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SPECIAL REPORT

Spending for I/S in Corporations

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SPENDING FOR I/S IN CORPORATIONS

INTRODUCTION

One of the most frequently asked questions by chief executives and chief financial officers in corporations today is: "How much should we be spending for information systems?" The frequency with which this question is asked has increased with the wave of restructuring that has swept corporate America and is now sweeping corporations in both Europe and the Asia-Pacific.

Even corporations like IBM are not immune to the question. According to an anecdote in *Business Week*,¹ one of the first questions IBM's new chairman asked in his search for ways to cut corporate overhead was "How much are we spending for I/S and how much are other corporations spending?" When he got the answer of 7% of revenues and 2% of revenues respectively, "IBM's CEO nearly fell off his chair."

Unfortunately, there aren't any good answers to the question of how much should a company spend for I/S. But there are several ways to approach the question.

The first is to look at the contribution of I/S spending to the corporate bottom line—the so called "business value" of I/S. While this is extremely complex and difficult to do, and therefore usually isn't done in practice, it is important to do. However, researchers are beginning to

¹*Business Week*, October 4, 1993, Cover Story, p. 90.

look seriously at the business value of I/S investments and there is hope of useful insights in the future.

The second way to address spending for I/S is to ask users for their subjective assessments of value. While research shows that users generally have a good sense of the value of the information systems they use, their ratings cannot be translated into metrics to answer the question of how much to spend for I/S.

The third way to address I/S spending, and the most common in practice, is benchmarking or comparison of a target corporation's spending with other corporations. Such a comparison might be made with all firms, with manufacturing or service firms, or with firms in particular industries such as banking, insurance, utilities, transportation and so forth.

We take the latter approach in this report. Although not without weaknesses, direct comparison of various spending measures with those of different firms provides at least a beginning point for answering the question of appropriate I/S spending levels. This benchmarking should be combined with business value whenever possible.

Methods and Data

Our general approach is to look at spending patterns for I/S over the last five years for a sample of 40 corporations.

These 40 firms were chosen as part of the Intercorporate Measurement Program (IMP)² from corporations that are at the leading-edge of I/S practice.

Exhibits A1-A6 in the Appendix show how our 40 IMP corporations compare with a larger sample of over 400 corporations³ on six key features:

- Percent I/S budget of total revenues
- Percent I/S employees of total staff
- Total I/S expenses
- Total I/S staff
- Total I/S penetration
- Corporate productivity

Comparison of the patterns in these exhibits indicates two significant features of the two samples. The 40 IMP corporations are consistently higher on most values than the larger sample, which is consistent with their being at the leading-edge of I/S practice. However, the "patterns" in the exhibits are similar which indicates that the IMP sample can be generalized to the larger sample.

²The Intercorporate Measurement Program is a sponsored research program conducted by CSC Consulting and the Center for Research on Information Technology and Organizations at the University of California, Irvine. The aim is to further the state of the art of I/S performance measurement and to improve I/S performance in practice. IMP conducts annual surveys of management practice and I/S performance in corporations. It feeds back the knowledge gained to survey participants, to IMP sponsors, and to CSC Consulting members through publications, workshops and client programs.

³The larger sample of over 400 corporations was created by combining those reported in the *Computerworld Premier 100* and the *Information Week 500* from years 1988-1992.

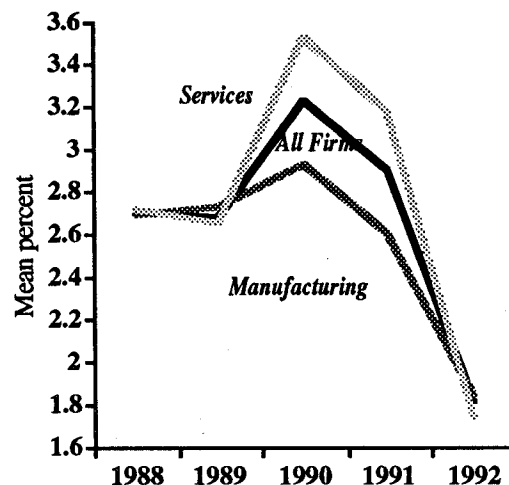
I/S SPENDING

Corporate spending for I/S is in decline overall, but some firms continue to spend at historically high rates as will be seen below. Corporate spending can be usefully benchmarked by two different but related measures: (1) percent I/S expenses of total corporate revenue, and (2) percent I/S expenses of total corporate operating expenses.

Percent I/S Expenses of Total Corporate Revenue

The average corporation's total spending on information systems through I/S departments accounted for approximately 1.8% of total corporate revenue in 1992, a decline from a high of about 3.2% in 1990 (Exhibit 1). However, about 10% of the firms are spending more than 4% of revenues (Exhibit 3).

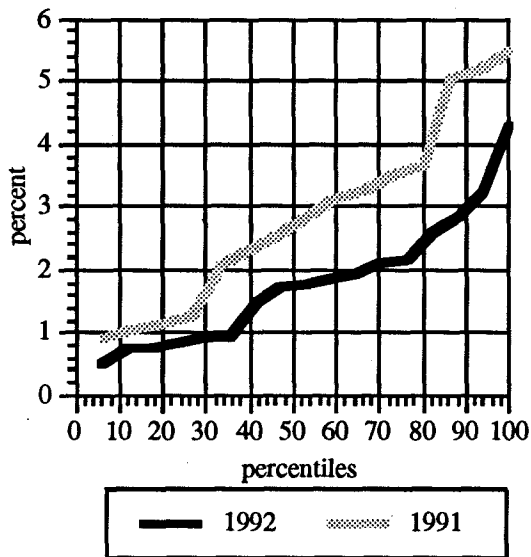
Exhibit 1. Mean Percent I/S Spending of Total Corporate Revenues, 1988-1992



This overall pattern of I/S spending as a percent of corporate revenues is essentially similar between manufacturing and service corporations. Although service firms spend relatively more than manufacturing firms, both types of firms show a continual decline in spending from 1989 to 1992. In fact, the decline is somewhat greater among service firms, because they grew to a higher overall percentage of corporate revenues in 1990. However, the overall pattern of decline in spending curves is similar, and both service and manufacturing firms currently spend around 2% of revenues.

Exhibit 3 displays the percentile distributions for the 1991 and 1992 corporations for I/S as a portion of total corporate revenues. These distributions indicate the range of spending patterns among the corporations. For example, for 1992, the bottom one-third of the firms allocate less than 1% of total revenues to I/S, the middle third allocate

Exhibit 2. Percentile Distribution: Percent I/S Expenses of Total Revenues

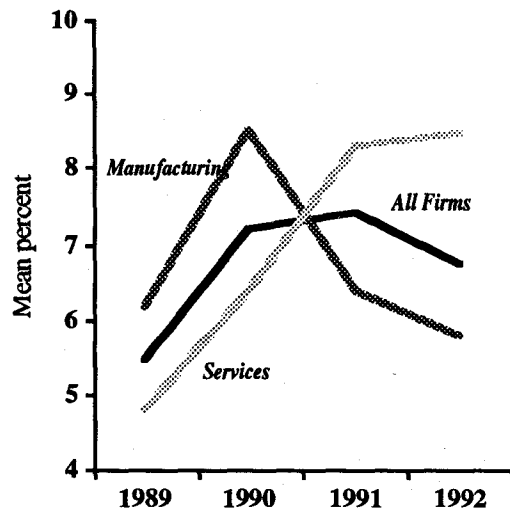


from 1-2%, and the top third, allocate more than 2%.

Percent I/S Expenses of Total Corporate Operating Expense

I/S spending as a percent of corporate operating expenses shows a different pattern overall. Here I/S expenses are steady since 1990 with the mean around 7% of total corporate operating expenses (Exhibit 3). Moreover, the top ten percent of corporations are spending over 20% of operating expenses on I/S (Exhibit 4).

Exhibit 3. Mean Percent I/S Spending of Total Corporate Operating Expenses, 1989-1992

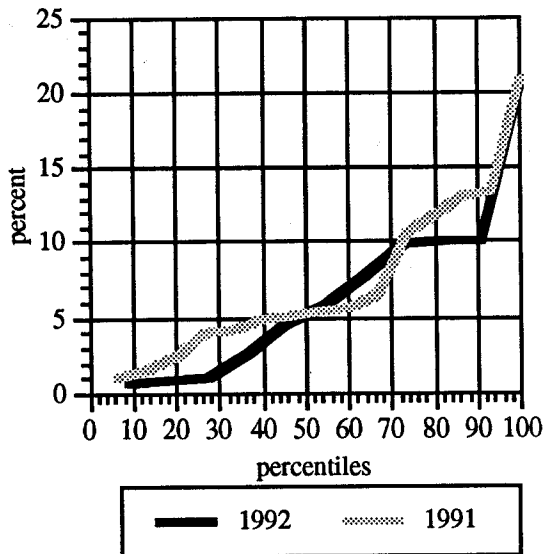


The pattern for the percent of operating expenses spent on I/S between manufacturing and service corporations is very different over the four years, essentially moving in opposite directions. Since 1989, service firms have allocated an increasing portion of operating

expenses to I/S, doubling from roughly 4% to 8%. In contrast, manufacturing firms have allocated a declining portion of operating expenses to I/S, with the decline being around one-third since 1990 (Exhibit 3).

Exhibit 4 displays the percentile distributions for I/S as a portion of operating expenses. It shows that one-half the firms spend more than 5% of operating expenses on I/S and the other half spend less than 5%. This median value is close to the mean or average reported above. Looking at the percentile distributions still another way, the bottom third spend less than 4%, the middle third spend from 4-7%, and the top third spend more than 7%.

**Exhibit 4. Percentile Distribution:
I/S Expenses of Operating
Expenses**

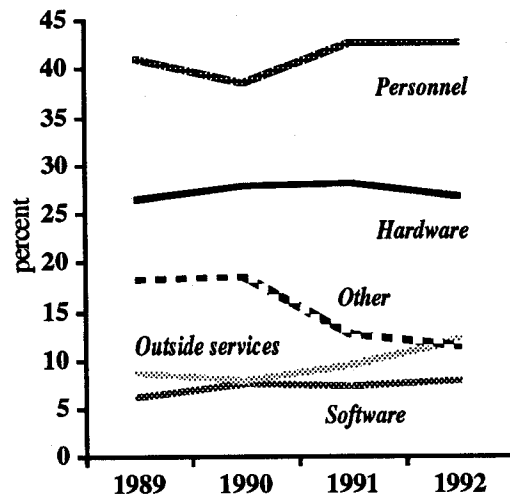


I/S BUDGET SHARES

The budget shares allocated to different I/S resources such as hardware and personnel show remarkable stability over the last four years despite the overall decline in spending for I/S (Exhibit 5). Hardware accounts for around 25% of an organization's I/S budget. Personnel expenses consume approximately 40% of the budget. Purchased software accounts for less than 10% of the budget. Outside services, such as outside time sharing, telecommunications, consulting, and outside training consume about 10% of the budget. Finally, approximately 10% of I/S budgets are Other expenses, such as rent, utilities, supplies, overhead, in-house training, space.

These overall allocations of I/S budgets by resource do not significantly differ between manufacturing and services firms.

**Exhibit 5. Distribution of I/S
Expenses: 1989-1992**

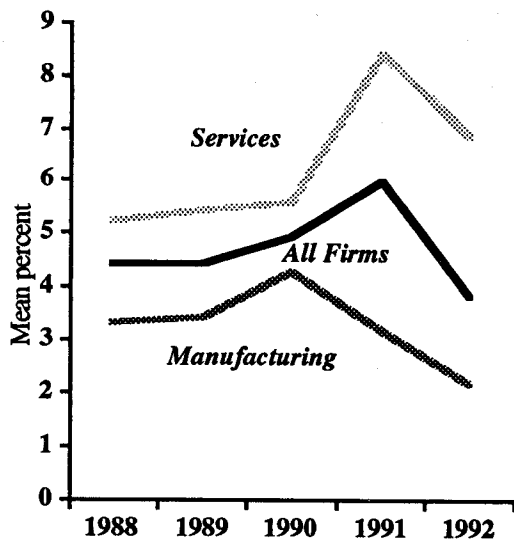


I/S PERSONNEL

Given that personnel represents the single largest category of I/S spending, it is useful to consider trends and benchmarks here too.

The number of personnel in the I/S function is on the decline, both absolutely and as a percentage of total corporate employees. Less than 4% of the total employees in a corporation work in the I/S function in 1992 compared to around 5-6% in recent years (Exhibit 6). The percentile distributions for 1992 are shown in Exhibit 7.

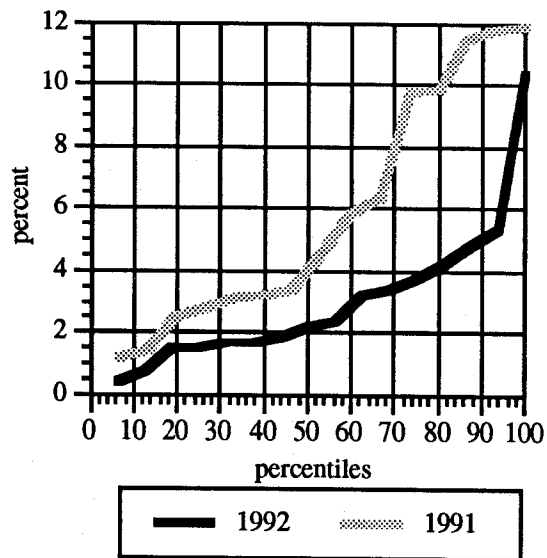
Exhibit 6. Percent I/S Employees of Total Corporate Employees: 1988-1992



The portion of corporation employees allocated to I/S in manufacturing and service firms shows considerable difference. As was the case for operating expenses, the portion of corporate employees allocated to I/S is increasing in service firms while decreasing in

manufacturing (Exhibit 6). Service corporations on average have more than three times the ratio of I/S employees to total employees than is found in the manufacturing firms. In 1992, approximately 2% of manufacturing employees were in I/S, while nearly 7% of service firm employees were in I/S.

Exhibit 7. Percentile Distribution: Percent I/S Employees of Total Corporate Employees



USING PERCENTILE FIGURES FOR BENCHMARKING

Individual corporations can usefully compare their own spending with the benchmarks represented by the corporations participating in this study. This is done by calculating the firm's own "I/S spending as a percent of revenues," or "I/S spending as a percent of operating expenses," or "I/S employees as a percent of total corporate employees" and locating those values on

the 1992 curves shown in Exhibits 2, 4, and 7. This will indicate where the corporation lies in the overall distribution of firms in the study.

In using benchmarks, it is helpful to remember that they vary by industry sector and subsector. Service firms generally spend more than manufacturing firms. Within the service industry, insurance firms generally spend more than banks and other financial institutions.

DISCUSSION

The benchmarks here show that spending for I/S is in decline. The average firm spent around 2% of revenues and 7% of operating expenses on I/S in 1992. The range in spending was from 0.5% to 12%.

Companies can spend too little and fail to get the benefits from I/S. It is likely that firms spending less than 1% of revenues should examine whether they are under-investing. Companies also can spend too much for I/S and fail to get the benefits. However, experts argue that firms which are engaged in business reengineering should expect to spend around 8% of revenues for I/S.

Budget shares for different I/S resources have been shown to be stable despite decline in overall spending for I/S. The fact that I/S budget shares are more or less stable over the last four years is significant. It fails to support two commonly held beliefs. The first is that personnel costs account for a rapidly

increasing share of the total I/S budget. In fact, the share is remarkably constant.

The second belief is that increasingly, purchased software is being used as a replacement for in-house development of systems. While firms continue to use purchased software, the data indicate that spending for purchased software is not increasing at all.

This finding is consistent with earlier research which showed that I/S budget shares had not changed significantly in fifteen years.

It is useful to remember that spending levels or other resource levels such, as I/S personnel, represent corporate *investments or inputs to I/S* only. They say nothing about the efficiency of investment, the return on investment, or the broader business value of I/S. However, they are useful precisely because such efficiency and effectiveness measures are lacking in the industry.

Thus, the spending benchmarks in this analysis are useful for several reasons. First, they are widely used and have been used for a decade or longer. Therefore, comparison measures usually can be found quite readily for different industries.

Second, an absolute measure such as average I/S spending is not useful for comparison because of size differences among firms. The measures used here all take size into account and therefore are comparable across firms.

Third, the measures used here show different things. For example, the rates of I/S spending to revenue tends to be more stable than the ratio to operating expenses because of differences in how firms define operating expenses. On the other hand, I/S spending to operating expenses is sometimes a more realistic figure because some firms (e.g., firms in the oil and gas industries) have very high revenues relative to operating expenses. In such cases, a revenue-based ratio masks the real level of spending.

Finally, our benchmarks are from firms engaged in continuous improvement through exchange of best practice with other firms, universities, and consultant groups. This suggests that they are at the high end of firms in achieving benefits from I/S. Therefore, it is likely that the median and higher levels of benchmarks from these firms represent values to which all firms should aspire in order to gain greater benefits from their I/S investments.

Exhibit A.1 Percent I/S Budget of Total Revenues, 1988-1992

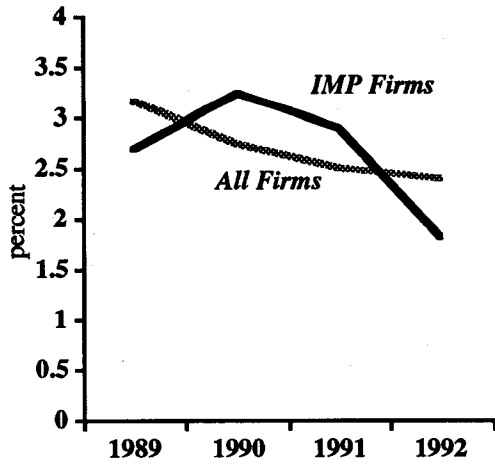


Exhibit A.2 Percent I/S Employees of Total Employees in Corporation, 1989-1992

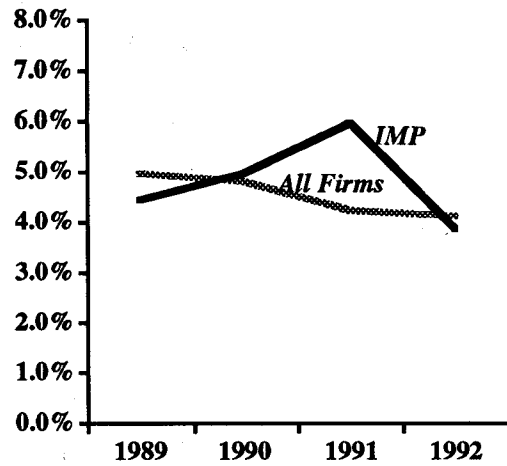


Exhibit A.3 Corporate I/S Expenses (in millions), 1988-1992

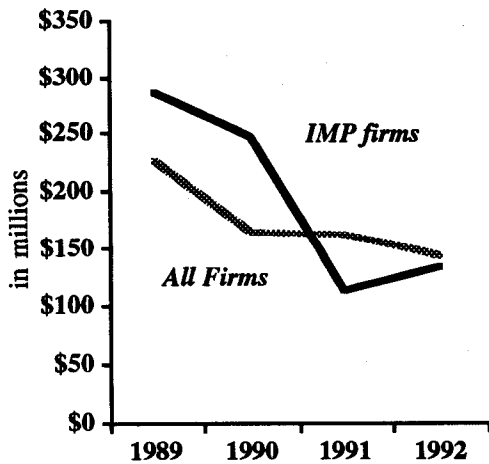


Exhibit A.4 Total I/S Staff in Corporation, 1989-1992

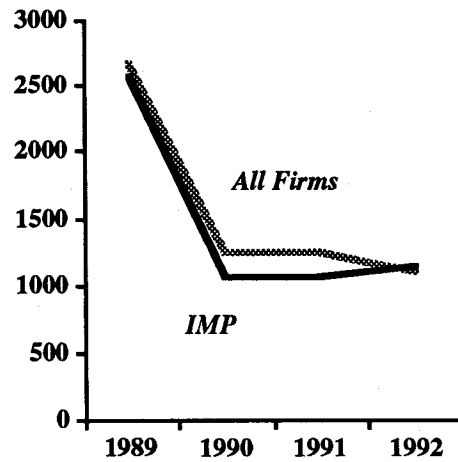


Exhibit A.5 Number of PCs/CRTx Per Corporation Employee, 1988-1992

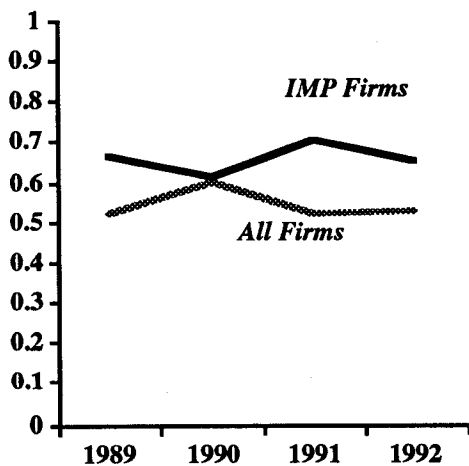
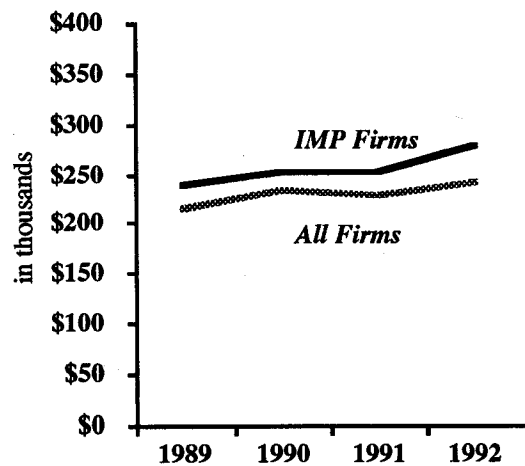


Exhibit A.6 Corporate Revenue Per Employee (in thousands), 1988-1992



About this Report

This special report is from "Performance Benchmarks for Information Systems in Corporations," the full report of the 1993 survey of I/S. Corporations interested in obtaining a copy of the report, participating in the next survey, or joining the select group of corporations that are sponsors of IMP, are invited to contact:

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About IMP

The Intercorporate Measurement Program (IMP), is a sponsored research program conducted by CSC Consulting and the Center for Research on Information Technology and Organizations at the University of California, Irvine to further the state of the art of I/S performance measurement and to improve I/S performance in practice. IMP conducts annual surveys of management practice

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About the Authors

Vijay Gurbaxani specializes in the economics of information systems and is the author of *Managing Information Systems Costs*, which deals with information systems budget planning and impact. **Kenneth L. Kraemer** specializes in the management of computing, and is co-author of *Managing Information Systems* and ten other books on computers and information systems in organizations. **Debora Dunkle** specializes in survey research, data analysis and statistical modeling. **Nicholas P. Vitalari** specializes in business process reengineering, accelerated applications development, and change management.

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