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Buying Core Competencies? A Study of the Impact of Outsourcing on IT Infrastructure Flexibility

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Introduction

In business, information technology (IT) outsourcing is the practice of purchasing information systems equipment or services from a vendor external to the firm. In businesses where information technology is key to business processes or products, issues concerning outsourcing are quite controversial. Does outsourcing allow firms to reduce high overhead costs and thus improve overall performance? Or does purchasing information systems services from the market weaken the business's position to use the technology either to innovate strategic uses or to keep up with competitors' innovations? A great deal of print has been dedicated to this debate in practitioners' professional and trade journals (see, for example, Halper's 1993 works) as well as in high-profile case studies (Huber 1993, and Loh and Venkatraman 1992b). Yet little deliberate research has been conducted to date (a notable exception is Loh and Venkatraman, 1992a).

In a 1994-95 study on IT infrastructure flexibility in the insurance industry, data on outsourcing behavior was collected from 82 firms to determine whether it affected infrastructure flexibility. Preliminary analysis of the data has resulted in evidence that in the insurance industry, outsourcing is negatively correlated with certain characteristics of infrastructure flexibility. This paper summarizes the theoretic grounds for both attitudes about outsourcing, briefly describes the study conducted, and explains the nature of the early findings.

The Debate

A discussion of the merits and hazards of outsourcing IT resources is inevitably clouded by the issue of *which* resources are to be considered. Usage of the term "outsourcing" is not specific; generally, it may refer to any act of purchasing information systems (IS) services from an outside provider. Yet certainly there are few companies today who do not purchase any IS services. Rather, firms struggle to identify those resources and services which are better purchased than developed internally.

Loh and Venkatraman (1992) define outsourcing as:

the significant contribution by external vendors in the physical and/or human resources associated with the entire or specific components of the IT infrastructure in the user organization (p. 9).

For academic purposes, it is reasonable to focus outsourcing research on the firm's dependence on vendors for fundamental IS resource components such as parts of--or all of--the IT infrastructure.

IT infrastructure is the complex set of IT resources which provide a technological foundation for a firm's present and future business applications (Duncan 1995). It usually includes platform hardware and software, network and telecommunications technology, core organizational data, and data processing applications which are fundamental to the business (Earl 1989, Niederman et al. 1991). This technological foundation is frequently complex both in technological characteristics and in its history of evolution.

Characteristics of the infrastructure determine the feasibility of changes and innovations in business applications.

The potential value of IT infrastructure has been discussed in the literature in qualitative terms such as "flexibility" and "responsiveness." How a firm should invest in infrastructure development and maintenance is consequently quite difficult to plan. The decision to outsource infrastructure may depend on a firm's assumptions about 1) the efficiency of the market for relevant IS resources, and 2) its own IS development capabilities.

Assumptions of Market Efficiency

The theory of transaction cost economics, along with resource-based theory, provides an argument that ownership of infrastructure is increasingly important for firms with strategies that require support for innovation or rapid responsiveness to change. The determination of whether to make or buy resources, according to Williamson (1983, 1985), depends on the efficiency of the market for the needed resource. Four factors are useful in determining that efficiency: 1) number of suppliers, 2) uncertainty/complexity of requirements, 3) market information impactedness, and 4) length of exchange periods.

Small numbers. When a large number of suppliers are available to a buyer, market efficiency will be great. It is when a buyer has access to only one or very few suppliers that the supplier may make opportunistic moves which make the market inefficient. When switching costs are high at contract renewal times, the market likewise becomes inefficient for buyers. Firms which consider outsourcing their IT infrastructure initially do have a large selection of providers to choose from. In the case of IT users, an initial contract may be made in an efficient market while renewals may not be, because the cost of changing suppliers would be quite high.

Uncertainty/complexity. Complexity of requirements can reduce the efficiency of the market for many IT users. In cases where requirements are not fully known, especially for the term of the contract, the development of an advantageous contract will be difficult for the buyer. Firms in industries where IT requirements change rapidly are thus likely to have difficulty developing adequate contracts.

Information impactedness occurs where there is a lack of true (and contractually important) information about the world. Where the fact of change is certain but the nature of change is uncertain, fair contracting for IT resources may be compromised.

Long exchange (contract) periods also decrease the efficiency of the market. Where a buyer is placed in a long term relationship with the supplier, the buyer becomes subject to "hold up" -- the supplier can demand higher returns than the buyer agreed to. In the case of IT users, the supplier in a market contract requires a long-term contract because it must make substantial investments at the beginning of the relationship. However, the uncertainty of future requirements is a potential source of recovery of the initial outlay, and more.

The standard period for an outsourcing contract with a service agency is ten years. As unanticipated needs arise over time, the supplier is in a position to charge higher than an efficient market price to the buyer because switching costs are extremely high.

Thus, where long-term requirements for IT are unknown, and especially where those unknown requirements may significantly impact future performance, transaction costs suggest IT infrastructure is best owned and managed internally. Organizations of this description which outsource their infrastructure place at risk their ability to change and to innovate; consequently, they may be expected to compete on product and service less effectively than those who keep infrastructure in house.

Assumptions of IS Capabilities

The second issue in the outsourcing decision depends on the decision maker's assumption about IS skills. The issue is explained in terms of the concept of core competencies (Prahalad and Hamel 1990, Stalk et al. 1992). Numerous high-profile outsourcing cases explained their decision in terms of competencies (e.g. Continental Bank and Eastman-Kodak). Proponents of this view argue that their firms are not in the information business, and thus managing information technology in-house requires a diversification of skills that may distract from the firm's central goals.

In this view, the firm is better off turning to a vendor whose purpose is IT service, and thus whose core competencies will be in information technology development and management. Because vendors work with a variety of customers, they develop greater expertise with a wider variety of technology. They also become more familiar with recurring problems and their solutions. Hence these service providers can offer a level of efficiency sufficiently greater than an in-house provider. This efficiency, we may reason, will make the market costs of the service comparable to or better than could be achieved internally.

The Study

In a study on infrastructure flexibility and resource management issues that might affect it, data on infrastructure characteristics and outsourcing behavior were gathered in the

insurance industry. With the help of LOMA, a professional organization of life / health insurance companies with a special division for MIS groups in the industry, a survey was sent to 411 firms. Eighty-two responses were received, for a response rate of 20%.

From this data, key factors of infrastructure flexibility, including the presence of architectural plans, platform standards, network connectivity, data compatibility and modularity were identified. Outsourcing data was gathered on several data processing systems common to life insurance firms, including policy issuance, policy administration, and claims management systems. Respondents were asked who developed the system (e.g., internal IS professionals, software vendor, service agency, etc.), who maintained the system, who owns the platform, and how old the system is.

Responses indicated that there are three common courses of action in securing the named systems. Of the respondents to the survey, 37% developed and maintained their Policy Administration systems internally and 12% relied upon IT service agencies. The rest purchased their systems from vendors (there are a few standard life systems packages which have been available with updates since the 1970s), and have relied on updates and their own internal abilities to customize and maintain the software to varying degrees. (These degrees were not captured).

The transaction cost view of outsourcing information technology would indicate that the longer a firm has been dependent on the market for its resources, the less flexibility its IT resources are likely to demonstrate. By measuring outsourcing as the number of years a firm has used its outsourced system (an internally developed system would be zero), we analyzed the impact of outsourcing on the measured infrastructure flexibility factors. This analysis indicated that outsourcing is negatively related to data modularity at the .01 level, to data compatibility at the .05 level, and to small systems connectivity at the .10 level.

Further analyses of other characteristics are possible, but this initial analysis offers some support to the argument that firms for whom information is a critical resource may be better off by keeping their major IT resources in-house.

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