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AN EXAMINATION OF INFORMATION SYSTEMS OUTSOURCING PRACTICES
IN LARGE U.S. FIRMS:
IMPLICATIONS FOR GLOBAL SERVICE PROVIDERS

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ABSTRACT

Outsourcing, the practice of subcontracting some or all of the information systems services to another firm, has become a topic of major interest to business leaders and information systems managers.

This paper presents empirical data from a survey to determine current and future trends of information systems outsourcing practices in large U.S. firms. The data are interpreted in the context of an analytical model. The findings provide some implications for potential global outsourcing service providers, particularly in the Asian Pacific Rim countries.

INTRODUCTION

Outsourcing, the practice of subcontracting some or all of the information systems services to another firm, has been around for many years. Recently, however, with the highly publicized decision by Eastman Kodak Co. (Caldwell, 1989) to outsource most of its information systems functions, the idea has received renewed interest among business leaders and has led to a rapid growth of outsourcing business.

In a typical outsourcing arrangement, a firm subcontracts with an outside vendor some or all of its information systems operations. The outsourced functions can span the whole spectrum of information systems operations, including data center management, applications development, network operations, system integration, and user training. In the case of data center management, it often involves the transfer of a firm's existing information systems resources (hardware, software, and personnel) to the service provider. An alternative is to let the vendor's own data center absorb the outsourced operations.

Many vendors have seized the opportunities of outsourcing as evidenced by the rapid growth in the number and size of outsourcing vendors in the U.S. According to an estimate by the Yankee Group, the U.S. market for information systems outsourcing is growing at a rate of 15 percent annually and is expected to reach $50 billion by 1994 (Moad, 1991). Outsourcing is also gaining momentum beyond U.S borders - the global outsourcing market is projected to reach $240 billion by 1994 (McMullen, 1990).

Global outsourcing has been made feasible in most part by the advancements in telecommunications technology, thus effectively removing traditional geographical boundaries for firms. Many activities which were previously limited to a specific geographic area can now be performed at locations which provide the best competitive advantage. It is now possible to outsource on a global basis with service providers in countries which offer significant cost advantages over home country service providers. Worldwide, firms are subcontracting software development to low-cost labor areas using satellite transmission to submit their work for compiling and testing (Keen, 1991). Global outsourcing of information systems has clearly become an acceptable way to manage information systems resources and is a valid option today in many areas of information processing (Apte, 1991).

This paper presents empirical data from a survey of current and future trends in information systems outsourcing practices in large U.S. firms, interprets the data in the context of an analytical model, and finally analyzes the implications of the findings for potential global outsourcing service providers, particularly in the Asian Pacific Rim countries.

RELEVANT LITERATURE

Since the Eastman Kodak decision, much has been written on information systems outsourcing. Most of the writings have appeared in business periodicals describing various outsourcing arrangements and their expected benefits. Despite the high level of interest in the topic, relatively few research papers have been published in this area.

A review of the sparse set of research papers indicates that the subject is being approached from a couple of different research perspectives. The first, and probably the most dominant perspective to date, is concerned with the factors which influence outsourcing decisions (Loh and Venkatraman, 1992a, 1992b; Zucchini, 1992). Another stream of research is concerned with the issues of governance, addressing the organizational and contracting issues in outsourcing arrangements (Richmond, Seidman, and Whinston, 1992; Whang, 1992). Yet another group of researchers is addressing the issues of outsourcing on a global scale (Apte, 1991; Apte and Mason, 1992).

The factors influencing outsourcing decisions are of great importance to the firms which provide outsourcing services. From the organizational theory point of view (Williamson, 1985), outsourcing can be put into the context of a tradeoff between agency costs and transaction costs (Gurbaxani and Whang, 1991). A firm may choose to outsource if its internal coordination costs (agency costs) are high relative to transaction costs associated with contracting with an outsider.

Loh and Venkatraman (1992a), in their cross-sectional analysis of 55 outsourcing firms, found that the degree of information systems outsourcing is positively related to both business cost structure and information systems cost structures, and negatively related to information systems performance. In other words, firms with high business costs or high information systems costs are more likely to consider outsourcing as a way to reduce their costs or change the cost structures. Similarly, firms with poor information systems performance are more likely to use outsourcing to improve the performance of information systems operations. Due's (1992) analysis of outsourcing practices concludes that most organizations are looking into outsourcing to reduce data processing costs, sometimes by as much as 50 percent. In addition, these organizations are able to receive special expertise on an as-needed basis.

Zucchini (1992) also recognizes that these two factors, potential cost savings (economic) and access to special skills (expertise), are the two most important reasons why firms decide to outsource. But he also suggests looking deeper into the motivations behind these considerations. He states that depending on the motives, outsourcing can lead to positive (functional) or negative (dysfunctional) outcomes. He proposes a two dimensional conceptual framework, called the Four-S outsourcing model as shown in Figure 1. The model reduces all outsourcing decisions to four basic categories: scale, sale, specialty, and surrender.

	Economics	Expertise
Functional	**Scale**	**Specialty**
Dysfunctional	**Sale**	**Surrender**

Figure 1:   The Four-S Outsourcing Model

Scale refers to outsourcing decisions made to achieve lower operating costs due to the vendor's more efficient operations or economies of scale. Sale, on the other hand, applies to decisions to give up the information systems operations to a service provider to achieve short-term earnings or balance sheet advantages. Specialty means outsourcing in order to get services that are narrowly focused on technical or operational specialties at attractive rates. Surrender describes decisions to give up control of information systems operations because of difficulties in managing it effectively. The model suggests that the scale and specialty categories are positive motives leading to functional outcomes, while the sale and surrender are fundamentally negative motivations which may produce dysfunctional results in the long run.

The studies of global information systems outsourcing to date are focused primarily on identifying the issues and opportunities in global outsourcing and developing guidelines for managing such global arrangements. Apte and Mason (1992) identify several advantages of global outsourcing, including substantial cost reductions, access to a large pool of skilled professionals, faster cycle time for development, and access to foreign markets. Their list of disadvantages includes communication and coordination difficulties, potential violation of intellectual property rights, lack of control over software quality and project schedules, and unclear governmental attitude toward transborder data flows and information systems activities. Apte and Mason (1992) also define three classes of managerial issues for global outsourcing: identifying activities for outsourcing, selecting the right service providers and countries, and creating appropriate organizational arrangements and coordinating mechanisms.

METHODOLOGY

Data for this study were obtained through a mail survey of U.S. firms with large investments in information systems. The self-administered questionnaire was designed to capture the respondent firm's current outsourcing practices in terms of the amount and type of information systems activities and the motivations for and against outsourcing them. In addition, the respondents were asked to forecast their plans for future outsourcing three years from now. The questionnaire allowed for open responses to indicate additional information relative to the firm's outsourcing practices and plans.

Self-administered questionnaires were mailed to 185 senior information systems executives of firms with an installed information technology base in excess of US$25 million. The mailing list was developed from Information Week's September 1991 listing of the biggest U.S. users of information technology. The value of the technology base represents Computer Intelligence Corporation's estimates of all computer hardware from PCs to supercomputers, including telecommunications hardware.

Our sample of 40 respondents (22 percent response rate) represents a broad range of industries as shown in Figure 2. Of the sample, 62% of the firms have an IT base over US$50 million, while the remaining 38% of firms have an information technology base between US$25 and US$50 million. The majority (69 percent) of the respondents are operating globally, having operating units outside the U.S.

RESULTS

Figure 2 shows the respondent firm profile by industry. The data show that two thirds of the respondents outsource some of their information systems activities while only one third of the firms do not. Among the firms that outsource their IT functions, the number of years of outsourcing experience varies over a wide range as shown in Figure 3. But the relatively large number of firms (about 40 percent) with less than four years of experience in outsourcing clearly indicates that many firms are still relatively inexperienced outsourcing their IT functions.
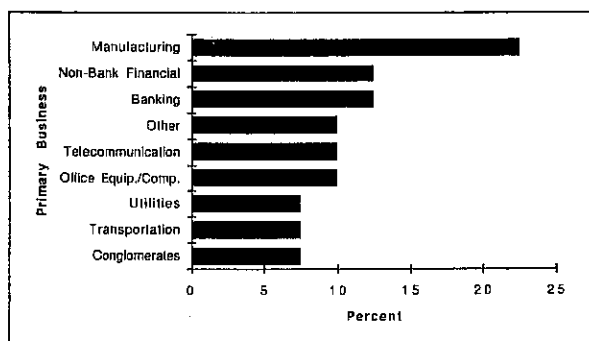

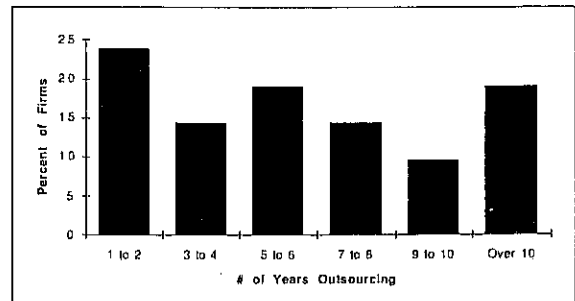**Figure 2: Respondent Firm Profile by Industry**

Figure 3: Outsourcing Experience

Among those firms that outsource (Figure 4) the overwhelming majority is outsourcing less than 20 percent of their information systems activities and only a very small number of respondents (less than 10 percent) outsource their information systems operations totally or almost totally (80-100%). This indicates that most firms are outsourcing very selectively and only in specific areas.
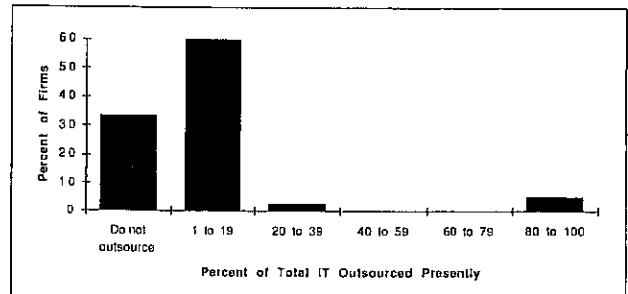

Figure 4: Amount of IT Activities Outsourced Presently

Figure 5 presents the data on the functions or activities being outsourced. It shows applications development as the most widely outsourced function, followed by user training, and data center management.
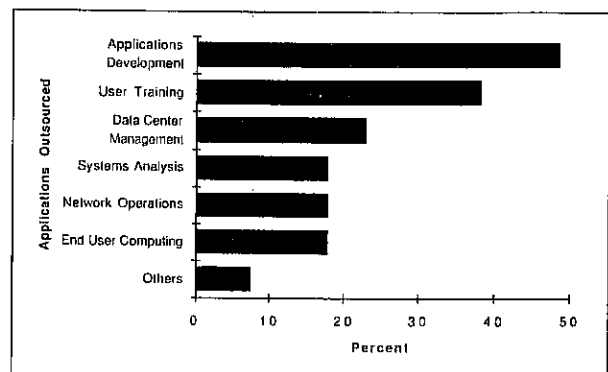

Figure 5: IT Activities Outsourced

When asked about the reasons for outsourcing, the responses were distributed among the Four-S categories in the following percentages: scale 33, sale 17, specialty 11, and surrender 6. The remaining 33 percent of responses did not fit well into any of the Four-S categories. These were statements such as - "need flexibility in controlling resources," "to focus on strategic planning," "require additional resources," "provide better information systems control," "to leverage with system suppliers," and "allows increased cost variability." These responses seem to suggest that many firms use outsourcing **selectively**. This strategy provides more flexibility in managing information systems resources and allows management to transfer some fixed costs components to variable costs. While most responses in this category can be considered functional, some responses imply management's inability to control the information systems operations in general, and are interpreted to be dysfunctional motivations reflecting management's surrender.

Among those respondents who are outsourcing to reduce costs, 17 percent indicated that they are currently outsourcing or are contemplating doing so with foreign or overseas vendors because of attractive labor cost differentials and the availability of skilled information systems professionals.

When asked to indicate the most important reasons against outsourcing, 54 percent of respondents listed "loss of IT control," 41 percent identified "high contract cost," and 13 percent claimed "contracting difficulties" as the primary deterrents to outsourcing. Less important factors were "vendor lock-in," "loss of critical skills," and "inability to reverse the decision."

Future plans regarding outsourcing reveal that more than 54 percent of firms which do not outsource now will do so in three years, and among those who do outsource now, the level of outsourcing will increase (Figure 6). While there is no indication of moving toward outsourcing all information systems capabilities, selective outsourcing is expected to increase from an average 11 percent level to 17 percent level in three years. The level of firms not considering outsourcing in the next 3 years shows a drop from 34 percent to 15 percent.
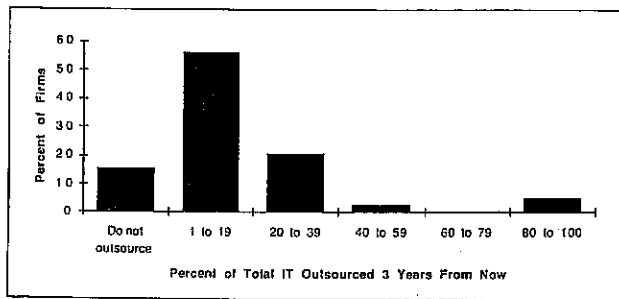

Figure 6: Future Outsourcing Plans

DISCUSSION

The findings from our study indicate that the primary motivation for U.S. fi to outsource information systems functions is predominantly financial reduce operating costs and even restructure their cost base. The study uncove another important motivation for outsourcing. That is to achieve flexibility i managing IT resources which we call "selectivity." The findings suggest that information systems managers want to have more flexibility in leveraging their IT resources, to be able to complement their own information systems resources selectively on an as-needed basis. By outsourcing only selectively on a temporary basis, management can more easily cope with the increased volatility in business volume and the increasing operating costs, which are major problems for information systems managers in the current business environment. Selective outsourcing in effect allows information systems managers to convert from "headcount-based" fixed costs to a variable cost structure and achieve cost flexibility.

Thus, the findings suggest adding another dimension to Zucchini's (1992) Four-S outsourcing model, which we call management, covering those motivations which are primarily concerned with issues related to information systems management. Although most management decisions are made with good intentions, they can lead to either functional or dysfunctional outcomes for the organizations. Functional outcomes occur when managers are using outsourcing selectively to streamline their activities to control or contain variable costs. Dysfunctional outcomes are the result of management's inability to manage the complexities of information systems functions, leading to loss of control over its IT resources in the long term (surrender). The new model, called the Five-S model is shown in Figure 7. It is similar to Figure 1 except that we have added a new functional category, called the "selectivity" under the management dimension. Selectivity provides management the flexibility to organize and control their IT resources so as to suit their short term as well as long term objectives, if planned judiciously.

Figure 7: The Five-S Outsourcing Model

IMPLICATIONS FOR SERVICE PROVIDERS

The findings have several important implications to potential global service providers. First, the trend toward increased use of outsourcing, especially among the firms operating globally, demonstrates the enormous business potential which exists for outsourcing service providers.

The fact that many firms prefer to use outsourcing selectively indicates that not all firms are planning to outsource their information systems operations totally to major outsourcing vendors, and that there are ample opportunities for smaller firms who can create a market niche for specialized services.

The primary emphasis on the reduction of operating costs suggests that vendors based in countries with labor rates lower than the U.S. rates can become formidable competitors because of their labor and other operating cost differentials. For example, software developers in India, Philippines and Singapore could take advantage of this opportunity. Indeed, some large U.S corporations (for example, Citicorp, Hewlett Packard, Texas Instrument, etc.) have already tapped into this pool of highly skilled software engineers in India. According to a World Bank report, average monthly wages for programmers in ~ US$225, compared with US$600 in Singapore and US$2500 in the

tage of outsourced applications development suggests that there tunities in this area than in other IS functions. Application also more suitable to outsourcing at remote sites than activities nter management or systems analysis where frequent customer tial.

necessary capabilities for the potential vendors to be successful? n to competitive labor rates, potential vendors must have competent staff, including key people able to communicate with English-speaking customers, a proven track record with similar projects in the past, financial stability, and access to modern, reliable telecommunications facilities at competitive rates. Singapore, with a small but well trained, disciplined group of IT professionals and its sophisticated and reliable telecommunication infrastructure, should be in a good position to provide software development and engineering designs to organizations that require fast turn around time using telecommunication facilities. Unfortunately, India has yet to develop its sophisticated stable telecommunication networks.

The concerns about the loss of control and contracting difficulties, listed by our respondents as factors against outsourcing, suggest that vendors need to develop strong project management capabilities. They also need to consider contractual arrangements which would alleviate their customer's concerns about potential vendor lock-in. Contracts must include clauses for handling changes to varying market conditions or new technological developments (e.g. agreements for handling change proposals, incremental contracting).

Other factors which are important in the selection of global vendors are the economic and political environment of the vendor's home country. The most frequently cited factors are the stability of the political and social environment, the infrastructure and support for global business, the size and the pool of skilled information professionals (many of which need to be English-speaking), and the country's attitude toward intellectual property rights and global business.

Time zone difference is another factor. Often seen as a disadvantage for establishing and maintaining direct communications between the firm and the vendor, it can also be used as an advantage. Large time zone differences can be used to develop around-the-clock working arrangements as well as cost effective use of computer resources during the customer's off-peak hours.

The above findings provide reasons for Asian Pacific rim countries like Singapore, Malaysia, Philippines, Hong Kong and Taiwan to create and develop certain expertise to provide IT outsourcing services to U.S and multinational firms. As the study indicates, software application development and user training are two highly outsourced functions. For those countries that do have

competitive costs structure as well as a disciplined and educated labor force, there is the potential to serve large U.S. firms in software development. In terms of work efficiencies and turnaround time, the Asian Pacific rim countries do have a favorable time zone with U.S. because most Asian countries are about 12 hours ahead of their U.S customers. Thus, work that is done during the day in Asia could be turned over to the U.S to workers when they arrive in the office thus providing an around the clock working arrangement. There is little language problem as English is widely used as an official language in business in most Asian Pacific rim countries.

SUMMARY

Outsourcing is seen by senior managers worldwide as a viable option for managing information systems resources efficiently and effectively in the 1990s. Our data show that the majority of firms in the U.S. outsource some or a significant portion of their information systems functions and are planning to increase the amount of outsourced activities in the next three years. Their primary motivations for outsourcing are to reduce operating costs and to achieve more flexibility in managing their information systems resources. For these firms, outsourcing is not limited to local U.S. vendors - many firms are currently outsourcing, or plan to outsource, globally. Our data provide evidence that there are many opportunities for global vendors to provide information technology services to these companies. We have identified several areas where the opportunities are the greatest and outlined specific factors which can be helpful in developing effective marketing strategies for these firms.

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