Winter 12-4-2009

Exploring the Collaboration Model of Offshore outsourcing: A Study of IT Software Development

Hwang-Yeh Chen

EXPLORING THE COLLABORATION MODEL OF OFFSHORE OUTSOURCING: A STUDY OF IT SOFTWARE DEVELOPMENT

Hwang-Yeh Chen
Department of Accounting Information
Tzu Chi College of Technology, Taiwan
hyjchen@tccn.edu.tw

Abstract

The practice of offshore software development is now as part of global trend adopted by some Western companies. The software development projects operating under geographically-separated settings present the tremendous challenges and require collaboration-intensive activities. This study examines the factors contributing to the success and failure within the context of offshoring software development projects. Furthermore, this study intends to develop a collaboration model for offshore software development that describes the key components operating under distributed development environment. The initial results and limitations of research are also discussed.

Keywords: collaboration model, offshore outsourcing, software development, transaction cost economics

Introduction

As part of the global trend, enterprises are increasingly outsourcing their internal IT work to external service providers to focus their valuable and rare resources on core competencies and businesses. Recent development indicates that offshore outsourcing is now an accepted practice for many firms in the US and Western Europe [1] [2].

Offshore outsourcing (offshoring) involves the practice of handing over IT development and services to offshore sites outside the host country [1] [3]. For instance, some western firms have transferred their software development tasks to offshore sites in the countries such as India and China. While prior research indicates firms may benefit from offshore outsourcing with lower cost, time to market, resource leverage and disperse risks [2] [3] [4], equally-weighted difficulties are reported in literature, such as cultural and time zone difference, communication ineffectiveness, geographic dispersion and language barrier [1] [2] [5] [6].

In particular, the process of software development work consists of many steps from planning, to coding, testing, implementation, and maintenance [3]. The projects of software development require more intense communication and coordination work. Offshore outsourcing operating under the globally distributed setting inevitably increases the difficulty and complexity of software development work. While prior research in offshore outsourcing may focus on the mitigation of transaction costs and the setup of effective computer-based communication environment [1] [6], little attention has been paid to more comprehensive understanding of collaboration mechanisms for distributed software development. The purpose of this study is to explore best practices operating under distributed environment and factors contributing to the success of offshoring software development projects. Furthermore, this study intends to develop a collaboration model for offshore IT software development that aims to effectively minimize the transaction costs and risks under distributed development environment. Our approach is to focus on the collaboration setting faced by host teams, remote teams and external vendors when sourcing software offshore.

Theoretical Background

Transaction cost economics (TCE)

Transaction costs arise due to information asymmetry and incomplete contracts that lead to subsequent renegotiations when the balance of negotiation power shifts between the transacting parties [7]. Transaction costs refer to the effort, time, and costs incurred in searching, creating, coordinating, negotiating, monitoring, and enforcing a contract between buyers and suppliers [8]. Drawing on TCE theory, outsourcing is considered to be favorable, when transaction costs are low in the external market [9] [10] [11]. Therefore, the decision of offshore software development is often viewed as a rational choice made by firms with lower overhead cost and more skilled labor in offshore sites.

The TCE theory provides the foundation of identifying the factors contributing to various transaction costs under the context of offshore software development, such as communication, coordination, negotiation and supervision. The setup of the multiple-team collaboration between clients and vendors across multiple locations may increase these transaction costs. This study adopts the previously-developed framework in literature that identifies people, process and technology as the basic components to present the collaboration mechanism from various offshore software development projects

[6]. Figure 1 provides the initial collaboration model derived from Bhat's work.

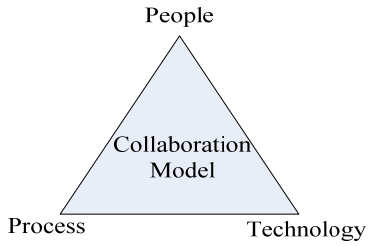

Figure 1: Collaboration Model of Offshore IT Outsourcing

Research Methods

Given the lack of prior research on offshore collaboration, the case study methodology was used to examine the phenomenon of offshore outsourcing arrangement within the context of software development. Qualitative data were collected through interviews and documentation during 2009. The initial phase of data collection was to identify the key components of the collaboration mechanism in offshore settings. The analysis unit based on each outsourced software development project.

The client firm, Company A, is a US-based international high-tech company manufacturing computing products. In order to achieve competitive advantage in the global market, Company A has been outsourced the software development task of various computing products (i.e. network devices) to offshore vendors for many years. This study examined the components consisting of globally distributed development setting and the difficulties associated with offshore software development.

Findings

Our initial findings have shown that communication obstacles increased due to cultural differences and language ability. Time-zone differences added to the difficulties of coordination work and geographic separation hampered knowledge migration. These hidden costs often offset outsourcing benefits such as cost reduction, risk minimization, and agile responses to business needs. Through years of failed experience, Company A arranged the existing working model to effectuate the project coordination and shorten the communication cycle. The project team for offshore software development consisted of the host team in US, the offshore team in Taiwan and the offshore vendor team in Taiwan (as shown in Figure 2).

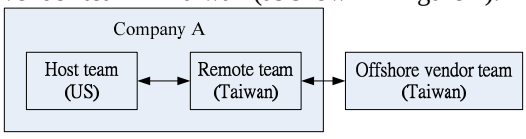

Figure 2: Offshore Outsourcing Team Arrangement

This collaboration arrangement was further analyzed based on three components, that is, people, process and technology. First, the addition of the remote team helped Company A to minimize the transaction costs associated with communication, coordination, and monitoring challenges. The members of the remote team were recruited by Company A to ensure team members' language ability and technical knowledge met the project requirements. Second, the processes of offshore software development project needed to be clearly defined, including project plan and deadline. Monitoring the project progress can be through the formal or informal discussion and the submission of progress reports. Third, the use of IT technology was also important to collaborate the multi-teams in different locations within an offshoring setting, such as Email, online chatting and conferencing tools, software development version control tool, and knowledge repository for prior projects. Prior research has also indicated that computer and communication technologies enable offshore system development [12]. As a result, the derived collaboration model for IT software development addresses the potential hidden costs and leads to the success of outsourcing relationships by facilitating the communication and coordination of offshore software development. Table 1 summarizes the initial results of the case in this study.

Table 1: The Primary Components of Collaboration Mechanisms

Collaboration Components	Best Practices
People	■ Tri-team concept
Process	■ Project plan and schedule ■ Formal and informal discussions (face-to-face and virtual) ■ Progress report, standard templates
Technology	■ Email, online conferencing tools (video and voice) ■ Software development version control tool ■ Project repository for best practices

Conclusions

This study only presents the initial results of the collaboration mechanisms for offshoring software development from a High-Tech firm. In fact, the existing collaboration arrangement within distributed development environment is still evolving. It takes tremendous effort to plan and manage offshore outsourcing projects in details. Future research is needed to further examine the relationships among the multi-team located in geographically separated locations. Despites the promising results, the study has the limited generalizability of the findings using the case methodology.

References

[1] Carmel, E., and Nicholson, B. Small firms and offshore software outsourcing: High transaction costs and their mitigation. *Journal of Global Information Management*, 13(3), 2005, pp. 33-54.

[2] Rottman, J. W., and Lacity, M. C. Proven practices for effectively offshoring IT work. MIT Sloan Management Review, 47(3), 2006, pp. 56-63.

[3] Niederman, F., Kundu, S., and Salas, S. IT software development offshoring: A multi-level theoretical framework and research agenda. *Journal of Global Information Management*, 14(2), 2006, pp. 52-74.

[4] Dibbern, T., Goles, R., Hirschheim, B., and Jayatilaka, B. Information systems outsourcing: A survey and analysis of the literature. *The DATA BASE for Advances in Information Systems*, 35(4), 2004, pp. 6-102.

[5] Bhat, J. M., Gupta, M., and Murthy, S. N. Overcoming requirements engineering challenges: Lessons from offshore outsourcing. *IEEE Software*, 23(5), 2006, pp. 38-44.

[6] Sinha, V., Sengupta, B., and Chandra, S. Enabling collaboration in distributed requirements management. *IEEE Software*, 23(5), 2006, pp. 52-61.

[7] Williamson, O. E. Transaction-cost economics: The governance of contractual relations. *Journal of Law & Economics*, 22(2), 1979, pp. 233-261.

[8] Mahoney, J.T. and Pandian, J.R. The resource-based view within the conversation of strategic management, *Strategic Management Journal*, 13(5), 1992, pp.363-380.

[9] Benslimane, Y., Plaisent, M., and Bernard, P. Investigating search costs and coordination costs in electronic markets: A transaction costs economics perspective. *Electronic Markets*, 15(3), 2005, pp. 213-224.

[10] Oh, W., Gallivan, M. J., and Kim, J. W. The market's perception of the transactional risks of information technology outsourcing announcements. *Journal of Management Information Systems*, 22(4), 2006, pp. 271-303.

[11] Shi, Z., Kunnathur, A. S., and Ragu-Nathan, T. S. IS outsourcing management competence dimensions: Instrument development and relationship exploration. *Information & Management*, 42(6), 2005, pp. 901-919.

[12] Sakthivel, S. Virtual workgroups in offshore systems development. *Information and Software Technology*, 47(5), 2005, pp. 305-318