정보시스템 아웃소싱의 성공요인 분석: 조직간 관계 관점에서의 실증적 연구

정영수
충남대학교 경영학과

요 약

정보시스템 아웃소싱 (outsourcing)의 적용 범위와 그 규모가 증대함에 따라, 아웃소싱은 정보시스템의 관리에서 근본적인 이슈로 등장하게 되었다. 정보시스템 아웃소싱의 중요성이 인식되었으나, 그에 대한 실증적 연구는 매우 미흡한 실정이다. 본 연구의 주요 목적은 정보시스템 아웃소싱에 있어 고객회사 (client firm)와 서비스 제공업자 (vendor) 간의 관계의 성공 및 실패에 영향을 미치는 요인을 조사하는 것이다. 본 연구의 연구 모델은 관계적거래이론 (relational exchange theory), 커뮤니케이션 행동 (communication behavior), 거래비용분석 (transaction cost analysis) 등의 조직간관계(interorganizational relationship) 이론에 기반을 두고 작성되었다.

미국의 207개 회사의 정보시스템 아웃소싱 설문조사에 의하여 다음과 같은 연구결과가 도출되었다. (1) 서비스 제공업자의 능력 (vendor capability), 관계결속성(solidarity), 관계지속성(Continuity expectation), 유연성(flexibility), 서비스업자의 활동에 대한 모니터링 (monitoring of the vendor), 참여도 (participation)등이 아웃소싱 관계의 성공과 양의 상관관계를 가지고 있으며, (2) 역할연합도(role integrity), 자산특이성(asset specificity) 등은 아웃소싱 관계의 성공과 음의 관계를 가지고 있는 것으로 나타났다. 이 결과에 의하면, 비관계적 거래 (discrete exchange) 보다는, 관계적거래 (relational exchange)에 기반을 두어 아웃소싱 관계를 운영하는 것이 아웃소싱의 성공적인 구현을 위하여 필수적으로 보여진다. 이 연구 결과를 기초로 하여 아웃소싱 대상 업무의 선택, 서비스 제공업자의 선택, 그리고 아웃소싱 관계의 지속적인 관리를 위한 지침을 제시하였다.

Factors Influencing IS Outsourcing Implementation: an Empirical Study from the Interorganizational Relationship Perspective

Young-Soo Chung
Department of Business Administration, Chungnam National University

Abstract

As information systems (IS) outsourcing expands in scale and scope, it has become a fundamental issue in management of information systems. While the importance of IS outsourcing has been recognized, very little empirical research has been done to address this issue. The primary purpose of this study is to investigate the factors contributing to the success and failure of IS outsourcing relationships between client firms and vendors. The proposed research model is based on the relational exchange theory, communication behavior, and transaction cost theory.

A survey study of 207 IS outsourcing relationships of U.S. firms indicates that (1) vendor capability, solidarity, continuity expectation, flexibility, monitoring of the vendor, and participation, and joint problem solving are positively related to the success of IS outsourcing relationships, and that (2) role integrity and asset specificity are negatively related to the success of IS outsourcing relationships. The findings suggest that a strong formation of relational exchange attributes, as opposed to discrete exchange, is essential to successful implementation of IS outsourcing. Based on the findings, managerial implications are discussed in selection of outsourcing tasks, selection of the vendor, and on-going management of relationships.

I. Introduction

An increasingly competitive and cost-conscious environment has caused organizations to reevaluate their approach to the management of information systems (IS) functions. The outsourcing of IS functions has become an acceptable solution to addressing the concerns of cost, quality, lagging IS performance, and the rapidly changing IS environment (Applegate et al., 1996). In this study, IS outsourcing is defined broadly as "the practice of turning over part or all of an organization's IS functions to one or more external service provider(s)" (Grover et al. 1996, p.91). Primary areas of IS outsourcing identified in the literature are data center, application development, and telecommunications/ network (Loh, 1994). IS outsourcing is expanding its scope, ranging from help-desk operations to systems design/planning to systems integration. The IS outsourcing market is growing very rapidly.

In the past several years, IS outsourcing has received a great deal of interest in the IS community. One investment analyst observed, "Outsourcing is by far the biggest trend in computing since the development of the PC over ten years ago" (Kirkpatrick, 1991). However, IS outsourcing is not a new practice. Firms have used outside IS services since the beginning of data processing (Collins and

Millen, 1995; Lacity and Hirschheim, 1993a). For instance, Ross Perot was performing data processing services for Frito-Lay and Blue Cross as early as 1963 (Mason, 1990). What draws the renewed interest in IS outsourcing is the increased scale and scope of IS functions outsourced, and its impact on firms' overall competitiveness.

As IS outsourcing expands its scope of outsourcing areas and its portion in the total IS expenditures increases, IS outsourcing has become a fundamental issue in management of information systems. Clark's (1992) study from interviews with thirty senior IS executives identified "management of outside providers" as one of six major systems management issues. Applegate et al. (1996) identified sourcing policy as one of six underlying themes in corporate IS management. While outsourcing has become a key issue in the field of MIS, research in outsourcing is still in its infant stage. Empirical studies in IS outsourcing are quite limited, and they have mainly focused on the investigation of the determinants of outsourcing (Nam et al., 1995). These studies have employed various theoretical perspectives including transaction cost analysis (TCA), diffusion of innovation, political model, and strategic resource theories. A relatively neglected area in IS outsourcing research is the process of implementing outsourcing services. There is very little empirical data available on the success or failure of outsourcing arrangements (Jones, 1994).

The benefits of IS outsourcing are well documented in the IS literature. They include cost savings, improved quality of IS services, access to up-to-date technology, flexibility in IS operations, and focus on core competencies. There is, however, a reason to believe that many outsourcing arrangements may have failed in fulfilling organizations' expectations. Most of the published stories of IS outsourcing are about successes (Lacity and Hirschheim, 1993b; Palvia, 1995; Palvia and Parzinger, 1995). Yet, other interorganizational arrangements such as strategic alliances have low success rates (Harrigan, 1988; Mohr and Spekman, 1994; Sherman, 1992), casting doubts on this anecdotal evidence. As for empirical data, in their case study of fourteen U.S. firms, Lacity and Hirschheim (1993b) found that many of the initially proclaimed benefits were not realized.

Although researchers in the IS outsourcing arena have emphasized the need for the investigation of critical success factors in outsourcing relationships (Loh, 1993; Klepper, 1995; Teng et al., 1995), very few empirical studies have investigated success factors in the implementation of IS outsourcing. Gable and Sharp (1992) investigated the success factors in the consultant engagement when external consultants are involved in the selection of a computer system. The data were collected from forty-nine computerization projects in the Small Enterprise Computerization Program of the Singapore government. The resulting path analysis showed that the client/consultant relationship and client involvement in the project are key factors to success. The results of this study might be useful for the management of a client/consultant relationship when an external consultant is involved in the ongoing management of IS outsourcing or initial assessment of the outsourcing decision. However, this study does not address other factors related to the implementation of IS outsourcing.

Cheon (1992) surveyed 188 U.S. firms to investigate implementation factors determining IS outsourcing success. This study was conducted as a part of a large scale study that focused on the determinants of IS outsourcing. The unit of

analysis in this study was an organization. The respondents were instructed to state overall perceptions when engaged with multiple service providers. The author found that the service quality of the vendor and the quality of the partnership influenced the degree of outsourcing success.

The primary objective of this study is to empirically investigate the factors contributing to the success or failure of IS outsourcing relationships between client firms and vendors. This study is intended to remedy problems in previous studies in success factors of implementation of IS outsourcing and to augment knowledge for successful implementation of IS outsourcing. First, the unit of analysis in this study will be the relationship between a client firm and a vendor in a specific outsourcing task. Utilizing a relationship as a unit of analysis allows an in-depth and precise analysis of an IS outsourcing relationship. The vast majority of studies in interorganizational relationship success also adopted a relationship rather than an organization as a unit of analysis. Second, this study will employ a more comprehensive model that includes factors not addressed in the previous studies, such as relational exchange characteristics, communication behavior, and task characteristics. Knowledge acquired in this study is expected to provide a framework for helping IS managers in the on-going management of the relationships as well as in the selection of vendors.

II. Theoretical Background

A relationship developed between a client firm and a vendor in IS outsourcing can be characterized as an interorganizational relationship (IOR) since two parties from different organizations work togetner. Various theories and frameworks of IORs have been utilized in organizational economics, organizational theory, strategic alliance, and relationship marketing literature. In this section, two major approaches in IORs, transaction cost analysis and relational exchange theory, are briefly reviewed to understand IS outsourcing from IOR perspective. The research model in this study is primarily based on these two approaches.

2.1 Transaction Cost Analysis

Based on the seminal work by Coase (1937), Williamson (1975; 1985) analyzed various types of contracts and transaction costs to develop a theory of organizational economics that is now called transaction cost analysis (TCA). The basic question posed in TCA is: Why and when a firm will go to the market for what it needs instead of providing it itself (make-or-buy decision) (Walker and Weber, 1984). The focus of analysis in TCA is to identify efficient governance structures that match transaction characteristics (Heide and John, 1988). In TCA, governance structure problems are studied in transaction cost minimizing terms. TCA postulates that appropriate governance structures are determined by three primary dimensions of the transaction -- uncertainty, frequency of exchange, and asset specificity. When uncertainty is high, transactions are recurrent, and/or when asset specificity is high in transactions, organizations are expected to adopt insourcing to avoid high transaction costs generated in transacting with outside parties. When transaction characteristics opposite to those described above exist, organizations are expected to adopt outsourcing (Williamson, 1975).

Although TCA has been widely applied to studying organizational governance, recently it has been under severe criticism.

For instance, Ring and Van de Ven (1992) pointed out three major limitations when TCA is applied to analyze interorganizational relationships. First, TCA assumes that managers will be motivated solely by efficiency considerations. Other factors, such as equity and flexibility, are largely ignored. Second, in TCA, opportunism is the primary behavioral principle. However, cooperative interorganizational behavior may occur frequently because of long-term efficiency resulting from cooperation and deletion of actors whose behaviors are habitually opportunistic (Hill, 1990). Third, TCA explores only two kinds of governance mechanisms -- markets and hierarchies. It does not adequately explore other available interorganizational governance structures between the extremes of market and hierarchy, such as joint ventures, partnerships, and outsourcing arrangements. In addition, TCA overemphasizes the structural features of the interorganizational exchange (Zajac and Olsen, 1993). It views IORs solely in terms of structural properties, but fails to recognize developmental processes of IORs. Hence, processual/behavioral aspects of interorganizational exchange are largely ignored in TCA.

Since TCA focuses on determining the appropriate governance structure or make-or-buy decision, it is not surprising that many studies in IS outsourcing have employed the TCA framework to investigate the determinants of IS outsourcing (e.g., Ang, 1993; Aubert and Rivard, 1994; Lacity and Hirschheim, 1993b; Loh, 1994; Nam, 1995; Saarinen and Vepsalainen, 1994). Although TCA has been mainly used in the investigation of governance structure, it also provides normative prescriptions regarding the organization of governance structure. It is suggested that an appropriate match between governance structure and task characteristics in TCA enhances performance. For instance, tasks with high uncertainty and high asset specificity will cause high transaction costs when transacting with outside vendors and those high potential transaction costs will eventually lead to decreased relationship performance. On the other hand, tasks with low uncertainty and low asset specificity will cause relatively low transaction costs, eventually leading to good relationship performance.

Research in IS outsourcing has largely neglected the relationship aspects of the client-vendor behavior while tending to study outsourcing transactions as discrete events. This tendency is reflected in the dominant use of the TCA framework in the empirical research in IS outsourcing. However, some researchers (Fitzgerald and Willcocks, 1994; McFarlan and Nolan, 1995) view IS outsourcing agreements as strategic alliances or partnerships and emphasize the importance of managing outsourcing relationships. In IS outsourcing, the average length of contract is estimated to be ten years (McFarlan and Nolan, 1995). As the outsourcing contract term becomes longer and the scope of outsourcing expands to more core, strategic areas of IS functions, it is essential to view IS outsourcing from the partnership perspective rather than from a discrete transaction perspective.

2.2 Relational Exchange Theory

Relational exchange theory, as Macneil's (1978; 1980) neoclassical contractual framework is often called, expanded Williamson's (1975) initial description of market versus hierarchy of the interorganizational governance structure. The theory suggests that the governance structure can be arranged on a continuum

of relationalism anchored by market (discrete exchange) and hierarchy (relational exchange) at the polar extremes (Noordewier et al., 1990). Macneil (1978; 1980) differentiated discrete exchange from relational exchange along several key dimensions. Discrete exchange is relatively short-term, and the relationships between highly autonomous buyers and sellers are designed to facilitate economically efficient transfer of goods or services (Ring and Van de Ven, 1992). Communication between parties is very limited and the contents are very narrow. Since virtually no social exchange is engaged, the identity of parties can be completely ignored. An approximate example in a pure form might be a one-time purchase of unbranded gasoline out-of-town at an independent station paid for with cash (Dwyer et al., 1987). Whereas, in relational exchange, each transaction must be viewed in terms of its history and its anticipated future. The participants are expected to derive complex, personal, non-economic satisfaction and engage in social exchange (Dwyer et al., 1987). Its pure form occurs in a form of hierarchy within an organization.

The concept of interorganizational structure or relational structure presented in the relational exchange theory provides a significant opportunity to study hybrid forms of interorganizational cooperative arrangements, which are neither markets nor hierarchies. Powell (1987) argued that simultaneous pressures towards efficiency, flexibility, and speed are pushing more and more firms to form hybrid arrangements. An IS outsourcing arrangement is a kind of hybrid interorganizational arrangement since it involves a long-term commitment with about ten years of the average length of contract. Relational exchange theory, to be discussed later in the attributes of relational structure, also addresses the behavioral/processual aspects of relationships. Hence, in this research, relational exchange theory will be used as the backbone of studying IS outsourcing relationship.

III. Research Model and Hypotheses

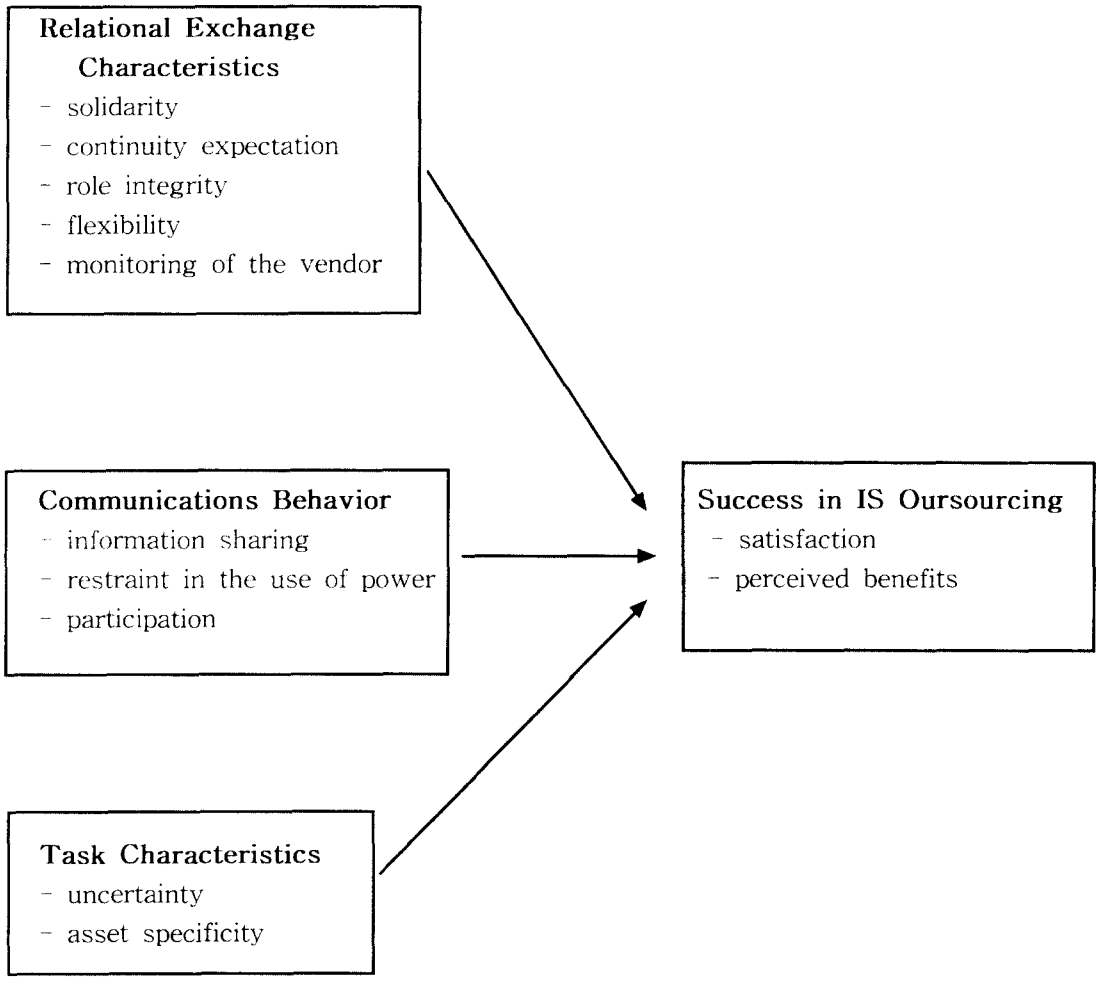
The model in this study is primarily based on the relational exchange theory. Two TCA factors, uncertainty and asset specificity, are also included in a form of task characteristics to provide an economic efficiency perspective. Based on the literature review presented in the previous section, literature in IS outsourcing, and relationship marketing literature, factors affecting success or failure of implementation of IS outsourcing are identified and presented in Figure 1. Factors identified are relational exchange characteristics, communication behavior, and task characteristics.

3.1 Relational Exchange Characteristics

The first component of the model identifies relational exchange characteristics.

To the best of this researcher's knowledge, no empirical study has ever been conducted to investigate the relational structure in the MIS field. Researchers in relationship marketing and strategic alliances have used a variety of sets of dimensions to measure the relational structure based on the situational factors of the research settings. Examples of dimensions include solidarity, continuity expectation, role integrity, mutuality, monitoring of the vendor, joint actions, flexibility, vendor assistance, information exchange, restraint in the use of power, and harmonization of conflict. Among these dimensions, the present study utilizes solidarity, continuity

Figure 1: Research Model



expectation, role integrity, flexibility, and monitoring of the vendor as the characteristics of relational structure. These dimensions are chosen to capture the essence of characteristics of the relational structure in IS outsourcing relationship. The first four items, solidarity, continuity expectation, role integrity, and flexibility, are included since these items are among the most frequently utilized. The remaining item, monitoring of the vendor, is included since it is considered a very important success factor in an IS outsourcing relationship by researchers.

Information exchange and restraint in the use of power are addressed in the separate section of communication behavior since these dimensions are important elements in communication behavior. The separation of communication behavior from the relational structure is consistent with the practice of other studies (e.g., Boyle et al. 1992; Mohr and Spekman 1994).

3.1.1 Solidarity

The norm of solidarity refers to the extent to which an on-going relationship (as distinct from a series of discrete transactions) is created and sustained (Kaufmann and Dant, 1992). It represents the norm of holding exchanges together (Macneil, 1980). In relational exchange, the preservation of a unique and continuing relationship is internalized by exchange parties as being important in and of itself, thus exhibiting a partnership mentality between parties. In comparison, discrete exchange displays little solidarity between parties due to its tendency to be adversarial in relationship (Kaufmann and Stern, 1988; Young et al., 1996).

3.1.2 Continuity Expectation

The norm of continuity expectation refers to the expectation of future exchange between parties (Noordewier et al., 1990). Note that the definition involves anticipated duration into the future rather than the historical duration of the relationship. In discrete exchange, the parties expect a low probability of future interaction. As transactions become more relational, the parties expect that the current relationship will last for the given contract period and renewal of relationship is also expected. When the parties expect continuity of the relationship, each party is expected to perform its activities more faithfully because "the shadow of the future" has been enlarged and thus future interactions between parties provide an opportunity to reward good behavior and punish opportunism (Axelrod, 1984; Heide and John, 1990).

3.1.3 Role Integrity

Role integrity refers to the extent to which the parties maintain highly complex and multi-dimensional roles (Kaufmann and Dant, 1992). In relational exchange, expectation of ongoing transactions necessitate complex roles involving a variety of business and non-business issues (Dant and Schul, 1992). In contrast, the roles to be maintained in discrete exchange are simplistic, just requiring simple buy-sell interactions (Young et al., 1996). In IS outsourcing, the parties are expected to exhibit highly complex and multidimensional roles in order to deal with the complexity of information systems.

3.1.4 Flexibility

Flexibility refers to smooth alterations in practices and policies in the event of unexpected or changing conditions (Boyle et al., 1992). As the transaction becomes more relational, the terms of trade becomes more open-ended. Thus, planning and adjustment are essential to cope with uncertain

environments. In comparison, a discrete exchange relationship requires little flexibility due to "binding and specific" terms of trade (Noordewier et al., 1990). In IS outsourcing relationship, maintaining flexibility is one of the important goals as well as a critical success factor (Duncan, 1995; Lacity et al., 1995; McFarlan and Nolan, 1995; Minoli, 1995). Sometimes, the fear of loss of flexibility can be a reason to avoid outsourcing (Palvia and Parzinger, 1995). Due to the long-term nature of IS outsourcing arrangements, it is nearly impossible to precisely prespecify everything in detail. Flexibility is required to cope with evolving technology, and changes in the organization's business posture, market, and climate (McFarlan and Nolan 1995; Minoli 1995).

3.1.5 Monitoring of the Vendor

Monitoring of the vendor involves the monitoring or supervisory actions that the client firm undertakes to secure satisfactory vendor performance in the execution of the agreement (Noordewier et al., 1990). The monitoring activities in IS outsourcing include developing performance standards, measuring results, and then interpreting them continuously (McFarlan and Nolan, 1995). In a typical discrete transaction where well-specified, simple products are delivered, enforcement of the contract is a simple task. When the contract becomes more relational, active supervision by the client firm is necessary to ensure satisfactory performance. In the IS area, contracts tend to be more relational since the contract is typically long-term and precisely prespecifying everything in detail is very difficult. Also, most of the critical measures of performance in IS outsourcing are intangible and play out over a long period of time (McFarlan and Nolan 1995). According to a survey on telecommunications outsourcing performed by Thobe (1992), the respondents generally did not feel that they have clear performance measures and indicated that clear definitions of responsibilities and performance measure as the most important factor for successful outsourcing arrangements.

3.1.6 Relational Exchange Characteristics and Success

As today's IS outsourcing contract term becomes longer and the scope expands to more core, strategic areas of IS functions, it is essential to view the IS outsourcing relationship from a partnership or relational exchange perspective rather than from a discrete exchange perspective (McFarlan and Nolan, 1995). Cheon (1992) found that the quality of partnership has a positive effect on the performance of IS outsourcing. Empirical studies in IORs have shown that a higher level of relational exchange characteristics has a positive effect on both polity performance (trust and satisfaction) and economic performance in interorganizational arrangements (Anderson and Narus, 1990; Dwyer and Oh, 1987; Robicheaux and Coleman, 1994). Thus, the following hypothesis is proposed regarding relational exchange characteristics:

H1: Success of an IS outsourcing relationship is positively associated with the degree of:

A. solidarity
B. continuity expectation
C. role integrity
D. flexibility
E. monitoring of the vendor

3.2 Communication Behavior

Since communication processes underlie most aspects of organizational functioning, effective communication between parties is

essential for the success of an interorganizational relationship (Mohr and Spekman, 1994). Effective communication between parties leads to collaboration and cooperation (Cummings, 1984). On the other hand, ineffective communication can be detrimental to the working relationship by causing conflicts and eventually leading to misunderstanding, incorrect business solutions, and mutual feelings of frustration (Etgar, 1979).

In IS outsourcing relationships, the interfaces between the client firms and vendors are very complicated since the parties are expected to maintain very complex and multidimensional roles in order to deal with the complexity of information systems. For this reason, effective communication between parties is considered a critical success factor in IS outsourcing relationships (Foxman, 1994; McFarlan and Nolan, 1995). In this study, three aspects of communication behavior are identified: information sharing, restraint in the use of power, and participation.

3.2.1 Information Sharing

Information sharing refers to the extent to which critical, often proprietary, information is communicated to each partner (Mohr and Spekman, 1994). Information sharing represents a mutual expectation that each party will proactively provide information useful to the other, so that each party can obtain valuable information regarding events or potential situations that influence the on-going operation (Dahlstrom et al., 1996; Heide and John, 1992). In an IS outsourcing relationship, two parties from different organizations work together to accomplish complex tasks. Therefore, information sharing is critical for parties to act independently in maintaining the relationship over time. Without sharing the critical information to accomplish tasks, the parties may make decisions in their own interest, leaving each party susceptible to the other party's opportunism (Whang, 1992). Information sharing has been known to be an important predictor of satisfaction and partnership success (Devlin and Bleackley, 1988; Mohr and Spekman, 1994). Effective information sharing tends to exhibit the following characteristics: (1) bi-directional rather than unidirectional flow of information, (2) frequent communication, and (3) more use of informal modes of communication (Mohr and Nevin, 1990).

3.2.2 Restraint in the Use of Power

Restraint in the use of power refers to the extent to which the parties restrain their use of legitimate power (Kaufmann and Dant, 1992). Power can be defined as the ability to influence or change another's behavior (Gaski, 1984; Tushman, 1977). Although use of power may serve as a means to exploit the target, it also plays a vital role in effective coordination necessary in IORs (Blau, 1964; Frazier and Summers, 1986). The use of power or influence strategy has been frequently conceptualized as an important component of communication behavior in marketing channels and IOR literature (Boyle et al., 1992; Dabholkar et al., 1994). Parties in a good working relationship are expected to voluntarily limit their use of power in a situation where they can legitimately exercise the power since the use of coercive power is detrimental to the cooperative working relationship (Kaufmann and Dante, 1992). Restraint in the use of power has been used as an important indicator of interorganizational cooperation (Heide and Miner, 1992) and it is shown to significantly influence relationship satisfaction (Park, 1995).

3.2.3 Participation

Participation in this study is defined as the extent to which parties engage jointly in planning and goal setting (Mohr and Spekman, 1994). In IS literature, participation is generally defined more loosely, simply representing the degree of engagement in activities related to a specific project (e.g., Robey et al., 1989; 1993). In this study, the construct of participation will focus on planning and goal setting since other aspects of engagement in activities have already been addressed in such constructs as "information exchange" and "role integrity." Engaging jointly in goal formulation and planning activities is an important aspect of participation that help the partnership succeed. It helps mutual expectation be established and cooperative efforts be specified (Dwyer and Oh, 1988; Mohr and Spekman, 1994). Participation in an IS outsourcing relationship may occur in a large number of activities such as defining an IS strategy to support business goals, formulating policies and procedures for information processing, making specific plans for improving information processing, and setting specific parameters of performance (Foxman, 1994). The following hypothesis is proposed regarding communication behavior:

H2: Success of an IS outsourcing relationship is positively associated with:

A. information sharing
B. restraint in the use of power
C. participation

3.3 Task Characteristics

3.3.1 Transaction Cost Analysis and Task Characteristics

Transaction cost analysis (TCA) has been the predominant framework employed to investigate the determinants of IS outsourcing. TCA provides explicit normative prescriptions regarding the organization of the governance structure. That is, an appropriate match between governance structure and task characteristics in TCA is expected to enhance performance. However, little empirical testing has been conducted to investigate the performance implications of the TCA framework (Heide and Stump, 1995). Following the tradition of recent empirical studies (Heide and John, 1988; Heide and Stump, 1995; Nidumolu, 1995b; Noordewier et al., 1990) that tested performance implications of TCA factors, this paper will test the link between TCA factors and performance. Among three major TCA factors, only uncertainty and asset specificity will be considered in the model. The remaining factor, frequency of exchange, is excluded since the transactions are performed on a continuous basis in IS outsourcing (Aubert and Rivard, 1994).

3.3.2 Uncertainty

Uncertainty refers to the degree to which future states of the world cannot be anticipated and accurately predicted (Pfeffer and Salancik, 1978). Uncertainty is created when insufficient information is available to make precise contract specifications, so that "future contingencies for which adaptations may be required cannot be anticipated at the outset" (Williamson 1979, p.237).

Three areas of uncertainty heavily studied in interorganizational literature are technological, measurement, and demand (or volume) uncertainty. Technological uncertainty is created due to technological changes and technological obsolescence. In the IS setting, technological uncertainty in a potential client-vendor relationship may come from adoption of new standards, introduction of new functionalities, and obsolescence of hardware and software (Loh, 1994). In information systems and software engineering literature, technological

uncertainty has long been recognized as a key source of uncertainty (Boehm, 1989; McFarlan, 1981; Nidumolu, 1995b; Zmud, 1980). The effect of technological uncertainty is expected to be large in the IS area since information technology is changing very rapidly and IS functions need to be adjusted for organizations to function properly in increasingly competitive environments. Measurement uncertainty is produced from the difficulties encountered in the evaluation of elements of exchange. In the IS setting, it might come from the difficulties of evaluating and monitoring (1) the quality of products/services delivered, (2) the cost-performance trends, and (3) the quality of IS staff (Aubert and Rivard, 1994; Loh, 1994). Finally, demand uncertainty is decided by measuring fluctuations in the demand for a task or component and the confidence placed in estimates of the demand (Walker and Weber, 1984). In the IS setting, the fluctuations in demand can be in hardware, software, IS personnel, and telecommunications/network requirements.

TCA predicts that high uncertainty will cause high transaction costs due to costs associated with writing, negotiating, monitoring, and enforcing contracts with outside vendors, and that high potential transaction costs will eventually lead to decreased relationship performance. In an empirical study of software development projects, Nidumolu (1995b) identified a negative relationship between project uncertainty and project performance. In an empirical study of a marketing channel relationship, Heide and Stump (1995) found a negative relationship between volume uncertainty and relationship performance. In terms of uncertainty and success of IS outsourcing relationship, the following hypothesis is proposed:

H3A: Success of an IS outsourcing relationship is negatively associated with the degree of uncertainty in the outsourcing task.

3.3.3 Asset Specificity

Asset specificity refers the degree to which the transaction utilizes specialized assets that cannot be transferred to any other transaction. Unlike assets that can be used to serve a variety of situations, assets with high asset specificity have primary value only in the particular relationship between the client firm and the vendor. Loh (1993) identified three sources of asset specificity in the IS outsourcing context. First, technical resource specificity arises when client firms have their hardware, software, and communications architectures or platforms uniquely developed for customized usage. Second, human resource specificity arises when IS staff are trained to operate only customized applications that are distinctive to the organization. Finally, technical procedure specificity arises when client firms have unique technical procedures in the process of systems design, operations, and maintenance.

TCA postulates that high asset specificity will cause high transaction costs and that high potential transaction costs will eventually lead to decreased relationship performance. In an empirical study of a marketing channel relationship, Heide and Stump (1995) found a negative relationship between asset specificity and relationship performance. In terms of uncertainty and success of IS outsourcing relationship, the following hypothesis is proposed:

H3B: Success of an IS outsourcing relationship is negatively associated with the degree of asset specificity in the outsourcing task.

3.4 Control Variable: Vendor Capability

Vendor capability is probably the most critical factor for the successful implementation of IS outsourcing (Ketler and Walstrom, 1993; McFarlan and Nolan, 1995). Many studies in interorganizational and interpersonal relationships studies have also related ability or capability as a critical characteristic of trust (Mayer et al., 1995), which is a strong predictor of relationship success. In view of strategic resource theories, such as the resource-based theory and resource dependence theory, organizations engage in outsourcing arrangements when they fail to generate necessary resources or capabilities internally (Teng et al., 1995). Hence, organizations are likely to engage in the IS outsourcing arrangements when organizations' IS capabilities fall short of expectation.

Empirical studies in the determinants of IS outsourcing have confirmed the role of IS capability in IS outsourcing decision. In their survey of 188 U.S. firms, Teng et al. (1995) found that difficulties in providing good information outputs and IS support services are associated with organizations' propensity to adopt outsourcing. In a similar study of 154 U.S. firms, Nam (1995) found that a low level of in-house IT competence is a strong predictor of IS outsourcing. In a financial analysis of 200 U.S. firms, Loh and Venkatraman (1992) found that the degree of IT outsourcing is negatively associated with IT competence.

The fact that IS capability is a major determinant of IS outsourcing implies that organizations need competent vendors to satisfy their outsourcing needs. In addition, IS outsourcing is usually contracted for a long term and it is very difficult to switch to another vendor during the contract term or to insource again. The vendor should have the capability to keep up with ever-changing technology and its financial structure should be stable to maintain undisrupted service. Important factors determining vendor capability include experience and track record, technical competence, and financial status (Collins and Millen, 1995; Foxman, 1994; Gupta and Gupta, 1992; Ketler and Walstrom, 1993; Williamson, 1991).

In this study, vendor capability is treated as a control variable since the researcher is primarily interested in the effect of independent variables discussed above. The treatment of vendor capability as a control variable will contribute to eliminating the confounding effects and focusing on the effect of research variables. Further control of industry sector and organizational size was not considered since there is evidence that industry type and organizational size do not affect the context of research on IS outsourcing (Loh and Venkatraman, 1992).

3.5 Success Measures of Implementation of IS Outsourcing

In MIS research, having well-defined success measure(s) or dependent variable(s) is very important since MIS research is intended to make a contribution to the world of practice (Delone and McLean, 1992). In the IS arena, research in interorganizational relationship (IOR) is sparse and most success measures have been utilized to measure performances of specific IS activities in non-IOR contexts. There is no consensus on the appropriate measures of success of IS outsourcing (Palvia and Parzinger, 1995) due to lack of study in the investigation of success of IS outsourcing.

Areas of outsourcing surveyed in this study are not restricted to any specific area, but include all areas of IS outsourcing. Due to difficulties in constructing success

measures in all areas of IS outsourcing and the space limitation of the questionnaire, quantitative measures, such as the system response time in mainframe operation outsourcing and network availability in telecommunications outsourcing, are not utilized in this study. Based on the literature of IORs in marketing channels, strategic alliances, and descriptive studies in IS outsourcing, this study employs two indicators of outsourcing success: satisfaction and perceived benefits.

Satisfaction is an affective measure that represents the degree of a client firm's satisfaction with the vendor. Satisfaction is defined as "a positive affective state resulting from the appraisal of all aspects of a firms working relationship with another firm" (Anderson and Narus 1984, p. 66). Since the measurement of satisfaction involves the evaluation of all aspects of the relationship, satisfaction is considered as a close proxy for perceived effectiveness of the relationship (Anderson and Narus, 1990). Satisfaction has been widely utilized as a measure of relationship success in IOR studies (e.g., Anderson and Narus, 1984; 1990; Frazier, 1983; Frazier et al., 1984; Mohr and Spekman, 1994).

Perceived benefits are a client firm's perception of benefits gained from a specific outsourcing relationship (Cheon, 1992). Since benefits of IS outsourcing are also underlying reasons for or expectations from outsourcing arrangements, perceived benefits measure the degree of accomplishment of expectations from the client firm's perspective. Hence, they are accepted as good measures of IS outsourcing success. Three major types of benefits identified in the literature are strategic, economic, and technological benefits (Altinkemer et al., 1994; Apte, 1990; Cheon, 1992; Collins and Millen, 1995; Gupta and Gupta, 1992; Khosrowpour et al., 1995; Mylott, 1995; Palvia and Parzinger, 1995; Wagner, 1994). First, strategic benefits refer to the achievement of focusing on core competence, enhancing strategic use of IT, and enhancing flexibility. Second, economic benefits refer to the capability to produce IS services at lower costs. The degree of economic benefits depend not only upon achieving economies of scale and scope in the areas of human and technological resources such as hardware and software, but also upon controlling cost structure. Third, technological benefits refer to the achievement of gaining access to leading-edge IT and avoiding the risk of IT obsolescence that results from accelerating changes in the nature of IT infrastructure.

IV. Research Methods

This study involved a cross-sectional field study via a questionnaire-based mail survey. This study focuses on the relationship in IS outsourcing. Hence, the unit of analysis in this study is the relationship between a client firm and one of its vendors. Researchers have recommended dyadic analysis to comprehensively investigate the interorganizational relationship (Heide and Miner, 1992; John and Reve, 1982). However, considering the immense difficulty of locating exact parties in IS outsourcing relationships, this study focuses on one perspective of the dyadic relationship, the client firm's view of the relationship with its referent vendor.

The sampling frame for this research consisted of the large U.S. firms listed in the *Directory of Top Computer Executives* (West Edition; Spring 1996 Version) published by Applied Computer Research, Inc. All listed organizations have their own IS departments. Among the organizations

listed in the directory, not-for-profit organizations and government organizations were excluded from the survey. Further control of the industry sector and organizational size was not considered since there is evidence that the industry type and organizational size do not affect the context of research on IS outsourcing (Loh and Venkatraman, 1992). The questionnaire was distributed to a sample of 2,200 firms in the twelve midwestern and central states on the list of the directory. The questionnaire was addressed to the top executive in charge of information systems. Approximately three weeks after the initial mailing, a follow-up mailing to 1,000 randomly selected companies was conducted with a copy of the questionnaire enclosed.

The questionnaire was basically composed of two portions. The first portion asked about the respondent's perceptions about IS outsourcing in general and the company's overall outsourcing practice without consideration of any specific outsourcing arrangement. The second portion of the questionnaire asked about the nature of the relationship in regard to a specific outsourcing arrangement. The respondents were asked to identify a specific vendor with which they are familiar. The relationship with this selected vendor then served as the referent for all further questions. Companies that were not engaged in any outsourcing arrangement did not complete the second portion of the questionnaire.

Of the 2,200 questionnaires mailed, 368 were returned. Upon further evaluation, thirteen incomplete questionnaires were determined unusable. Thus, 355 responses was usable, resulting in a usable response rate of 16.1%. Possible nonresponse bias was evaluated by comparing early respondents (67.3 % within three weeks) with late respondents, due to unavailability of nonrespondent firms' data. The underlying assumption here is that late respondents are in some way more like nonrespondents (Achrol and Stern, 1988; Armstrong and Overton, 1977). The comparison indicated no significant differences between early and late respondents in characteristics such as total sales, IS department budget, number of total employees, and number of IS employees, at the significance level of 0.05.

Profile of the Respondents

The respondents had an average length of 21.8 years of experience in the IS field. A large number are Directors/Asst. Vice Presidents(VPs) (36%), CIOs/VPs (34%), and Managers (28%). The responding organizations had an average number of 5,051 total employees. They represented a broad spectrum of industries, with the largest segment coming from manufacturing (36%).

Measurement

Whenever possible, measures that have been utilized and validated are adopted for this study. All the variables were measured with multiple-item scales. Each item were measured according to a seven-point Likert-type scale. The measures of relational exchange characteristics and communication behavior were adopted from the relationship marketing literature. For the two TCA factors, uncertainty and asset specificity, this study utilized the measures developed by Nam (1995). Measures of vendor capability were based on the items used by Loh (1993) and Collins and Millen (1995).

The present study utilizes two measures of success in the implementation of IS outsourcing: satisfaction and perceived benefits. Satisfaction was measured by three items adapted from Park (1995), who in

turn based his scale on the work of Anderson and Narus (1984; 1990). Perceived benefits were measured by nine items based on Cheon (1992) and Collins and Millen (1995). Each item of perceived benefits was measured by a seven-point Likert-type scale, anchored from "much worse" to "much better" in comparison to the client firm's expectation. This type of measurement approach represents the concept of "outcomes given comparison level (Outcomes\CL)" proposed by Thibaut and Kelley (1959) from the perspective of social exchange theory. The comparison level in the present context can be defined as a standard representing the quality of outcomes the client firm has come to expect from a given type of relationship, based upon present and past experience with similar relationships, and knowledge of other IS outsourcing relationships (Anderson and Narus, 1984). Thus, perceived benefits in this study are conceptualized as outcomes obtained from a relationship, against the comparison level defined above. The comparison level is introduced as an anchor for assessing perceived benefits to control different expectations by different IS activities outsourced.

Measurement Assessment

Each set of multiple-item scales was initially subjected to an examination of item-to-total correlations to identify items that did not belong to the specific scale. An item with low item-to-total correlation indicates that the item is not drawn from the same domain and should be deleted to reduce error and unreliability (Nunnally, 1978). Items were deleted if their item-to-total correlation was below 0.35. (Based on this criterion, three items were excluded from further analysis.)

In order to assess unidimensionality, principal components factor analysis was conducted on subsets of variables. Varimax was the rotation method for all analysis. Factor loadings of less than .50 are dropped from further analysis. Table 1 lists summary scale statistics.

Table 1: Reliabilities of Final Scales

Construct	Number of Items	Item-to-Total Correlation		Alpha
		Min.	Max.	
Partnership	6	.37	.72	.84
Role Integrity	3	.63	.77	.82
Flexibility	3	.42	.67	.74
Monitoring	4	.48	.70	.79
Information sharing	4	.49	.65	.77
Restraint in the use of power	3	.49	.59	.72
Participation	4	.67	.73	.85
Uncertainty	4	.56	.75	.81
Asset specificity	3	.31	.40	.54
Vendor capability	5	.43	.62	.78
Satisfaction	3	.93	.93	.97
Perceived non-economic benefits	5	.59	.74	.85
Perceived economic benefits	3	.72	.78	.87

The table lists the extracted final constructs. All items except two cases cleanly loaded to the intended construct. First, for the relational exchange characteristics, all items of solidarity and continuity expectation were merged into one factor. Upon inspection of the items, the new factor was subsequently labeled as "partnership" to reflect the fact that the items depict closeness and long-term orientation, which are the essence of partnership in the working relationship. It is not uncommon that items from different scales are combined into one factor in relational exchange scales. Second, for perceived benefits, two factors emerged from nine items. The split of perceived benefits into two factor was not intended, but it is not unexpected since the items represent a diverse set of benefits including strategic, technological, and economic dimensions. Upon an inspection of the items, the two factors were termed as "perceived non-economic benefits" and "perceived economic benefits" respectively. The items of non-economic benefits generally reflect strategic and technological benefits. As a result, three dependent variables will be utilized for hypothesis testing.

Table 1 also lists the result of the reliability test. All Cronbach's alphas except that of asset specificity exceeded the generally accepted minimum value of 0.70, demonstrating satisfactory evidence of internal consistency. The Cronbach's alpha for asset specificity was 0.54. Nunnally (1967) suggested that a coefficient value of between 0.5 and 0.6 is sufficient for early basic research. Considering the exploratory nature of this study, the researcher decided to retain the measures of asset specificity for further analysis.

Table 2.
Descriptive statistics of outsourcing relationships with the referent vendor

Characteristics	Freq.	Percent
IS Activity		
Application develop./ maintenance	96	46.4
Data center operation/ facility mgmt.	34	16.4
Telecommunications/ network	26	12.6
Systems integration	24	11.6
End user support/ help desk	15	7.2
Training/education	4	1.9
Others	8	3.9
Length of contract (yrs.)		
Less than 1	35	17.1
1 - less than 2	62	30.0
2 - less than 4	56	27.1
4 - less than 6	32	15.5
Over 6	18	8.7
Unknown	2	1.0
Average	2.70	
Contract Amount		
< $50,000	24	11.6
$50,000 to < $100,000	24	11.6
$100,000 to < $1 mil.	69	33.3
$1 mil. to < $ 10 mil.	50	24.2
$10 mil. to < $100 mil.	15	7.2
Over $100 mil.	8	3.9
Unknown	17	8.2

V. Results

5.1 Characteristics of Outsourcing Relationships

For the hypothesis testing purpose, only the second portion of the questionnaire were utilized. Of the 355 responses of the survey, 148 responses did not completed the second

portion of the questionnaire. Ninety of them were non-outsourcing firms. A total of 207 outsourcing relationships were utilized for hypothesis testing. The descriptive statistics of outsourcing relationships are summarized in Table 2.

The table includes a breakdown of outsourcing arrangements by IS activity, length of the contract, and contract amount. It indicates that the sample of outsourcing relationships is heavily concentrated on the application development/ maintenance area (46.4%). A majority of the relationships had a contract period of two years or longer (51.3%). However, the average contract length of 2.7 years was shorter than the contract period of five to ten years typically discussed in the literature. Less than 24% of the contracts had an amount of less than $100,000. The contract amount also represents a wide spectrum of contract size.

5.2 Tests of Hypotheses

Multiple regression analysis was employed to test the hypotheses. For each group of hypotheses (four groups: H1A to H1E, H2A to H2C, H3A to H3B), multiple regression was run separately for each of the dependent variables: satisfaction, non-economic benefits, and economic variables. Following guidelines suggested by Cohen and Cohen (1983), the control variable (vendor capability) was added to the each regression run before adding the independent variables. In this way, the effect of a control variable can be partialed out prior to hypothesis testing.

The results of hypothesis testing are shown in Table 3. As shown in the table, the results of regression runs for three dependent variables were consolidated to one table for easy comparison. The table reports the standardized regression coefficient (), adjusted squared multiple correlation coefficient (adjusted R^2), and change in F value after partialling out the effect of the control variable.

Hypothesis 1 generally posited that relational exchange characteristics are positively associated with successful implementation of IS outsourcing. As Table 3 shows, partnership (i.e., the combined measure of solidarity and continuity expectation) is found to be positively associated with satisfaction ($p<.01$), providing support for H1A and H1B. Flexibility is significantly associated with both satisfaction and non-economic benefits ($p<.01$), providing support for H1D. Monitoring of vendor is significantly associated with both non-economic and economic benefits ($p<.01$), providing support for H1E. Interestingly, role integrity is negatively associated with satisfaction. Since role integrity is proposed to be positively associated with dependent variables, H1C is rejected. Overall, relational exchange characteristics, except the case of role integrity, are significantly, positively associated with at least one of three success measures.

Hypothesis 2 is concerned with the effect of communication behavior on the success of IS outsourcing. Table 3 indicates that participation is positively associated with both satisfaction and non-economic benefits ($p<.01$), providing support for H2C. Both information sharing and restraint in the use of power have no significant effect on any of the success measures. Thus, H2A and H2B are rejected.

Hypotheses 3 is concerned with the effect of task characteristics on the success of IS outsourcing. It posited that uncertainty (H3A) and asset specificity (H3B) are negatively associated with success of IS outsourcing. Table 3 indicates that asset specificity is negatively associated with satisfaction ($p<.01$), providing support for

Table 3. Beta coefficients from regression analyses

	Dependent Variables		
	Satisfaction	Non-economic Benefits	Economic Benefits
Hypothesis 1			
Control Variable:			
Vendor capability	.54***	.41***	.28***
Independent Variable:			
Partnership	.29***	--	--
Role Integrity	-.21***	--	--
Flexibility	.15***	.17***	--
Monitoring of the vendor	--	.13***	.18***
*Change in F^*	10.37***	6.34***	2.50**
Adjusted R^2	.54***	.40***	.17***
Hypothesis 2			
Control Variable:			
Vendor capability	.63***	.48***	.31***
Independent Variable:			
Information sharing	--	--	--
Restraint in power use	--	--	--
Participation	.15***	.28***	--
*Change in F^*	3.46**	10.67***	3.25**
Adjusted R^2	.48***	.42***	.17***
Hypothesis 3			
Control Variable:			
Vendor capability	.67***	.59***	.39***
Independent Variable:			
Uncertainty	--	--	--
Asset specificity	-.14***	--	--
*Change in F^*	4.50**	--	2.91*
Adjusted R^2	.48***	.34***	.16***

* $p<0.10$; ** $p<0.05$; *** $p<0.01$; -- nonsignificant

^ The change in F-statistic shows the significance of the variance explained by the independent variables after accounting for (partialing out) the variance explained by the control variable (covariate).

H3B. However, uncertainty is found to be not associated with any of the success measures. Thus, H3A is rejected.

In all nine regression runs (three dependent variables by three sets of hypotheses) discussed above, the control variable (vendor capability) was found to be positively related to dependent variables (all p's<.01), indicating that vendor capability is a prime predictor of IS outsourcing success.

As discussed above, hypothesis testing has been conducted for each group of hypotheses. In order to check the overall soundness of hypothesis testing, one overall regression run, which addresses all ten independent variables and the control variable, was performed for each dependent variable. The findings were quite similar to those of separate runs presented in Table 3.

VI. Discussion

The following variables were found to be significantly, positively related to predicting the success of IS outsourcing (either satisfaction or benefits): partnership, flexibility, monitoring of the vendor, and participation. These findings suggest that as these variables are present in a high degree, there is a greater likelihood of outsourcing success. On the other hand, the following variables were found to have negative influence on the success of IS outsourcing: role integrity and asset specificity. A great degree of presence of these variables is expected to reduce the chance of the success in IS outsourcing.

Except for role integrity, all dimensions of relational exchange were positively and strongly related to at least one of the three success measures. These findings generally suggest that a strong formation of relational exchange attributes, as opposed to discrete exchange, is essential to successfully implement IS outsourcing. That is, a traditional discrete governance structure, characterized by adversarial arm's-length relationships, should be supplanted by cooperative relational exchange relationships.

Partnership was the strongest predictor (Beta=.29) of satisfaction among relational exchange characteristics. Since partnership, measured by solidarity and continuity expectation, largely represents the feeling of closeness or cohesiveness of the relationship, it may psychologically influence satisfaction, the affective measure. Flexibility appears to be a very strong predictor of success, as it is significantly related to two success measures, satisfaction and non-economic benefits. The finding of flexibility is consistent with the IS literature which suggests that flexibility is a key for outsourcing success to cope with evolving technology, and changes in business needs. Monitoring of the vendor was not significantly related to satisfaction, but it is the only variable in relational exchange significantly associated with both non-economic and economic benefits. Hence, when it comes to actual outcomes represented by benefits, monitoring seems to be a critical element. The finding is consistent with IS literature that puts a heavy emphasis on monitoring to ensure successful performance in IS outsourcing. Firms need to put more effort to monitoring activities in such areas as developing performance standards, measuring results, and interpreting them.

The negative association between role integrity and satisfaction is both surprising and inconsistent with the prediction. It is possible, however, that the greater level of role integrity may generate unattainable high expectations among parties and this in turn may result in a lower satisfaction rating.

Among communication behavior variables, participation was the only variable significantly related to any of the success measures. Participation is found to be significantly and strongly associated with both satisfaction and non-economic benefits. The finding of participation as a key success factor is consistent with the findings of other IS implementation studies, in such areas as end user computing and systems development. Contrary to expectation, this study did not find positive association between information sharing and success. However, similar results also have been found in other studies (Mohr and Spekman, 1994; Park, 1995). A possible explanation is that greater information sharing may give the vendor the impression that it is entitled to a greater share of the fruits of the outsourcing relationship (Mohr and Spekman, 1994).

Asset specificity was found to be negatively associated with satisfaction. The finding is consistent with the prediction. Task characteristics including asset specificity are largely not controllable after an outsourcing relationship begins. Hence, firms need to avoid outsourcing tasks with high asset specificity. Uncertainty was not found to be significantly associated with any of the success measures. A possible explanation may lie in the nature of uncertainty in IS outsourcing. In the IS arena, uncertainty is largely influenced by technological elements since IS tasks are very sensitive to technological changes. Mahoney (1992) argues that a higher level of technological uncertainty leads organizations to utilize less firm-specific assets. Thus, the resulting reduction in asset specificity may confound the effect of technological uncertainty. Overall, task characteristics do not seem to be good predictors of success of IS outsourcing.

Finally, the importance of vendor capability, which was utilized as a control variable, needs to be mentioned. For all regression runs, vendor capability was found to be strongly and significantly related to success with beta values ranging from .28 to .67. Hence, the single most important thing a firm can do for outsourcing success can be to select capable vendors.

This study provided an empirically-tested, comprehensive framework for studying the implementation of IS outsourcing. The research framework includes a variety of components including relational exchange, communication behavior, and TCA factors. The three success measures identified can be very useful for other IS implementation studies as well as IS outsourcing implementation. Knowledge acquired in this study is expected to provide a framework for helping IS managers in the on-going management of the relationships as well as in the selection of vendors. Also, this study is probably the first empirical study in the IS area that rigorously tested multiple dimensions of relational exchange characteristics. The measures and findings from relational exchange characteristics in this study is expected to provide guidance in probing relational structure concepts in such IS areas as interorganizational systems (IOS) and electronic commerce.

Efforts should continue to further refine the research framework. The research framework in this study does not address other potentially important factors, such as employee morale, top management commitment, and other task characteristics including complexity and standardization. Also, investigation of antecedents of relational exchange characteristics and communication behavior variables can be interesting. Political economy paradigm and

resource dependence theory can be guides to investigate the antecedents. Future research can also extend this research by including objective success measures, such as financial performance, system response time, and network down time. A natural extension of this study can be to retest the research framework in a more controlled setting. The research results may be not the same in different industries, different outsourcing tasks, and different contract sizes. Different success factors can dominate in a different environment.

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Note: Full References are available upon request.

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