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Achieving offshore software development success: An empirical analysis of risk mitigation through relational norms

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ABSTRACT

Behavioral risks such as shirking and misappropriation of information assets are more prominent in offshore software development context and could adversely affect offshore outsourcing success. This paper studies the moderating effects of different relational norms on the link between behavioral risks and offshore software development success. We focused on three major modes of relational norms: norm of flexibility, norm of solidarity and norm of information exchange. Using PLS path modeling to test a sample of 40 US corporations engaged in offshore software development, we found that the norms of solidarity and flexibility reduced the negative effects shirking risk on offshore software development success. Our results suggest that client firms shall benefit by forming the right mode of relational norms to achieve offshore success.

1. Introduction

Offshoring of Software Development (OSD) has become an established business practice (King and Torkzadeh, 2008).[2] While there are potential benefits in offshoring software development such as cost savings and access to highly skilled professionals (Gwebu et al., 2010; Khan et al., 2003; Tafti, 2005), it could also result in significant losses as companies have to face very different kinds of risks in a culturally different environment (Aron et al., 2005). Compared to other types of IT offshoring initiatives, OSD projects have some unique characteristics that may exacerbate risk factors and influence OSD performance. First of all, OSD projects tend to be less structured in general and software specifications are more likely unclear and incomplete (Gopal et al., 2003). The requirement uncertainties create problems in estimating and scheduling development time and further increase the level of difficulty in controlling and monitoring service provider behavior. Secondly, software development projects require knowledge specific investments such as training service provider employees to get familiar with client's business and operation processes. Such investments may have little or no value if the contract terminates prematurely in a short run. Third, software development is knowledge-intensive with high level of task interdependency, requiring the integration of tacit knowledge between client and service provider (Nicholson and Sahay, 2004). It is common that client organizations share information about the client's customers, product design, and business processes with service providers. Service provider's performance and the quality of software somewhat depends on effectiveness of communication and coordination between clients and service providers (Rai et al., 2009). But intensive interactions and communications take up most of software engineers' work hours

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(Cherry and Robillard, 2004). This nature of inter-dependence further magnifies the difficulty in measuring service provider's effort and outcome of the effort in software development, which increases service providers' inclination to behave opportunistically. Service providers may exert less effort than is agreed upon in software development to increase their own benefits at the expense of the client (Clemons and Hitt, 2004). Another risk of opportunism that client firms may face is that service providers or their employees may accidentally or purposefully release client's intellectual assets and proprietary information to interested third parties such as client's competitors. These kinds of risks becomes more prominent in OSD due to the differences in work styles, ethics, culture, and the level of intellectual property protection at offshore and onshore sites of OSD (Aron et al., 2005; Clemons and Hitt, 2004). Given that these natures of OSD projects critically affect OSD projects, there is a need to better understand how to mitigate risks more effectively in offshore projects.

Previous research suggests that relational norms play a major role in the maintenance of a highly interactive, flexible inter-organizational relationship (Lee and Kim, 1999; Goles and Chin, 2005), especially for knowledge – intensive activities (Dwyer et al., 1987; Kern and Blois, 2002; Kern and Willcocks, 2001). Relational norms are multidimensional in the sense that the effectiveness of individual relational norm may relate to particular kinds of behaviors (Heide and John, 1992; Choudhury and Sabherwal, 2003; Jap and Anderson, 2003). Though several recent anecdotal and case analyses of offshoring suggest that it is necessary to further examine effects of individual modes of relational norms in offshoring projects separately (Bryson and Sullivan, 2003; Gefen and Carmel, 2008; Heiskanen et al., 2008), so far as we know there is no systematic and empirical analyses on this issue.

To fill this research gap, we take client's perspective and aim to empirically examine the moderating effects of individual mode of relational norms on the relationship between particular opportunistic behaviors and OSD success. Our empirical analysis uses a survey of 40 senior IT executives who have an average of 6 years of experience in the offshore software development to validate our main hypotheses. The results help to enrich our limited understanding of relationship management in OSD projects and the conditions under which clients are better off to use a specific mode of relational norms to facilitate OSD success. The next section provides a theoretical background for our research. It follows a section of hypothesis development. We then proceed to describe data collection and empirical analyses followed by the presentation of results. We conclude the paper with a discussion of the key findings and directions for future work.

2. Theoretical framework

2.1. Opportunism in offshore outsourcing

Opportunism is defined as "self-interest seeking with guile" (Williamson, 1985: p. 47). Two types of opportunistic behavior are prominent in OSD practice: (a) shirking (Aron et al., 2005); and (b) misappropriation of information assets (Clemons and Hitt, 2004). Shirking is about reneging on explicit or implicit commitments and failing to fulfill promises and obligations (Jap and Anderson, 2003). It may take several forms in OSD activities. For example, an offshore service provider may deliberately shirk its effort and deliver a product or service inferior to what was promised, but may claim the full reward. This occurs as the service provider has alternative uses of resources deployed for the client and the client lacks the ability to monitor service provider behavior closely (Alchian and Demsetz, 1972; Aron et al., 2005). Shirking may also occur when an offshore service provider assigns an experienced programming staff in a given project to another more demanding project and substitutes a staff who is new to the project and does not enjoy as much expertise as the former (Aundhe and Mathew, 2009). This adds to the transaction cost of the client especially in a time and materials contract. Service provider may also under invest in training, equipment or just not putting enough efforts in a project (Aron et al., 2005).

Misappropriation of information assets (MIAS) involves the leakage of a client's proprietary information to a third party and the misappropriation of the client's intellectual assets for service provider's own benefit (Brynjolfsson, 1994; Clemons and Hitt, 2004). Clients and service providers share proprietary information including business plans and process specifications, product sales information, technical and performance specifications and customer data. These information assets are non-excludable and non-rival in consumptions, that is, the use of information assets by one party does not automatically exclude another party from use of the same asset and the consumption of the asset by one party does not reduce availability of the asset for the other parties. These unique attributes of information assets in software combined with the difficulties of monitoring service provider behavior pose additional misappropriation problems as well (Aron et al., 2005; Clemons and Hitt, 2004). For example, in the Financial Services domain, a service provider developing supporting software for a client's new credit card product might win the bid for a similar project with the first client's competitor. In such a situation the second client could receive some private information about the product of the first client through the service provider's IT staff (Clemons and Hitt, 2004). Misappropriation of information assets may also happen when service provider staffs who betray the company release client's valuable information to competitors purposefully. Such leakage of information assets through an IT service provider or employees is detrimental to the client.

2.2. Offshore software development (OSD) success

Firms expect to realize good outsourcing service performance such as reduced costs in staff and technology investment, access to world-class technological expertise, access to global market, improved enterprise-wide performance, and improved