

A Contingency Fit Between Client IT Capability and Vendor Competence in IS Outsourcing Relationship

Yunweon Seo, Hyun-Soo Han

Graduate School of Information & Communications, Hanyang University, Seoul Korea

Jae-Nam Lee

School of Business IT, Kookmin University, Seoul Korea

Abstract

This study develops a contingency fit between client IT capability and vendor competence in IS outsourcing relationship by integrating both the contingency theory in organization and the relationship theory in IS outsourcing. By adopting a fit as a moderation, the relationship intensity of IS outsourcing is hypothesized to be influenced by the fit between client IT capability and vendor competence, thereby leading to the success of outsourcing. The testing data was obtained from 20 IS outsourcing projects from both clients and vendors in Korea. The research model proposed in this study was then tested using the structural equation model (SEM). As expected, the result shows that when there is a fit between client IT capability and vendor competence, higher level of relationship intensity and outsourcing success exhibits. The findings have significant implications for further research and practice.

Key words: Contingency Fit, Client IT Capability, Vendor Firm Competence, IS Outsourcing, Relationship Intensity, Outsourcing Success.

1. Introduction

Over the last decade, Information Systems (IS) outsourcing has been one of the most widespread trends in meeting an organization's IT needs (Dibbern et al., 2004). Nowadays IS outsourcing is a commonly accepted and growing practice. In recent years, an emerging stream of research has focused on managing the relationship between the vendor and the client (McFarlan & Nolan 1995; Lee & Kim, 1999; Kern & Willcocks, 2002; Lee et al., 2003). In these studies, the researchers emphasized that the management of outsourcing relationship is crucial to outsourcing success. Using various contextual variables from different theoretical perspectives, extensive empirical testing results are reported to examine the importance of outsourcing relationship as key antecedent to outsourcing success (Grover et al., 1996; Kern 1997; Lee & Kim, 1999; Kern & Willcocks, 2002).

Despite the efforts of the past researches, there are certain weaknesses. One of the significant weaknesses is deemed to not considering the capability or competence of both the client and vendor at the same time. Though most previous studies emphasized the necessity of understanding both parties to understand the relationship, they overlooked the importance of the capability or competence of the client and

vendor (Saunders et al. 1997; Kern & Willcocks, 2002). Only few conceptual studies indicate the importance of the capability in IS outsourcing (Levina & Ross, 2003; Pinning & Woolcock, 1997). Thus, the notion of the capability from both the client and vendor perspectives needs to be extended to IS outsourcing relationship and its success.

The goal of this paper is to begin this task. Specifically, this study intends to answer the following question based on a contingency theory and a relationship theory: Do relationship intensity and outsourcing success come from the fit of client firm capability and vendor firm competence? To do so, we first adopt a contingency theory in the field of management, which argues that organizational effectiveness results from fitting the characteristics of organizations to contingencies (Donaldson, 2001). Second, we develop a contingency fit model between client IT capability and vendor competence in outsourcing relationship. Third, we insist that outsourcing success is achieved by the fit through the relationship intensity. Finally, empirical testing is conducted with the data gathered from 20 outsourcing projects in Korea, to validate the contingency model proposed in this study.

This paper is organized as follows. We begin to introduce the contingency theory and the relationship theory. Then, research model, hypotheses and empirical testing results are discussed in order. Finally, the implications and limitations are offered.

2. Theoretical Background

2.1. Contingency Fit Theory.

Contingency theories are one of the dominant scholarly studies of organization behavior, design, performance, planning, and management strategy. While they vary widely in subject matters, they have the common proposition that organizational outcome is the consequence of a fit or match between two or more factors. Fit is the key concept in this proposition (Van de Ven, & Drazin. 1985).

The term of fit is commonly used in a variety of models that deal with contingencies among variables, but its precise nature and meanings are seldom defined (Zigurs &

Buckland, 1998). Different definitions of fit, in three distinct approaches to structural contingency theory, have been identified: fit as selection, fit as interaction, and fit as systems (Van de Ven & Drazin, 1985). These ideas were extended to identify six unique perspectives on fit in the strategy literature: fit as moderation, as mediation, as matching, as gestalts, as profile deviation, and as covariation (Venkatraman, 1989). These perspectives vary in their degree of specificity of the theoretical relationship between variables, in the number of variables involved in the fit relationship, and in whether the concept of fit is anchored to a particular criterion variable (Zigurs & Buckland, 1998). The fit as moderation, mediation, and matching are criterion-free, and they have universal applicability not anchored to any particular dependent variable. The number of variables considered is limited for the fit as gestalts and profile deviation. They are typically used in an association between a single dependent variable, and a single predictor variable including a single moderating or intervening variable (Venkatraman, 1989).

The contingency theory necessarily involves the concept of a fit (Drazin, & Van de Ven, , 1985; Donaldson, 2001). Many studies adopting the concept of fit in organizational research focus on the relationship between strategy and one or more organizational or environmental variables (Lawrence & Lorsch, 1967; Ensign, 2001). Previous contingency theory literatures indicate that most effective organizations are achieving maximal fit configuration among contextual, structural, and strategic factors (Doty et al. 1993). Application of contingency approach requires conceptualization of fit, and definitional rigor since different conceptual definitions of fit imply different meanings of a contingency theory and different expected empirical results (Barki, et al., 2001).

Among the six perspectives, fit as moderation, as in the case of this study, has been commonly used when contingency is operationalized within interaction perspective (Venkatraman, 1989). When contingency theorists assert that there is a relationship between the variables predicting a third variable, they are stating that interaction exists between them. The moderation perspective implies that the impact of the predictor variable on a criterion variable is dependent on the level of a third variable. When the moderation effect is strong, the fit between the predictor and the moderator becomes the primary determinant of the criterion variable (Venkatraman, 1989; Donaldson, 2001; Drazin & Van de Ven, 1985).

2.2. Relationship Theory

As the trading of goods and services began, relationship among people was also created at the same time. Trust and friendships are forming as the relationship supported by quality products and services continue over time. Today, the relationship among the business partners has become strategic. And the relationship development pace is accelerated as firms strive to achieve their goals (Wilson, 1995).

According to relationship theories, cooperation, interactions, and social and economic exchanges are crucial factors enabling successful inter-organizational relationships (Dibben, et al., 2004). Specifically, the focus is on the interaction between parties that are geared towards the joint accomplishment of the individual party's objectives. Relationship theories appeared in diverse academic disciplines including strategic management, marketing, and supply chain management. They addressed topics of alliances and partnerships, competitive advantages, and supplier-buyer relationships (Dibben et al., 2004).

The partnership relation emerges when both parties are in mutual agreement that the resulting outcome from long-term engagement will be better than the outcome attainable through other forms of exchange, or from exchange with different partners. This motivates the parties to consider the relationship is important in and of itself, and to devote more resources towards its development and maintenance (Klepper, 1995; Kern, 1997). The variance in relationship ranges widely from management, evolutionary development, inter-organizational coordination and cooperation, and so on. The earlier researches on inter-organizational relationship focused on structural and behavioral characteristics in the distribution channel, and have been expanded to exploring antecedent conditions and evolutionary processes (Kern & Willcocks, 2000).

IS outsourcing tends to be more complex than other forms of outsourcing, due to the fact that IT is so pervading over the organization, and it could affect and reshape most organizational processes in some way. In this respect, the evolving outsourcing relationship becomes critical in the sense of securing key support services necessary to run organizational processes (Kern and Willcocks, 2002). IS outsourcing relationships have already received focal attention in the literature (Klepper, 1995; McFarlan & Nolan 1995; Willcocks & Kern, 1998; Lee & Kim, 1999).

There are many researches studying IS outsourcing relationship and success (Henderson, 1990; Lasher, et al., 1991; Grover et al., 1996;

Saunders, et al., 1997; Lee & Kim, 1999 Kern & Willcocks 2002). Whole body of the literatures emphasized that the relationship between client and vendor plays a crucial role on IS outsourcing success. The management of the relationship includes all conscious activities of the parties to sustain the relationship in their desired way. The management of the relationship might lead to modifications and adjustments of both the formal and the psychological contracts. There must be a link between how an outsourcing arrangement is structured and managed, and the subsequent outcomes. As such, the capability or competences of the both parties in IS outsourcing shall impact the formation of successful IS outsourcing relationship.

The influence of the vendor firm's competence on IS outsourcing relationship and success was conceptually addressed by Saunders, et al. (1997); Kern & Willcocks (2002); and Leviana & Ross (2003). Feeny & Willcocks (1998) and Kern & Willcocks (2002) also suggested that the client firm's IT capability could be an antecedent of the effective outsourcing relationship. Although these studies are mostly conceptual and formal constructs are not defined, the implications are evident for the causal relationships of capability and relationship process in IS outsourcing.

Client firm's IT capability is more than a specific set of sophisticated technological functionalities, as it is an enterprise-wide capability to leverage technologies for gaining and maintaining competitive advantage. Since IT capability is embedded within the fabric of the organization, it can be tacit and difficult to identify. The presence and effectiveness of the IT capability is also reflected in business performance (Bharadwaj, 2000; Peppard & Ward, 2004). That includes organization-specific routines, processes, skills, and resources (Hejden, 2001). Further, both the client and vendor firm's competencies should be involved to ensure effective IS outsourcing relationship management (Kern & Willcocks, 2002).

3. Research Model and Hypotheses

3.1. Developing the Research Model

The firm's resource and capability have a significant influence on inter-organizational relationship (Kern & Willcocks, 2002; Levina & Ross, 2003). But only few studies conceptually indicate the importance of the firm's resources and capabilities impact on IS outsourcing. Most IS outsourcing relationship researchers focused on the view of client, and paid only slight attention on the integrated perspective incorporating both client and vendor. That could lead to the limited understanding of outsourcing relationship. To overcome the problem, we consider both the client and vendor firm simultaneously to provide a deeper understanding of outsourcing relationship. As being an early effort in that direction, a research model is proposed based on the contingency theory.

The contingency theory is related to the fit between the elements. Fit refers to a match between two or more factors and is conceptualized as having an impact on organizational outcomes (Van de Ven & Drazin, 1985). We apply this theory to the context of IS outsourcing. On one hand, client firm's IT capability can ensure that adequate IT resources is appropriately distributed to meet organizational requirements. It encompasses organizational relationship management, managerial competence, architecture planning, and monitoring emerging technologies. On the other hand, vendor firm's competence can afford benefits to clients, by providing core skills required to build high quality information systems, and helping to build good relationship with clients (Levina & Ross, 2003). At the same time, the fit between client IT capability and vendor competences could ensures effective client-vendor relationship, thereby increasing the relationship intensity, and consequently leads to outsourcing success. The research model proposed in this study is shown in Figure 1.

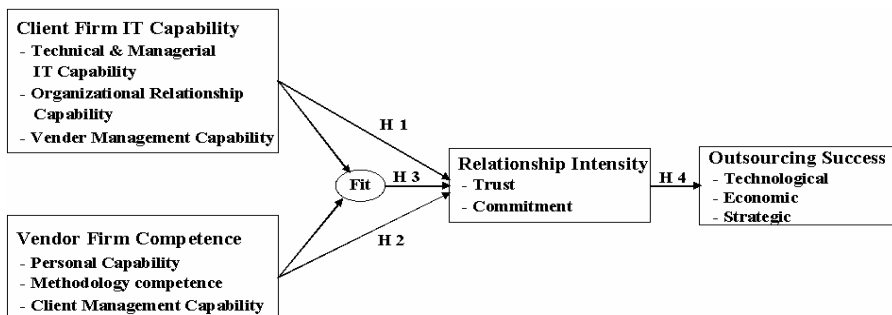


Figure 1. Contingency fit model of IS outsourcing relationship

3.2. Variables of Research Model

3.2.1 Client Firms' IT Capability

Variables in the firms' IT capability are extracted from the existing IS literature conducted mainly from the resource-based view (RBV). The RBV provides a theoretical foundation to explain the firms' IT capability and resource. Based on Lee, et al. (1995) and Feeny & Willcocks (1998)'s studies, we introduce three variables to reflect the client firm's IT capabilities affecting outsourcing success through relationship intensity. The variables are IT capability consisting of technical IT capability and managerial IT capability, organizational relationship capability, and vendor management capability. Technical IT capability refers to the technical knowledge and skills needed to develop applications in the firm (Lee, et al., 1995). Managerial IT capability refers to where and how to deploy IT effectively and profitably for meeting strategic business objective (Mata, et al., 1995). Organizational relationship capability reflects the relationship level between IT and business groups within an organization, which enables the business to constructively engage in IT issues (Bassellier, et al., 2004). Vendor management includes the capability to looking beyond existing contractual arrangement to explore the long-term potentials to create win-win situation (Feeny & Willcocks, 1998).

3.2.2 Vendor Firm's Competence

Vendors may possess distinctive competency and resources, which leads to becoming the dominant player in the area of outsourcing (Pinningt & Woolcock, 1997). Despite growing interests in vendor's competency and resources, the prior studies paid only slight attention on the vendor's competency and resources and how it generates value in outsourcing relationship. Instead most researches discussed on corporate IT assets requirements, skills required to IT personnel.

Kim and Chung (2003) argued that the vendor capability includes experience, track record, technical competence, and financial status. Levina & Ross (2003) divide it into three classes - personnel capability, methodology competence, and client management capability - and consider them as key enablers to have healthy client-vendor relationship and client satisfaction. This study adopts this classification for vendor firm's competence.

3.2.3 Relationship Intensity

Mohr & Speknam (1994) defined relationship as the purposive strategic relationship between independent firms who

share compatible goals and strive for mutual benefits to acknowledge the high level of mutual interdependence. The relationship intensity has been referred as diverse terms such as relationship closeness, relationship quality, relationship strength (e.g. Bove & Johnson, 2001), partnership quality (Lee and Kim, 1999), and so forth. Variables employed to measure the level of relationship intensity in the literature are as follows; trust, dependence, commitment and coordination (Mohr & Speknam, 1994); trust, business understanding, benefit and risk share, conflict, commitment (Lee & Kim, 1999); communication, trust, cooperation, satisfaction (Grover et al., 1996). Bove & Johnson (2001) summarized the prior literature and proposed two key attributes of relationship intensity, i.e., trust and commitment. This study adopts them as main constructs of the relationship intensity.

3.2.4 Outsourcing Success

The outsourcing success in previous studies has been interpreted as satisfaction (Grover et al., 1996; Saunders et al., 1997; Lee & Kim, 1999). Satisfaction is defined as a positive and affective state resulting from the appraisal of all aspects of a firm's working relationship with another firm (Anderson & Narus, 1990). Satisfaction, as investigated by the previous research, is a reasonable surrogate for measurement of IS outsourcing success. Hence, satisfaction has been accepted as good measure of IS outsourcing success. The major types of IS outsourcing satisfaction identified in the literature are economic, technological and strategic benefits (Grover et al., 1996; Saunders et al., 1997; Lee & Kim, 1999), which are adopted in this study.

3.3. Research Hypotheses

3.3.1. Relationship between Client Firm's IT Capability and Relationship Intensity

The client's firm's IT capability is important to ensure effective relationship with vendors in IS outsourcing (Kern & Willcocks, 2002). The capability can convince the vendor of client firms' goal and concern, and help clients achieve the goal (Feeny & Willcocks, 1998; Bassellier et al., 2004). Client firm's IT knowledge on IT trends can encourage vendors to share valuable information with their partners. It is also true that the firm having a clear IT standardization and blueprint should be in a better position to communicate with its vendors. That in turn improves the relationship intensity with vendor.

Relationship between IT and business groups within an organization enables business people to more actively engage in IT issues (Bassellier & Benbasat, 2004). Close inter-organizational

relationship can induce more information sharing between the client and the vendor not only to correctly reflect business needs but also to achieve business goals. Even somewhat confidential information can be shared each other. That may lead higher degree of relationship intensity of the vendor.

Vendor management helps vendors to successfully implement their services to satisfy all user's needs (Lacity et al, 1995). In addition to contractual obligations, formalized outsourcing management processes and work evaluation principles are required to higher level of relationship intensity. Also a good relationship cultivated by effective vendor management will create the win-win situation for potential future benefits (Feeny & Willcocks, 1998).

In sum, the existing literature suggests that higher client firm's IT capability is associated with higher level of relationship intensity. Thus, the following hypothesis is proposed.

H1: Client firm's IT capability has a positive effect on relationship intensity

3.3.2. Relationship between Vendor Firm's Competence and Relationship Intensity

The vendor capability is critical to successful implementation of IS outsourcing (Kim & Chung, 2003; McFarlan & Nolan, 1995). When a vendor possesses distinctive competency and resources, it can become the dominant player in their business (Pinning & Woolcock, 1997). Many studies in inter-organizational and inter-personal relationships have considered ability or capability as a critical characteristic of successful relationship. Therefore, vendor should have the capability to keep up with ever-changing technology and to maintain the service and relationship (Kim & Chung, 2003). Client satisfaction is achieved when the application of core competencies to projects is enabled by a healthy client-vendor relationship, which is in part influenced by the vendor's competencies in managing client relationships (Levina & Ross, 2003).

We divide the vendor capability into three classes, personnel capability, methodology competence, and client management capability, according to Levina & Ross (2003)'s study. Personnel capability reinforces customer relationship by ensuring that staffs understood and accepted accountability for meeting contractual obligations. Effective inter-personal skills will help establishing right customer expectations to build healthy relationship. The methodology competence of vendor's firm is necessary for consistent delivery of solution to client problems in the process of IS outsourcing.

This leads to significant operational improvements and efficiencies in the project process, and improves relationship by defining and standardizing best practices. The client management capability reduces uncertainty, thereby creating ongoing relationship between client and vendor. Thus, the vendor firm's competencies have a positive effect on the relationship intensity. Thus the following hypothesis is proposed.

H2: Vendor firm's competence has a positive effect on relationship intensity

3.3.3. The Fit between Client Firm's IT Capability and Relationship Intensity

The fit among contextual, structural, and strategic is the most significant characteristics found in the high performance firms(Doty et al. 1993). The contingency theory discussed above led us to believe that fit between client firm's IT capability and vendor firm's competence will contribute to better relationship and IS outsourcing success.

Client technical capability fit is associated with vendor firm's personal capability, methodology competence, and client management. The synergy will be captured necessarily in the sense that vendor competencies will be exerted more effectively under the productive environment afforded by the client IT capability. Client firm's favorable inter-organizational atmosphere with business people will allow vendor firm personnel to better communicate with them. And that client personal capability can be better exercised to meet the customer requirements. That will effect higher relationship. Similarly, the vendor firm's methodological competence can be utilized in a better way if the client can appreciate methodologies, and knows how to manage them. It also makes sense that vendor firm's client management competence can work better when client is ready.

On the other hand, client IT capability should effect better relationship when they are working with qualified vendors. For example, technically qualified vendor personnel will appreciate well-designed IT blueprint of the client. Vendor management capability and favorable inter-organizational environment of the client will necessarily encourage vendor's endeavor to fully exercising their competency. We hypothesize this as follows.

H3: The fit between client firm's capability and vendor firm's competence has a positive effect on relationship intensity

3.3.4. Relationship between Relationship Intensity and Outsourcing Success

Many research indicated that the relationship between client and vendor influences the success of IT outsourcing (Grover et al., 1995; Klepper, 1995; McFarlan & Nolan, 1995; Lee & Kim, 1999; Kern & Willcocks, 2002). We identified the importance of relationship intensity, including trust and commitment, from the previous literature (e.g., Bove & Johnson, 2001). As an antecedents of IS outsourcing success, the two variables are good indicators of measuring relationship intensity (Grover et al., 1996; Lee & Kim, 1999; Kern & Willcocks, 2002). Trust can be defined as a firm's belief that another company will perform actions that result in positive outcomes for the firm and not engage in unexpected behaviors with negative outcomes (Anderson & Narus, 1990; Grover et al., 1996). Commitment is defined as an exchange partner's belief that an ongoing relationship with another is so important as to warrant maximum efforts on maintaining it. Thus, the relationship intensity is associated with outsourcing success, and the following hypothesis is proposed.

H4: Relationship intensity has a positive effect on outsourcing success

4. Research Methodology

4.1. Measures

This study adopted constructs that had already been used and validated by other researchers. Client firm's IT capability variables were measured based on Lee et al. (1995), Bassellier et al. (2003), Nelson & Coopridner (1996), and Feeny & Willcocks (1998)'s studies. The vendor's competence variables were assessed by adopting Levina & Ross (2003), Lee et al. (1995), and Bassellier et al. (2003)'s measures. The measures of the relationship intensity variables were developed based on the concepts of commitment-trust theory by Morgan & Hunt (1994). Finally, outsourcing success was measured in terms of strategic, economic, and technological outsourcing gains developed by Grover, et al. (1996). A five-point Likert-style questionnaire was developed for all measures.

4.2. Data Collection

The initial version of the questionnaire was pre-tested by faculty members, managers in IT organizations, and IS workers in client firms. Each item was reviewed by them to improve content and construct validity. The final questionnaire consisted of 54 items for 11 constructs. Data collection involved 25

outsourcing projects between clients and vendors. Finally, we collected 185 responses, 84 from clients and 101 from vendors, from 20 outsourcing projects. We summarize the profile of respondents in Table 1.

Table 1. Profile of respondents

Sample	Response classification		Response frequency		Outsourcing type*
	Client Firm	Vendor Firm			
20 projects	84		Team leader	9	SI: 12 SM : 8
			Project Manager	11	
			Team Worker	64	
	101		Team leader	14	
			Project Manager	19	
			Team Worker	68	
Total	185		185	20	

* SI: Systems Integration; SM: System Management

4.3. Reliability and Validity of Measurement Models

We analyzed the gathered data using the confirmatory approach by maximum-likelihood estimates of the LISREL 8.54. Before analyzing the structural model, the validity of the measurement model was examined. Among 54 items, 15 were discarded due to lower consistency between measurement items. Finally, 39 items were used for the final analysis.

The reliability was then estimated by examining composite reliability. The value of composite reliability ranged from 0.79 to 0.93, as shown in Table 2, which is higher than a commonly used threshold for acceptable reliability, 0.7. Three types of validity were assessed: content validity, convergent validity, and discriminant validity. Content validity was established by ensuring consistency between measurement items and the extant literature. This was done by interviewing the faculties and practitioners and during the pilot-testing of the instrument. We assessed convergent validity by examining composite reliability and average variance extracted (AVE). AVE for our measures ranged from 0.50 to 0.86, while the threshold for acceptable convergent validity is 0.5 (Hair et al.1998). For discriminant validity, it was assessed by looking at the square root of the average variance extracted. The square root of the average variance extracted for each construct was greater than the correlations between all other constructs, as described in Table 3.

Table 2. Reliability and Validity

Measure	Item		Standard loading	Composite Reliability	AVE*
	Initial	Select			
Client IT Capability					
Technical & managerial IT	10	6	0.75, 0.85, 0.78, 0.78, 0.76, 0.74	0.90	0.65
Organizational relationship	5	4	0.79, 0.84, 0.82, 0.83	0.89	0.67
Vendor management	5	5	0.78, 0.83, 0.84, 0.85, 0.86	0.92	0.69
Vendor Competence					
Personnel capability	12	6	0.65, 0.72, 0.70, 0.76, 0.69, 0.70	0.85	0.50
Methodology competence	5	4	0.72, 0.81, 0.76, 0.86	0.87	0.62
Client management	5	4	0.77, 0.80, 0.71, 0.74	0.84	0.57
Relationship Intensity					
Trust	4	3	0.70, 0.83, 0.90	0.85	0.66
Commitment	4	3	0.87, 0.84, 0.77	0.87	0.67
Success					
Strategic benefit	3	3	0.83, 0.80, 0.83	0.86	0.67
Economic benefit	3	3	0.83, 0.81, 0.84	0.87	0.68
Technological benefit	3	3	0.88, 0.86, 0.70	0.86	0.67
Second order Variables					
Client IT Capability	3	3	0.86, 0.78, 0.76	0.84	0.64
Vendor Competence	3	3	0.87, 0.83, 0.91	0.90	0.86
Client * Vendor	9	9	0.65, 0.57, 0.70, 0.77, 0.72, 0.84 0.89, 0.90, 0.92,	0.93	0.56
Relationship Intensity	2	2	0.69, 0.92	0.79	0.66
Success	3	3	0.92, 0.85, 0.92	0.93	0.81

* Average Variance Extracted

Table 3. Correlation of between constructs

	1	2	3	4	5	6	7	8	9	10	11
1. Technical & managerial IT	0.78										
2. Organizational relationship	0.69	0.82									
3. Vendor management	0.66	0.54	0.83								
4. Personnel capability	0.03	0.31	0.33	0.71							
5. Methodology competence	0.27	0.44	0.37	0.66	0.79						
6. Client management	0.09	0.34	0.40	0.75	0.74	0.76					
7. Trust	0.30	0.47	0.40	0.52	0.56	0.53	0.82				
8. Commitment	0.19	0.34	0.39	0.71	0.62	0.75	0.64	0.83			
9. Strategic benefit	0.25	0.42	0.50	0.59	0.56	0.65	0.54	0.62	0.82		
10. Economic benefit	0.16	0.23	0.39	0.50	0.41	0.51	0.34	0.55	0.76	0.83	
11. Technological benefit	0.14	0.24	0.42	0.57	0.50	0.58	0.42	0.59	0.80	0.81	0.82

The members on the diagonal are the square roots of the average variance extracted

Table 4. Measures of model fit

Comparison Measures	Recommended Level	Research model
Absolute fit Measures		
Chi-Square/df (p-value)	p>0.05	297/139(P=0.00)
Goodness of Fit Index (GFI)	Higher	0.87
Root Mean Square Residual (RMSR)	lower	0.08
Root Mean Square Error of Approximation(RMSEA)	<0.08	0.07
Incremental fit Measures		
Non-Normed Fit Index (NNFI)	>0.9	0.96
Adjusted Goodness of Fit Index (AGFI)	>0.8	0.80
Normed Fit Index (NFI)	>0.9	0.95
Parsimonious fit Measures		
Normed Chi-Square	1.0~2.0/3.0	2.13
Comparative Fit Index (CFI)	High value	0.94
Critical N (CN)	>100-150	112
Overall model fit Measures		
Normed Chi-Square	1.0~2.0 or 3.0	2.13

5. Analysis and Finding

5.1. Measures of Model Fit

Before evaluating the structural equation

model, we assessed the overall fit of the model to ensure that it was an adequate representation of the entire set of causal relationships. We assessed the three types of goodness-of-fit measures:

absolute fit measures, incremental fit measures, and parsimonious fit measures (see Table.4). As for the absolute fit measures, the chi-square result was nonsignificant (297, $p=0.00$) and the GFI (0.87) was lower. But, other incremental fit measures and parsimonious fit measures indicated that the model is marginally acceptable. And normed chi-square (2.13) for the model was found to be within acceptable threshold limits (1.0–2.0 or 3.0). Thus, overall model fit measures indicate that this model is acceptable. We summarize all the measures in Table 4.

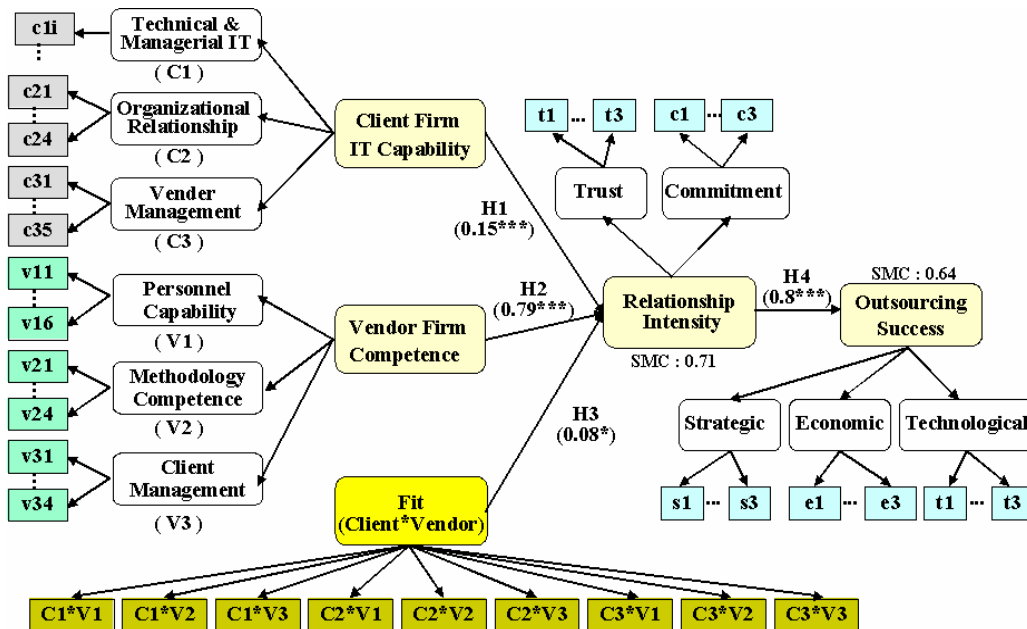
5.2. Testing the Hypotheses

The proposed model and hypotheses were analyzed with the method of maximum-likelihood estimates by the LISREL 8.54 with the sample covariance matrix for all indicators used in this study as the input matrix. The structural model was assessed in terms of path significance (t value). The level of significance $p < 0.10$ ($t > 1.64$) was employed.

We adopted the two steps approach method for analyzing the research model. First, we calculated the value of composite indicators of the first order latent variables. The composite indicator values were computed from confirmatory factor analysis (CFA), and illustrated in Table 2. Second, using the composite indicator, we developed the

interaction model for analyzing the effect of the fit on relationship intensity. There are several methods to treat the interaction terms; using all feasible product terms of the variables (Kenny and Judd, 1984), using one product term selected from all variables (Jöreskog and Yang, 1996), using a single interaction indicator obtained from summated rating scales multiplication computed from each latent variables (Ping, 1995); using latent variables score (Schumacker, 2002). In this study, we used all feasible product terms method (Kenny & Judd, 1984) to estimate the interaction effect. The method has been generally used for interaction effect measurement study.

The results show that client firm's IT capability (H1) and vendor firm competence (H2) significantly influences relationship intensity. Moreover, the interaction effect, i.e., fit between client firm's IT capability and vendor firm competence, is significantly associated with relationship intensity (H3). Finally, the relationship intensity has a significant positive impact on outsourcing success (H4). We present the result of hypotheses testing in Figure 2 and Table 5. Also significant indirect effects are revealed between these antecedents and outsourcing success, which indicate that relationship intensity is a meaningful mediating construct.



SMC : Squared multiple correlation

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 2. Result of the analysis of model using LISREL

Table 5. Measures of testing the hypothesis

Path	Hypothesis	Estimate	T-value	Result
Client IT capability → Relationship intensity	H1	0.15	2.77***	Support
Vendor competence → Relationship intensity	H2	0.79	12.48***	Support
Client * Vendor(fit) → Relationship intensity	H3	0.08	1.74*	Support
Relationship intensity → Success	H4	0.67	9.81***	Support
Indirect effect				
Client IT capability → Success		0.10	2.69***	Significant
Vendor competence → Success		0.53	8.31***	Significant
Client * Vendor(fit) → Success		0.06	1.73*	Significant

*p<0.10, **p<0.05, ***p<0.01

6. Discussion and Conclusion

The contribution of this study is the introduction of strategic fit theory in IS outsourcing relationship research. Also the following characteristics are distinguished from most prior IS outsourcing studies. First, we considered both client IT capability and vendor competence at the same time to examine their impact on relationship intensity. Second, we measured the research model at individual base to reflect the tendency that IS outsourcing relationship take place at IS worker level rather than firm level. Third, we collected samples from both client and vendor instead of client only, which most other studies did. Synthetically, we believe that this study provides a better understanding of the outsourcing relationship and how it can be managed to ensure outsourcing success.

By adopting a fit as a moderation, we proposed the hypotheses that client IT capability, vendor competence, and the fit among them shall positively impact the relationship intensity, thereby leading to the success of outsourcing. The fit was tested using the structural equation model (SEM) with the 185 responses obtained at IS worker level from 20 IS outsourcing project teams of both client and vendor. The empirical testing results support our hypotheses.

The limitation of this study was the composition of the sample. Somehow it lacks randomness in the sense that the number of project units is limited, and they are selected mostly via personal acquaintances. However, we believe that it does not significantly harm the research findings due to high quality data that were randomly distributed and collected. Second, this study was conducted as a snapshot research without considering the dynamic nature of outsourcing relationship. On the base of this research, further research could be recommended. Contextual situations and contexts of IS outsourcing environment can be considered to extend the proposed model in this study.

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