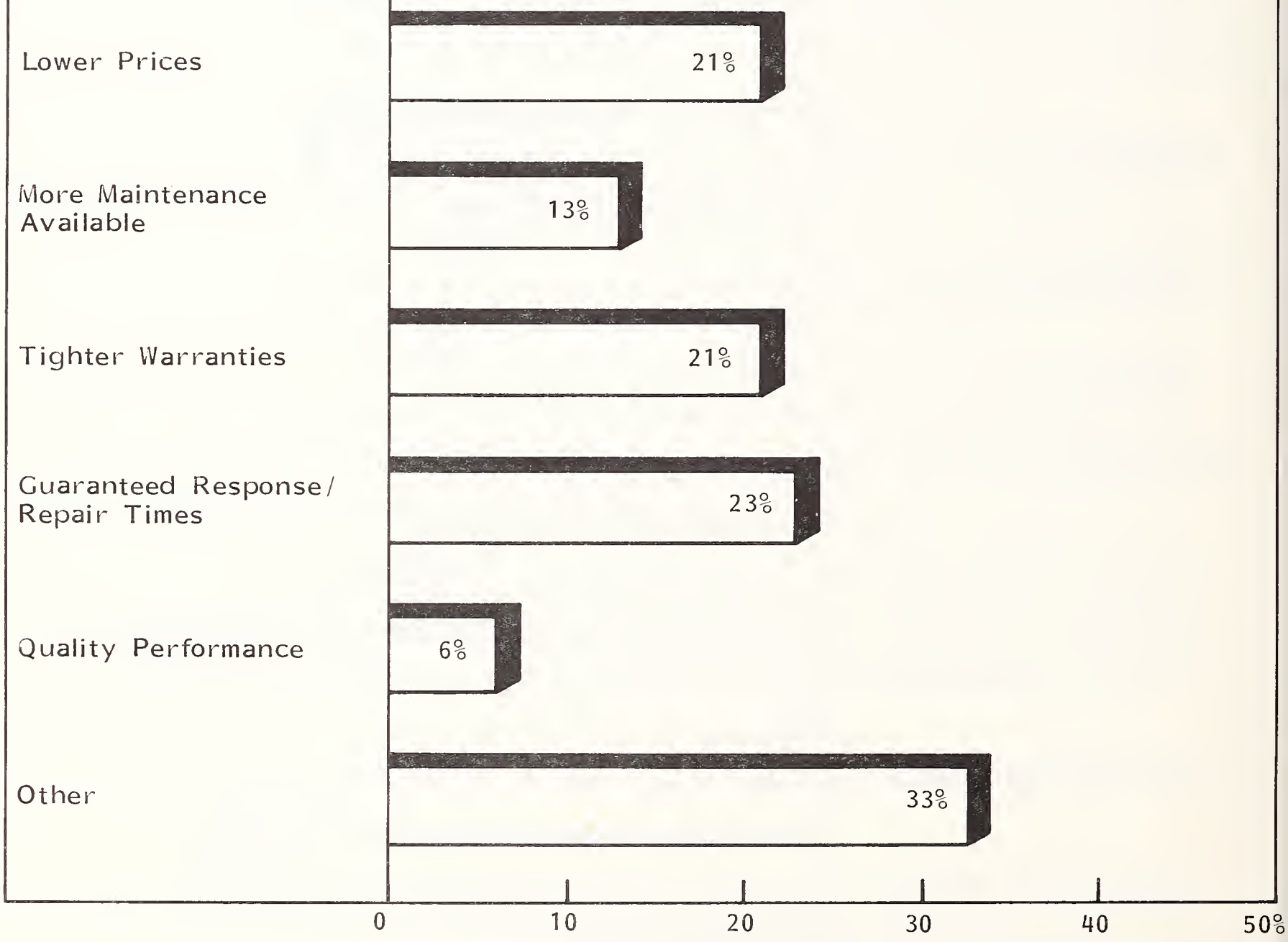


EXHIBIT V-5

LOWER PRICES DESIRED AS CHANGE IN CONTRACTUAL TERMS
(By Industry)

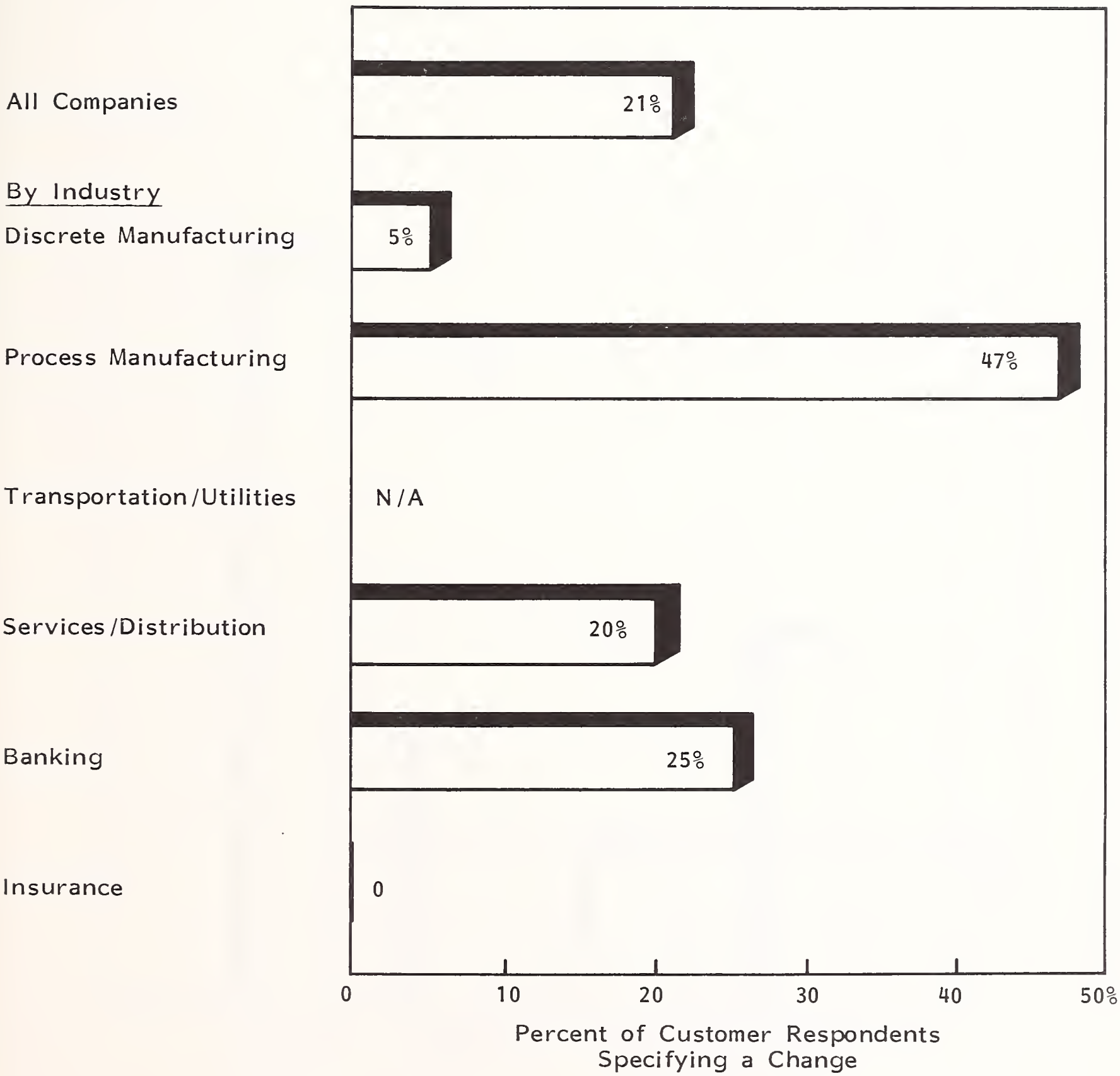


EXHIBIT V-6

TIGHTER WARRANTIES AS DESIRED CHANGE IN CONTRACTUAL TERMS
(By Industry Size)

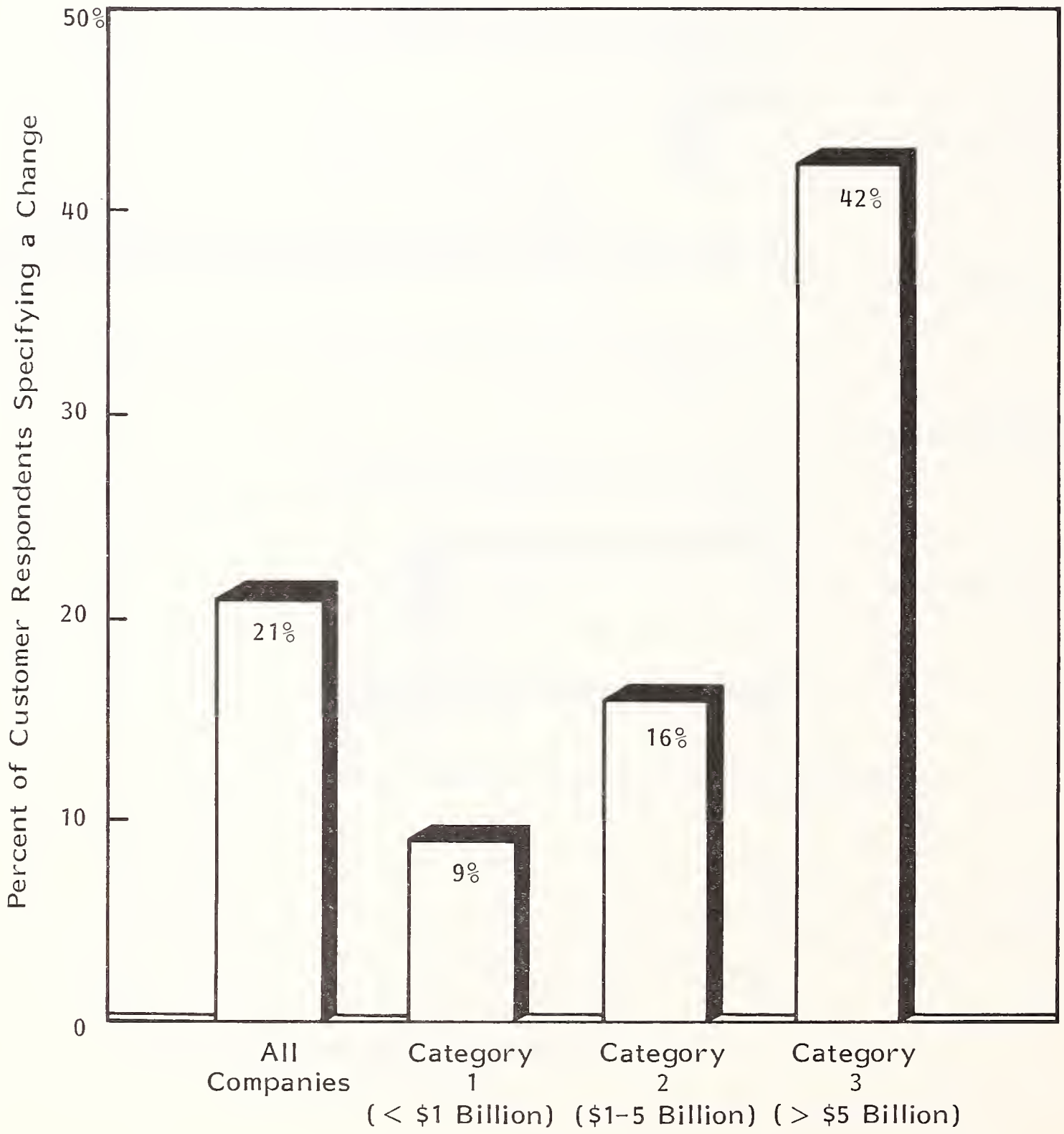


EXHIBIT V-7

GUARANTEED RESOLUTION TIMES AS DESIRED CHANGE IN CONTRACTUAL TERMS
(By Industry)

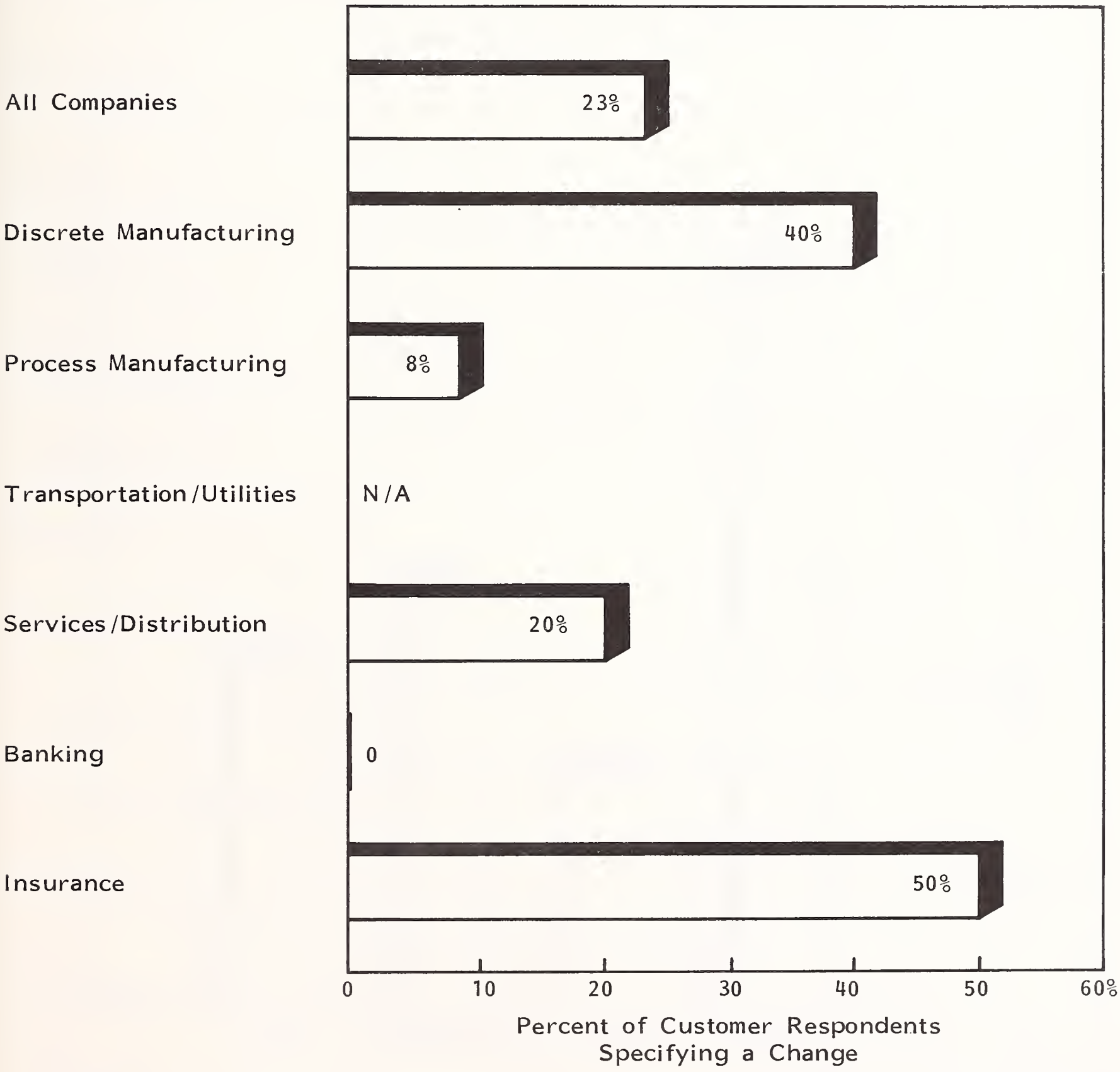
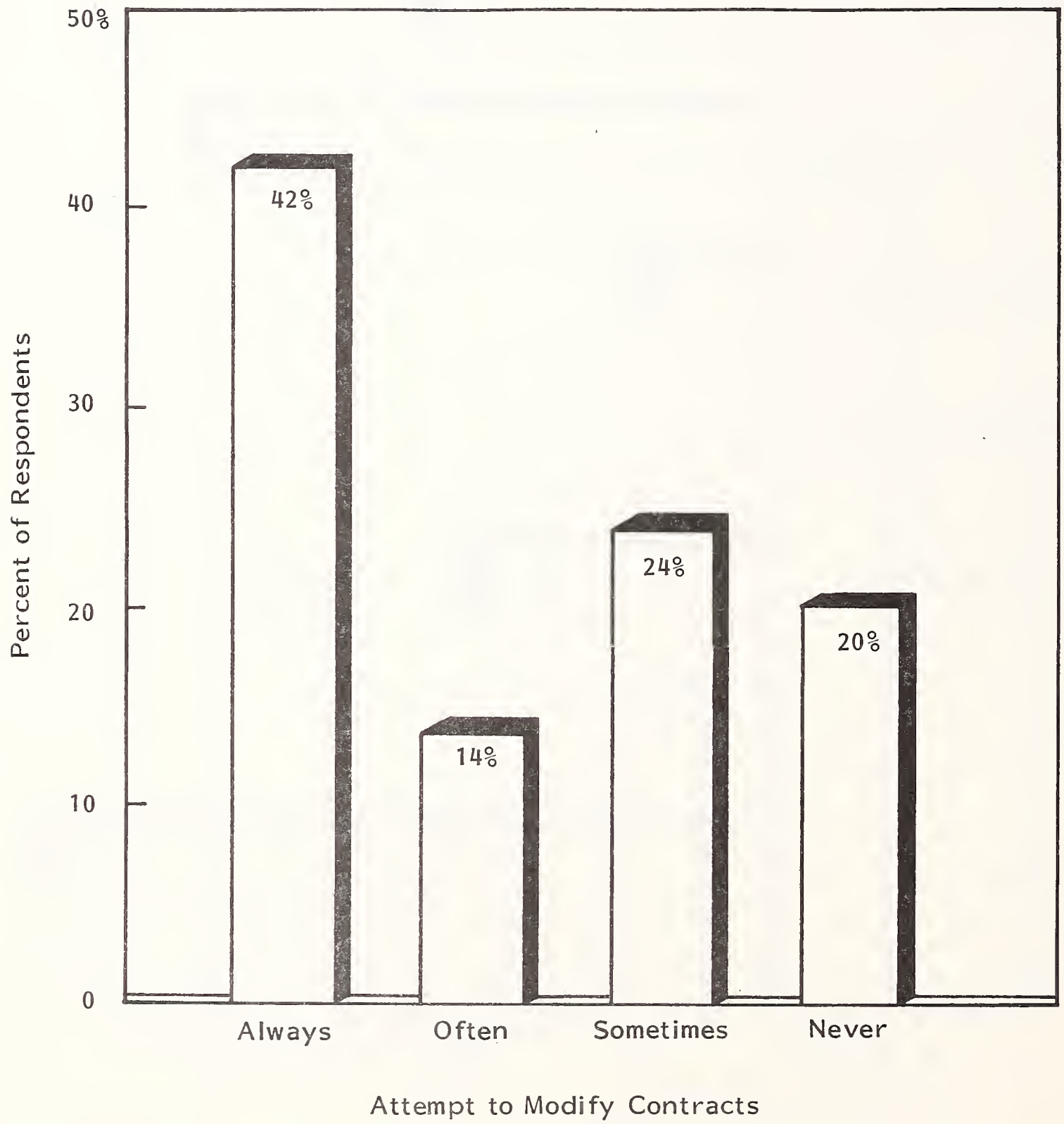


EXHIBIT V-8

EXTENT TO WHICH CUSTOMERS TRY TO MODIFY CONTRACTUAL TERMS




Note: Most customers (56%) expect to modify software support contracts.

EXHIBIT V-9

# CHARACTERISTICS OF CUSTOMERS THAT ALWAYS REQUIRE CONTRACT MODIFICATION

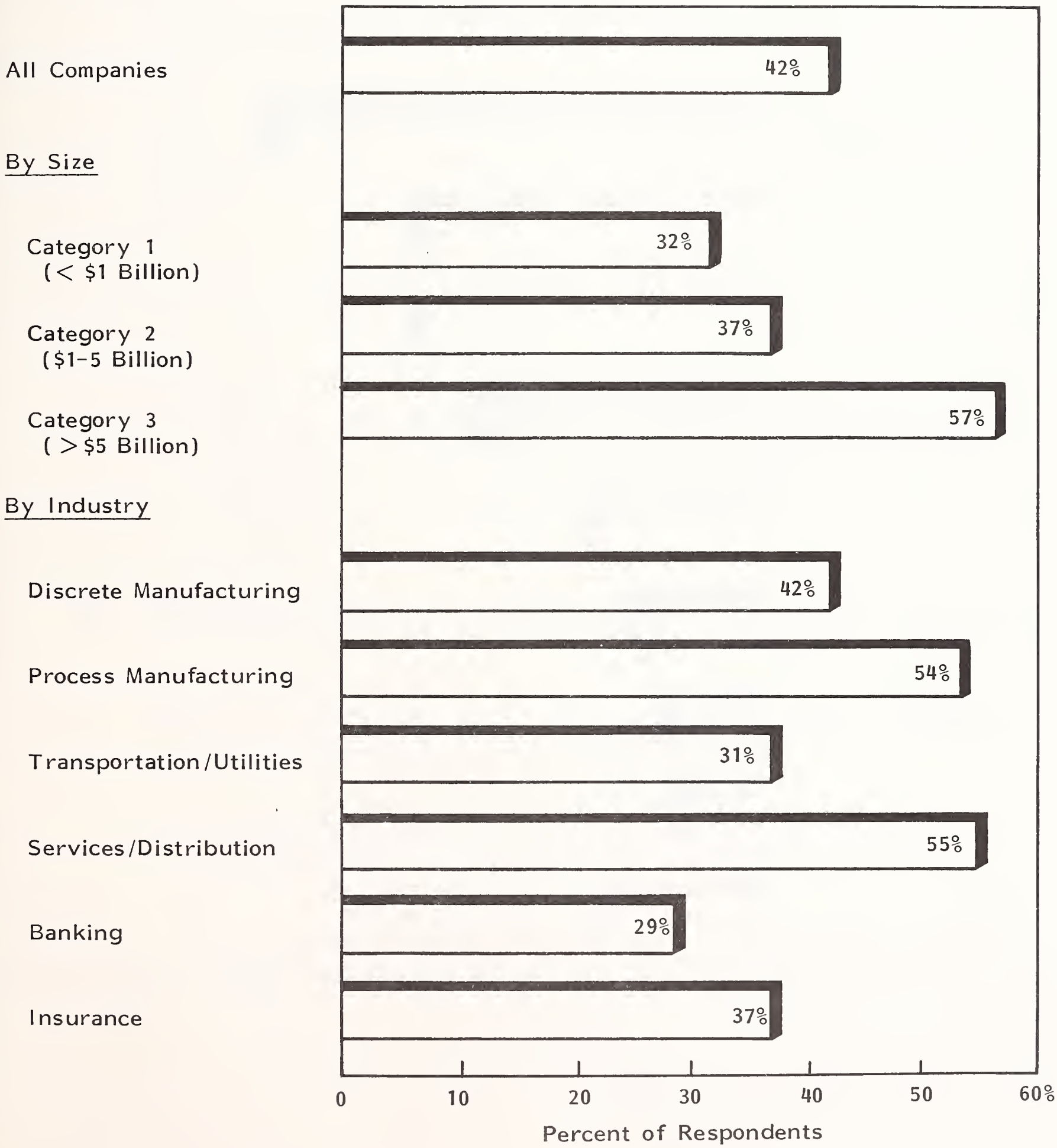
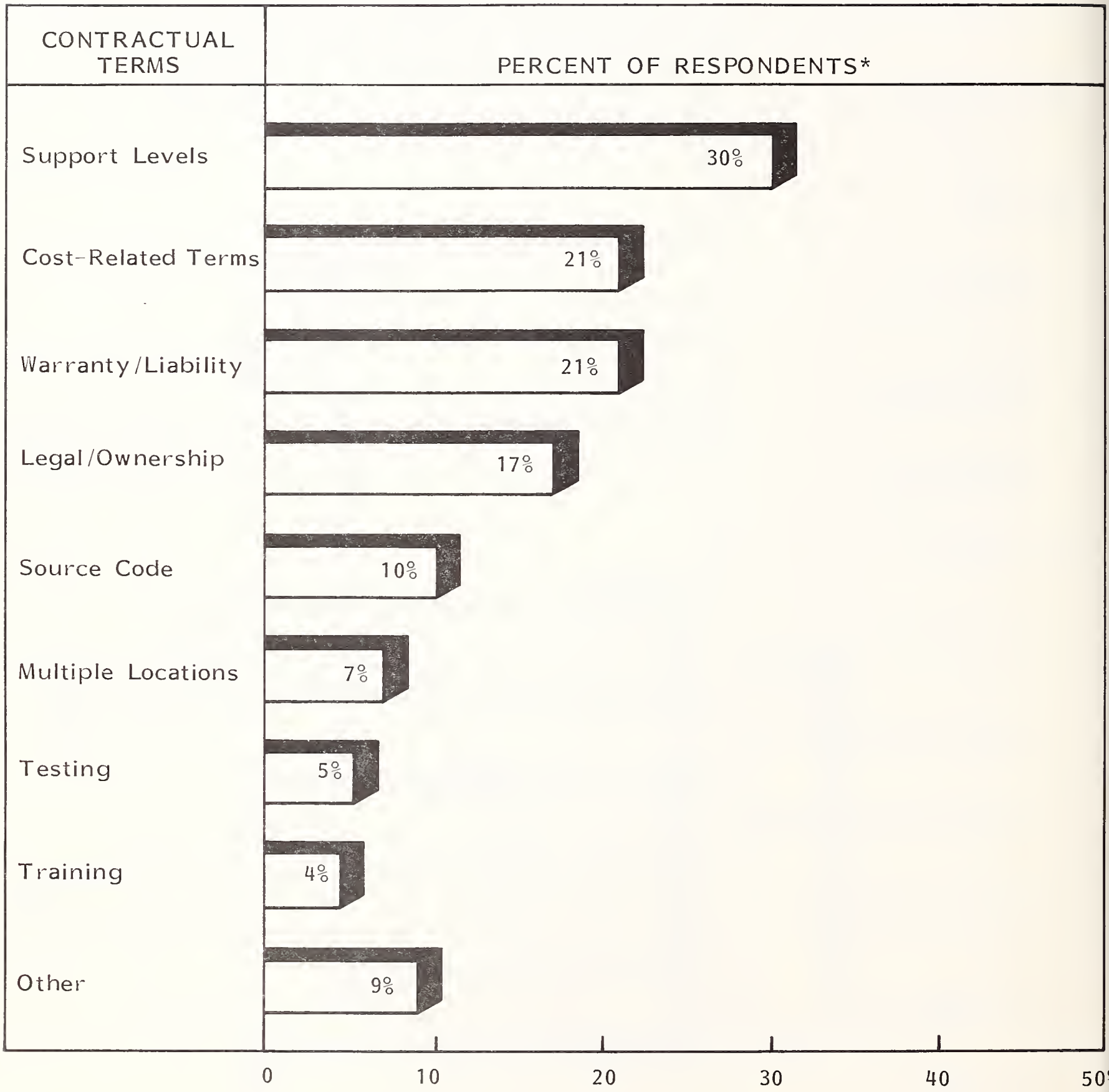


EXHIBIT V-10

## CONTRACTUAL TERMS THAT CUSTOMERS ATTEMPT TO MODIFY




*Totals more than 100% due to multiple responses.

- Companies say they almost always have success in seeking to modify contractual terms, as shown in Exhibit V-11.

- Success is quite consistent across different size and industry groupings, as shown in Exhibit V-12.

- Of great importance to vendors should be the fact that customers are unaware of changes in terms and conditions planned by vendors, as shown in Exhibit V-13.

  - For those seeking to keep such plans proprietary, there has been obvious success.

  - However, if customers were consulted beforehand, then customers would not be forced to make so many changes in terms and conditions. The fact that so many of their changes are successful shows that prior consultation would probably be beneficial to both sides.

## B. CUSTOMERS' TRACKING OF TERMS AND CONDITIONS

- Slightly over half the companies interviewed have a control point for tracking software terms and conditions, as shown in Exhibit V-14.

  - Another tenth of the firms plan on doing so, as shown in Exhibit V-15. All of this growth is concentrated in smaller firms.

  - The services/distribution and banking sectors plan the largest increase and will then have the highest proportion of firms engaged in tracking.

EXHIBIT V-11

CUSTOMER SUCCESS IN MODIFICATION OF CONTRACTUAL TERMS

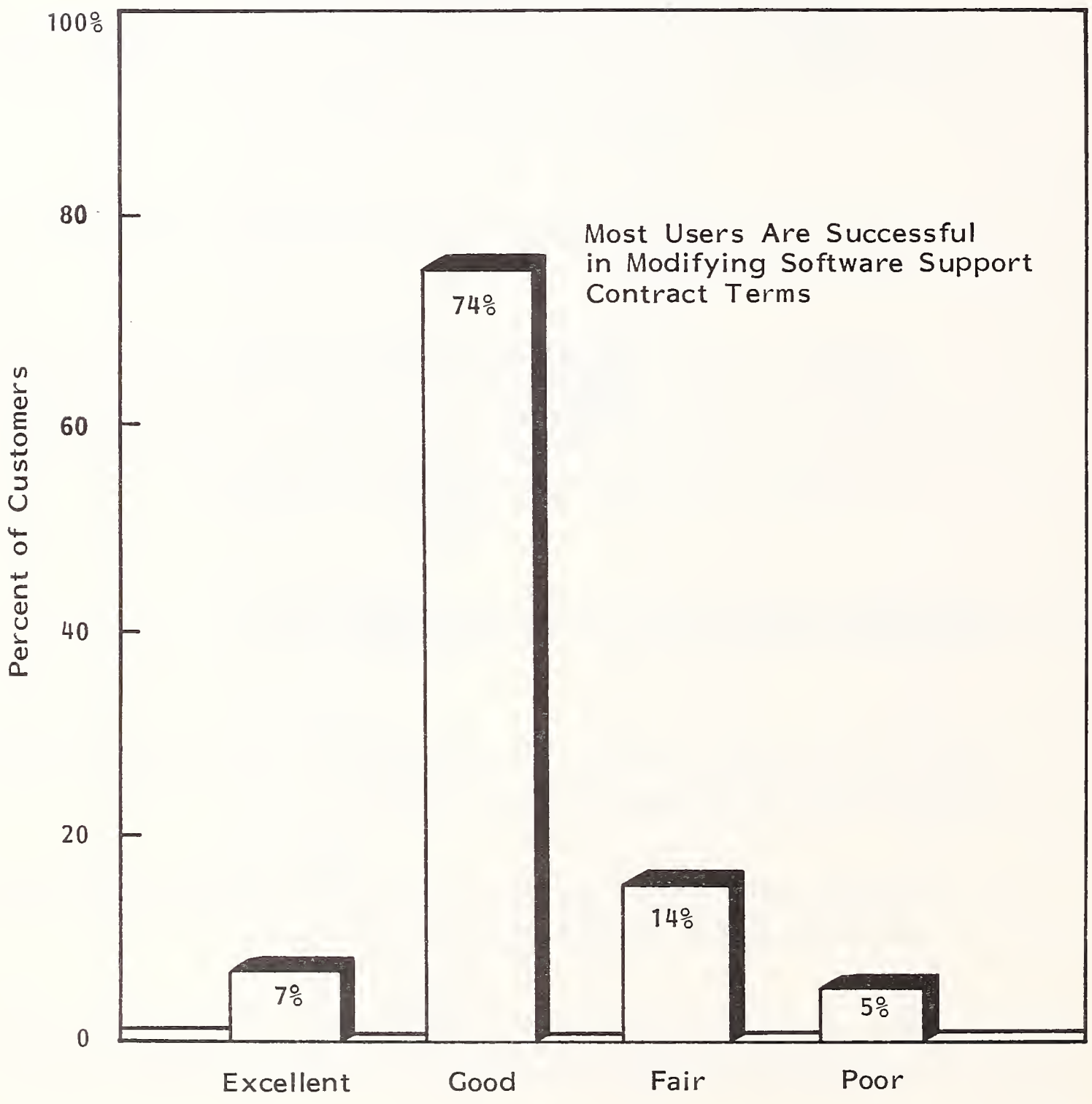


EXHIBIT V-12

## EXCELLENT OR GOOD SUCCESS IN MODIFYING CONTRACTUAL TERMS

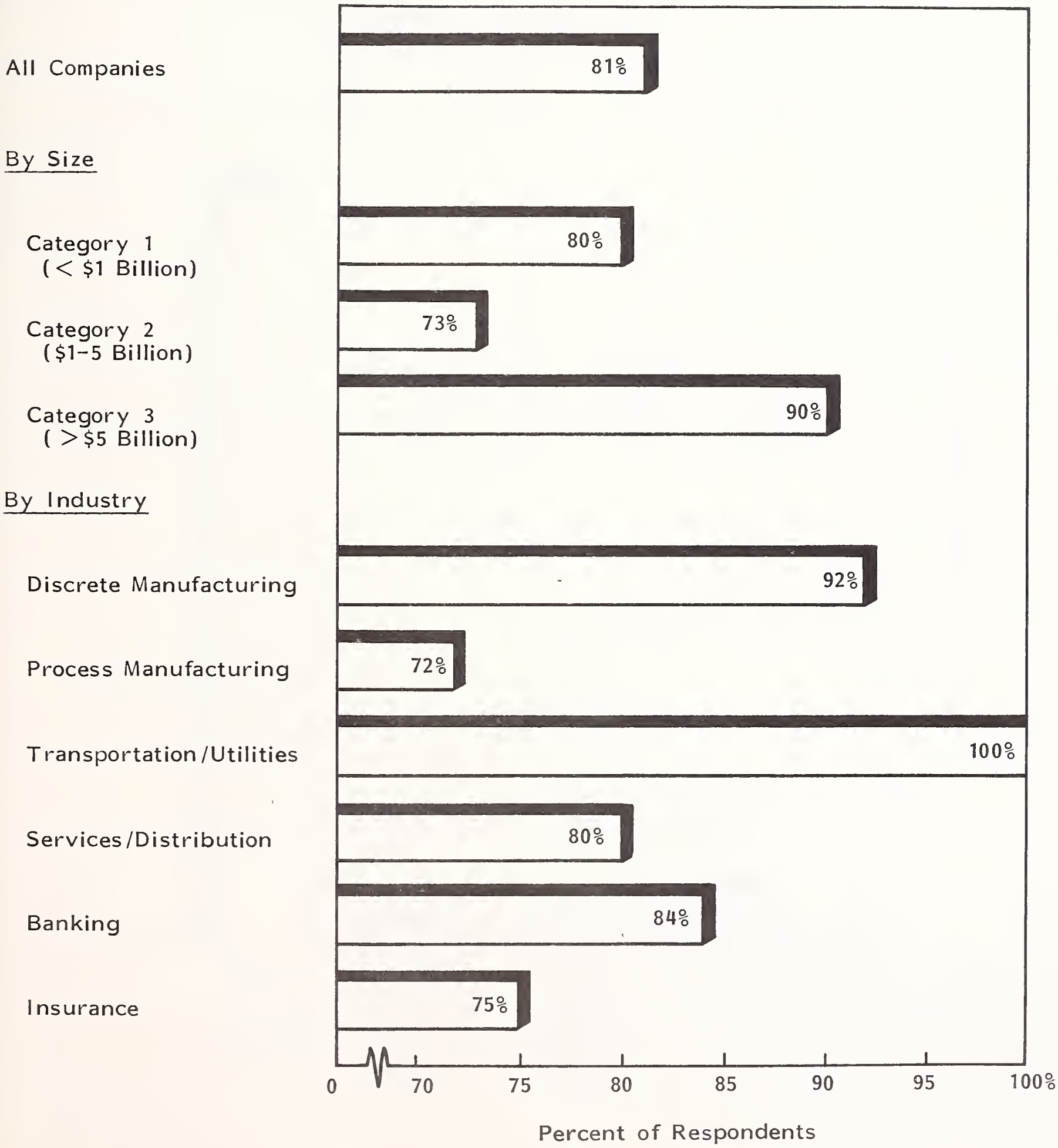


EXHIBIT V-13

CUSTOMER PERCEPTIONS OF CONTRACTUAL CHANGES
PLANNED BY VENDORS

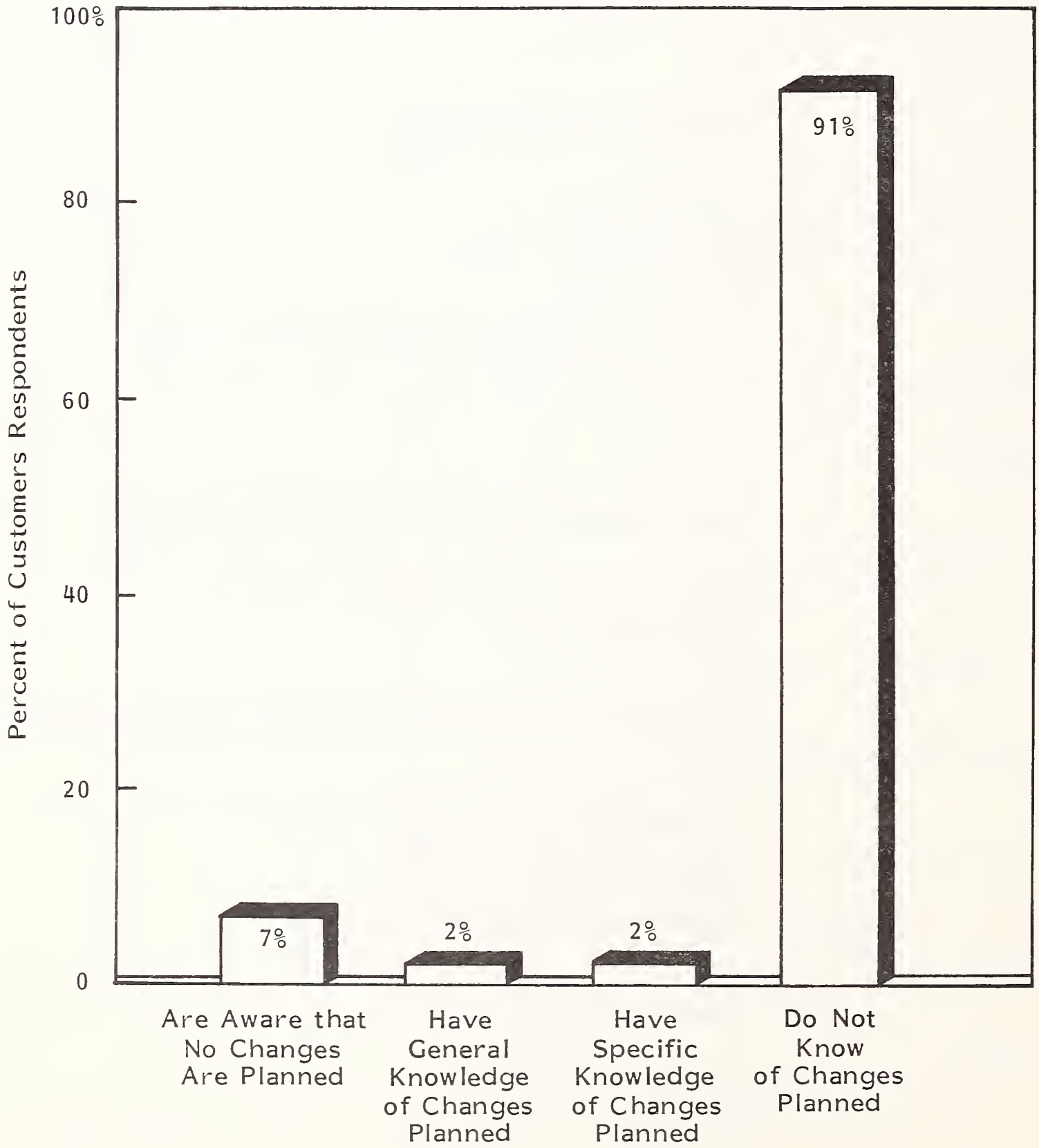
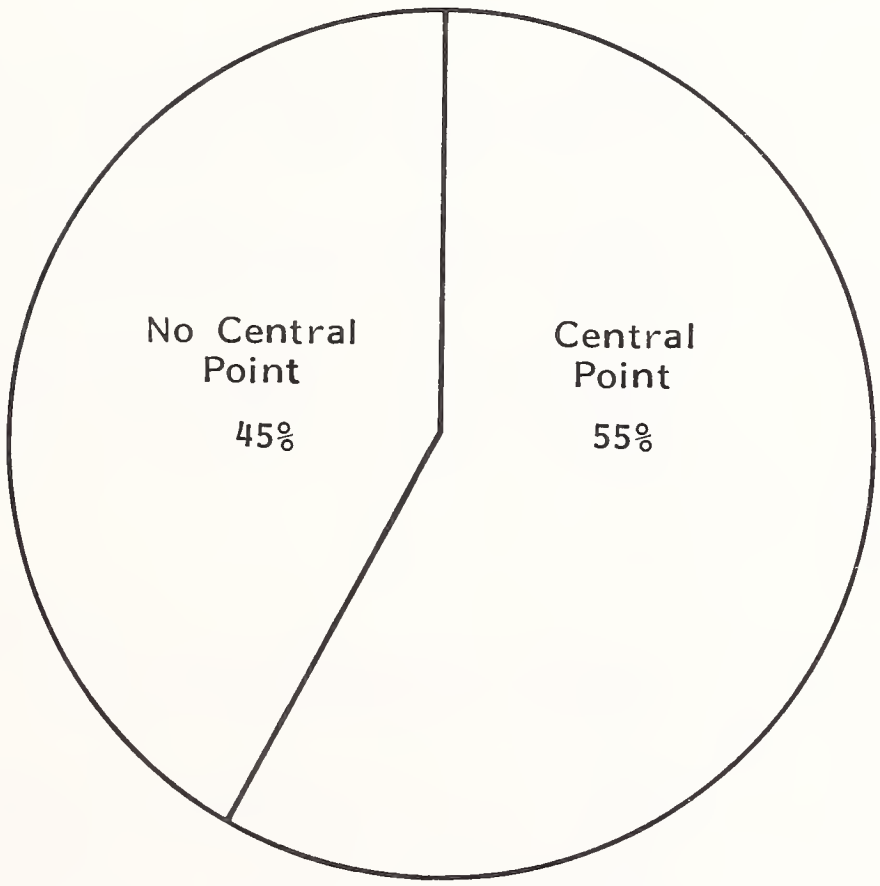


EXHIBIT V-14

## CENTRAL CUSTOMER POINT FOR TRACKING CONTRACTUAL TERMS

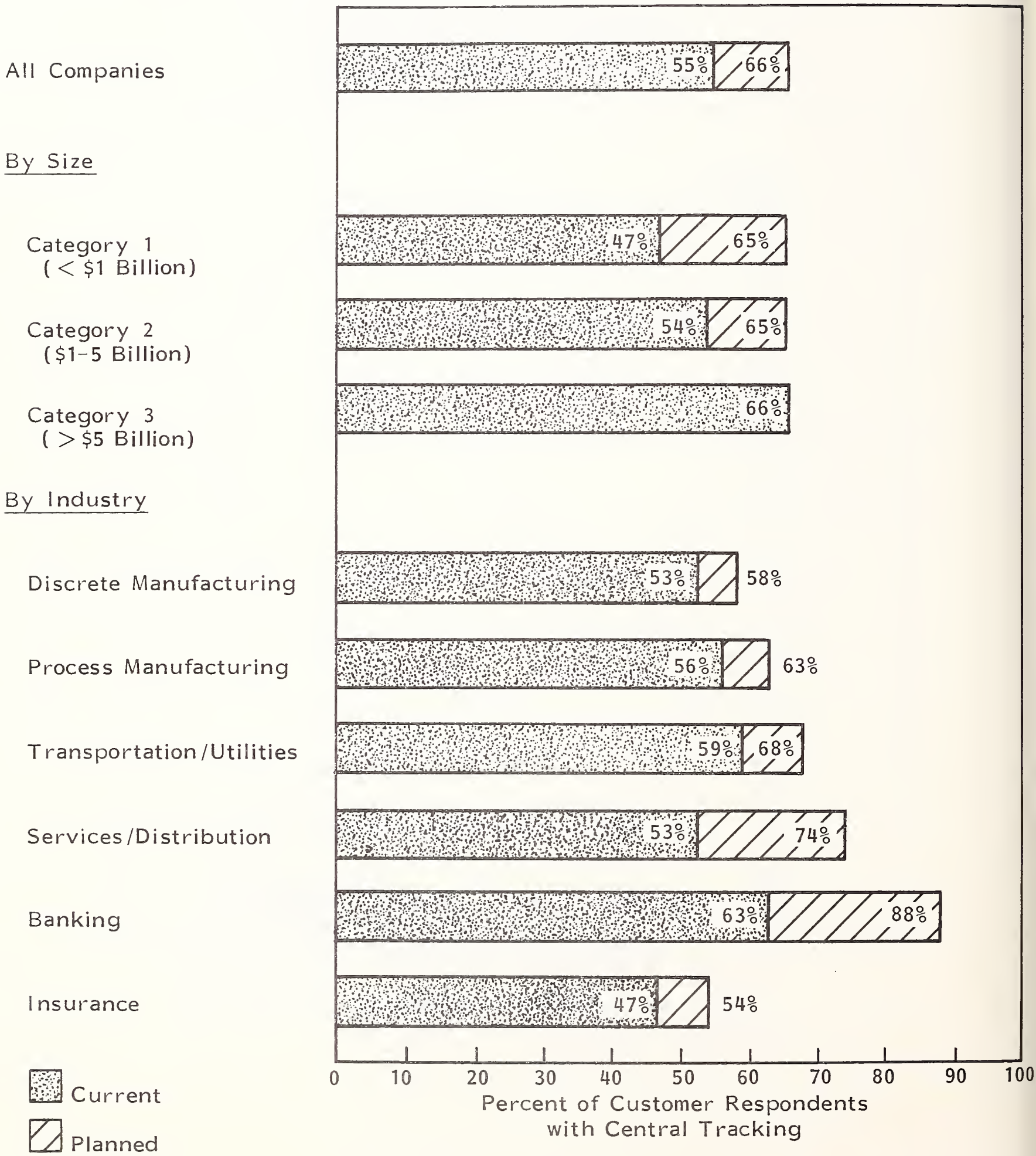



Percent of Customer Respondents

- Customers with a Central Tracking Point can Place More Pressure on Vendors
- This Type of Central Tracking can also Make it Possible for Vendors to Make Special Arrangements with Major Customers

EXHIBIT V-15

## CENTRAL CUSTOMER POINT FOR TRACKING CONTRACTUAL TERMS
## CURRENT VERSUS PLANNED



- Firms have had these tracking systems installed for an average of five years, as shown in Exhibit V-16.

  - Size is not a factor in past installations.

  - Services/distribution and banking are, again, an exception.

- The number of products tracked averages 78, with surprisingly large variations due to company size, as shown in Exhibit V-17.

- There are many types of benefits seen from tracking terms and conditions, as shown in Exhibit V-18.

  - Cost control is the leading benefit seen, but only by one-third of companies.

  - The more abstract benefits of having uniform terms and assembling information about terms are, together, valued by almost half of respondents.

  - The ability to change specific terms or extend the customer's legal rights are less valued.

- Larger companies value uniform terms much more than smaller companies, as shown in Exhibit V-19.

  - Small companies place much more value on tracking terms in order to assure legal protection.

  - Perhaps not surprisingly smaller companies also track terms without knowing why: follow the leader?

EXHIBIT V-16

# CENTRAL TRACKING OF CONTRACTUAL TERMS
## AVERAGE TIME INSTALLED

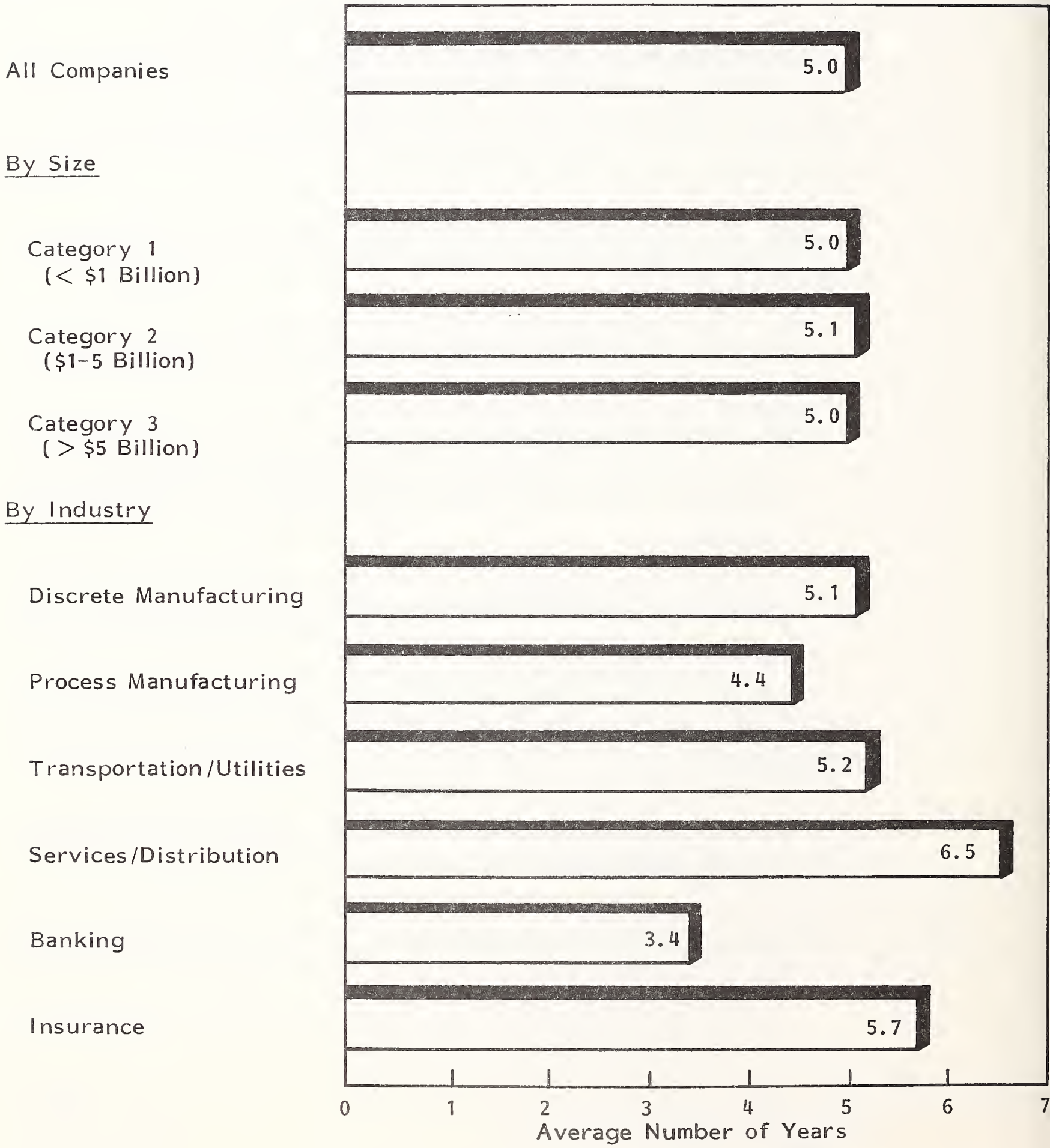


EXHIBIT V-17

NUMBER OF PRODUCTS TRACKED
(Over an Average Period of Five Years)

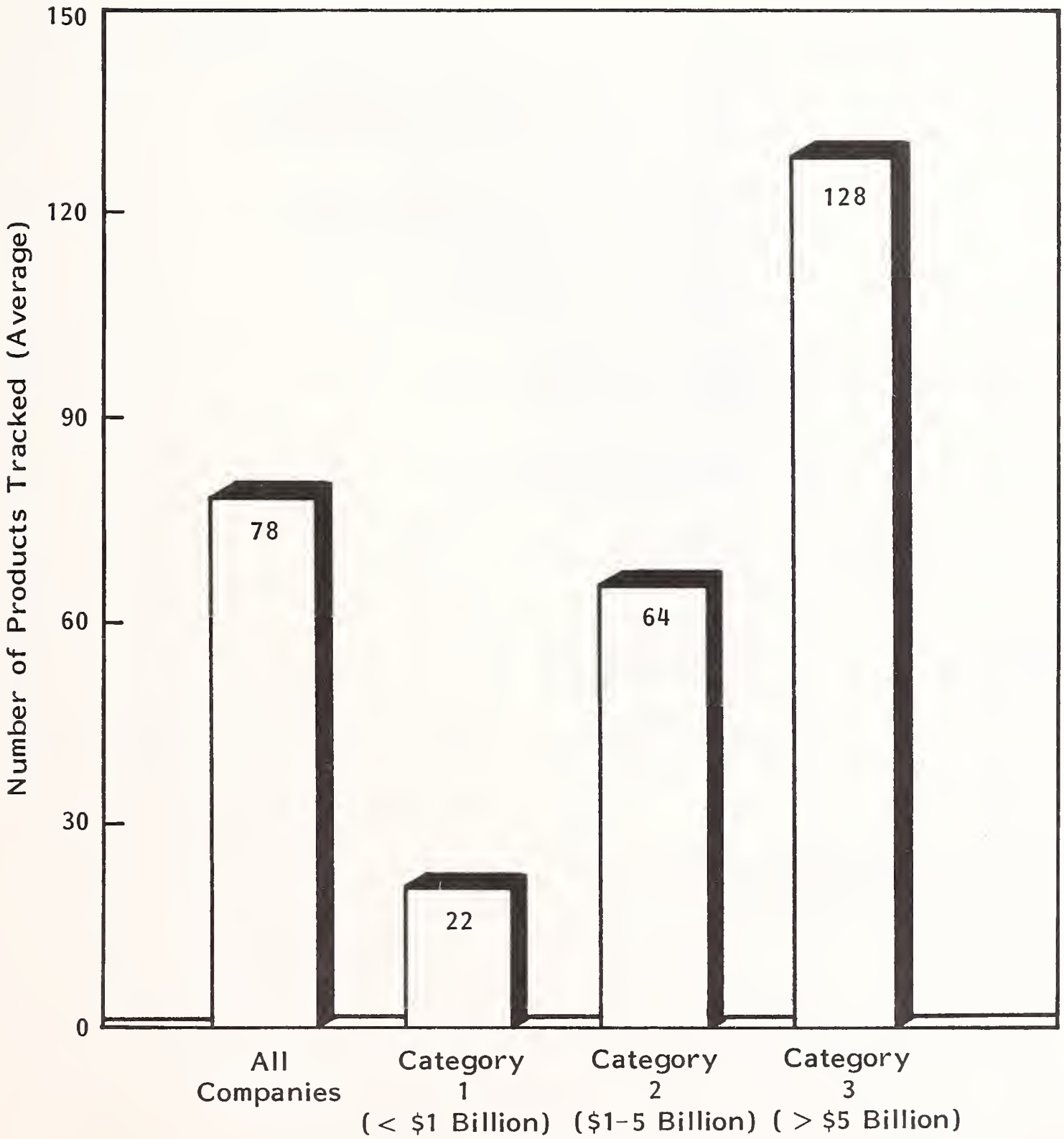
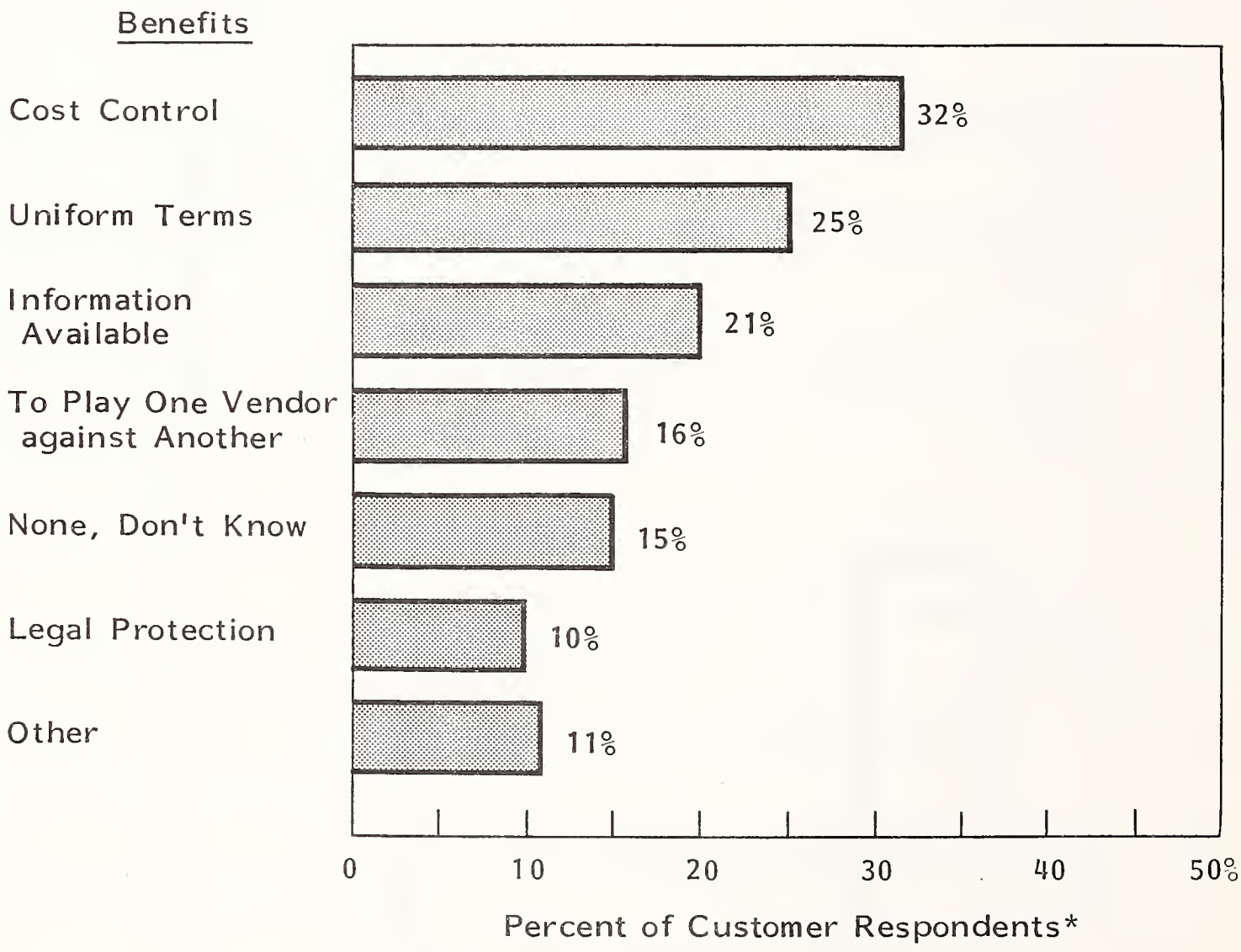


EXHIBIT V-18

## BENEFITS TO CUSTOMER FROM CENTRAL TRACKING OF CONTRACTUAL TERMS

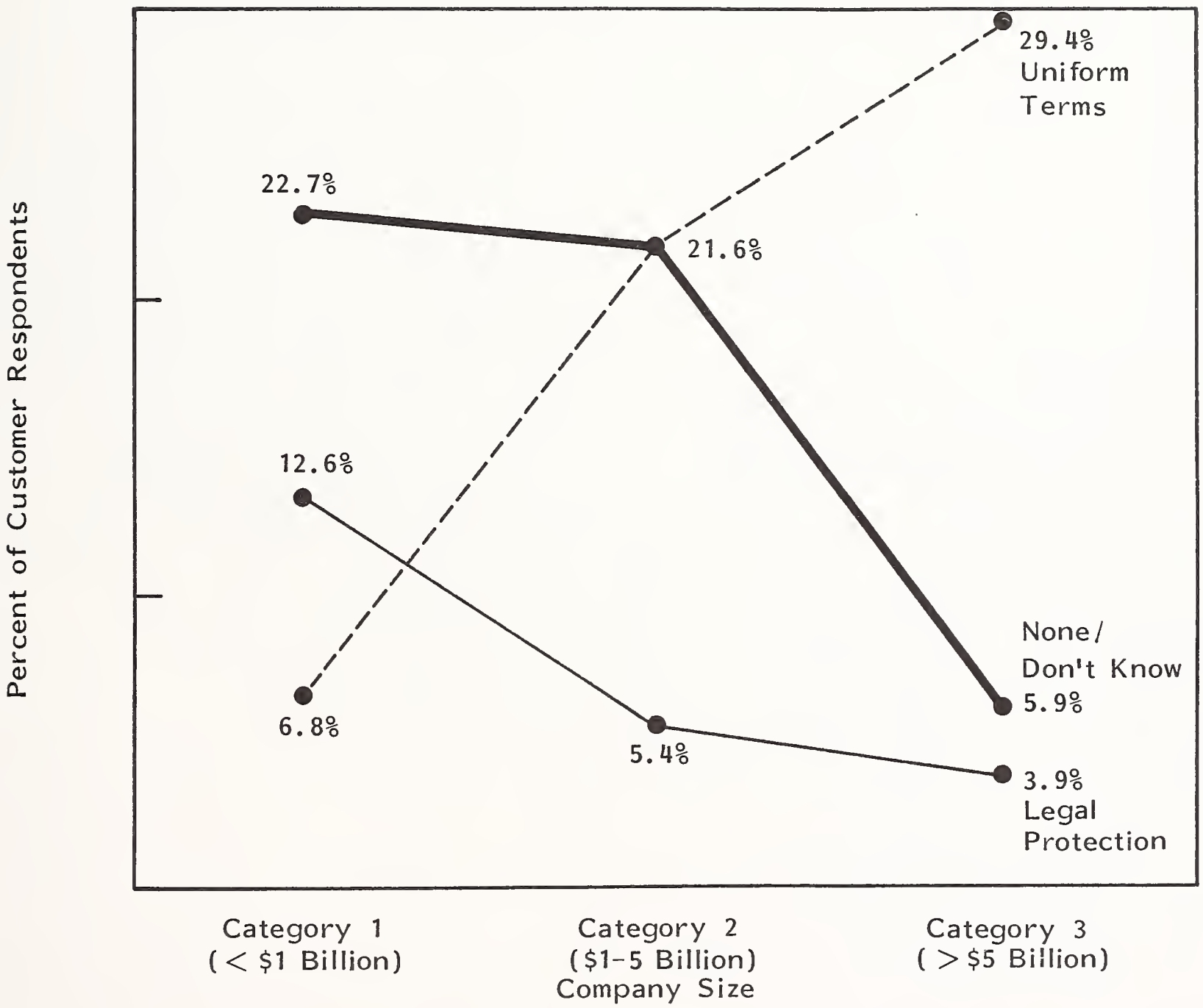



*Totals more than 100% due to multiple responses.

Note: Open-ended, coded question.

EXHIBIT V-19

## SELECTED BENEFITS TO CUSTOMERS FROM CENTRAL TRACKING OF CONTRACTUAL TERMS



# VI SUPPORT ISSUES

# VI SUPPORT ISSUES

- This chapter discusses the larger issues raised in the course of the research. (INPUT's findings and recommendations have been highlighted in Chapter II.)

- Half of the companies interviewed feel they have little or no control over software support provided by vendors, as shown in Exhibit VI-1. This is consistent with earlier findings that showed that firms did not know what changes vendors were planning (see Exhibit V-13), and that customers were being offered far fewer incentives than they desired (see Exhibit III-6).

- This is why almost four-fifths of customers described the kinds of steps they would take to influence the direction of vendor software support. In practice nearly that proportion do nothing at all, as shown in Exhibit VI-2. Ominously, the percentage advocating the nonpurchase of support is the closest to remaining unchanged.

- Respondents were asked to volunteer the issues that they saw as being important support issues; these were then classified into major categories, as shown in Exhibit VI-3.

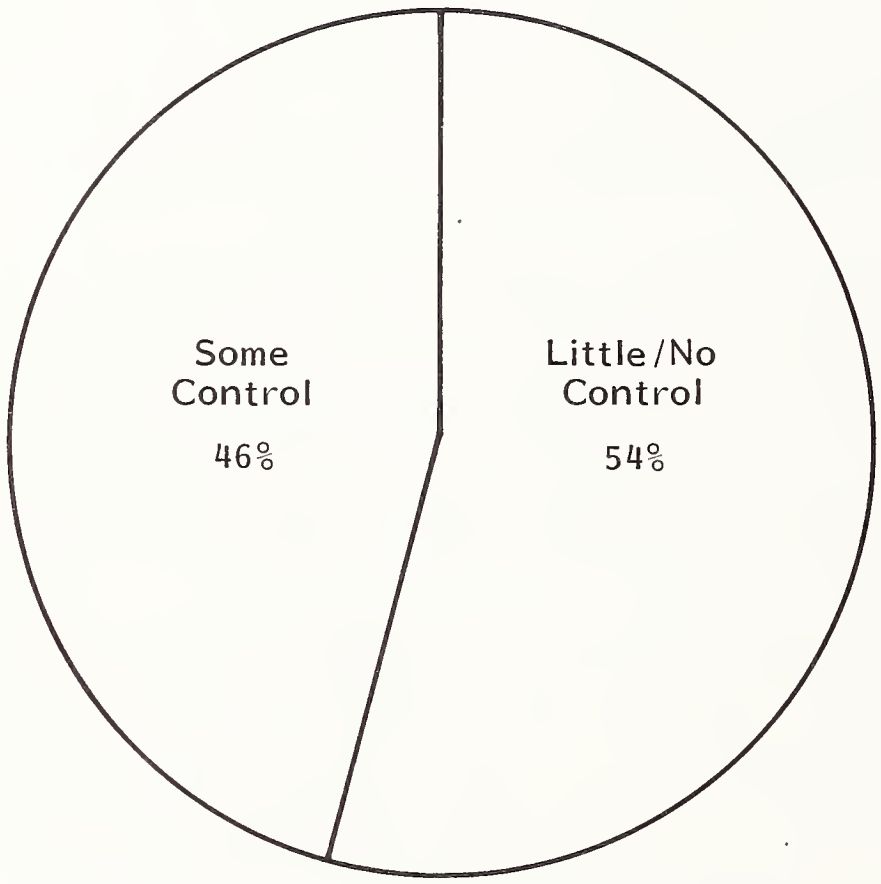
  - Quality proved to be of prime importance, e.g.:

    . Quality of service.

    . Quality of underlying product.

EXHIBIT VI-1

## CUSTOMERS' PERCEIVED CONTROL OVER SOFTWARE SUPPORT



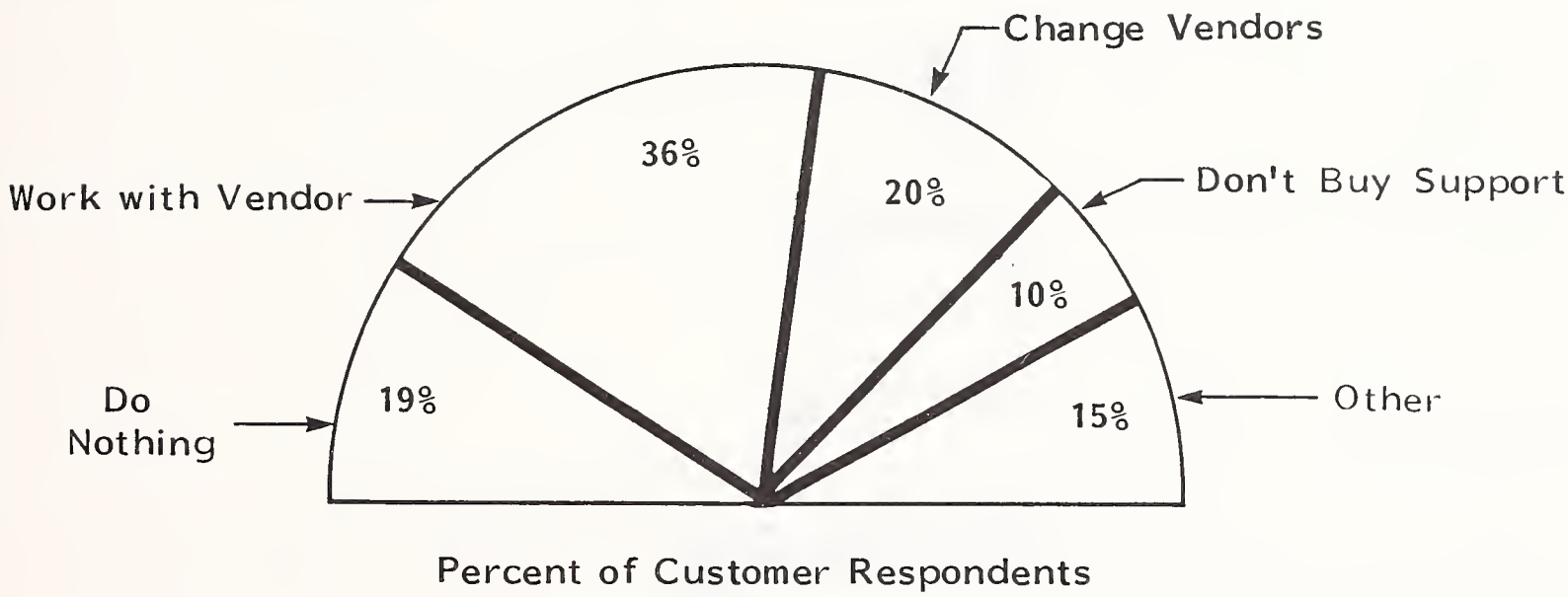

Percent of Customer Respondents

- This illustrates a widespread vendor-customer communication problem.
- Vendors will be able to make changes more easily if customers have a higher perception of control.

EXHIBIT VI-2

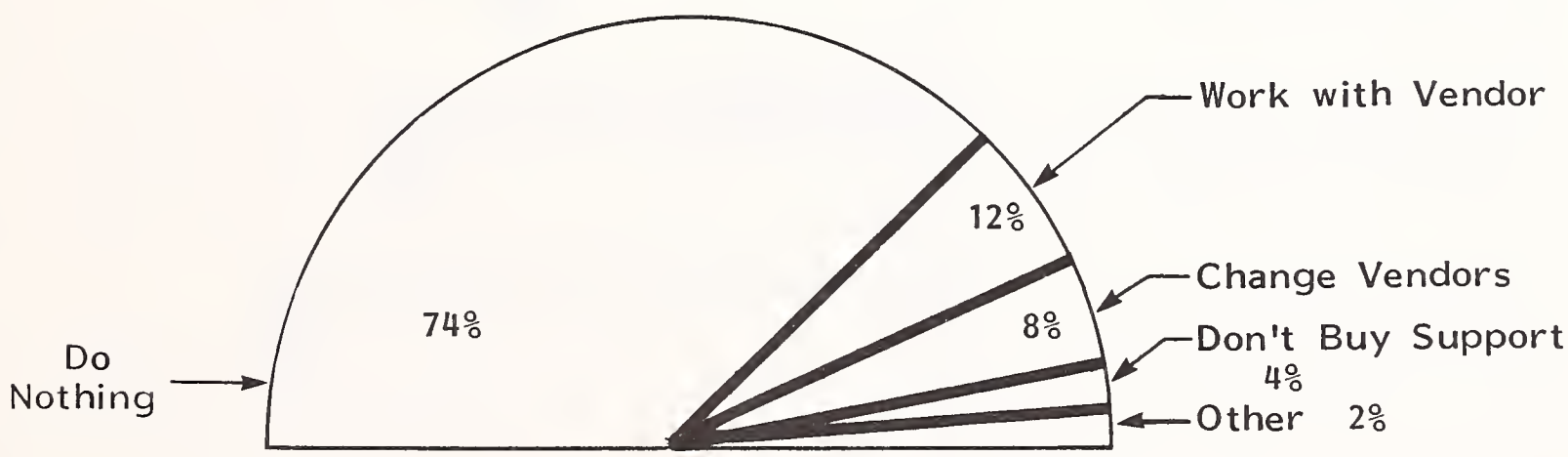
# THEORETICAL AND ACTUAL STEPS TO INFLUENCE VENDOR SOFTWARE SUPPORT

## THEORETICAL STEPS




Percent of Customer Respondents

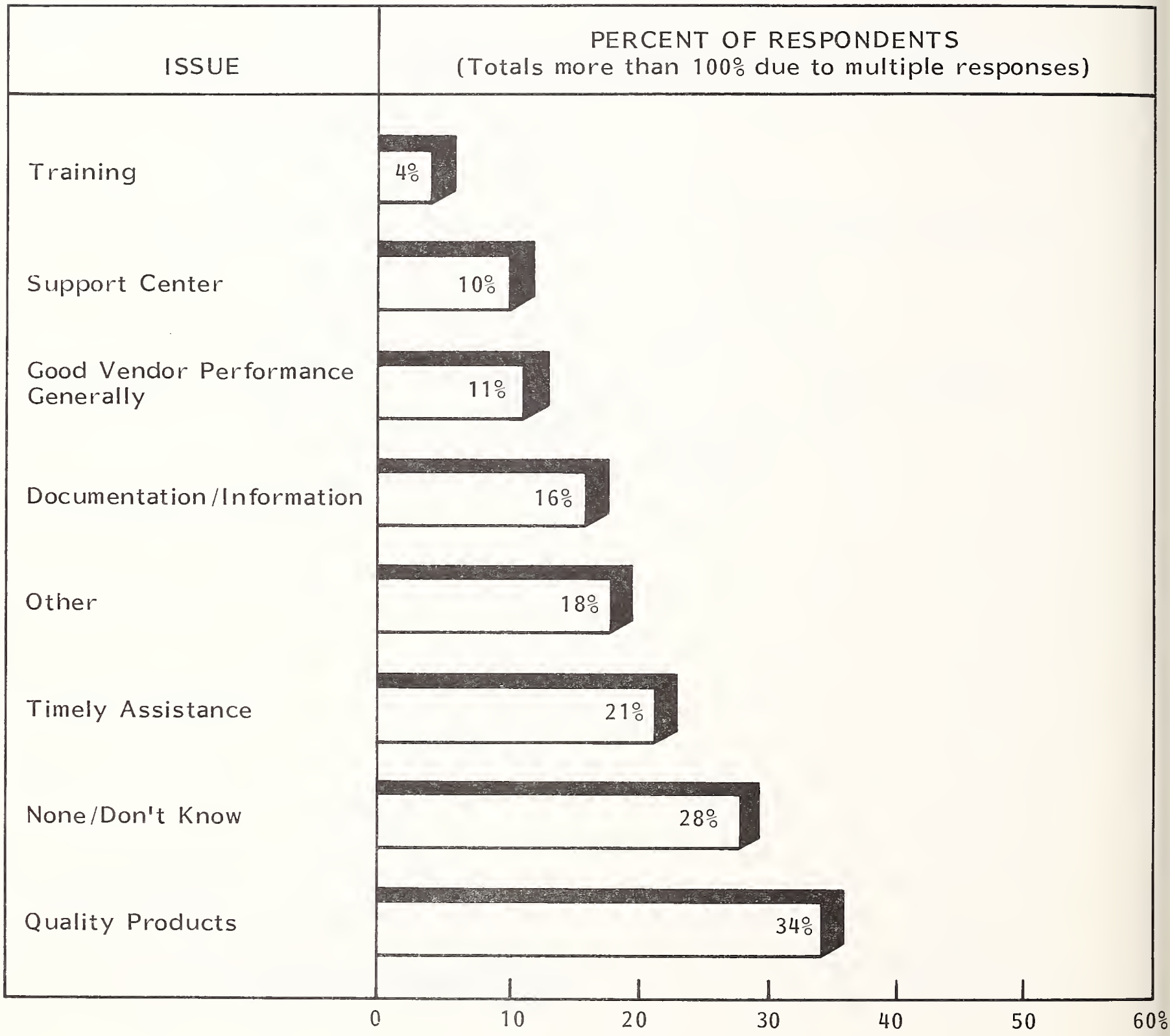
## ACTUAL STEPS




Percent of Customer Respondents

EXHIBIT VI-3

SOFTWARE SUPPORT ISSUES IMPORTANT TO CUSTOMERS



- Costs and pricing were volunteered by a very small proportion of respondents. Since this question was raised after respondents had been sensitized to cost issues, INPUT believes that this is a significant omission, and one that presents opportunities to product planners.

- It is interesting to contrast the issues of importance to customers (see Exhibit VI-3), to the changes that customers see occurring, as shown in Exhibit VI-4:

  - The largest group simply doesn't know what will be happening; in contrast, virtually all customers have views on what they consider to be important.

  - The next largest group is made up of those who feel less support is needed (as opposed to less support being offered.) Implicitly, this group will tend also to see less reason to pay at existing pricing levels unless vendor support improves qualitatively. Note, however, that only 5% of customers spontaneously assert that support quality will improve.

  - Customers see technical changes occurring, especially in the increased use of electronic support.

- Smaller companies are more likely than larger companies to either see less support in the future or not to be able to forecast changes, as shown in Exhibit VI-5. Larger companies are much more likely to foresee technical changes.

- Changes foreseen by industry groupings are much more heterogeneous, as shown in Exhibit VI-6:

  - Manufacturing companies are less likely to have views on major changes.

EXHIBIT VI-4

CHANGES FORESEEN BY CUSTOMERS IN SOFTWARE SUPPORT

| FORESEEN CHANGES | PERCENT OF RESPONDENTS (Totals more than 100% due to multiple responses) |
|---|---|
| None/Don't Know | 38% |
| Less Support | 28% |
| • Easier Installation | 9% |
| • Better Code | 7% |
| • Fewer Releases | 6% |
| • Self-Support | 6% |
| Technical Changes | 27% |
| • Downloading, Remote Fixes | 23% |
| • Integrated Systems | 4% |
| Other | 35% |
| • Support Center | 7% |
| • Better Quality Support | 5% |
| • Pricing Changes | 3% |
| • More Support Needed | 3% |
| • Miscellaneous | 17% |

0 10 20 30 40 50%

EXHIBIT VI-5

MAJOR CHANGES FORESEEN BY CUSTOMERS, BY COMPANY SIZE

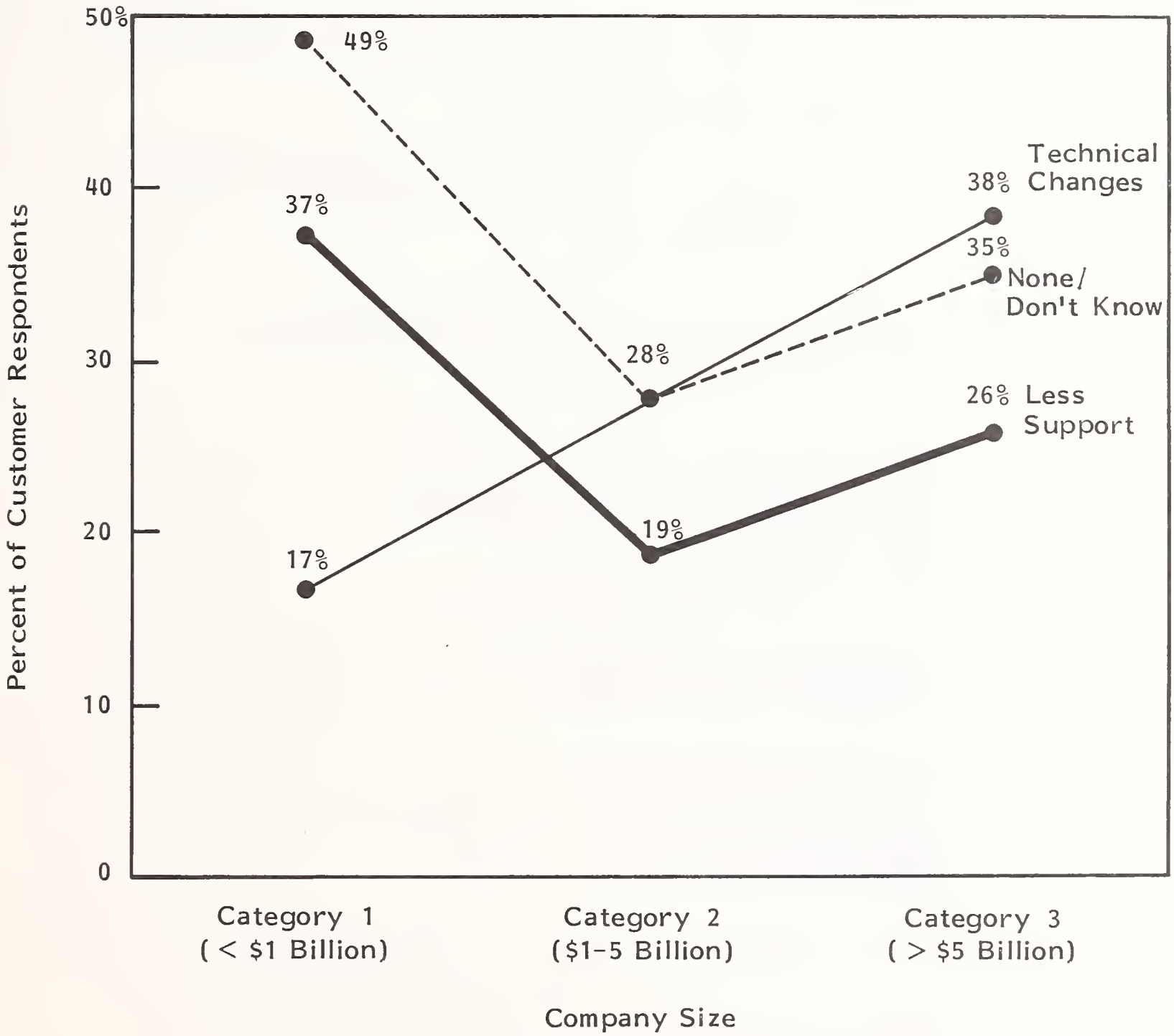
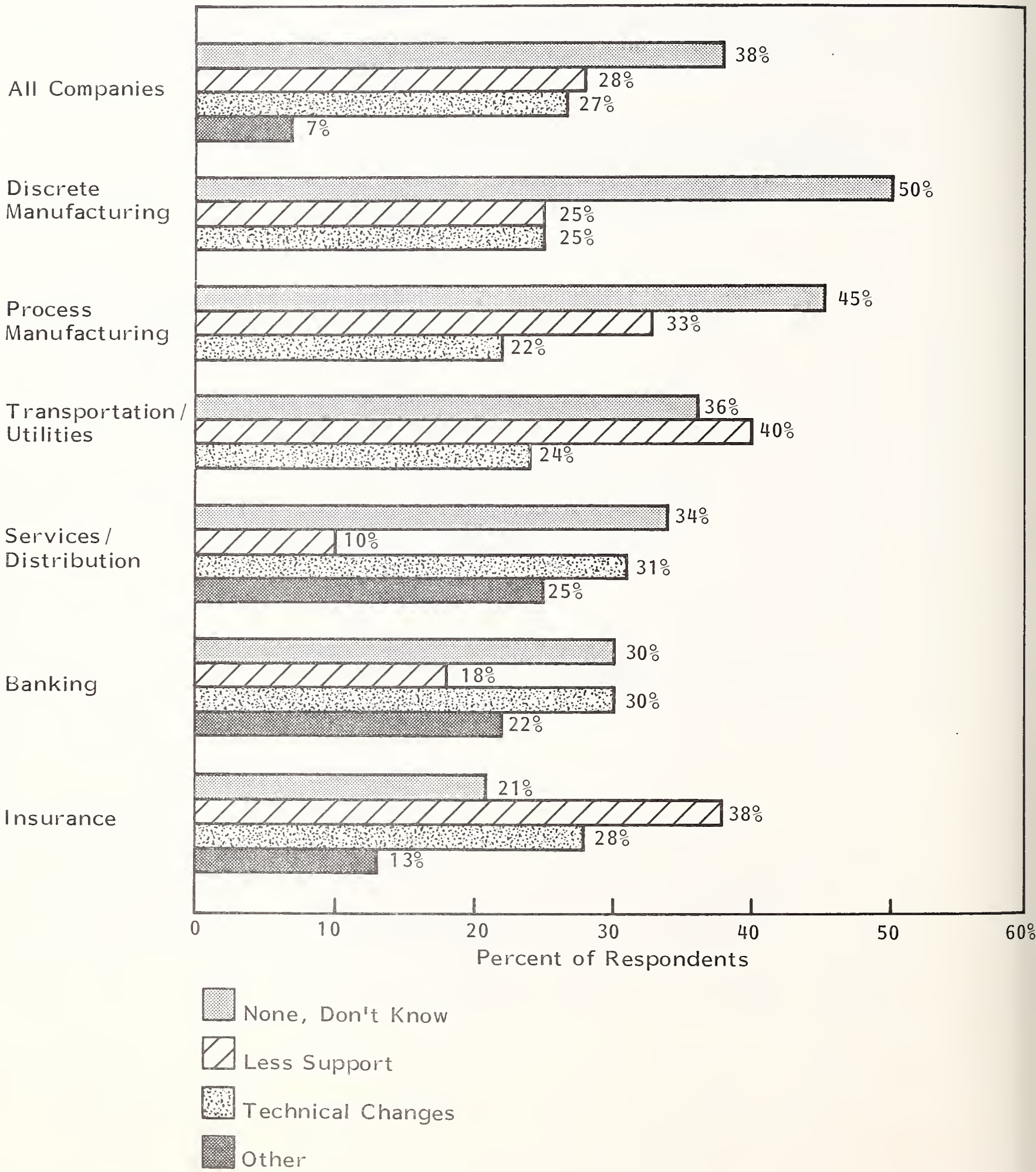


EXHIBIT VI-6

MAJOR CHANGES FORESEEN BY CUSTOMERS, BY INDUSTRY



- Services/distribution and banking see less need for support, while transportation/utilities and insurance see more.

- There is much less variation between industries in regard to technical change.

- A substantial percentage of both banking (22%) and service/distribution (25%) believe that there will be "other" changes which will have a major impact on the mainframe software support market. These changes include increased user pressure on the market as users become more demanding of new services and as service product loyalty decreases. Users will expect improved "direct" service from the vendor and an elimination of intermediate support mechanisms, such as understaffed regional or local support centers.

# APPENDIX A: REPRESENTATIVE RESPONDENT TITLES

## APPENDIX A: REPRESENTATIVE RESPONDENT TITLES

- Manager, Information Technology.
- Manager, Technical Center.
- Systems Manager.
- Director, Software Services.
- Director, Systems Planning.
- Director, Administration.
- Technical Support Manager.
- Assistant Vice President.
- Director, Corporate IS.
- DP Manager.
- Director, MIS.
- Planning Analyst.

- Technical Specialist.
- Senior Support Systems Analyst.
- Corporate Vice President.
- Manager, Systems and Programming.
- Director, Information Center.

# APPENDIX B: SOFTWARE SUPPORT CORPORATE QUESTIONNAIRE

APPENDIX B

# SOFTWARE SUPPORT
# CORPORATE QUESTIONNAIRE

Introduction:

INPUT is a research and consulting firm. We are conducting a study on issues and trends in packages software support and maintenance from the corporate customer's standpoint. We will make recommendations on how corporations can best deal with these issues in the coming years. We would like your organization to take part in this study by describing what you are doing now, what your plans are and what problems you see. This information will be used by IS departments in their planning and will also be used by a wide variety of information service vendors to offer more useful products and services.

None of the information that you provide will be associated with your company. In return for your taking part in this study, we will send you a summary of this study on its completion and will also send you a summary of INPUT's report PC Software Support in Large Corporations.

1. a) Are your responsible for all significant packaged software support matters in your organization?

☐ Yes ☐ No

If No to 1.a)

b) Are you knowledgeable about all significant packaged software support matters in your organization?

☐ Yes ☐ No

If No to 1.b)

Which of the following are you Responsible for or Knowledgeable about: (Note with "R" or "K")

| | Operating System(s) | Other Systems Software | Application Software |
|---|---|---|---|
| Mainframe | | | |
| Minicomputer Software | | | |
| Microcomputer Software | | | |

(NOTE: get names of other people to complete the matrix).

For the rest of this interview I would like to discuss with you your support requirements for _____ software. (If respondent is responsible for one area select that; if responsible/knowledgeable in more than one, follow instructions).

2. Who are the suppliers of your major software packages, categorized by software type (Operating Systems, Other Systems Software, and Applications Software) and hardware type? (Use following matrix).

Software Suppliers

| | Software Type | | |
|---|---|---|---|
| | Operating System(s) | Other Systems Software | Application Software |
| Hardware Type | | | |
| Mainframe | | | |
| Minicomputer<br>- IBM Sys 38,<br>- Series 1,<br>- 8100 | | | |
| DEC Minicomputer | | | |
| Prime Minicomputer | | | |
| Data General Minicomputer | | | |
| Other Mini<br>_____ | | | |
| Office/PC<br>- IBM PC Family<br>- Other | | | |

3. a) Using these same categories, about how much did you spend in 1983 on:

   - Software licenses, fees, lease or rental payments, etc? $_____

   - Software support or maintenance fees either in dollars or as a percent of License fees? $_____

     _____% of license fees.

   b) For what percent of your software is support included in the license fee? _____%

   c) What percent of your software is not supported by the vendor? _____%

   d) Overall, how much do you expect these to change in 1984 and 1985? ($ or percent change)

Changes in:

| | Total License Fees | Total Support Fees |
|---|---|---|
| 1984 | | |
| 1985 | | |

   e) If any of the changes in 3d were significant (i.e., 10% or more):

   - What is the reason for this? _____

     _____

   Do you expect this amount of change to continue? _____

   _____

4. a) I will read a list of functions or services that are sometimes or usually included as part of standard software support services. Please tell me how important each is to your organization generally and whether there are exceptions, depending on the type of package? Please be specific about the exception (e.g., from a particular vendor, for a particular application, at a particular location, for a particular type of machine). Please rate their importance on a scale of 1 to 5 with 1 being low importance and 5 representing high importance.

SOFTWARE SUPPORT FUNCTIONS

IMPORTANCE

| Functions | Generally | Exceptions |
|---|---|---|
| Fix Errors | | |
| Improve Features of Functionality | | |
| Add Features or Functionality | | |
| Extend Features or Functionality | | |
| Training | | |
| Consulting | | |
| Other (Describe) _____ | | |

4. b) How well have your software vendors generally met these support requirements? Have certain vendors performed much better or worse? (Note: Specific vendor names are preferred, but generic descriptions are acceptable; Please rate your satisfaction by the same functional areas (on a scale of 1 to 5).

Satisfaction with Software Support

| Functions | Generally | Exceptions |
|---|---|---|
| Fix Errors | | |
| Improve Features or Functionality | | |
| Add Features or Functionality | | |
| Extend Features or Functionality | | |
| Training | | |
| Consulting | | |
| Other (describe) _____ | | |

5. a) What kinds of services do your software vendors offer in addition to those contained in the standard support contract (e.g., additional training, consulting)? How extensive are they?

_____

_____

5. b) About how much do you spend annually on these additional services?

$ _____

c) What additional services do you expect to purchase from your packaged software vendors?

- When: _____

_____

- Why?: _____

_____

- What would this translate to in dollars? $_____

6. a) Have you experienced situations recently where a software vendor has brought out a new product rather than enhancing or modifying an existing product?

☐ Yes ☐ No

- If Yes:

  - Which product(s) was it? _____

  - Do you feel this was justified? ☐ Yes ☐ No

    Explain: _____

    _____

  - Did licensees of the old product receive a discount on the new product? ☐ Yes ☐ No

    If Yes, how much was it and was it fair in your opinion?

    _____

    _____

  - Overall, do you feel the vendor(s) handled the situation well from your standpoint? ☐ Yes ☐ No

    Why? _____

    _____

6. b) Do you think that bringing out new products in this way will be a more common situation in the future?

☐ Yes ☐ No

Why? _____

_____

If yes, will this be common for:

☐ Mainframe Software
☐ Mini Software
☐ Micro Software

7. a) Does your organization keep logs or other records of major and minor bugs or other problems in packaged software?

☐ Yes ☐ No

- If Yes:
  - How many major and minor problems are reported annually for operating systems software, other systems software and application software packages? How many are resolved? What is the average time to resolve these problems? (Use attached matrix.)

7. a) Problem Reporting or Resolution

| | Package Type | | |
|---|---|---|---|
| Problems | Operating System(s) | Other Systems Software | Application Software |
| Major<br>Number Reported | | | |
| Number Resolved | | | |
| Average Time to Resolve | | | |
| Minor<br>Number Reported | | | |
| Number Resolved | | | |
| Average Time to Resolve | | | |

7. b) Overall, is this problem resolution performance satisfactory?

☐ Yes ☐ No

If No:

How should it be improved? _____

_____

To what extent do you expect it to be improved? _____

_____

7. c) How much do you expect automatic downloading and installation of new releases, remote diagnostics, and remote fixes to improve problem resolution and other services? Are these being done now at your installation? If so, what is your experience?

| | Being Done Now (Yes/No) | Expected Improvements | Experience |
|---|---|---|---|
| Automatic Down-loading and Installation of New Releases | | | |
| Remote Diagnostics | | | |

8. a) Is there one person in your company who tracks and analyzes software support contractual terms and conditions for all software products?

☐ Yes ☐ No

- If Yes:
  - How long has this been done? _____
  - How many products are covered? _____
  - What benefits has your company received? _____
- If No:
  - Do you plan to? ☐ Yes ☐ No

8. b) Do you feel that current contractual terms and conditions applying to software support and maintenance are satisfactory?

☐ Yes ☐ No

Why: _____

_____

- What sort of changes would you like? _____

_____

_____

- What kind of changes do you believe vendors are planning?

_____

_____

c) Does your firm ever seek to modify standard terms and conditions concerning software support?

☐ Yes ☐ No

Why? _____

_____

If Yes:

- How often is this attempted? _____

_____

- What terms do you try to modify? _____

_____

- What success have you had? _____

_____

9. To what extent do you feel you have little or no choice in the type or amount of software support you will be receiving?

_____

_____

_____

- What can you do about this? _____

_____

- What are you going to do about it? _____

_____

10. a) How much and what kind of self-support of packaged software is your organization currently doing?

_____

_____

Why? _____

_____

10. b) Do you usually, sometimes or never perform the following types of self-support? What are your future plans? (fill in matrix below)

| Type of Self-Support | Current | | | Future | | |
|---|---|---|---|---|---|---|
| | Usu. | Some | Never | Usu. | Some | Never |
| Install Initial Release | | | | | | |
| Install Subsequent Releases | | | | | | |
| Modify Packages | | | | | | |
| Fix Errors | | | | | | |
| Set up a Single Point in your Organi-zation to Funnel Questions to a Vendor | | | | | | |

c) Do you expect to do more in the future? ☐ Yes ☐ No

Why? _____

_____

_____

If yes:

What kind of self-support? _____

_____

d) What kind of incentives do software vendors now give you to perform self-support functions?

_____

_____

_____

10. e) What additional incentives would you find attractive? _____

_____

_____

11. What other software support issues are important to you or your organization?

_____

_____

12. Overall, what changes do you see occurring in the way in which packaged software support is delivered?

_____

_____

_____