The Amount of Control in Offshore Software Development Projects

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ABSTRACT

Prior research has focused on factors influencing the choice of controls in traditional project settings. Building on this research, this paper investigates the amount of control—defined as the variety and intensity of control mechanisms—in offshore software development projects. Using a comparative case study approach, the authors put forward eight propositions regarding the factors that influence the amount of control and its dynamics. Their results not only confirm existing findings, such as the predominance of formal controls and the negative effect of trust on the amount of formal control, but also contribute with new findings. For instance, they were able to identify particularly high levels of control in projects with high task complexity and/or high offshore team involvement as well as intensive use of formal (outcome) control in high volume and strategically important projects. The authors’ empirical findings are integrated in a conceptual model that leads to a better understanding of the antecedents of the amount of both formal and informal controls. In contrast with previous studies, their findings do not support the notion that the amount of control is directly related to project success.

Keywords: Amount of Control, Control Theory, Dynamics of Control, Information System Offshoring, Managerial Control, Offshore Software Development

INTRODUCTION

The offshoring of Information Systems (IS) represents a significant global phenomenon (King & Torkzadeh, 2008). It became popular in the early 90s with Kodak shifting the operation of its information center to a global provider (Rajkumar & Mani, 2001; Rao, 2004).

In subsequent years, the IS offshoring industry grew to $80 billion in 2008, and industry growth is expected to continue in the near future (Kaka, 2009). A key driver of this growth is the increasing importance of offshore software development (OSD)—viewed in this paper as the design, coding, testing, and/or implementation of software by a vendor organization located in a foreign, mostly low-cost country—in strategic IT projects (Aird & Sappenfield, 2009). Major reasons for this include cost benefits...
and flexibility gains (Amoribieta, Bhaumik, Kanakamedala, & Parkhe, 2001), as well as increased project management and process quality by OSD providers (Herath & Kishore, 2009). However, in comparison to in-house or domestically outsourced projects, offshore software projects also show a higher risk of failure (Dibbern, Winkler, & Heinzl, 2008). One approach for managing risks associated with OSD is the exercise of control, which refers to any attempt to motivate individuals to behave in a manner consistent with organizational objectives (Jaworski, 1988; Ouchi, 1979).

Researchers often argue that the OSD context has higher complexity than “traditional” in-house or domestically outsourced contexts (Dibbern et al., 2008; Wiener & Stephan, 2010), making the task of controlling IS offshoring projects particularly challenging (Gopal & Gosain, 2010; Kirsch, 2004; Rustagi, King, & Kirsch, 2008). For these contexts, studies on IS project control have evolved from an early focus on antecedent conditions of control choices (e.g., Kirsch, 1996, 1997) to an increasing attention being placed on control outcomes (Gopal & Gosain, 2010; Tiwana, 2010; Tiwana & Keil, 2009). In spite of these advances, however, our understanding of how IS offshoring projects are controlled, why certain combinations of control forms are chosen, and how much control is beneficial for project success is still limited.

In particular, only a few studies so far have tried to operationalize and study the ‘amount of control,’ defined as the variety and intensity of control mechanisms used within a control portfolio (Rustagi et al., 2008). This is even more surprising given that the amount of control might significantly add to project coordination costs and thus might have significant impact on individuals and firms. For example, results from a study focusing on the predictors of the amount of formal control in IS outsourcing suggest that controllers with technical or relationship management knowledge, or high levels of trust in their vendors, use formal control mechanisms to a lesser extent (Rustagi et al., 2008). Furthermore, they argue that high task uncertainty increases the amount of formal control. In contrast, Vlasic and Yetton (2004) find that task uncertainty decreases the amount of formal control. However, their study was conducted in the construction industry, which is claimed to be similar to the software industry. In addition, prior studies have only focused on formal controls, widely neglecting the potentially positive effects of informal controls on project success. For example, Mishra and Dillon (2008) concluded that formal control mechanisms are inadequate if the informal aspects of the control environment are not taken into account. It also appears that contract-driven formal controls complement informal controls (Goo, Kishore, Rao, & Nam, 2009), and that other forms of formal controls may also enhance the impacts of informal controls (Chua, Lim, Soh, & Sia, 2007).

In summary, a better understanding of factors influencing the amount of both formal and informal control is expected to reveal important implications for OSD project management. Thus, the objectives of this paper are twofold: First, it investigates the amount of control in various OSD settings. Second, it identifies factors that influence the amount of control in such settings. Using a comparative case study approach, we suggest eight propositions refining the relationship between the amount of control and its influencing factors.

The paper first introduces organizational control theory and briefly reviews prior literature, further clarifying the theoretical gap in previous research. Next, we describe the case study methodology, introduce the cases, present the results and discuss the findings by formulating eight propositions. The paper closes with integrating the findings into a model showing antecedents of the amount of control.

**ORGANIZATIONAL CONTROL THEORY**

Our study adopts a behavioral view of organizational control consistent with prior studies in IS (e.g., Choudhury & Sabherwal, 2003; Kirsch, 1996, 1997), organization design (e.g.,
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