Chapter 7
Project Quality of Off-Shore Virtual Teams Engaged in Software Requirements Analysis:
An Exploratory Comparative Study

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ABSTRACT

The off-shore software development companies in countries such as India use a global delivery model in which initial requirement analysis phase of software projects get executed at client locations to leverage frequent and deep interaction between user and developer teams. Subsequent phases such as design, coding and testing are completed at off-shore locations. Emerging trends indicate an increasing interest in off-shoring even requirements analysis phase using computer mediated communication. We conducted an exploratory research study involving students from Management Development Institute (MDI), India and Marquette University (MU), USA to determine quality of such off-shored requirements analysis projects. Our findings suggest that project quality of teams engaged in pure off-shore mode is comparable to that of teams engaged in collocated mode. However, the effect of controls such as user project monitoring on the quality of off-shored projects needs to be studied further.

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INTRODUCTION

The past two decades have witnessed significant globalization of the software development process with development rapidly moving away from the traditional collocated model, often called *on-site development*, to the off-shoring model. With the availability of increasingly skilled, flexible, and economical IT workforce in countries such as India, Malaysia, and China, it makes financial sense for United States and European client organizations to execute a significant portion of software projects in these countries. This growing trend towards off-shoring has, in turn, spurred growth in many Asian nations, creating improved economic and IT infrastructure and enhancing the viability of these countries as software service providers. For example, India has emerged as a dominant off-shore software development industry with revenue of about $16.7 billion, which is projected to reach $60 billion by the year 2010 (Carmel, 2006; National Association of Software and Service Companies, 2005).

The Indian off-shore software industry has matured over the years, and process capability has been steadily improving. Coordination and communication problems typically encountered in off-shore development (see Battin, Crocker, Kreidler, & Subramanian, 2001, for an extended discussion), are mitigated by the use of processes such as rational task assignments and liaisoning, and tools such as centralized bug reporting system and software configuration management platforms. A case in point is India's Infosys Technologies, which has significantly leveraged time zone differences with its clients by modifying its organizational culture, processes, and communication technologies (Carmel, 2006).

The typical off-shore development model, followed successfully for over a decade by many Indian software companies such as Infosys, Wipro, TCS, and Satyam, is illustrated in Figure 1.

Requirements analysis refers to that stage of the system development life cycle wherein the information and information processing services needed to support select objectives and functions of the organization are (i) determined and (ii) coherently represented using well-defined artifacts such as entity-relationship diagrams, data-flow diagrams, use cases, and screen prototypes (Hoffer, George, & Valacich, 1999). As suggested in Figure 1, typically this phase is conducted at the client location, since this phase requires frequent and significant interaction between users and developers. Business and systems analysts are physically located at the client site to perform this activity. Global projects consultant teams from off-shore location travel to the user site to gather and analyze requirements in face-to-face meetings (Damian & Zowghi, 2002). The consultants then communicate the requirements to the development staff in the offshore site. Depending on the nature of the project, high-level design is conducted in both on-site and off-shore mode due to comparatively lower interaction needs with the client. Detailed design, coding, and testing are executed at the off-shore site. Off-shore vendors also deploy liaisons who coordinate activities between on-site users and the off-shore development team. These liaisons are critical for effective communication and coordination between users and developers (Battin et al., 2001).

Increasingly, both client and software providers are now considering the possibility of off-shoring the requirements analysis phase, traditionally done on client site, away from the client location. In such a scenario, analysts and developers located at the off-shore location would interact in a virtual mode with the clients situated at their premises to determine and structure the requirements. Such a shift could potentially improve the cost arbitrage of the projects for instance by cutting down travel costs incurred for sending analysts to the client site for face-to-face meetings. In an extreme case, the entire team of analysts and developers could be based in off-shore location such as India while the client could be in Europe or the United States. Requirements gathering would then be

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