INFORMATION SYSTEMS DEVELOPMENT OUTSOURCING: THE ROLE OF CONTROL CONFIGURATIONS

Research-in-Progress

Subasinghage Maduka Nuwangi
Information Systems School,
Queensland University of Technology,
Brisbane, Australia
maduka.subasinghage@qut.edu.au

Darshana Sedera
Information Systems School,
Queensland University of Technology,
Brisbane, Australia
d.sedera@qut.edu.au

Shirish C. Srivastava
Operations Management and
Information Technology Department
HEC, Paris, France
srivastava@hec.fr

Abstract

The Control theory provides a useful theoretical foundation for examining the coordination between the client and the vendor in information systems development outsourcing (ISD-outsourcing). Recent research has identified two control mechanisms: structural (structure of the control mode) and process (the process through which the control mode is enacted). Yet, control theory research to-date does not describe the ways in which the two control mechanisms can be combined to ensure project success. Grounded in case study data from eight ISD-outsourcing projects, we delineate three 'control configurations'; i) aligned, ii) negotiated, and iii) self-managed, which describe the combinative patterns of structural and process control mechanisms within and across different control modes.

Keywords: Information system development outsourcing, Software, Control Theory, Control configurations

Introduction

In recent years there has been a substantial interest in information systems development outsourcing (ISD-outsourcing) (Rustagi et al. 2008; Wanjin et al. 2007). According to recently published reports on IT outsourcing trends (Computer Economics 2012; Europe 2012), ISD-outsourcing continues to remain the most popular type of outsourcing. In a similar vein, recent years have witnessed a continuous growth in ISD-outsourcing as a viable method for software development (Remus et al. 2012; Willmott 2012). However, 50% of outsourcing projects fail outright or do not meet client expectations (Rombach 2010), primarily due to the lack of coordination amongst the comprising entities with partially congruent objectives (Nakatsu et al. 2009; Tiwana et al. 2009). Coordination between the client and the vendor in outsourced ISD projects is relatively more crucial than in internal ISD projects (Tiwana et al. 2009). This is due to the fact that outsourced ISD projects involve managing employees from different companies, as opposed to employees from the same company. According to Tiwana et al. (2009), there is a greater perceived risk of opportunism in outsourced ISD projects relative to internal ISD projects. Most firms outsourcing their ISD, attempt to minimize these issues by experimenting with coordination and control mechanisms between the client and the vendor (Choudhury et al. 2003; McBride 2008).

Control theory (Kathleen 1985; Kirsch 1996; Ouchi 1979) has often been invoked to explain the coordination between client and vendor in ISD-outsourcing (Kirsch et al. 2002; Narayanaswamy et al. 2005). Prior control literature discusses factors such as outcome measurability (Kathleen 1985), behavior measurability (Kirsch 1997), explaining the choice of control modes or examining the specific control modes (e.g., outcome, behavior, clan, and self-control modes) used for a project (Srivastava et al. 2012b; Tiwana et al. 2009). According to Tiwana et al. (2009), while controller driven mechanisms (outcome, behavior, and clan control) are utilized to a greater degree in outsourced ISD projects, controllee-driven control mechanisms (self-control) dominates internal ISD projects. Moreover, recent literature explains how the control mechanisms can be utilized to improve the performance of ISD-outsourcing projects (Gopal et al. 2010; Srivastava et al. 2012b). Srivastava and Teo (2012b) suggest that the control mechanisms can be broadly divided into two categories; the structural control and process control. While the structural control mechanism is about "what" operates the control mode or the structure of the control mode, the process control mechanism explains "how", or the process through which the control mode is enacted. Past research also shows that ISD-outsourcing projects were unable to deliver the expected results due to inappropriate control mechanisms (Benko et al. 2003; Tiwana et al. 2009). Although the control literature discusses structural and process control mechanisms, it does not describe the *configurations* in which the structure and process mechanisms can combine. These combinative configurations of structural and process control mechanisms in a client-vendor relationship can be described as control configurations. We argue that in order to better leverage the control perspective, *control configurations* should be monitored so as to govern the client-vendor coordination efficiently, resulting in better project outcomes in terms of cost and quality (Gopal et al. 2010; Srivastava et al. 2012a; Srivastava et al. 2012b). Monitoring control configurations provides an early clue to the condition of projects that can help companies minimize ISD-outsourcing project failures.

In recent times, multiple levels of outsourcing partners have added an additional layer of complexity to the ISD-outsourcing projects (Nuwangi et al. 2012; Olsson et al. 2008), where outsourcing partners now re-outsource components of software development to other outsourcing companies. We posit that such growing complexities require greater attention in monitoring control configurations to foster project success. In general, companies are not able to observe the control configurations until the project "goes live"[1]. In most cases, such observations are too late to solve problems and can only be a learning for future work. A proactive approach where the ISD-outsourcing partners implement the appropriate control configuration will enhance the likelihood of project success.

Thus, the two main objectives of our study are: (1) to identify the control configurations through which the control mechanisms manifest in client-vendor relationships; and (2) to identify the relationship between control configurations and ISD-outsourcing project success. This research-in-progress paper conceptualizes and reports our early observations on *control configurations*. We also identify the

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[1] Go-live is when the software product is implemented after the completion of software development.

relationships between control configurations and ISD-outsourcing project success. The preliminary analysis and recommendations presented in this paper are aimed at providing insights into the landscape of control configurations in ISD-outsourcing projects.

Theoretical Background: Exploring Control Configurations

Given the unique characteristics of ISD-outsourcing, the selection of appropriate control mechanisms is crucial for project success (Maruping et al. 2009). ISD-outsourcing projects are inherently complex as they involve multiple parties from multiple companies working on a single project. Most projects involve several iterations of software deliveries, over several months. In this lengthy software development process, multiple versions of contracts[2] need to be managed carefully and diligently, controlling volatility of client requirements. Moreover, ISD-outsourcing project will be governed by multiple contracts, developed by each ISD-outsourcing partner, thus information in one contract may not be fully understood by the other party. According to Poppo and Zenger (2002), ISD-outsourcing contracts tend to be incomplete due to the asymmetric information amongst the different partners. Hence, monitoring the control mechanisms is crucial for the success of the ISD-outsourcing projects. For example, in ISD-outsourcing projects, even with a contract with high contract-specificity[3], partnering vendors may not be able to understand all the client requirements without specifically dedicated knowledge transfer sessions (Sedera et al. 2013).

Control theory (Kirsch 1996; Ouchi 1979) is widely used in the ISD-outsourcing domain to explain the controlling mechanisms between the outsourcing partners (Choudhury et al. 2003; Srivastava et al. 2012b). Studies have discussed specific control modes such as outcome control (Eisenhardt 1985), behavior control (Eisenhardt 1985), clan control (Kirsch 1996) and self-control (Kirsch 1997). Several studies have highlighted the influencing factors for exercising control mechanisms, which can be broadly categorized into project characteristics (Heiskanen et al. 2008; Kirsch 1997), relationship characteristics (Choudhury et al. 2003; Rao et al. 2007) and task characteristics (Kirsch 1996; Remus et al. 2012). Whilst most control theory studies have focused on explaining internal project control [all functionalities (e.g. software development, quality assurance) of the project are conducted by a single company] (Kirsch 1997; Kirsch et al. 2002) or outsourced project control (Choudhury et al. 2003; Rustagi et al. 2008) separately, Tiwana et al. (2009) highlighted the differences between internal and outsourced project control.

As per control theory (Kirsch 1996; Ouchi 1979), the term 'control' in ISD-outsourcing, refers to the mechanisms that govern the actions of the outsourcee firm (vendor or controllee) in a manner that furthers the interests of the outsourcing firm (client or controller) (Kirsch 1996). According to Srivastava and Teo (2012b), the control mechanisms can be broadly divided into two categories of structural and process control mechanisms. While the structural control mechanism is about "what" operates the control mode or the structure of the control mechanism, the process control mode explains "how", or the process through which the control mode is enacted.

In relation to control theorists, structural control mechanisms can be broadly divided into two categories of formal and informal controls (Kirsch 1996). The formal mode involves controlling the employees through performance evaluation, while the informal mode uses social or people strategies (Jaworski 1988; Kirsch et al. 2002). The formal control mode can be further subdivided into outcome-based and behavior-based modes. The outcome-based mode includes the mechanisms that specify the expected outcomes (Eisenhardt 1989a), whereas the behavior-based mode is implemented through the mechanisms of appropriate behaviors (Kirsch 1997). The informal mode consists of clan and self-control modes. Ouchi (1978) describes clan control as a group of individuals who have common values and beliefs. In contrast, self-control occurs when the employees of the company control their own actions (Manz et al. 1986).

Srivastava and Teo (2012b) illustrate that the process control mechanism includes three governance mechanisms: 1) mechanistic governance, 2) relational governance, and 3) self-governance. Mechanistic governance describes the coordination between the client and the vendor by strict adherence to the specific contract, whereas relational governance focuses on the shared values, beliefs, rituals and the ongoing relationship between the two parties. Self-governance occurs when there is no coordination

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[2] We consider documents or software systems that include the client requirements as the contracts between the outsourcing partners.
[3] Explicitness of details specified for coordinating the relationship between the client and vendor. Mooi, E. A., and Ghosh, M. 2010. "Contract Specificity and Its Performance Implications," *Journal of Marketing* (74:2), pp 105-120.

between the client and the vendor as the task is self-monitored by the vendor. In general, organizations utilize different combinations of structural and process control mechanisms according to the situation. Although control theory literature discusses structural and process control mechanisms separately, it does not describe different configurations in which the structural and process control mechanisms can combine. Hence, in addition to acknowledging the presence of structural and process control mechanisms, it is important to understand the "control configurations" in which the structural and process control mechanisms combine. We believe that identifying and examining the nature of control configurations will assist in a better appreciation of ISD-outsourcing project success (See further discussion and illustration in (Srivastava et al. 2012b)). For example, business requirement specification can be considered as one of the formal structural control mechanisms, which specifies the expected outcomes of the ISD-outsourcing projects. Organizations may decide to follow the business requirement specification closely (mechanistic governance) or they may rely more on ongoing relationship to decide about emergent operational situations (relational governance). Utilization of mechanistic governance for projects which lack of specificity[4] in their business requirement specifications can lead to project failures. Therefore, ISD-outsourcing organizations should use the control configurations appropriately to ensure the project success.

Research Method

This research paper explores the control configurations and the impact of control configurations for ISD-outsourcing project success. As the objective of this paper is exploratory in nature, case study method was considered as appropriate method. Moreover, qualitative case study technique is recognized to be an appropriate method for exploratory research, complex environments and contemporary events (Benbasat et al. 1987). Additionally as the purpose of the current research is to answer "how" questions related to identifying and examining the control configurations governing the process of ISD-outsourcing, case study method is particularly appropriate (Yin 2003). Specifically, the main objectives of this case study are: (1) to identify the control configurations; and (2) to examine the relationship between control configurations and ISD-outsourcing project success.

Case Context

Three conditions described the benchmarking criteria for the selection of the case organization. First, the case organization should have been involved in ISD-outsourcing for at least five years, to have mature and stable control structures. Second, the organization must be sufficiently large in ISD-outsourcing, with a standard hierarchy of employment. Third, the case organization must be involved in executing multiple ISD-outsourcing projects. The chosen case organization, Company-A[5], was a large ISD-outsourcing company, engaging in stock market-related software application development. Company-A has been in the business for over 10 years, employing over 300 staff. The aforementioned characteristics convinced the selection of Company-A as our target case. Moreover, Company-A regularly re-outsources its software quality assurance functions to another global ISD-outsourcing company, Company-B, which makes the outsourcing process more complex, involving multiple levels of outsourcing partners, thus demonstrating the current environment of software outsourcing. Involvement of multiple outsourcing partners increased the visibility for different types of control configurations in ISD-outsourcing projects. Other than the three benchmarking criteria mentioned above, ability to access both companies justified the selection of Company-A and Company-B as our case organizations.

Company-A developed capital market automation software including the functionalities of multiple trading methods (such as auctions, continuous matching[6]), multiple asset classes (such as equity, fixed income, commodities and derivatives) and multiple market structures (such as regulated exchange, the Over-the-Counter-market). Moreover, the company developed post-trade applications, wherein the settlement of the trade was automated. Post-trade applications provided the central clearing and settlement for the trades. Company-A was involved in developing the clients' requested functionalities (onwards and upwards) of software projects even after the project goes live. Company-B was involved in conducting the quality assurance function of the software products developed by Company-A.

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[4] Business requirement specification specificity : the explicitness of details specified in the business requirement specification
[5] To maintain confidentiality, the names of the company, all projects and personnel were disguised.
[6] Auction trading involves calculating the opening and closing prices of a security at the opening and closing of the trading hours whereas continuous matching operates during the regular trading sessions.

Data Collection and Analysis

Twenty (20) semi-structured interviews each lasting between 40-50 minutes were conducted at Company-A and Company-B. Participants were selected from eight (8) ISD-outsourcing projects executed jointly by the two companies. From each project, two members were selected: the lead project manager from Company-A (denoted as PM1 - PM8) and one quality assurance staff from Company-B (denoted as QA1 - QA8). The selection of the lead project manager (from Company-A) is appropriate to understand the overall outcomes of the project and to understand the controlling structures of the entire project. The quality assurance staff was selected to better understand the *configuration* mechanisms. Our interviews also included four project managers (denoted as PM9 - PM12) who were working in more than one (of the 8) project. To minimize the effect of power relationship between two case organizations that might bear on responses, we conducted the interviews independently in each organization. Moreover, confidentiality of interviews was guaranteed. Herein, we recognize that the locus of control changes from client to vendor in their interactions, making the implicit power between each party unbiased.

The sampling technique is non-probability, purposive and employed the 'snowball technique', where the interview participants were appropriate opinion leaders with well-developed views on the research topic (Minichiello et al. 1995). At the beginning of the meeting, the participants were briefed about the objective of the study. At the end, participants were asked to suggest other employees who are knowledgeable about the control mechanisms in projects. Participants were diverged as new employees were converged to the sample in the interview process, according to recommendations from previous participants (Patton 2002). All the interviews were recorded and transcribed, with additional notes taken whenever necessary. In total, the interviews approximately totaled 14 hours and 15 minutes, and were later transcribed to about 150 pages. The interview data was supplemented with the business requirement specifications[7] and other internal documents such as quality assurance documents (test cases and test scenarios) and change request documents. Those documents increased the understanding of different types of control configurations in ISD-outsourcing projects.
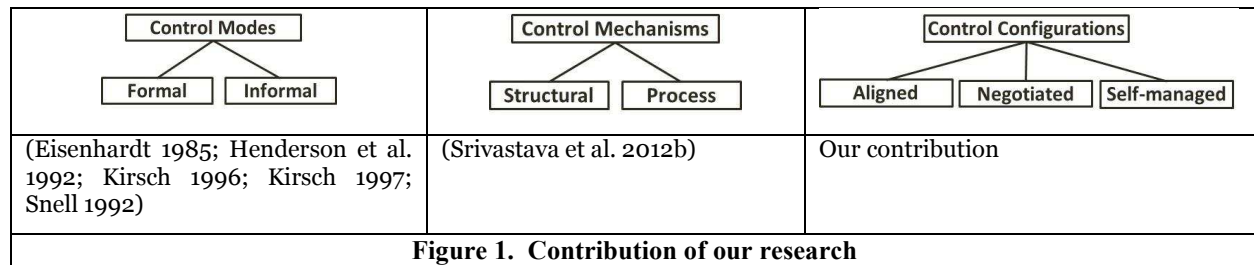
Following the guidelines of Eisenhardt (1989b), data analysis was performed in tandem with the data collection to take advantage of the flexibility that the case study affords. The emergent concepts in one interview were verified in the subsequent interview until the state of theoretical saturation was reached, which is the point where it is possible to comprehensively explain the findings of the case study (Eisenhardt 1989b). Theoretical saturation was identified when the incremental learning was minimal during the interviews. For example when the number of interviews were close to 20, data become repetitive, ensuring that most or all of the perceptions that might be important are already uncovered. The structural and process control mechanisms formed the initial set of themes through which we analyzed the interview data. In the early interviews, we recognized some emerging concepts about the control configurations. While some of the emerging concepts were verified by the case evidence, some were revised or disconfirmed. Replication logic were utilized, where the logic of treating each case study as an experiment with each case serving to confirm or disconfirm the findings (Eisenhardt 1989b). Herein, the cases which confirm emergent relationships improve the richness, depth and validity of the relationships (Patton 2002), whereas cases which disconfirm the relationships were used to refine and extend the theory. For example, it is observed that while the structural control mechanisms were aligned with process control mechanisms, sometimes it was not aligned. Disconfirmation of the alignment of structural and process control mechanisms lead to theoretical extensions introducing other configuration types. In addition, a systematic verification procedure was established to ensure that each finding was supported by at least two sources of data (Klein et al. 1999). Data analysis is reported under two headings: 1) identifying the control configurations and 2) identifying the relationship between control configurations and ISD-outsourcing project success.

Identifying Control Configurations

From the case study data, three control configurations were identified, which we label as: 1) *aligned* configuration, 2) *negotiated* configuration, and 3) *self-managed* configuration (see figure 1 and table 1).

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[7] The business requirement specification is considered as the contract, which specifies all the client requirements of the software development outsourcing projects.

Control Modes	Control Mechanisms	Control Configurations
Formal Informal	Structural Process	Aligned Negotiated Self-managed
(Eisenhardt 1985; Henderson et al. 1992; Kirsch 1996; Kirsch 1997; Snell 1992)	(Srivastava et al. 2012b)	Our contribution
Figure 1. Contribution of our research		

1. Aligned Configuration

An aligned configuration is observed when the structural and process control mechanism combinations with the vendors and the clients are aligned within the corresponding control mode. Herein, the client always follows formal structural mechanisms (outcome/behavior) with mechanistic governance. When the client follows clan control they utilize relational governance as the process control mechanism. Self-control is always combined with the self-governance mechanism. In an aligned configuration, *locus of control* is with the client.

The client utilization of the formal structural control with mechanistic governance is observed in most ISD-outsourcing projects. The client maintains the detailed requirement documents (e.g., business requirement documents, change request documents) and wants the vendor to follow the documents very closely. Examples of this approach were reported in the interviews. For example, according to QA1, *"until all the outsourcing companies signoff the documents[8], we are not supposed to start testing"*. In those projects, the change request documents are utilized to manage the changes to the initial client requirements. Frequently, after the project goes live, clients request additional functionalities (onwards and upwards) of the software product. These requests will also be managed through the change request documents. According to PM9, *"If there is some functionality that developers can't provide as it is, we tell the developers not to develop it. It should come as a change request document"*. PM8 highlighted that the formal controlling will be aligned only if they follow mechanistic governance to manage the ISD-outsourcing process. He stated: *"We have to go with the exact documents to provide the actual client requirements"*. The client utilizes relational governance to manage projects which have good team spirit, shared values and norms. QA6 stated: *"In our project, we had a good relationship with our client. So, we were able to talk with them and work. Sometimes, all the things were not documented"*. Moreover, PM11 explained that *"Sometimes, we ask our vendors to test the product without any written document to follow. Then they can find more issues in the system"*. In an aligned configuration, the client combines self-control mechanisms with self-governance. In our study context, the vendor has to provide individual time estimations for software quality assurance. In the situations where the vendor recognizes that they will not be able to meet the deadline, working extra hours are essential as the client will not change previously agreed timelines. QA4 stated: *"Most of the time we are working late hours to achieve the targets"*. According to QA8, *"When we have to finish some work before deadline, we work till late night"*.

2. Negotiated Configuration

A negotiated configuration occurs when the structural and process control mechanism combinations with the client and the vendor are flexible across the different control modes. For example, the client and the vendor follow any of the structural control mechanism with any of the process control mechanism according to the situation. In a negotiated configuration, the *locus of control* is with both the client and the vendor.

Most respondents highlighted the importance of a negotiated configuration in ISD-outsourcing projects. PM4 stated: *"There are some functional areas that we have to implement somehow. But, we will not be able to implement in the way that the client has mentioned. So, we have to convince the client the best way to do the particular function and get the permission from them"*. PM3 explained the negotiated configuration in terms of time management: *"We agree upon certain time lines. But, if it is really unfair, either party can speak and get it extended"*. According to PM6, *"If we can't complete a task on time, we talk to the client and we are getting more resources"*. QA5 explained, negotiated configuration is crucial

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[8] Key terms of the quotations were underlined

for the success of an ISD-outsourcing project. QA5 stated: *"Sometimes, we don't know the actual client requirement. We can write testing procedures. But when we start testing only we know that we can't do this in this way. We will get it from the maturity in that application"*. PM9 highlighted the same idea by stating: *"If they are <u>flexible</u>, we can do a better job. Otherwise we have to reduce the quality of work, due to time constraints"*. According to QA7, sometimes they experience a high negotiated configuration in ISD-outsourcing projects: *"When the time is crunched business analysts say that they don't have the time to document everything. So, we have to <u>trust</u> them and work ahead"*.

3. Self-Managed Configuration

The self-managed configuration can be observed when the vendor is self-disciplined regardless of the control mechanisms of the client. In a self-managed configuration, the *locus of control* is with the vendor.

Most respondents discussed the self-managed configuration according to the time factors. QA2 explained that they have to work extra hours to meet the deadlines: *"We are working in a tight deadline; definitely we have to make some arrangements by working <u>extra hours</u>"*. Confirming QA2 argument, QA8 mentioned; *"If we can't finish the quality product on time, we have to <u>stay till late night</u> and finish our work"*. PM4 stated that they have internal software releases[9] before they send the software product to the client. These internal releases represent the self-managed configuration in an ISD-outsourcing project. As PM8 explained, *"We have lots of <u>internal releases</u>. Then only we provide the software product to the client side"*. PM1 discussed that the vendor should have the discipline to adjust to the changing requirements of the clients: *"You should be organized. You should have a proper process to document and you should be <u>disciplined</u>"*. PM10 highlighted that the self-managed configurations of the vendor company minimize the problems in ISD-outsourcing projects: *"Our natural tendency is to adapt to what client says, which not the best thing is always. Sometimes we are getting in to worst situations. So, we should have our own <u>standards</u> to deal with the client"*.

Table 1: Key properties of the configurations	
Configuration	**Key Properties**
Aligned configuration	Structural and process control mechanism combinations with the vendors and the clients are aligned within the corresponding control mode. Herein, the client always follows; 1) Formal structural mechanisms (outcome/behavior) with mechanistic governance, 2) Clan control with relational governance mechanism and, 3) Self-control with the self-governance mechanism.
	Locus of control is with the client.
Negotiated configuration	Structural and process control mechanism combinations with the client and the vendor are flexible across the different control modes. Herein, the client and the vendor follow any of the structural control mechanism with any of the process control mechanism according to the situation.
	Locus of control is with the client and the vendor.
Self-managed configuration	Vendor is self-disciplined regardless of the control mechanisms of the client.
	Locus of control is with the vendor.

Identifying the Relationship between Control Configurations and ISD-Outsourcing Project Success

Having identified control configurations, we then explore the relationships between the control configurations and ISD-outsourcing project success. We summarized the comments provided by the respondents regarding different projects and derived the conclusions accordingly (see Table 2). "Project stage" includes the classifications of: development early stage (less than 3 months of development), middle stage (between 3 to 6 months), final stage (more than 6 months till goes-live), completed[10] (after

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[9] Internal software releases consist of releasing software for quality assurance before sending the product to the client.
[10] Case organization develops the "onwards and upwards" functionalities of completed projects.

go-live) and terminated. "Status" was categorized into three groups: 1) 'unsuccessful', where the client discontinued or demonstrated strong dissatisfaction with the outcomes of the software product, 2) 'average', the client is satisfied with the software product as a whole, but there were issues with some functionality or 3) 'successful', the client is satisfied with more than 80% of outcomes of the product. We acknowledge that the level of configuration; 'high', 'medium' and 'low' is a relative indication. In the current context, the level of configuration was determined at post data-collection and analysis, with two researchers going through the comments of all interviewees across the 8 projects. The assertions derived by the researchers were then discussed with a panel that comprised of the two lead researchers, project managers and quality assurance staff. Consensus was derived through discussion. We employ the rankings to demonstrate the existence of the three configurations and their composition; 'high', 'medium' and 'low' demonstrate that the three configuration types are mutually exclusive.

Project	Company		Project Stage	Configuration			Status
	A	**B**		**Aligned**	**Negotiated**	**Self-Managed**	
1	PM^1	QA*1	Completed	High	Medium	High	Successful
2	PM2	QA2	DM^^	Medium	High	High	Average
3	PM3	QA3	DE^	High	High	High	Successful
4	PM4	QA4	DM^^	Low	High	High	Average
5	PM5	QA5	DM^^	Medium	High	High	Average
6	PM6	QA6	Terminated	Low	Medium	High	Unsuccessful
7	PM7	QA7	Completed	High	High	High	Successful
8	PM8	QA8	Completed	High	Low	High	Successful

Table 2: Summary of the results of data analysis

PM^: Project manager, QA*: Quality Assurance staff, DE^: Development (early stage), DM^^: Development (middle stage).

Observing the relationship between control configurations and the ISD-outsourcing project success or failure, we were able to make a number of observations. ISD-outsourcing projects could have control configurations independent of one another, meaning that high level of one configuration does not ensure or lead to high, medium or low of another. As an example, P3 had a high negotiated configuration with high aligned configuration whereas P4 had high negotiated configuration with low aligned configuration. According to PM1, in project P1 they had high aligned configuration: *"Our client wants us to follow the documents as it is. So, most probably we will be providing exactly what the client wants"*. PM1 also explained that: *"Sometimes, we suggest new ways of doing things. Most of the time client agrees with us and update the documents according to our suggestions"*. This indicated that P1 consisted of a high aligned configuration as well as a high negotiated configuration.

The data analysis revealed that all the ISD-outsourcing projects between Company-A and Company-B had high self-managed configuration. This indicated that, regardless of the controlling process, all the employees tended to work extra hours to achieve the targets. According to QA2, *"We are working in a tight deadline; definitely we have to make some arrangements by working extra hours"*. Most of the projects had standard processes like internal releases for employees' self-management. According to PM4, *"We provide our software to the client after several internal releases"*.

According to P3 and P7, high aligned configuration leads to successful projects, regardless of the negotiated configuration. PM3 from project P3 explained: *"To be successful, you have to follow the requirement documents as it is"*. PM7 from P7 stated: *"We should have proper documents and we should follow these. Otherwise project will defiantly fail"*.

According to P2 and P5, when the aligned configuration is medium and the negotiated configuration is high, projects were in average condition. This indicated that an ISD-outsourcing project with less aligned configuration can still be managed in average condition, if it is compensated by high negotiated configuration. According to PM5, *"We were managed to execute our project even with less specified*

documents, because we had a very <u>good relationship</u> with the client company. They were willing to provide the information so quickly". PM2 stated that: *"There were some issues with the documents. The level of information the client provides were not enough. However, we managed to run our project because we had <u>good relationship</u> with our client".*

When there is low aligned configuration with high negotiated configuration, as in P4, the project was in average condition. Most importantly, P6, which had low aligned configuration and medium negotiated configuration, was terminated. This indicated that a low aligned configuration leads to unsuccessful projects, unless it is compensated by high negotiated configuration. PM6 noted that: *"Sometimes they ask us to follow <u>documents as it is</u>. But they haven't written all the required information".*

Discussion

The goal of the study is to explore control configurations and to identify the relationship between control configurations and ISD-outsourcing project success. To the best of our knowledge, none of propositions discussed above have been tested in previous information systems studies on ISD-outsourcing projects.

In this research, we introduced the control configurations in which the structure and process control mechanisms combine, thereby offering a more nuanced theoretical understanding of control mechanisms. Grounded in the case study data, three control configurations were identified: 1) aligned configuration, 2) negotiated configuration, and 3) self-managed configuration. An aligned configuration can be observed when the structural and process control mechanism combinations are aligned within the corresponding control mode, whereas a negotiated configuration occurs when the structural and process control mechanism combinations are flexible across the different control modes. A self-managed configuration can be observed when the vendor is self-disciplined regardless of the control mechanisms exercised by the client. More importantly, the data analysis revealed: 1) different projects within the same company could have different control configurations; 2) control configurations are independent of one another; and 3) control configurations have a bearing on the ISD-outsourcing project success. Moreover, we identified: 1) ISD-outsourcing projects have high self-managed configuration, 2) a high aligned configuration leads to successful projects, regardless of the extent of the negotiated configuration, 3) a project with low aligned configuration can still be adequately managed, provided it is compensated with high negotiated configuration; and 4) a low aligned configuration leads to unsuccessful projects, unless compensated by high negotiated configuration.

Our study has the potential to influence the practice of ISD-outsourcing. First, it allows practitioners to understand the control configurations in ISD-outsourcing projects. Revealing the three control configurations namely, 1) the aligned configuration, 2) negotiated configuration, and 3) self-managed configuration shows the impact of different control configurations on the projects. Second, it points out the relationships between the control configurations and ISD-outsourcing project success. It highlights the need for aligned configuration in ISD-outsourcing projects, thereby notifying the project managers to maintain high aligned configuration in their projects. In addition, it shows the importance of the negotiated configuration when the aligned configuration is low in ISD-outsourcing projects. More importantly, our study emphasizes the need to monitor control configurations to minimize ISD-outsourcing project failures.

Our preliminary study results are heartening, and further work is underway to establish our research objectives. In the second phase of the research, we intend to trace the evolution of control configurations over the lifecycle of an ISD-outsourcing project. We noticed that the configurations change over time and some trajectories may be more amenable to ISD-outsourcing project success. We observed that the aligned configuration was dominant in the initial stages of the projects; that is, the vendor can be controlled by the client, since the vendor does not have a clear understanding of the project requirements. As the project matures, with the vendor's familiarization with the project requirements, the middle stages of the project can be best managed by the negotiated configuration. Towards the end of the project, the self-managed configuration dominates the project due to vendor maturity. Further, we also intend to conduct a survey to validate the preliminary findings of the first phase of the research. In this research, we observed three types of control configurations. It is possible that other combinations may yield new and alternative configurations. Future research can explore this further. Although several past studies have observed structural controls (Jaworski 1988; Kirsch et al. 2002) and process controls (Srivastava et al. 2012b), we are yet to identify any studies on the control configurations of ISD-outsourcing projects.

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