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정보 시스템의 아웃소싱의 유형별 구분에 따른 관리 기법

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An Analytical Framework of Information Systems Outsourcing

Information systems outsourcing takes diverse forms for various reasons. In order to analyze the diverse types of outsourcing relationships between outsourcing vendors and clients, two dimensions of outsourcing decisions proposed by Nam et. al. (1996), "the extent of substitution by vendors" and "the strategic impact of outsourced IS applications", are utilized as a framework. Four cells depicting types of outsourcing relationships are described based on the two dimensions. This paper studies the outsourcing experiences of four representative firms selected from 15 case study firms located in the U.S. within the framework of the proposed four types of outsourcing relationships. The movement of four firms in terms of its outsourcing decision within and across the cells is examined in order to derive the managerial guidelines over time.

1. INTRODUCTION

Outsourcing has emerged as a key method of managing Information Systems in the 1990s. Outsourcing has existed for many years in one form or another, even though the IS industry had not recognized

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the term "outsourcing" explicitly until 1989 when Eastman Kodak and IBM initiated their landmark outsourcing contract (Loh and Venkatraman, 1992: Teresko, 1990: Rothfeder,1989). In banking, outsourcing has been used since the late 1950s, when data processing technologies first began to influence the financial services industry. Electronic Data Systems (EDS) and Systematics, for example, have provided facilities management services for decades (DiGiammarino and Zucchini, 1992). However, today's outsourcing contracts frequently cited as examples in trade literature are different from the traditional IS vendors' involvement in terms of the relationships as well as the services.

A key difference is that there have been internal changes among organizations with respect to the role of IS. In the early 1980s, companies invested large amounts of money in purchasing new hardware and application systems, often without well-organized plans, however (Cash et. al., 1992). The belief that drove the investment was that information technology (IT) per se was the key to obtaining strategic advantage over competitors. As a result, managers thought that they should have superior IT and be able to control IT within the organization. The role of outside vendors was rather limited. Nowadays, the technology-oriented view of IT has changed to the business-value oriented view of IT. Managers realize that strategic advantages are derived from how they use IT, not from whether they own IT or not. As a result, most managers are more interested in the outcome of IT and its impact on efficiency and effectiveness rather than in the technical superiority of their organizational IT structure (Keyes, 1992). Therefore, some IS managers believe that IT can be managed by third parties as long as firms can achieve the desired objectives. The pros and cons of outsourcing have been discussed and reported in trade literature (Apte and Mason, 1992: Gantz, 1990: Kelly, 1990: Kirkpatrick, 1991). A group of researchers have also studied outsourcing based on case studies (Fitzgerald and Willcocks, 1994: Lacity and Hirschheim, 1994, 1993a, 1993b: McFarlan and Nolan, 1995: Nam et. al., 1994b) and surveys (Ang, 1993: Arnett and Mary, 1994: Cheon, 1992; Grover et. al., 1994: Nam et. al., 1996). Most IS researchers have focused on whether firms should insource or outsource. Transaction cost economics theory (Williamson, 1987, 1979, 1975) and the economic literature on bidding (Chaudhury et. al., 1995, 1992:

Nam et. al., 1995) has been used as a basis for studying the outsourcing phenomenon. Findings are diverse, and suggestions have often varied. For instance, based on a study of thirteen companies, Lacity and Hirschheim (1993b) suggest that outsourcing vendors cannot be real strategic partners because the profit motive is not shared. In contrast, McFarlan and Nolan (1995), advise that IS managers should manage the relationship with the vendor less as a contract and more as a strategic alliance.

In this paper, two dimensions of outsourcing decisions (Nam et. al. 1996) are utilized as a framework in order to group diverse types of outsourcing into four types of vendor–client relationships. Nam et. al. proposed two dimensions, the extent of substitution by vendors and the strategic impact of outsourced IS applications, in their study and based on the two dimensions they named the resulting four types of outsourcing relationships as support, alignment, reliance, and alliance (See Fig. 1). In their prior study, they investigated whether the resulting four types affect the persistence or continuation of outsourcing relationships between outsourcing vendors and client firms. However, even though the proposed framework could be used to study both static and dynamic aspects of outsourcing relationships (Dess et. al., 1993), the dynamic aspects of relationships between outsourcing vendors and clients have been neglected. Hence, this paper applies the framework to the dynamic movement among four cells in order to derive an organization's outsourcing strategy over time.

For this study, interviews with IS professionals from 15 firms were conducted in the U.S. Firms were from diverse sizes which were involved in outsourcing in different ways over the last three years. In this paper, outsourcing experiences of four representative firms are summarized. Experiences of these four firms show how IS managers approach and implement outsourcing in different ways even though they have the same motivations such as cost reduction or acquisition of technical expertise. Also these four cases demonstrate how different each firm's decision criteria can be when IS managers consider whether to outsource or not. In addition, even though the analysis were conducted based on the firms from the U.S., the analytical framework can be applied to Korean firms that have relationships with outsourcing vendors.

This paper is organized as follows. For

the completeness of this paper, the next section explains two dimensions of outsourcing decisions from Nam et. al. (1996). Four types of outsourcing relationships are also summarized based on the two dimensions. Subsequently, four firms' outsourcing experiences are summarized. The fourth section discusses the four cases in terms of the four types of outsourcing relationships. The final section concludes the paper.

2. TWO DIMENSIONS AND FOUR TYPES OF OUTSOURCING DECISIONS

The term "outsourcing" is difficult to define universally in spite of the attempts by some researchers and practitioners (Weinstein and Murray, 1992). For example, Chaudhury et. al. (1992) defined outsourcing as "the contracting of various information systems functions such as managing of data centers, operations, hardware support, software maintenance, network, and even application development to outside vendors." Another definition is that outsourcing is "a contractual relationship between an external vendor and a user, in which the vendor assumes responsibility for one or more IT functions" (Terdiman, 1993). Involvement of outside vendors for any IS function is a key factor in the outsourcing activity. Burns (1992) states "outsourcing is the process in which (a bank) uses an external provider to handle certain system functions, especially core data processing applications such as consulting, systems development, systems integration, and systems management." This definition includes all types of IS functions under the outsourcing umbrella.

This problem of defining outsourcing is directly associated with the boundary of outsourcing. The current practice of outsourcing shows that companies have used outside vendors in many different ways, (Eckerson, 1990: Gantz, 1990: Kelly, 1992) so much so that some IS managers believe that any type of involvement of third party vendors can be considered to be outsourcing. Requirements for outsourcing are not uniform, and managers have different evaluations and different approaches to the process (Venkatesan, 1992: Schatz, 1993: Welch and Nayak, 1992: Walker, 1988). For example, some outsourcing contracts include the transfer of IS assets while others do not.

In order to study diverse types of

outsourcing a fundamental framework is required. The two dimensions discussed here represent important decision factors that IS managers consider in outsourcing contracts. The two dimensions satisfy the criteria of differentiability and comprehensiveness: differentiability, in terms of the ability to differentiate different types of outsourcing that include, for example, traditional IS vendors' services and the Kodak–IBM type of IS vendors' services; and comprehensiveness, in terms of being able to capture the diverse types of IS vendors' services. Based on the above two criteria, two dimensions are proposed: the extent of substitution by vendors, and the strategic impact of outsourced IS applications. The next two sub–sections explain the two dimensions in detail.

2.1 Extent of Substitution by Outside Vendors

In 1989, in a dramatic move, Kodak outsourced its data center operations, telecommunications services and personal computer support to IBM, Digital Equipment Corporation, and BusinessLand respectively (Cash et. al., 1992). The major difference between the Kodak outsourcing example and the traditional IS vendor service is that in the former case, most internal IS functions were replaced by outside IS vendors. This trend is also seen in the banking business and is well described by Forbes (1992) as follows.

> While the magnitude of this [processing oriented] type of outsourcing would traditionally seem targeted at banks at the smaller end of the spectrum, many of the country's largest banks are currently reviewing such proposals... outsourcers [outsourcing vendors] have geared up to provide a core menu of services beginning with inbound transportation of work from a bank's branches and the clearing house. The outsourcers will then capture all inclearings, including the report of reject items and balancing··· In addition to item processing, the outsourcer can also provide full deposit accounts services: return item, exception processing, statement rendering, check filing and bank accounting settlement···

As the above statement implies, a major feature of the current outsourcing phenomena in the banking industry is that more internal IS functions are transferred to outside vendors who have developed a "core menu" of services. The decision on

the part of client firms, therefore, seems to be not just whether to outsource or not but which services they should choose from a vendor's menu of offerings. Based on this important difference between the traditional IS vendors' service and current outsourcing trends, the first dimension, extent of substitution by outside vendor is proposed. This dimension is defined as the degree of substitution of in- house operations by outside vendors. Hence, this dimension focuses on the IS vendor. This dimension is illustrated for some IS functions below.

A. Application Development and Maintenance

a. In-house development
b. Modify commercial software in-house
c. Hold analysis and design in-house, and ask only for coding or modification by independent outside vendor with maintenance in-house or by vendor
d. Let the third party do everything from analysis to maintenance

B. Data Center Management

a. In-house department controls data center and IS personnel
b. Only vendor's data center is leased, but use in-house personnel
c. Outside vendor controls data center and IS personnel

For each IS function, the ways in which external IS vendors are involved are different. For example, for applications development, outside vendors can be contracted to work on the programming aspect only. Alternately, they can be fully involved in the entire spectrum of activities — systems analysis, development of specifications, programming, installation, and maintenance. For data center operations, firms may own and control everything ranging from hardware to IS staff, or they may outsource either the hardware or the IS personnel or both. Also, even though outside vendors may take full responsibility for data center operations, in-house IS departments can hold the responsibility for applications development.

As can be easily seen from the above illustrations, the extent of involvement by vendors may be different for each IS function. Further, for some IS functions, the extent of substitution may be at the firm or business unit level while for others it may be at a much lower level. For example, in the case of applications development, the degree of substitution may be high for some applications systems while

for some others it may be low. In the case of data center operations, outsourcing decisions may have to be taken at the firm or business unit (geographic or product/market) level.

There are at least three important sub-dimensions of the extent of substitution dimension: the extent of physical presence of outside vendors, the extent of ownership of property, and the extent of control by outside vendors. The physical presence of outside vendors may be limited by the nature of the outsourcing firm's business. For example, in defense- related industries, outside vendors may have to undergo security clearance in order to be physically present on the client's premises. The other two subdimensions are determined by the characteristics of the vendors and the outsourced IS activity. For example, large vendors are likely to demand and get a larger degree of ownership of property than small vendors. Outsourced IS activities that require higher levels of asset specificity may have different levels of ownership and control than IS activities that need lower levels of asset specificity.

2.2 Strategic Impact of Outsourced IS Applications

One commonly found outsourcing decision criterion is "limit outsourcing only to non-core IS functions". This general guideline is frequently reported in trade literature (Horwitt, 1992: Johnston-Turner and Juneau, 1992: Johnston-Turner, 1992: Kelly, 1990: Kirkpatrick, 1991). Core activities are those activities which help in moving the organization toward its stated goals, and support problem solving activities, while non-core activities are routine activities (Simon Business Review, 1991). Examples of non-core IS functions are scheduled maintenance for hardware, or coding of application programs. Such a criterion has been applied in Kodak's outsourcing relationships in which only non-core IS activities are outsourced by KODAK. Katherine Hudson, vice president and director of corporate information systems at Eastman Kodak Company, stated as follows (Simon Business Review, 1991),

> "Functions such as keypunching and computer maintenance were obviously not strategic core services,... But critical elements such as strategic planning, database service and systems integration had to be retained,··· Outsourcing allowed us to shift management attention away from low-priority concerns

and gave us the opportunity to add more value to the company by working on solutions instead of boxes."

Kodak still controls core IS functions such as planning and design of systems while it transferred non-core activities such as the data center operations to the vendors.

However, one important point should be discussed with respect to the "core/non-core" criterion. According to Lacity and Hirschheim (1993b), even though firms are reported to restrict outsourcing to the utility types of IS functions that correspond to non-core IS activities, the IS functions that are outsourced may actually have more impact on how the business is conducted. For instance, the data center is usually known as a non-core IS operation. However, in some industries (e.g., airlines) data center operations are in fact too strategic to be turned over to another entity (Phalen, 1992). Therefore, the concept of "core/non-core" activities needs to be reinterpreted, since the determination is company or industry dependent.

Another concept that is used for outsourcing decisions is the "mission critical/non-mission critical" nature of an IS function. However, the same problem is found with this notion as with the core/non-core concept. "Mission critical" implies that the failure of the system is likely to have a large impact on the activities of the organization (e.g., lost sales). But it is not clear that a mission-critical function will affect the strategy and the long-term competitiveness of the firm. The term "mission critical" does not necessarily describe the significance of an IS function. For instance, disaster recovery is a mission critical IS function because any failure to recover data or IS operations can significantly impair normal business in most cases. However, it may not be a core or strategic IS function in the sense that it may help neither in problem-solving nor in obtaining a long-term competitiveness unless, of course, it happens often.

Based on the recent trends of outsourcing, this paper uses an alternative decision rule to the "core/non-core" or "mission critical/non-mission critical" rule. One of the major trends of outsourcing is an expansion to strategic IS activities as well. While firms earlier looked for "operations vendors" in traditional IS vendors' service, they are now looking for "strategic vendors" (Phalen, 1992). Terdiman (1993) discusses the current trend as follows:

> Today, there isn't much differentiation among vendors with respect to pricing data center operations deals. However, users are increasingly looking at ways to add value to the organization, frequently by re-engineering their business processes and /or implementing new systems. Vendors are happy to oblige. Many of them, particularly some of the large professional services companies like CSC and EDS, are branching into new areas, such as strategic consulting or business process re-engineering··· The latter dovetails with another current business trend – the move to a virtual organization.

Therefore, some companies seem to outsource their IS functions in order to have competitive advantages while in past years vendors' involvement was restricted to IS activities where the strategic impact was rather limited. According to the Yankee Group, many companies will initially outsource only commodity functions. However, more companies will turn to vendors to handle strategic applications (Eckerson, 1990). As users gradually gain confidence that vendors can manage strategic applications effectively, strategic functions are expected to be outsourced. For example, Chevron outsourced its point-of-sale (POS) network to Hughes Network Systems to obtain a competitive advantage. According to the manager of network design, Chevron outsourced the POS network precisely because it was an extremely critical component of the company's retail operations (Eckerson, 1990). Another example of outsourcing of strategic applications is the relationship between Covia and United Airlines (Gants,1990). In the early phases, this relationship had the vendor providing commodity services such as network management or call processing. The later phases entailed services that call for a close partnership in which the vendor and the user worked together to develop strategic relationships. One such example was their initiative to offer on-line data and information linkages to all their member clients (Neumann, 1994).

The above examples show that outsourcing is not a simple substitution of in-house operations. The concept of strategic impact is a key decision factor that managers need to consider in conjunction with the first dimension, the extent of substitution by outside vendors. The strategic impact dimension is defined in terms of the strategic impact of IS applications that cli-

ent firms outsource.

Examples of high strategic impact are found when firms outsource for the purpose of new product development or service development, or penetration into a new market (Campbell, 1992). Also, when vendors contribute to develop important applications or are involved in the analysis and design phases, the strategic impact is high even though they may not be involved in subsequent phases such as coding. If vendors are in charge of IS data center operations and are responsible only for routine transactions processing, the strategic impact of those IS applications is generally low.

2.3 Four Types of Outsourcing Relationships

Based on the two dimensions proposed in the previous section, it is possible to classify the diverse patterns of outsourcing relationships into four types. Figure 1 shows these four types in terms of two outsourcing dimensions (Nam et. al., 1996, 1994a, 1994b) together with some key questions for each dimension. These four types of relationships are: support, reliance, alignment, and alliance.

The support relationship has a low extent of substitution and a low strategic impact. This cell corresponds to the traditional IS vendor's service and the most primitive type of outsourcing relationship. Vendors are usually restricted to non-core IS activities and the size of contract is smaller than that in other cells because the role of IS vendors is limited. Examples are contract programming, maintenance for hardware, minor technical services, installation of hardware or software, etc. Length of outsourcing is usually short-term and it is relatively easy to find alternative vendors.

The reliance relationship has a high extent of substitution and a low strategic impact. This cell corresponds to the most popular form of outsourcing reported in the 1990s. The Kodak-IBM outsourcing exemplifies this relationship. IS functions outsourced are mostly non-core activities and cost reduction is one of the major motivations since outside vendors substitute for non-strategic in-house IS operations. The length of contract is longer than in the case of support relationship and outsourcing in this cell requires more commitment from vendors and clients.

The alignment relationship has a low extent of substitution and a high strategic impact. Examples of this cell are consulting for IS activities, where vendors are not significantly involved with client firms' IS

Figure 1. Four Types of Outsourcing Relationships

Extent of Substitution by Vendors

High

KEY QUESTIONS:

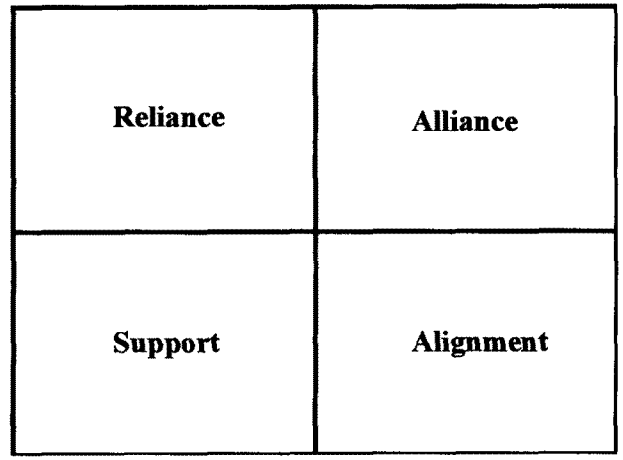
Does the vendor have the ownership of the information systems' hardware and software?

Does the vendor control the rule/procedures?

Does the vendor's personnel replaces inhouse IS personnel?

Low

Is the vendor responsible for the IS activity?



KEY QUESTIONS:

Is the IS vendor involved in IS activities that allow a firm to have competitive advatages?
Is the IS vendor involved in IS activities that change the way of business with suppliers, buyers, or competitors?
Is the IS vendor involved in IS activities that change barriers to entry?
Does the IS vendor add value to an existing systems?

operations, and yet the vendors' impact lasts longer than in the support cell. This type of outsourcing relationship has been popular with firms that lack IS expertise and is similar to the support relationship in popularity. The main difference is that vendors are involved with more strategic IS functions.

The alliance relationship has a high extent of substitution and a high strategic impact. Outside vendors not only take over in-house IS operations but also are responsible for highly strategic IS activities such as IS planning and design, and system integration on an ever present basis. This type of outsourcing relationship evolves based on mutual trust. The term of contract is longer than that of other types of relationships. Highest levels of commitment from vendors and clients are required.

2.4 Characteristics of the Four Types of Relationships

In this section the characteristics of the four types of relationships are discussed.

In the support relationship, the role of the outside vendor is limited. Insourcing is more prevalent than outsourcing. The alignment relationship enables firms to obtain vendors' technical expertise on a project basis. The reliance relationship requires more commitment to the relationship from client firms because significant portions of the in-house operation are transferred to the outside IS vendors. In alliance relationships, in contrast to other types of outsourcing relationships, vendors and clients are considered to be strategic partners with a common goal.

Different outsourcing relationships require different types of competencies and different measurement and monitoring mechanisms as described in Table 1. The support relationship, where the extent of substitution is low, involves low coordination costs and monitoring of the relationship is easy. In contrast, in the reliance or alliance relationships, coordination is much more complex and monitoring becomes more difficult. The choice of outsourcing relationship may depend on the level and type of competencies available within the client firm.

Alliance relationships grow and build upon previous small, but successful, exchanges between organizations. The evolution of alliance relationships is thus preceded by interactions; and current interactions form the basis for future interactions because of increased interorganizational coordination and communication. Thus the

development of an alliance relationship is an interactive, dynamic process.

When the extent of vendor involvement is low, as in the case of support and alignment relationships, clients make little investment in vendor–specific assets. Consider the case of contract programming (for a project) which is a support relationship. Here the length of the vendor– client relationship is usually short and specific to the project. The design, specifications, and implementation aspects of the project are controlled by the client. The relationship does not entail any transfer of skill to the client or training of the client's personnel. Therefore, the client's investments in vendor–specific assets are low. This, in turn, implies that no opportunistic behavior is possible for the vendor. Hence, there is little need for incentives and penalties to be specified in detail.

On the other hand, when the extent of substitution by vendors is high, vendor–specific investments by clients are also high. For example, clients may be more committed to vendors' equipment, technology, systems, and skills. This results in a locked–in relationship and what Williamson (1972) refers to as "small numbers opportunism." Further, as the vendor–client relationship moves from a support to alignment relationship or to reliance and finally to alliance, measuring vendors' contribution becomes progressively difficult because of the higher impact of vendors' activities on clients' strategy. Similarly, monitoring of vendors' activities to ensure that they are aligned with client firms' interests also is increasingly difficult. This calls for a detailed system of incentives and penalties. Further, in the case of the alliance type of relationship, trust becomes an important mechanism in assuring that vendors' interests coincide with clients' interests.

Building trust is essentially creating a "zipper" to bind the client and vendor organizations by having people at different levels in one organization interface with people at corresponding levels in the other organization. Through trust, the patterns of actions and interactions between vendors and clients become stabilized over time and a collective structure of behavior develops between them. This process reduces client's and vendor's uncertainty, increases the commitment of both to the relationship and also facilitates increased investment of resources in the relationship by the client and the vendor.

Table 1. Characteristics of Four Cells

Reliance	Alliance
Extent of substitution : high Strategic impact : low • IBM–Kodak type of outsourcing. • Cost reduction is the major motivation. • Contract periods are usually long term–based. **Movement** • Firm can move into the alliance cell when they choose their assessment of outsourced IS to strategic. • It is usually difficult to return to the support, or alignment cell due to tied–in relationships with the IS vendor. **Required Competency and Monitoring Mechanism** • Ability to routinize rules are procedures are required. • Ability to evaluate multiple bids are needed. • Effective Incentive plans are wanted. • Outcome based control is more effective than behavior based control. • Well–organized future plan is required upon the expiration of the contract.	Extent of substitution : high Strategic impact : high • Most comprehensive type of outsourcing. • Management of strategic partnership. **Movement** • Movement into other cells is the most difficult • Switch IS vendors carry the highest set–up and switching costs. **Required Competency and Monitoring Mechanism** • Mutual trust should be developed over time. • A profit sharing rule needs to be set up. • A common objective should be set up. • Informal communication channels are important. • Behavior based vendors' performance measurement.

Support	Alignment
Extent of substitution : low Strategic impact : low	Extent of substitution : low Strategic impact : high
· Traditional IS services. · Insourcing is the primary governance mode. · Outsourcing vendors are used on a selective basis. · Lowest switching and set-up costs.	· Consulting type IS services. · Mostly project-based IS services. · Technical expertise is the major motivation.
Movement · Firms can consider a movement into the reliance, alignment, or alliance cell. · A full-scale movement to the alliance cell is risky.	**Movement** · Firms choose this cell as a interim process into the alliance cell. · Firms preferring insourcing may choose this cell as a temporary movement to the support cell due to low risk.
Required Competency and Monitoring Mechanism · Ability to call for multiple bids are required to reduce costs. · Monitor the alternative vendors. · Outcome based vendors' performance measurement.	**Required Competency and Monitoring Mechanism** · Ability to integrate the existing systems with vendors recommendation is required. · Some number of technically competent in-house personnel are needed. · For the measurement of vendors' performance, behavior based control is considered more effective than outcome-based control.

2.5 MOVEMENT ACROSS AND WITHIN THE FOUR CELLS

Obviously, outsourcing decisions of firms are likely to change over time due to changes in the external environment and the internal requirements. Figure 2 represents such evolution of outsourcing relationships in terms of possible movements of firms across and within the four cells in the matrix.

Firms in the support cell may move into other cells. Alternatively, they may decide to remain within the support cell. The alignment relationship is the least risky movement from the support cell because it usually does not involve large investment. Instead, such a movement facilitates acquisition of vendors' expertise without a long-term commitment. From the alignment cell, client firms may decide to move to reliance or alliance cells progressively increasing their commitment. On the other hand, they may revert back to the support cell once they have acquired the expertise from the vendors. This is a significant feature of the alignment cell. Movements into the reliance and alliance cells require progressively more commitment to the relationship from client firms because of the increased level of involvement of the vendors in client firms' IS activities. Therefore, the irreversibility of the outsourcing decision increases in these movements. A movement from the support to reliance cell is similar to the IBM-Kodak type of outsourcing relationship. As the outsourcing relationship moves from the support type to the alliance type, there is (1) increased transfer of information; (2) increased level and content of services that are transacted; and (3) development of mutually shared expectations and evaluations of each other by vendor and client.

Outsourcing of traditional types of IS services corresponds to a movement within the support cell. It is named "Supportive Movement". Movements from the support cell to the reliance or alignment cell are named "Substitutional Movement" because either strategic or operational in-house IS activities are replaced by outsourcing vendors. Movements to the alliance cell from other points in the matrix follow a trend that is accentuated by the fact that vendors are consistently striving to expand their offerings in the outsourcing market. It is named as "Strategic Movement" because vendors become strategic partners of the client firms.

One of the current trends of outsourcing is the evolution from the "supportive move-

ment" to the "substitutional movement" and in the long run to the "strategic movement." It is observed (in this case studies, described in subsequent sections) that "strategic movement" is less prevalent than "substitutional movement" due to the nature of commitment required and the time it takes to develop mutual trust. The low frequency of "strategic movement" may also be due to the recency of the phenomenon, or the slow evolution of firms towards it.

The degree of locked-in relationships is the highest in the alliance cell. Since a successful locked-in relationship is built on mutual trust over a period of time, "strategic movement" needs to be based on prior "substitutional movement". Therefore, if client firms move into the alliance cell from the support cell directly without prior relationships, both parties will suffer due to lack of built-in rules and procedures. Moreover, the impact on the organization is so large that it is difficult to reverse the relationship. In this sense, a direct movement from support to alliance is more risky than a movement from reliance to alliance, low alliance to high alliance, or alignment to alliance.

3. FOUR CASE STUDIES

This section summarizes the outsourcing experiences of four firms. Their names are disguised for reasons of confidentiality.

Table 2 summarizes the profiles of the four companies. All four firms considered outsourcing for their data centers. Out of the four firms, one decided to outsource the data center operations and the remaining three opted for insourcing or selective outsourcing. The major reason for outsourcing is also described. Each case illustrates the diversity of motivations as well as the decision process.

Case 1: DDD Firm

DDD company is in the manufacturing sector with 3000 employees in the U.S. Total sales range from $600 to $700 million per year and the budget of the IS department ranges from $6 to $7 million with about 45 employees. The director of the IS department was interviewed first in 1992, and again in 1995. During that time, he was first in charge of the company-wide IS project and was later promoted to the position of vice president of IS.

a. Background of IS

Historically this company has not kept

Table 2. Profile of Four Case Firms

Name of Firm	Industry	Size of Firm	Interviewee	Functions Considered for Optsourcing	Major Reason	Decision	Type of Outsourcing
DDD	Manufacturing	$600–$700M.	Vice President of IS	Data Center	Technical Expertise	Outsourced IS Consultation	Alignment
FFF	Manufacturing	over $700 M.	CIO IS Director	Data Center	Merger	Outsourced Data Center	Reliance
MMM	Financial Service	$10 Billion (Total asset)	Vice Preisident of IS Vice President of Admin	Data Center	Technical Expertise	Insourced Data Center Outsourced some IS Applica	Support
EEE	Health Care	550 Beds	IS Manager	Data Center	Technical Expertise	Outsourced Data Center	Alliance

pace with IS changes and was characterized as a "laggard" in its industry. Its IS budget was below the industry standard. In 1993 corporate executives initiated a new plan to be more competitive in the industry and found that information technology was fundamental to achieve the new strategic plans. Hence it was decided to bring their information systems up to date and to set a goal to implement a totally new system which could be integrated into all aspects of the business. However, the centralized mainframe computing center of this company was outdated and not sufficient to achieve the new goal of becoming a technology leader in the industry.

When the IS director was first interviewed in 1992, the new corporate plan was not well conceptualized because the plan was in the beginning stage. The director was able to describe only the existence of the new corporate plan but without any details. At that time the IS director's view about outsourcing was narrowly focused. Most applications were developed and maintained by the in-house IS department. Only one IS vendor was involved in one application development and the director was satisfied with the results.

b. Consideration of Outsourcing

After the new corporate plan was conceptualized, high levels of technical difficulty were expected. Hence, the director considered the possibility of outsourcing the data center. With the information gathered during the investigation process, DDD

decided to keep the operations of data center in-house because vendors' proposals were substantially different from DDD's internal plans for outsourcing. DDD wanted to keep important IS personnel and functions while vendors requested to take over the whole IS operations. Instead of negotiating the differences, DDD decided against outsourcing data center operations, and the company went looking for vendors who could help the in-house staff to keep up with the new technologies as well as help the firm to choose the future direction.

DDD finally selected one vendor based on price, its experience in strategic planning and implementation, and its proximity to the firm as a local vendor. The final vendor was the one who had developed applications for DDD before the consideration of outsourcing. In addition, the primary vendor was allowed to select a secondary vendor for supplying applications.

Case 2: FFF Firm

FFF is a manufacturing firm that sells several hundred items through retail, discount and chain stores, and catalog showrooms. Their products are sold world-wide and there are over 5000 employees around the world. The control of distribution systems is considered one of the most important functions in this industry. Its annual sales are approximately $700 million. FFF merged with another company in 1993. Two interviews were conducted: before the merger and after the merger. Before the merger, the senior vice president (also the CIO) and one director of the IS department were interviewed. After the merger, the IS director was interviewed. FFF had outsourced its data center operations subsequent to the merger. Completely different ways of managing information systems are seen before and after the merger.

a. Before the Merger (Background of IS)

Before the merger, the IS department had almost 100 people involved in computer operations, support, applications, programming, maintenance and repair. The IS budget ranged around $ 15 million. The company's IS function was centralized and was used as a source for gaining a competitive advantage. The information system was considered very important in the company, and received good support from top management. In order to have more efficient distribution systems than competitors, FFF made a major IT investment and built more efficient centralized systems in

the mid of 1980s. Headquarters had the ultimate decision concerning the purchase of hardware or software at sales offices all over the country. FFF was considered to have good IT competency before the merger. The practice of outsourcing for this company had been limited only to the traditional functions. FFF considered outsourcing to be very convenient and beneficial but only with short-term benefits. Hence, FFF used outside vendors for temporary projects or independent IS functions. For instance, outside vendors were contracted for coding on a temporary basis. Disaster recovery was also outsourced because using outside vendors was considered convenient and cost-effective. The new function considered for outsourcing was PC maintenance. The centralized control of IS necessitated the shipment of all PCs to the headquarter maintenance center. Since this process was very inefficient, PC maintenance was considered for outsourcing.

In general, the primary agent for managing information systems was the in-house department. For instance, when FFF implemented EDI across its retailers, FFF bought packages from the outside vendors and modified them in-house. Even for the installation of LAN and WAN, telecommunications persons were sometimes sent from the headquarters. Also, in-house operations were considered to be more flexible and adaptable to retailers' requests.

b. After the Merger

In 1993, FFF merged with another company, parent company, in the same industry. (FFF still retained much of its identity, including its name, though significant changes occurred in its IS area). The parent company planned to integrate FFF's information systems into its information systems because it did not want to lose control over FFF. Distribution systems are so important in this industry that the parent company wanted to meet the requirements of its retailers as a single company after the merger. The parent company believed that integration of the two companies' information systems could serve retailers' demands effectively with better control, thereby maximizing the synergy effects.

Several events then took place. FFF's old mainframe was sold in order to follow the parent company's lead in using client-server systems. The expected technical difficulties for the conversion were high. It was then that the parent company decided to move aggressively to outsourcing. Cost

reduction was the major reason for outsourcing. About half of FFF's employees were transferred to the outsourcing vendor resulting in about 50% reduction of the original IS department.

Case 3. MMM Firm

MMM firm is a firm involved in diverse financial services such as leasing and brokerage. MMM has assets of about $ 10 billion with 4000 employees. The IS budget is $ 50 million with 40 IS employees. MMM's IT functions are centralized in the headquarters and MMM uses strict chargeback systems to allocate costs back to the user departments. Two interviews were conducted a year apart with a vice president of IS operations.

a. Background of IS

MMM focused on serving the needs of the local residents. It enjoyed the reputation of being a conservative, strong and stable institution. In the mid 1980s, MMM merged with several other firms. This expansion tripled its assets to over $ 9 billion within five years.

In the early 1990s, top management realized that they needed an efficient and effective information system in order to manage the expanded organization. However, MMM's information system was very outdated. Some transactions were still batch-processed. It also appeared that additional mergers were imminent. MMM wanted to integrate many different application systems into one to reduce costs and streamline processing. Hence, an overall system upgrade project was initiated and a new head of IS department was recruited for this project. An executive group including the new head of IS, CEO and vice presidents was formulated to set up a new strategic plan for IS. Finally it was decided to upgrade MMM's data center and most of the applications.

b. Consideration of Outsourcing

MMM's in-house IS department was not sufficiently technically competent to update the information systems. The new head of IS who had successfully implemented outsourcing before in another firm, initiated outsourcing, including full scale outsourcing, as an alternative. Cost reduction was not a primary driver for outsourcing. Initially, MMM selected four well-known outsourcing vendors in the market and hired a consulting firm for advice. After an initial analysis, only one vendor was asked to submit a proposal and the in-house department also submitted its proposal. The outside consultant conducted a review of the two proposals

and concluded that the outsourcing vendor was slightly more cost-effective than the in-house group. The vendor already had a good reputation in the industry and was considered to have an attractive and reliable proposal. However, the consulting firm indicated that any possible delays or additional costs would result in high stress on the employee morale and MMM's customers. Other issues also arose. First, the proposed length of contract term was too long to be accepted by the conservative executive group. They thought that tying themselves to a ten year contract could leave the firm with a loss of competitive IT advantage if the organization outgrew its contract in less than ten years. Second, the executive group was concerned with loss of control and felt that it was too dangerous to leave all the responsibility in the hands of the vendor. Third, even though outsourcing was cheaper than insourcing, the savings were not very significant. Besides, the executive group was not cost driven. Fourth, full outsourcing would involve a tremendous and colossal systems conversion all at once. All employees would need to be re-trained to use the vendor's systems.

Finally, the executive group decided to upgrade information systems using the in-house department. It was also decided that as the need arose for applications systems, outsourcing was to be considered on a case by case basis. MMM made an investment of about $ 40 million for three years in order to upgrade its information systems. This investment allowed IT to have a strategic impact on the firm's operations. Also the CEO became a firm believer in the strategic importance of high technology and of the IS department's role in the financial services industry.

Case 4: Firms EEE and BBB

Two firms are involved in this case. BBB is an IS vendor to the EEE firm. However, BBB is not a commercial vendor. An interview with BBB is summarized first in order to explain the relationship between the two firms.

BBB Firm

BBB is a medical institution with about 400 employees. It offers medical treatment to inpatients as well as outpatients and has a medical research center. An interview was conducted with the vice president of the IS department. There are about 40 employees in the IS department.

BBB made an investment amounting to $ 10 million, above the normal budget, in the early 1980s because BBB's informa-

tion systems were considered outdated. Subsequently, the updated IS department supported all the systems within the hospital from inventory to ordering systems. BBB was considered very qualified to handle the technical aspects of implementing IS operations on its own. So it started to offer its IS services to other similar organizations. BBB is not in the business of selling its IS services commercially in the market. It provides the IT services that were already in place at BBB and focuses on areas that it is very familiar with, namely, hospital information systems.

The major strength of BBB was that it had its own comprehensive IS applications. Also, BBB's prior experience with modifying commercial applications allowed it to deliver customized services at lower costs within a short period of time compared to other major commercial vendors. Additional cost advantages could be obtained when the application systems are sold to hospitals within the same state because all in-state hospitals are subject to the same rules and regulations.

BBB's bidding criteria as a vendor are different from other commercial IS vendors. BBB prefers a customer to be a partner who is willing to share the systems and combine forces for new system development in order to increase the overall system efficiency. Hence, BBB sells IS services as a way of defraying costs of future systems modifications and reducing its own operating costs, not for profit generation.

EEE Firm

EEE is a primary receiver of IS services from BBB. EEE is a marginally smaller medical institution. The IS department has about 35 employees. The interview was conducted with a manager of the IS department.

a. Background

In the early 1990s, EEE had IS systems that were not well coordinated within the organization. The head of the IS department realized a definite need for consolidated information services. EEE decided to outsource its data center operations to get outside expertise that could facilitate the integration of different systems. BBB was the finalist in the vendor selection process. BBB could provide EEE with a short development time since BBB had several years of experience in modifying other vendors' systems for hospital use. BBB had training resources that EEE lacked. If EEE chose an alternate vendor, training as well as delayed time for the modification of systems would be an extra cost to EEE.

There were also drawbacks. First, EEE's employees could resist BBB's systems, for example application screens or data entry, because they were different from the current systems. Second, BBB was one of the competitors in the same locality. Third, BBB had no experience with outsourcing contracts of this size.

Nevertheless, BBB was selected as an outsourcing vendor and EEE still had its own IS department. Seven IS personnel were transferred from BBB to EEE as training and support personnel. These personnel remained BBB employees, but their salaries were paid directly from the contract with EEE. Interestingly they considered themselves to be employees of EEE because they did all of their work at EEE. EEE considered its relationship with BBB to be more of a partnership than a vendor relationship. At the time of the interview, EEE intended to continue with the relationship. One important change that happened after outsourcing was that the head of IS department at EEE now reported to the CEO directly. Before outsourcing, he used to report to the finance manager. Clearly, as a result of the partnership, the importance of the IS function had also increased.

4. DISCUSSION

Case 1: DDD Firm

The main thrust of the transformation of the IS department was to bring the latest information technology to the firm. The director, now VP, of the IS department was the primary person in charge of the new project. He saw outsourcing as a tool to move the company forward quickly in its IS skills. According to the director, without the help of the outside vendor DDD would have had difficulties in developing IS as an effective strategic tool. DDD had earlier used outside vendors as a means to improve the firm's manufacturing competitive edge, and collaborated with them to develop excellence in technical and customer service aspects which had a high strategic impact. However DDD preferred the limited role of the IS vendor as a consultant to a full"fledged take"over of its IS functions by the vendor. Therefore, DDD's outsourcing has a low extent of substitution by vendors. In terms of the matrix, DDD's outsourcing corresponds to the alignment relationship. Prior to the development of DDD's new corporate plan, DDD outsourced IS applications of little strategic impact with a rel-

atively low level of substitution by vendors. This earlier relationship would amount to a support relationship. Hence, DDD's outsourcing decision represents a transition from the support cell to the alignment cell. This firm does not have a plan to move to the reliance or alliance cell in the future. Instead, once the required skills are acquired by in"house employees, the VP plans to scale back outsourcing. He still views outsourcing as a tool for transition to a more aggressive IS policy. DDD will return to the support cell in order to have full control of the IS operations.

DDD's action demonstrates how firms can use outsourcing vendors to overcome technical difficulties with minimum risks. Of course it was possible because of DDD's initial base in IS although it was considered a "laggard" in its industry in terms of its expenditure on IS. Any movement to a reliance or alliance relationship may warrant a reassessment of its skills in managing these relationships.

Case 2: FFF Firm

According to the director, most of the initial problems, both technical and behavioral (primarily due to the mixing of two totally different company cultures), were ironed out with constant feedback and communications. The director believed that this contributed to the good relationship between the parent company and the vendor. He felt that the parent company had achieved its intended objectives of cost reduction with increased efficiency. In the future, FFF is planning to outsource training of employees and PC maintenance.

FFF company's outsourcing story is interesting. Outsourcing was initiated by the parent company even though FFF had good IT competency before the merger. Before the merger, insourcing was the major way of managing information systems. Before outsourcing, FFF had a low strategic impact of outsourced IS applications and a low extent of substitution. After the merger, FFF outsourced its data center in order to reduce costs to the parent company. In terms of the dimension of the extent of substitution, most in"house data center operations including IS personnel were transferred to the IS vendor resulting in high extent of substitution by vendors. However, the outsourced IS applications, including management of data center, has a low strategic value to FFF even after the merger because the parent company now takes care of the important strategic IS functions. FFF's new outsourcing relationship belongs to the reliance cell.

FFF's outsourcing decision is a transition from the support cell to the reliance cell. The major motivation was the reduction of expected cost which would be incurred during the implementation of the new client and server systems. This case included the typical problems of outsourcing such as the problem of employee morale and the negotiation of the term of the contract.

Case 3. MMM Firm

This case is a good example that shows how a firm makes outsourcing or insourcing decisions and how an outdated in"house IS department can overcome the technological difficulties without using outside vendors. Control and employee morale were the major decision criteria for insourcing. If outsourcing had been estimated as significantly less costly than insourcing, outsourcing could have been considered more seriously. However, cost was not the primary factor.

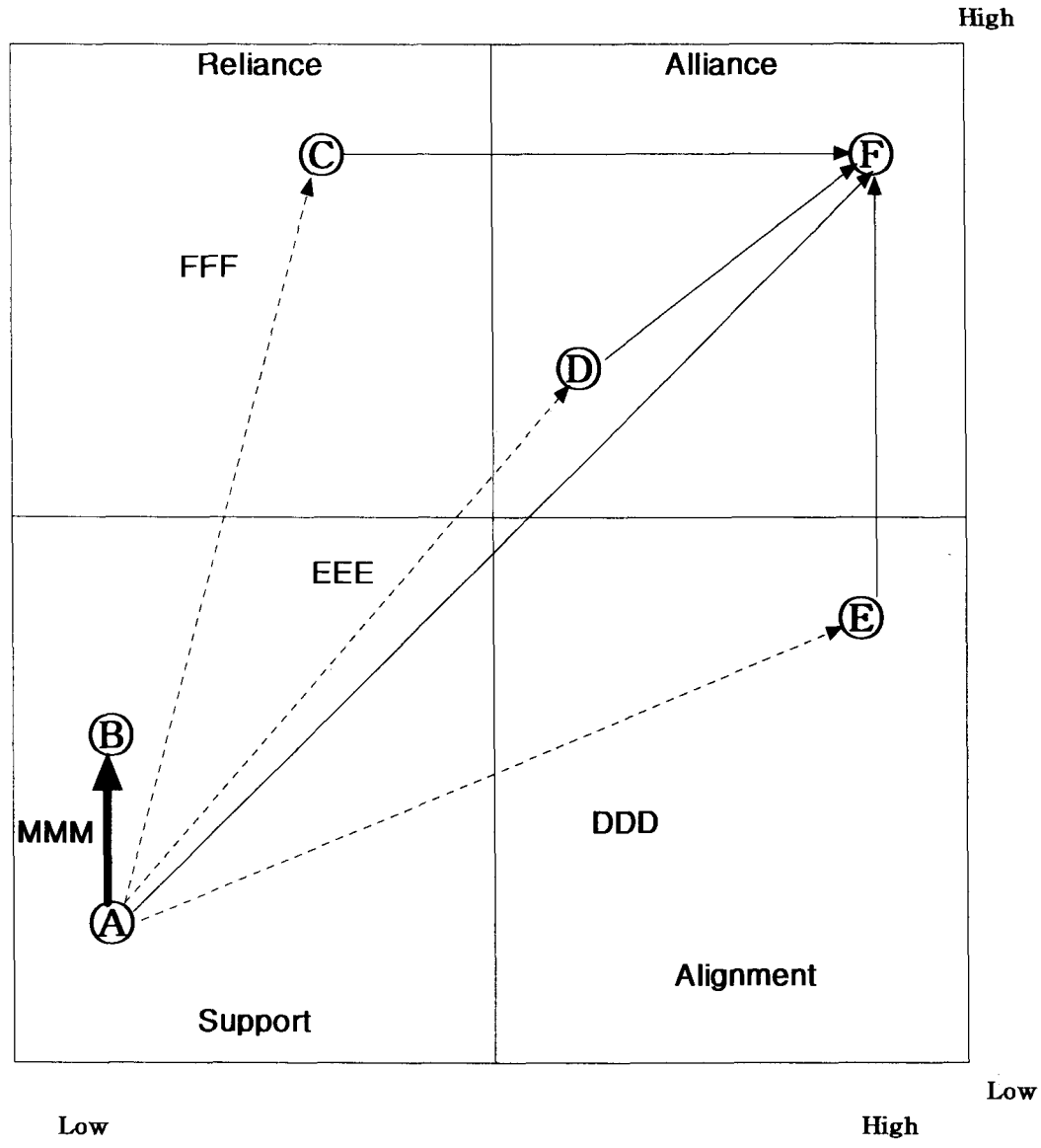
Before the consideration of outsourcing, MMM was in the support cell because its data center was operated in"house. Even though MMM considered outsourcing, it was going to keep the strategic functions in" house. Therefore, MMM planned to move from the support cell only to the reliance cell. However, MMM finally decided to outsource only applications development on a selective basis instead of full scale outsourcing of the data center. In terms of two outsourcing dimensions, the extent of substitution by vendor has increased a little due to selective outsourcing and the strategic impact of outsourced IS applications has remained low as before. Therefore, MMM's outsourcing decision was to remain in the support cell. MMM's decision shows that insourcing can be as effective as outsourcing even though MMM did not have the required level of IT expertise.

Case 4: Firms EEE and BBB

Before outsourcing both firms were competitors in certain niche areas. Subsequently the relationship evolved into a strategic one. Both hospitals obtained synergy because they were able to share mutual benefits. This also created a locked in relationship between EEE and BBB. It would not be easy to change vendors because of lack of expertise in the health care industry. Moreover with BBB as the vendor, EEE enjoyed the benefits of lower costs, improved efficiency, and increased productivity.

EEE is an aggressive user of outsourcing. EEE outsourced its data cen-

Figure 2. Movement of Four Firms' Outsourcing Decisions



ter as well as telecommunications. In terms of the two outsourcing dimensions, the extent of substitution by vendors increased because potential in"house operations were replaced by the outside vendor. The strategic impact of outsourced IS applications has also increased because the outside vendor helped EEE to enhance important IS functions and significantly contributed to the modernization of EEE's IS departments. Hence EEE's outsourcing decision is a movement from the support cell to the alliance cell.

MMM remained within the support cell (Movement from A to B). The firm decided to operate the data center in-house and use outside vendors only for non-strategic IS functions. Firm FFF's movement from A to C is similar to the IBM-Kodak type of outsourcing. Firm EEE's outsourcing became more strategic and so it moved to the alliance cell (movement from A to D). DDD's outsourcing decision corresponds to a movement from A to E.

4.2 Implications and Guidelines

Several implications and guidelines may be developed from the above discussion.

Firms should consider the costs and risks of moving from one quadrant to another in determining the direction of movement. Not all firms choose the least expensive choice. Firms should clarify the decision criteria for outsourcing. The decision to outsource is a firm-specific problem. Even though many firms consider outsourcing in order to reduce costs, technical expertise for new IT is a major reason for outsourcing in the 1990s. For example, in the case of firm DDD the final vendor was not the least expensive vendor. Similarly, insourcing was not the cheapest option to MMM. Another major reason for not choosing the least expensive mode is that, as already discussed, the types of competencies and measurement and monitoring mechanisms may differ across the four outsourcing relationships. The level and type of skills may dictate the choice of outsourcing relationship. Hence, firms should develop their own outsourcing strategies as dictated by their pool of managerial skills.

Firms can consider multiple movements from one cell to other cells in the matrix through selective outsourcing. For certain projects a firm can move from the support cell to the reliance cell and for others, the firm can move to the alliance cell. However, firms should use selective outsourcing with more caution. As shown

in Table 1 and Figure 2, even though all four firms considered outsourcing of their data centers, only FFF did full scale outsourcing of the data center, moving it into the reliance cell. The remaining three firms decided to use outside vendors on a selective basis. An advantage of selective outsourcing is that several IS vendors can be used simultaneously depending on the vendors' specialty. In this sense, EEE is a good example of selective outsourcing. While EEE developed good relationships with BBB for the data center, it outsourced its telecommunications to another vendor and plans to outsource other IS related activities to other vendors.

An advantage of multiple–vendor selective outsourcing is that it allows the client firms to minimize costs and maximize benefits at the same time. However, coordination is a difficult problem with multiple–vendors. The client firms should be able to coordinate vendors' activities. If coordination is difficult, each IS activity that the corresponding vendor is involved with needs to be independent of any other. Further, multiple outsourcing calls for managing a web of relationships that may be at different stages of evolution in the classification. For example, one relationship may be of support type while another may be of reliance type. Yet another relationship may be of alliance type. As discussed in Table 1 these relationships require different types of competencies and measurement and monitoring mechanisms. The client should be able to manage these relationships concurrently according to their requirements.

Depending on which quadrant in the matrix the organization wishes to be, outsourcing should be considered more as management of relationship with vendors than as a simple subcontract for IS commodities. In this study, it was found that the technical competency of a vendor is an indispensable factor for the success of relationships. The most important factor affecting the success of outsourcing, however, is whether the client and the vendor have mutual understanding or partnership. In this case study, all successful outsourced firms had meetings with the vendors at the top management level on regular basis. Outsourcing between BBB and EEE firms is another good example that demonstrates how competitors share information systems and how they develop mutual relationships. Hence, when firms extend the types of outsourcing relationships, it is important to design the structural relationship between

the partners from the beginning.

Firms must have a plan for their future movement among the quadrants in the matrix. It is frequently found that some firms do not have a plan for what to do upon expiration of the outsourcing contract. Once firms have relationships with certain vendors, it is not easy to switch vendors unless the relevant services are pure commodity. Depending on the future outsourcing strategy the current outsourcing contracts need to be fine-tuned. Firms need to be clear about what kind of competencies need to be developed over time. If firms intend to insource upon the expiration of outsourcing contract in the future, firms have to consider the potential problems. For instance, software ownership or transfer of key IS personnel need to be fully considered. If firms intend to extend their movements of outsourcing in the future, they can use multiple vendors on a selective basis in order to minimize the risk as well as maximize the benefits.

5. CONCLUSION

This paper has investigated the movement across four cells based on Nam et. al.'s two dimensional framework to analyze information system outsourcing behavior of organizations. Four types of relationships have been proposed to help provide outsourcing guidance. The analysis reveals any outsourcing decision should be embedded in an overall strategy with respect to IT and the role of IT itself in firm's competitive strategy.

Outsourcing practice in the U.S. is a little bit different from that in Korea. For instance, client firms rarely transfer the IS personnel or the ownership of IS department to outsourcing vendors. Also, subsidiary types of outsourcing firms are major players in the market. However, even though the origin of outsourcing firms is different from that of the U.S. firms, the relationships between outsourcing vendors and client firms in Korea can be still interpreted in terms of two dimensions and four types of relationships.

Future research may investigate a number of questions that have a bearing on the outsourcing decision. For example, the proposed framework indicates that the following list of issues, while not exhaustive, may be pertinent: the type of competencies that are required in managing the four outsourcing relationships; the effect of the fit between these competencies and the four type of relationships on client's per-

formance; definition and measures of vendor performance; factors that affect movements among the cells and the stability of the outsourcing relationships. In general dynamic features of outsourcing relationships and critical factors for the movements need to be further examined in the future.

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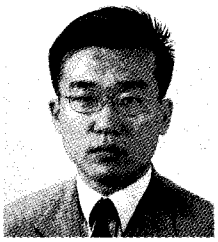
◇ 저자소개 ◇



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