The Impacts Of Network Governance On The Erformance Of Ito: A Study Of Taiwanese Firms

Tzu-Chuan Chou  
Department of Information Management, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C,  
tcchou@mail.ntust.edu.tw

Shu-Mei Hsu  
Department of Information Management, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C,  
D9809202@mail.ntust.edu.tw

Gwo-Guang Lee  
Department of Information Management, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C,  
lgg@cs.ntust.edu.tw

Follow this and additional works at: http://aisel.aisnet.org/pacis2012

Recommended Citation  
http://aisel.aisnet.org/pacis2012/132

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2012 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.
THE IMPACTS OF NETWORK GOVERNANCE ON THE PERFORMANCE OF ITO: A STUDY OF TAIWANESE FIRMS

Tzu-Chuan Chou, Department of Information Management, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C., tcchou@mail.ntust.edu.tw

Shu-Mei Hsu, Department of Information Management, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C., D9809202@mail.ntust.edu.tw

Gwo-Guang Lee, Department of Information Management, National Taiwan University of Science and Technology, Taipei, Taiwan, R.O.C., lgg@cs.ntust.edu.tw

Abstract

Information technology outsourcing (ITO) has been a topic of great interest, one that organization researchers have studied extensively. Previous studies have suggested that ITO research has expanded from one organization and bilateral partnerships to a network form of organization that links multiple organizations and spans inter-organizational boundaries. Yet, little research has been conducted on the link between network governance and ITO performance as a way to understand an organization’s ITO efforts. This study proposes a model that employs several constructs: inter-organization coordination, contractual governance and relational governance, and technological hegemony. The model explores the mediating roles of these governance mechanisms and the moderating role of technological hegemony as it influences the IT manager’s perception of the performance of ITO. Empirical testing of the model is based on a sample of 191 companies from Taiwanese industries. The results support the mediating effect of relational governance and the moderating effect of technological hegemony. The implications of these findings for ITO management are discussed.

Keywords: ITO, network governance, inter-organization coordination, contractual governance, relational governance, technological hegemony
1. **INTRODUCTION**

Information technology outsourcing (ITO) refers to transferring part or all of a firm’s Information Systems/Information Technology-related functions, business processes, internal activities, and services to an external provider (Chen and Wang 2009; Kern and Willcocks 2000). Much research has focused on the economic perspectives of ITO such as transaction cost theory, resource-based theory, and agency theory (e.g., Choudhury and Sampler 1997; Teng et al. 1995; Willcocks et al. 1995). Research has shifted its focus, however, from economic viewpoints to social viewpoints, such as social exchange theory and outsourcing relationships (e.g., Okoli and Oh 2007; Chou et al. 2006; Kern and Willcocks 2000). Indeed, the relational network can promote a normative environment that facilitates cooperation among various actors (Coleman 1990).

The concept of ITO cooperation has also expanded from one organization or a bilateral partnership to a network form of organization, which links multiple organizations and spans inter-organizational boundaries. In this way, the practice has become an entire community (Hätönen and Eriksson 2009; Miranda and Kavan 2005). Accordingly, inter-firm cooperation has progressed to a somewhat symbiotic and coexistent community, which tends to unite cooperative companies and vendors around the firm as a network organization (Li 2009). Along with developing the concept of a network organization, these studies imply that understanding network governance of ITO is an important viewpoint when examining the performance of ITO. Yet, despite a growing body of research focusing on IT governance, previous studies have neglected the impact of network governance on ITO performance.

Lack of a thorough understanding of network governance is a drawback in pursuing improved ITO performance. On the one hand, in ITO, network governance not only serves to negotiate and harmonizing certain unequal situations and conflicts, but also enhances the quality of relationships and contracts and introduces more efficiency in governing contracts and relationships (Lin et al. 2011). On the other hand, the relationship between the outsourcer and the contractor can be seen as a double-edged sword: it can be treated as both a resource in facilitating ITO projects and as a burden in reducing the rationality of decision-makers (Chou et al. 2006).

A great deal of the research has examined the influence of partnership on ITO performance has ignored the role of organization autonomy in developing partnerships. The gap is especially notable because it may lead to an increase in the phenomena of technological hegemony, because the outsourcing relationship is sometimes operated under knowledge asymmetry and the commissioned contractor (the agent) has more professional technology than the outsourcer (the principal) (Goo et al. 2009; Tiwana and Bush 2007). As a result, the outsourcer could be dominated by the superior techniques of the IT contractor because trust and dependence are embedded in the outsourcing partnership. Such technological hegemony can induce contractors to demand more resources from the outsourcer and leverage their strengths to force the outsourcer to accept unattractive governance features then make outsourcer lose autonomy unconsciously (Bosse and Alvarez 2010; Bunderson and Reagans 2011). Clearly, then, the phenomenon of technological hegemony is a crucial threat to outsourcing activities; thus, we should further investigate its influence in inter-organizational cooperation.

Examining these underlying influences by integrating insights from the literature on network governance, technological hegemony, and ITO performance provides the primary motivation for the current study. Based on prior literature, the constructs and hypotheses are developed. Scales for these constructs are then validated empirically using data collected from a national survey of 191 companies from Taiwanese industries. A Partial Least Squares (PLS) method is used to test the reliability and validity of constructs and hypothesized relationships. The implications of the findings for effective ITO performance are discussed.
2. THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

2.1. Theoretical Background

Network governance research has received attention from various fields including health service (Lewis et al. 2008), supply chain (Wong et al. 2009), and semiconductor industry alliances (Lin et al. 2011). Liebeskind et al. (1996) suggested that network governance refers to a collective of individuals whose interactions only take place within the realm of shared norms and trustworthy behavior. In terms of ITO, the outsourcer and contractor also possess similar characteristics of network governance. The rationale for building our theoretical model, therefore, is as follows.

First, prior research has suggested that inter-organizational coordination is the core of network governance (Grandori and Soda 1995; Jones et al. 1997) and positively enhances project performance (Moenaert and Souder 1990; Hoegl et al. 2004).

Second, inter-organizational cooperative relationships can be built based on contracts; however, IT ventures possess the characteristics of future uncertainty and contract incompleteness (Heiskanen et al. 2008). In other words, network governance encompasses multiple autonomous organizations, rendering the need to resort to social and institution mechanisms to embed network governance in the structure of non-contractual and social relationships (Yoon and Hyun 2010). In particular, it is necessary to use relationship mechanisms to help cooperative arrangements perform smoothly and thus enhance performance (Goo et al. 2009; Luo et al. 2002). Accordingly, network governance not only concerns contractual governance mechanisms, but also embeds relational governance mechanisms (Lin et al. 2011). Accordingly, the present study examines inter-organization coordination, contractual governance, and relational governance as the three core constructs to represent network governance.

Third, among these three core constructs, because network governance requires a coordinating mechanism to reinforce both transactional and relational mechanisms (Lewis et al. 2008; Wong et al. 2009), the present study suggests that inter-organization coordination is the antecedent, contractual governance and relational governance are the means, and ITO performance is the result of the corporation’s ITO activities. As such, the influences of inter-firm coordination on ITO performance could be both direct and indirect through the intermediator mechanisms of contractual and relational governance. The mediating roles of those two governance mechanism should be depicted clearly.

Fourth, because social networks may be plagued by the risk of “overembeddedness” (Uzzi 1997, p. 24) thereby leading to a situation in which the outsourcer’ overly trusts and depends on the contractor. The present study suggests that technological hegemony plays a negatively moderating role in the relationship between relational governance and ITO project performance. Based on these discussions, Figure 1 illustrates the proposed research model. The details of this model and the proposed hypotheses are discussed in the following sections.

![Diagram of Theoretical Model of the Present Study](image-url)
2.2. Inter-organizational coordination

In ITO research, inter-organizational coordination is not only a core element of the network governance concept, but also a prerequisite capability of alliance management (Kandemir et al. 2006; Schilke and Goerzen 2010). Inter-organizational coordination ensures that cooperative relationships are governed efficiently and that the legitimacy of transactions between the partners is enhanced (Kumar and Nti 1998). One important aspect of inter-organizational coordination is the role of operational adaptation as a relational mechanism, in which firms are willing to adapt to their partner’s unforeseen needs in the process of cooperating (Walter 2003). Further, inter-organizational coordination can help an organization accumulate social capital in an era characterized by network cooperation (Miranda and Kavan 2005; Schilke and Goerzen 2010). Accordingly, positive coordination between the outsourcer and contractor will create new alliance management capabilities, and in turn create the conditions to maximize the synergy of the joint cooperation. In contrast, the lack of an effective coordination mechanism between the outsourcer and contractor could induce asynchronous conditions between activities and lead to the risks of conflict and misunderstanding (Jha and Iyer 2007). For these two reasons alone, inter-organizational coordination is of critical importance in studying ITO performance.

2.3. The relationship between inter-organizational coordination and contractual governance

Outsourcing is a kind of transaction mode of delayed accomplishment that needs a mechanism to protect the interests and rights of both parties. The economic perspective of outsourcing governance from the perspective of the New Institutional Economics (NIE) relates to transaction costs, which legally enables contract control (e.g., Aulakh and Gençtürk 2008). Based on NIE, a contract provides a legally binding, institutional framework that can regulate explicitly the penalty of failing to fulfill obligations and can curb opportunistic actions (Hoetker and Mellewigt 2009; Liu et al. 2009; Lui et al. 2009). In other words, both parties are bound to resolve disputes and conflicts by following the transaction rules of the contract, which arrange the responsibilities, rights, and benefits of the relationship (Ring and Van de Ven 1992).

A completed contract can decrease risk and uncertainty (Lui et al. 2009) and lead to a high quality ITO relationship (Goo and Huang 2008). A contract does not ensure, however, the success of an outsourcing transaction. Indeed, many examples of failures confront the question of lacking consensus between organizations (e.g., Davies et al. 2011). That is, contracts may help legalize the parameters of the outsourcing agreement, but efforts are still needed to coordinate activities and processes day-to-day that determine the effectiveness of such contracts (Nielsen 2010). As such, inter-organizational coordination can enhance the quality of the contract for both parties to ensure the contract performs as designed (Hoegl et al. 2004). Similarly, Ness and Haugland (2005) argued that coordination and governance mechanisms were complementary, and the former, in particular, needs to be used in earlier stages of a cooperative arrangement. Therefore, the current paper expects the extent of inter-organizational coordination will impact the effects of contractual governance of ITO projects:

Hypothesis 1: Inter-organizational coordination is positively related to the effects of contractual governance of ITO projects.

2.4. The relationship between inter-organizational coordination and relational governance

Relational governance refers to informal governance mechanisms of inter-firm network governance (Lin et al. 2011; Miranda and Kavan 2005). It is the social dimension of outsourcing governance, which emphasizes that all economic activities, including outsourcing, are embedded in the social structure and will be influenced by interpersonal relationships through social relationships and informal self-restraint (Ferguson et al. 2005). Relational governance is desirable for all ITO projects, because IT/IS outsourcing projects are characterized as an “incomplete contract” (Heiskanen et al.
In terms of the inter-organization perspective, relational governance has been operationalized as the extent to which social norms exist in inter-organizational transaction activities (Ferguson et al. 2005). In other words, relational governance encourages the responsibilities, goals, expectations, and commitments through relational or social mechanisms. In an ITO process, inter-organizational coordination and negotiation between the outsourcer and contractor can foster more consistent consensus (Ferguson et al. 2005) and coordination could enhance inter-firm information sharing and teamwork capabilities (Kandemir et al. 2006). Accordingly, Todeva and Knoke (2005) indicated that relational governance between organizations had built on coordination mechanism, which composes mutual regulation and social interaction. Based on these studies, the present study expects the extent of inter-organizational coordination will impact the effects of relational governance within ITO projects.

**Hypothesis 2:** Inter-organizational coordination is positively related to the effects of relational governance of ITO projects.

2.5. **Perceived Outsourcing project performance**

Although ITO project performance is the key dependent variable, evaluating effective outsourcing performance may not be an easy task. In terms of network governance, the present study suggests focusing on perceived project satisfaction by asking questions such as ‘we are satisfied with the outcomes of this ITO collaboration’ rather than an objective measure of project performance. Lee et al. (2003) supports this approach: “Performance measures were often not generalizable, since they depended on the specific nature of the outsourcing projects.” In other words, this study is interested in alliance performance, which refers to the perceived performance of outsourcing projects on the dimension of inter-organizational cooperation within an alliance orientation. Previous studies (e.g., Schilke and Goerzen 2010) used the term alliance management capability to highlight that cooperative capabilities within an alliance can positively enhance alliance performance (Kandemir et al. 2006). Because the cooperative pattern in today’s business environment is generally considered a symbiotic network, the level of ITO project performance should focus on viewing the network from a higher level to study the governance mechanisms on performance. Thus, the analysis unit of the performance construct in the present study focuses on the project level of inter-organizational cooperation.

2.5.1. **Relationship between contractual governance and perceived outsourcing project performance**

Contracts have been considered as a governance mechanism in ITO projects. Generally, contracts are a kind of safeguard mechanism (Wang et al. 2008) and, under explicit responsibilities and obligations, functions to reduce disputes related to any uncertainties that occur in a transaction or project (Lui et al. 2009). Furthermore, transaction cost economics (TCE) has been used widely to explain how outsourcing governance structures have enabled exchanges by safeguarding against hazards that may arise from exchange characteristics, such as specificity and uncertainty (Chen and Bharadwaj 2009). Accordingly, contractual governance can be referred as the ex ante measures that actors involved in an exchange may implement to mitigate risks and therefore also improve performance (Rooks et al. 2006).

Although effective contractual governance may increase transaction costs, as Kern and Willcocks (2000) noted that the IT outsourcing contract is unarguably for outsourcing success. Because a contract can also effectively predict and manage future activities, which guarantees future transactions (Goo and Huang 2008), and in turn leads to managing the alliance more easily, it is obvious that the extent of contractual governance will influence the perceived performance of outsourcing projects. As such, the third hypothesis is proposed as follows:

**Hypothesis 3:** The level of contractual governance is positively related to the extent of perceived outsourcing project performance.
2.5.2. Relationship between relational governance and perceived outsourcing project performance

Previous studies (e.g., Poppo and Zenger 2002) have suggested that relational norms, such as trust, are viewed as substitutes for complex, explicit contracts or vertical integration. Accordingly, relational exchange theory posits that relational norms are a distinct form of governance (relational governance) that prescribes commitment and proscribes opportunism in exchange relationships (Joshi and Stump 1999). In ITO projects, the relational governance mechanism is of vital importance because the ITO relationship is based on trust and commitment, which binds the parties to one another (Heiskanen et al. 2008).

Many previous studies have demonstrated that relational governance between firms will positively and strongly influence transaction performance (e.g., Ferguson et al. 2005; Lacity et al. 2009). In addition, lacking a mature relational governance mechanism may lead to poor outcomes because, even with a detailed contract, the partners’ cooperative goals will likely fail in the end (Cannon et al. 2000). With contracts, inter-firm trust and commitment facilitate the cooperation, which in turn leads to project success (Ferguson et al. 2005). Also, inter-firm commitment encourages the partners’ willingness to ensure projects perform well, and reduce the risks of harming cooperation (Morgan and Hunt 1994; Hoegl et al. 2004). Therefore, the present paper expects the level of relational governance will influence the extent of perceived project performance. We thus propose Hypothesis 4:

Hypothesis 4: The level of relational governance is positively related to the extent of perceived outsourcing project performance.

2.6. The mediating relationship between interorganizational coordination and relational governance and perceived outsourcing project performance

Some studies (e.g., Hoegl et al. 2004) have suggested the direct link between interorganization coordination and outsourcing project performance. In contrast, other researchers (e.g., Nevens et al. 1990) have emphasized that high-performing companies build an extensive cross-boundary network connecting which is better than those of low-performing companies. The contradiction between these two outcomes implies that assessing outsourcing project performance may include the direct effects of interorganization coordination and indirect effects that are mediated by governance mechanisms. Previous studies (e.g., Vandaele et al. 2007; Han et al. 2011) have suggested that governance mechanisms are an important mediator. For example, Ferguson et al. (2005) adopted boundary-spanner closeness perspectives to examine how governance mechanisms play a mediator role and affect project performance.

Information technology outsourcing contracts are characterized as incomplete and uncertain (Ness and Haugland 2005). On the one hand, both the outsourcer and contractor need ex ante communication and coordination in seeking a high-quality contract that meets both parties’ expectations. On the other hand, because mutual coordination facilitates consensus, which can increase the level of trust and commitment (Ferguson et al. 2005), a good relationship network can also affect the outcome of ex ante communication and coordination. Under such relationships, performance and satisfaction are far better than those with a contract only (Liu et al. 2009). The implications of these indirect effects for project performance should be depicted clearly. Accordingly, the present paper proposes the next two hypotheses in testing the mediating effects of both contractual and relational governances in linking interorganizational coordination and ITO project performance:

Hypothesis 5a: Contractual governance mediates the relationship between interorganizational coordination and IT outsourcing project performance.

Hypothesis 5b: Relational governance mediates the relationship between interorganizational coordination and IT outsourcing project performance.

2.7. The moderating role of technological hegemony

The concept of hegemony has been discussed in political, cultural, and medical arenas (e.g., Ekers 2009; File 2004), but has been neglected by the IT management field. Xue et al. (2008) described that
the more powerful IT functions are, the more influence they will have on IT investment decisions. Therefore, the present paper argues that the phenomenon of technological hegemony may exist in inter-firm transactional relationships in which one party may dominate the other. In addition, a hegemonic project affirms relationships of domination (Filc 2004).

In the context of IT outsourcing, the outsourcer without proper knowledge and technology could experience poor IT performance. Choosing a trustworthy contractor seems to lead to many advantages (such as saving the costs of self-implementation and self-maintenance) and reduce risks of failure. From another perspective, as time passes, the outsourcer may come to depend heavily on its contractor. This is particularly true because knowledge asymmetry between the outsourcer and the contractor tends to favor the IT contractor and leads to the outsourcer having less control over IT projects, resulting in the outsourcer ceding its control authority to the contractor and losing autonomy (Park et al. 2011). For example, Dencker (2009) pointed out that when one party is more dependent than the other party, it has decreased bargaining power and therefore loses control over the relationship.

The present paper has emphasized that a good relationship with a contractor is important to get more support and increase satisfaction with project performance. As mentioned, however, the outsourcer’s tendency to trust too much and become dependent on the contractor leads to overembeddedness, which reduces the outsourcer’s autonomy. Outsourcing activity is thus an agency behavior, and the agent may engage in opportunistic behavior. By holding more information than the principal, information asymmetry will occur (Tiwana and Keil 2009). Moreover, the predominant party will tend to dominate discussions and influence decisions within the unequal relationship (Bunderson and Reagans 2011).

As a result, Gassenheimer et al. (1996) showed that opportunism can hinder the development of trust and commitment. In addition, Caniëls and Roeleveld (2009) discovered that when the power relationship is asymmetrical, the quality of cooperation will deteriorate. Based on these arguments, the present paper suggests that technological hegemony plays a moderating role between relational governance and ITO project performance; that is, the higher the level of technological hegemony, the lower the extent of the firm’s autonomy. As a result, the strength of the positive effect of relational governance on outsourcing performance will be impaired. This leads to Hypothesis 6:

Hypothesis 6: Technology hegemony negatively moderates the relationship between relational governance and IT outsourcing project performance.

3. RESEARCH METHODOLOGY

3.1. Sampling and data collection

To test the proposed hypotheses empirically, the study selected the TOP500: The Largest Corporations in Taiwan, published by China Credit Information Service, Ltd. in 2010, as our target population. A list with the names of 1,000 corporations was collected from the manufacturing, banking, and service industries. Of the 1,000 surveys mailed, we received 22 undeliverable returns and 978 successful deliveries. Follow-up letters were sent approximately two weeks after the initial mailings. A total of 191 usable questionnaires were returned for a response rate of 19.5% after deleting six questionable surveys. The response rate is close to the minimum recommended level of 20% for organizational surveys and similar to rates obtained in many other organizational surveys (Ravichandran and Rai 2000).

3.2. Construct measurement

3.2.1. Inter-organizational coordination

Interorganizational coordination, which was measured using a 3-item reflective scale, measured the extent to which a firm engaged in coordinating both parties’ cooperative activities and strategies and
in the sharing knowledge across ITO cooperative suppliers. Scales developed by Schilke and Goerzen (2010) and Kandemir et al. (2006) served as the starting point for measuring this construct.

3.2.2. Relational governance

Brown et al. (2000) suggested that the relational governance construct is viewed as a multifaceted, underlying syndrome that can be described in a second-order confirmatory factor model. Cannon and Perrault (1999) also mentioned that relational governance should be considered as a single, higher-order construct in a second-order factor model, in which the first-order factors are a set of highly correlated relational norms. Researchers that have used higher-order constructs have argued that such constructs allow for more theoretical parsimony and reduce model complexity (e.g., Edwards 2001). Following Zhang et al. (2003), Goo and Huang (2008), Goo et al. (2009), and Lui et al. (2009), a second-order factor was used to measure relational governance that embodies trust and relational commitment. The four items in the survey regarding trust reflect the extent to which outsourcers perceive in the confidence that exchange parties possesses reliability, integrity, and benevolence. Another three items to measure relational commitment focused on the extent to which both parties were willing to engage deeply in sustaining the relationship through investing resources and effort.

3.2.3. Contractual governance

The contractual governance construct refers to the extent to which the contract ensures the ITO project can be performed. In other words, it can be guided task fulfillment and stipulated obligation via contractual mechanisms. The measurement scales for contractual governance were based on the scales used by Wang et al. (2008), Liu et al. (2009), and Han et al. (2011).

3.2.4. ITO perceived project performance

As described, it is insufficient to investigate inter-firm relationships by focusing only on a single organizational stance. And, it is difficult to obtain overall financial information on a project’s financial performance; hence, we adopt awareness of performance to evaluate overall performance of an IT outsourcing project. In line with Bercovitz et al. (2006), who pointed out that precise economic measures of exchange performance are generally unavailable; hence, research studies have adopted perceptual measurement to evaluate overall performance. Therefore, we take a similar perspective to measure the construct of perceived outsourcing project performance in the present study. We assessed perceived outsourcing project performance using three items that reflected the parties’ perceptions of satisfaction, worthiness, and better than expected goal fulfillment of outsourcing cooperation. We used a 3-item scale that was developed based on Bercovitz et al. (2006) and Schilke and Goerzen (2010).

3.2.5. Technological hegemony

Because few investigations have focused on technological hegemony in the IT management field, there is no indicator can be used. In the present study, the technological hegemony construct refers to the extent that outsourcing strategies, decision making, evaluation, and governance have been affected or controlled by the provider. We thus developed a new scale for this construct on the basis of Chou et al. (2006) and Haas (2010) to address explanations related to technological hegemony.

4. RESULTS

SmartPLS 2.0 was used to analyze the samples to test the proposed research model (Fig. 1) (Ringle et al. 2005). Following Anderson and Gerbing (1988), we adopted a two-phase analysis approach to the model testing: the measurement and structural models. We used the bootstrapping re-sampling technique to estimate the significance of the paths with the structural model. Some scholars have suggested that more bootstrap re-samples (involving 500 sub-samples) means more stable standard error estimates (e.g., Tenenhaus et al. 2005; Sanchez-Franco and Rondan-Cataluña 2009). Hence, raw data was used as input to the PLS program, and path significances were estimated using the bootstrapping re-sampling technique with 500 sub-samples.
4.1. The measurement model

Construct validity of the measurement scales was assessed using confirmatory factor analysis (CFA). Convergent validity shows the degree to which items of the instrument are truly related and can be assessed using three criteria suggested by researchers: (1) a common rule of thumb for assessing construct validity is that individual items should have a factor loading of at least 0.6 (Karimi et al. 2000); (2) the composite reliabilities for each construct should exceed 0.8; and (3) the average variance extracted (AVE) for each construct should exceed 0.5 (Fornell and Larcker 1981). Based on these criteria, all CFA loadings were significant, as shown in Table 1. Composite reliabilities of all factors also exceeded the required minimum of 0.8, with the lowest value being 0.86 for the technological hegemony construct. Furthermore, the smallest AVE value among all five constructs in the CFA model was 0.63 for technological hegemony, which was greater than the desired minimum of 0.50. Therefore, all three conditions for convergent validity were met.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Factor Loadings</th>
<th>Cronbach’s alpha</th>
<th>CR</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First-order loadings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-organizational coordination</td>
<td>0.78</td>
<td>0.87</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>IC1</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC2</td>
<td>0.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC3</td>
<td>0.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.91</td>
<td>0.94</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>TR1</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR2</td>
<td>0.89</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR3</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR4</td>
<td>0.86</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td>0.84</td>
<td>0.90</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>CM1</td>
<td>0.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM2</td>
<td>0.91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM3</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractual governance</td>
<td>0.86</td>
<td>0.92</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td>CG1</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CG2</td>
<td>0.92</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CG3</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological hegemony</td>
<td>0.88</td>
<td>0.86</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>HG1</td>
<td>0.94</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HG2</td>
<td>0.97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HG3</td>
<td>0.59</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HG4</td>
<td>0.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived project performance</td>
<td>0.81</td>
<td>0.89</td>
<td>0.72</td>
<td></td>
</tr>
<tr>
<td>PP1</td>
<td>0.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP2</td>
<td>0.81</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PP3</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Second-order loadings</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relational governance</td>
<td>0.93</td>
<td>0.94</td>
<td>0.71</td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.97</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td>0.94</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * For reflective scales, the standardized loading is provided.

CR = composite reliability; AVE = average variance extracted

Table 1. Standardized estimates of the first-order and second-order CFA model
Discriminate validity was assessed using Fornell and Larcker’s (1981) criterion that the square root of AVE for each construct should exceed the correlations between that and all other constructs. As the data in Table 2 shows, the highest correlation between any pair of constructs in the CFA model was 0.72, between relational governance and technological hegemony. This figure was lower than the lowest square root of AVE among all constructs, which was 0.84 for relational governance. These results suggest that the constructs were reliable and valid.

4.2. The test of the structural model

Because component-based PLS does not generate an overall goodness-of-fit index, model validity is assessed primarily by examining the structural paths and R2 values (Chwelos et al. 2001). We verified the t-value for the standardized path coefficients and calculated p-value based on a two-tailed test with significance levels of 0.1, 0.05, and 0.01. Table 3 shows that most of the paths in the model were supported at the 0.01 significance level.

### Table 3. Results of hypotheses testing

<table>
<thead>
<tr>
<th>Hypothesized relationship</th>
<th>Path coefficient</th>
<th>t-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter-organizational coordination → Contractual governance (H1)</td>
<td>0.32</td>
<td>3.59**</td>
<td>Supported</td>
</tr>
<tr>
<td>Inter-organizational coordination → Relational governance (H2)</td>
<td>0.50</td>
<td>4.50**</td>
<td>Supported</td>
</tr>
<tr>
<td>Contractual governance → Project performance (H3)</td>
<td>0.04</td>
<td>0.65</td>
<td>—</td>
</tr>
<tr>
<td>Relational governance → Project performance (H4)</td>
<td>0.68</td>
<td>12.43**</td>
<td>Supported</td>
</tr>
</tbody>
</table>

Note: **p < 0.01, *p < 0.05, †p < 0.1 (based on t(499), two-tailed test).

4.2.1. Mediation Effect Test of Structural Model

To test for mediation, the Sobel test was conducted, as suggested by Preacher and Hayes (2004). Among the two mediating effect hypotheses, contractual governance was fell short of our expectations; therefore, we followed Baron and Kenny’s (1986) suggestion that to establish mediation, one of the conditions must hold, that is, the mediator must affect the dependent variable. If the above condition was not satisfies, this mediating effect would not exist. Thus, we conducted relational governance to test the Sobel test. To generate the required t-values, we ran two independent PLS models. The first model included paths from the independent variable (interorganizational collaboration) to the mediator variables (relational governance) and yielded the t-values shown in Table 4. The second model included paths from the mediator variables to project performance, as well as paths from interorganizational collaboration to project performance, and provided the t-values. As indicated in Table 4, the results of the Sobel test led us to conclude that the effects of interorganizational collaboration on project performance were significantly mediated by relational governance (Sobel test = 4.13, p < 0.001). Therefore, it appears that relational governance fully mediates the relationship between interorganizational collaboration and project performance.

### Table 4. Sobel test of mediation

<table>
<thead>
<tr>
<th>Path</th>
<th>t-value</th>
<th>Model B Path</th>
<th>t-value</th>
<th>Sobel test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inter-organizational coordination → Relational governance</td>
<td>4.499</td>
<td>Relational governance → Project performance</td>
<td>10.423</td>
<td>4.131</td>
<td>0.00004</td>
</tr>
</tbody>
</table>
4.2.2. **Moderation Effect Test of the Structural Model**

The moderating effects of technological hegemony were tested as part of the overall structural model with interaction terms formed by cross-multiplying all standardized items of the relational governance and technological hegemony constructs. Technological hegemony had a significant moderating effect ($\beta = -0.16, p < 0.1$) on the relationship between relational governance and project performance, supporting Hypothesis 6. To estimate the moderating effect further, we used the procedure of Chin et al. (2003), which estimated the moderating effect size by computing Cohen’s $f^2$. Assessing the relationship with (interaction effect) and without the moderating effect (main effect), the R$^2$ values of each model (Table 5) were compared. The computed Cohen’s $f^2$ of the moderating effect possessed a significantly higher explanatory power (R$^2$) than the main effect model. Model 1 explains 52% of the variance in project performance versus 55% with Model 2. The interaction had a small to medium effect size ($f^2 = 0.55–0.52/1–0.52 = 0.06$). Thus, technological hegemony has a negative moderating effect on the relationship between relational governance and project performance.

![Table 5](image)

<table>
<thead>
<tr>
<th>Paths</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main effect</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relational governance→Project performance</td>
<td>0.71**</td>
<td>0.68**</td>
</tr>
<tr>
<td><strong>Interaction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relational governance× Technological hegemony→Project performance</td>
<td>N/A</td>
<td>-0.16+</td>
</tr>
<tr>
<td>$R^2$ Project performance</td>
<td>0.52</td>
<td>0.55</td>
</tr>
</tbody>
</table>

**Table 5. Results of moderating effects**

5. **DISCUSSION AND CONCLUSIONS**

5.1. **Summary**

The present paper adopts a relationship perspective to investigate the impact of relationship on the ITO governance process, especially considering that many firms still consider ITO as a contract transaction. We shift the focus in studies of network governance by linking the core governance factors to the ITO performance. All of the hypotheses, with the exception of hypotheses 3 and hypotheses 5a, received support from the data (see Table 3). Inter-organizational coordination positively influences contractual governance (Hypothesis 1) and relational governance (Hypothesis 2). The findings are consistent with some prior research (e.g., Ness 2009; Nielsen 2010) that good coordination between network members represents an important element that cultivates the efficiency of governance mechanisms on cooperation. Furthermore, we find that the effect of relational governance on performance is more than contractual governance. We also show the effect of technological hegemony on relational governance mechanism. Consistent with our model, we further find that positive effects of relational governance on performance diminish significantly with increased levels of technological hegemony.

5.2. **Meaning and importance of findings**

The core concept of network governance emphasizes coordination. Some of these studies show that coordination can enhance performance (e.g., Jha and Iyer 2007; Kotabe et al. 2008). However, in the present study we find that enduring the relationship is important mediators between coordination and performance involve trust and commitment. If the outsourcer wants to achieve the perfect outsourcing performance, it needs to continually maintain the relationship after coordination, but not just early in the relationship. Thus, the mediator of relational governance plays an important role in interorganizational cooperation. To strengthen outsourcing project performance effectively, outsourcers should resort to relational governance. This finding is the most important for interfirm cooperation activities.
Compared with relational governance, contractual governance has no significant benefit to the performance of outsourcing projects. According to the results of the present study’s hypotheses testing of mediating effects (H5a, b), we find that the two governance mechanisms may have different attributes. Further, the timing of their use can result in a contract being less effective than sustaining the relationship despite coordination between the parties. This could be explained by the following reasons. First, because contractual governance is impossible to complete in the transaction, the relationship is the best way to supplement an incomplete contract. In other words, when a relationship exists with cooperation, the influence of contractual governance decreases.

Second, IT outsourcing is a kind of inter-firm know-how sharing activity in terms of social exchange, beyond IT/IS implementation. Moreover, the outsourcer can learn the specialized know-how from the contractor through the outsourcing process. For example, Hoetker and Mellewigt (2009) addressed the notion that knowledge-based assets will be better suited to the use of relational governance mechanisms due to the inability to specify exact processes and outcomes in advance. That is, the outsourcer’s intangible know-how and skills are knowledge-based assets. Thus, the contract plays the stipulating role, instead of promoting performance.

In addition, although contractual governance cannot contribute to increasing outsourcing project performance, this does not mean it is not important. For example, the contract is the groundwork for the exchange relationship between the buyer and the supplier (Weber and Mayer 2011) and many studies have addressed the notion that the contract facilitates reducing risks and hazards during trade for the outsourcer (e.g., Liu et al. 2009; Lin et al. 2011). All the above-mentioned reasons explain that our results rationally explain why the effectiveness of sustaining a relationship is more than just a contract.

We also find that if outsourcers rely exclusively on the contractor, the outsourcer is easy to be dominated, especially if the contractor possesses the core technology. This is because the outsourcer depends on the contractor based on the key technology or resource. In such situations, the outsourcer’s autonomy decreases and induces contractors to assume the power to intervene in the project proceeding. Moreover, if the contractor diminishes the effectiveness of relational governance at the same time, it will also impair the quality of the outsourcing project performance.

5.3. Theoretical implications

This study contributes to the IT governance literature in four ways. First, the main findings of the present study support social network theory and boundary spanning theory and demonstrates the theory’s relevance in explicating IT governance. The network governance is composed of social network theory and organizational boundary spanning theory. Moreover, the evolution of the viewpoint of IT governance began from the transaction cost theory, and then become social exchange theory to focus on partnerships, and finally emphasis on the present alliance relationships of network organization (also called barrierless organizations) (Hätönen and Eriksson 2009). Very little is known about network governance, which only points to the concepts of coordination, relational governance, and contractual governance, but does not include the relationships among each others. To fill this gap, we demonstrate the relationship among the three parts to discover the context development of precedence relationships. Furthermore, this study also demonstrates that the governance mode of IT outsourcing was already moving toward network governance.

Second, our analysis also supports some major notions in social capital theory. We find that social exchange is an important intermediate mechanism in IT sourcing activity. The coordination mechanism is important for interorganizational governance and differs from prior research studies, which consider that building the coordination mechanism will directly result in good performance (Hoegl et al. 2004; Kotabe et al. 2008). We find that coordination alone cannot directly enhance performance effectively, but through of social exchange embedded in the whole business. That is, the coordination mechanism builds mutual consensus, which fosters the quality of the social exchange process, strengthens mutual relationships, and further drives performance improvement.
Third, to our best knowledge, the present study is the first empirical study examining the effect of technological hegemony on ITO governance. We note that social exchange can encourage good relationships, but that the outsourcer is dominated by the contractor unconsciously. When limited costs (including when knowing information is limited) and agent theory face information asymmetry and moral opportunity, the outsourcer will experience technological hegemony by the contractor. According to Emerson (1962), the power-dependence model was derived from social exchange theory, which refers to the relative dependence between two actors in an exchange relationship determining their relative power. In the present study the occurrence of intangible technological hegemony results from the contractor holding the core technology that can dominate project progression and intervene in the outsourcer’s IT decisions. This finding may apply to similar transaction styles of knowledge-based assets and may allow outsources to recognize technological hegemony and its crisis as early as possible.

Finally, we find that the contract cannot enhance outsourcing performance, which differs from past studies’ results including Cai et al. (2009) and Han et al. (2011). We consider that contractual and relational mechanisms are both necessary, although contracts have the defect of being incomplete. Furthermore, trading in the East is influenced strongly by Guanxi, which induces the prominent effectiveness of the contract less than relational governance. In addition, the present study also supports ways to improve contract quality effectively. To improve the quality of the contract, mutual coordination in needed before signing the contract. Coordination can produce a consistent consensus through communication, knowledge sharing, and eliminated divergence. In this way, the contract could protect both parties to avoid risks or hazards.

5.4. Managerial implications

From a practical perspective, our results yield actionable guidelines for the management of ITO relationships. First, the managerial implications of ‘opening the black box’ between the outsourcing inter-firm network and outsourcing performance are important. In addition to better coordination, the outsourcer should continually strive for good relationships that enhance mutual relationships between parties (Ness 2009). Especially, the trade arena in the East regards Guanxi and Renqing, in which the relationship is the core of cooperation, is the soft constraint, and can complete unspecified situations without a contract (Luo et al. 2002; Zhuang et al. 2010).

Moreover, supplementing each party’s demands (such as know-how or technology) can create symbiosis or alliance. Through outsourcing activities, the contractor can reinforce its technology specialty and learn more industrial know-how to stretch their business domain. On the other hand, outsourcers can develop IT installation expertise and enhance technology capabilities by investing in outsourcing relationships that fill the gap of the outsourcer’s core capability. This situation will develop into a cooperative form of alliance, which develops a symbiotic and coexistent system to reach a win-win situation. Therefore, a manager can strengthen relationships between parties (or the contractor) to improve outcomes.

Second, outsourcing is a good strategy for enhancing operational performance; however, becoming overly dependent will induce technological hegemony in which the outsourcer may experience contractor dilemmas, such as low bargaining power. The phenomena of technological hegemony occurs not only in politics, but also in many other fields. Therefore, to avoid the above situation, the outsourcer should develop new symmetrical relationships through decreasing the influence of the contractor or dependence on core resources, specialized skills, and knowledge from the contractor. Alternatively, the outsourcer can choose multiple contractors to scatter the outsourcer’s investments to avoid being dominated by one contractor, which causes network cooperation to reach a new balance. For example, Choi and Beamish (2004) suggested a balance in management control to enhance alliance stability and performance.
Reference


