

## Chapter 8.12

# Flexible Global Software Development (GSD): Antecedents of Success in Requirements Analysis

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### ABSTRACT

Globalization of software development has resulted in a rapid shift away from the traditional collocated, on-site development model, to the offshoring model. Emerging trends indicate an increasing interest in offshoring even in early phases like requirements analysis. Additionally, the flexibility offered by the agile development approach makes it attractive for adaptation in globally distributed software work. A question

of significance then is what impacts the success of offshoring earlier phases, like requirements analysis, in a flexible and globally distributed environment? This article incorporates the stance of control theory to posit a research model that examines antecedent factors such as requirements change, facilitation by vendor and client site-coordinators, control, and computer-mediated communication. The impact of these factors on success of requirements analysis projects in

a “flexible” global setting is tested using two quasi-experiments involving students from Management Development Institute, India and Marquette University, USA. Results indicate that formal modes of control significantly influence project success during requirements analysis. Further, facilitation by both client and vendor site coordinators positively impacts requirements analysis success.

## **INTRODUCTION**

Globalization has resulted in software development being outsourced to emerging and developing nations (Edwards & Sridhar, 2005). An increasing range of services and processes are being delivered by global vendors as per quality, price, and requirements independent of geography, suggesting a growing capability and acceptance of global service delivery (NASSCOM, 2007). Outsourcing is the largest and fastest growing category within worldwide IT services spending. In 2006, the total spending on IT outsourcing was estimated at over USD 170 billion (more than 36% of the total) with an above average growth at 7.3 % (NASSCOM, 2007). Accordingly, software development has moved away from the traditional colocated model, often called on-site development, to the offshoring model (Edwards & Sridhar, 2006) in which global virtual teams collaborate across national borders (Carmel, 1999).

Global software development (GSD) presents abundant business opportunities as well as challenges in terms of control, coordination, communication, culture, and technology. To address these challenges, many researchers propose that firms must have ambidextrous capabilities (Lee, Delone, & Espinosa, 2006) and combine the flexibility offered by the growing agile development approaches with the traditional plan-based approaches (Agerfalk & Fitzgerald, 2006; Lee, Banerjee, Lim, Hilleberg, & Wei, 2006; Ramesh, Cao, Mohan, & Xu, 2006). As organizations

become more virtual, distributed development will become increasingly apparent throughout the entire software development life-cycle, particularly so in early stages such as requirements analysis (Evaristo, Watson-Manheim, & Audy, 2005). Despite the abundance of literature on globally distributed virtual teams (see Powell, Piccoli, & Ives, 2004) and IT outsourcing (see Dibbern, Goles, Hirschheim, & Jayatilaka, 2004; Yadav & Gupta, 2008), very few studies address the critical requirements analysis phase of GSD (Yadav, Nath, Adya, & Sridhar, 2007).

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). Typically in GSD this phase is conducted at the client location since this phase requires significant interaction between users and developers. Business and systems analysts are physically located at the client site to perform this activity. 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 (Carmel & Tijia, 2005).

Damian and Zowghi (2002) report that in global projects consultant teams from the off-shore location travel to the user site to gather and analyze requirements in face-to-face meetings. The consultants then communicate the requirements to the development staff at the offshore locations. An emerging stream of research, on the other hand, puts forward the phenomenon of distributed requirements engineering (Bhat, Jyoti, Gupta, & Murthy, 2006; Edwards & Sridhar, 2005; Evaristo et al., 2005; Nath, Sridhar, Adya, & Malik, 2006). An interesting alternative being considered by software companies is the possi-

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