Chapter 13
A Framework of Risk in Global IT Projects and Mitigation Strategies from Service–Oriented Architecture

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ABSTRACT

Global Information Technology (IT) projects span multiple locations that are typically employing different practices, adhering to different standards, and using different technologies – at the same time operating in highly diverse cultures. Differences such as these are prevalent factors that increase risk on global IT projects. Further, they are prone to changing continuously over the course of a project, with the consequence that risk becomes highly unpredictable and dynamic. This chapter proposes a framework to characterize risks within the people-process-technology-external elements of a global IT project. The framework gives particular consideration to risks that arise from interactions of multiplicities within and between those elements (i.e. dynamic risks). The principles of Service-Oriented Architecture (SOA) are adopted to propose specific strategies for mitigation of these dynamic risks. Two case studies further illustrate how those strategies can mitigate the risks.

INTRODUCTION

Risks are uncertainties that potentially cause a project to deviate from its planned progress or outcomes (Barkley, 2004). Project risks refer to uncertainties which may prevent a project from delivering expected outcomes within the planned time, scope, budget, and/or quality (Badiru, 2009). Our research

focuses on the risks associated with global information technology (IT) projects. Global IT projects are characterized as having "geographically dispersed people working interdependently with shared purpose across space, time and organizational boundaries and using technology to communicate and collaborate" (Sakthivel, 2005, p. 139).

Risks are accentuated on global IT projects because of differences and variations with respect to locations, cultures, groups, and interests (Persson, Mathiassen, Boeg, Madsen, & Steinson, 2009). Among differences known to increase risk on global IT projects are geographic distances, ineffective structures for collaboration, language barriers, and technological incompatibility (Dawidson, Karlsson, & Trygg, 2004; Persson et al., 2009; Powell, Piccoli, & Ives, 2004).

These multiple differences, termed *multiplicities*, mean that each team and every individual involved in a global IT project may have a different set of goals, objectives, interests, standards, workflows, development platforms, and technologies (Kotlarsky, Oshri, van Hillegersberg, & Kumar, 2007). The magnitude of differences, and the consequent risk, vary not just between teams and individuals, but they can also change over time as a project progresses. Because of their unpredictable nature on global IT projects these risks have been termed *dynamic risks* (Lee, Banerjee, Lim, Kumar, van Hillegersberg, & Wei, 2006).

Several previous studies of risks in a global project setting have been conducted. For example, Sakthivel (2005) examines management systems for virtual project management having multiple tasks with respect to the impact of multiple cultures. Mohtashami, Marlowe, Kirova, and Deek (2006) find trust, cultural management, and collaborative communication as critical risk factors in global IT projects, and Persson et al. (2009) identify areas and risk factors including task integration, knowledge management, geographical distribution, collaboration structure, and stakeholder relations. Although restricted to agile software development, Lee and Baby (2013) also proposed a framework for risk management on global IT projects. Our work extends theirs in order to develop a more generalized framework.

Prior work has not studied dynamic risk in global IT projects extensively, nor has prior work considered the implications of how multiplicities such as described here can interact and amplify project risk. We draw on the extant studies in this area, including from Lee and Baby (2013), and aggregate them into a comprehensive risk framework in global IT projects. Our framework of risk is based on prior research which defines the elements of an IT project and we specifically adopt the people-process-technology framework first introduced by Berkun (2005).

The framework developed in this chapter considers how the multiplicities inherent within the elements of global IT projects, i.e. people, process, technology, and external environments, can interact and accentuate risk. With the framework for risk in global IT projects established, we turn to developing strategies to mitigate those risks.

Principles of service-oriented architecture (SOA) have been adopted to prescribe recommendations in other areas such as for agile enterprise management (Bieberstein, Bose, Walker, & Lynch, 2005; Schroth, 2007), and to enable business structures to rapidly adapt to changing environments (Niemann, Eckert, Repp, & Steinmetz, 2008). We follow this prior research and relate SOA principles to risk in global IT projects. Using this approach we are able to develop and propose risk mitigation strategies.

This chapter is structured as follows. First, based on the definitions of the internal and external elements of a project we enumerate dynamic risks that can arise from the interaction of multiplicities within each element and in combinations of elements, which is the basis for our framework presented next. We then show how risk in global IT projects can be considered in the context of SOA principles, and adopt

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