



Understanding the impact of risks on performance in internal and outsourced information technology projects: The role of strategic importance

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Received 2 August 2013; received in revised form 18 January 2014; accepted 23 January 2014
Available online 17 February 2014

Abstract

Successfully managing the risks of information technology projects continues to be a central problem for organizations regardless of whether the project is outsourced or not. While a plethora of studies has examined the effects of risks on performance, majority fail to distinguish the sourcing characteristics of the projects investigated. Furthermore, little is known about the joint effects of strategic importance and the risk on system performance across internal and outsourced projects. Based on data collected from 77 internal projects and 51 outsourced projects, we find that social subsystem and project management risks are negatively associated with system performance in both internal and outsourced projects. However, technical subsystem risk negatively affects performance only in internal projects. While social subsystem risk exerts greater influence on system performance in outsourced projects than in internal projects, the technical subsystem risk has greater effect on performance in internal than that in outsourced projects. Moreover, the effect of project management risk is not different in both types of projects. In addition, strategic importance moderates the relationship between risks and performance. The negative impact of risks on performance is greater in projects that are more strategic. Strategies are proposed to reduce the complexity and potential conflicts inherent to strategic projects because these characteristics may amplify a risk's impact.

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Keywords: Information technology; System performance; Strategic importance; Project risk; Information systems development

1. Introduction

Successfully managing the risks of information technology (IT) projects continues to be a central problem for organizations regardless of whether the project is outsourced or not because of the low success rate of IT projects in recent years. According to the 2011 Chaos report, the Standish group revealed that only 37% of the projects were delivered with intended benefits, whereas 63% of the projects encountered schedule, budget, and function problems (Curtis, 2012). The situation is even more pessimistic in outsourced projects. The Aberdeen Group reports

that the failure rate of outsourced projects accounts for almost 50%, and 76% of companies believe that vendor management costs are higher than expected (Outsourcing Today, 2012). The overall results suggest that past IT projects do not manifest high system performance (i.e., the project is delivered with reliable outcomes and with satisfying functional requirements) and risks are not managed appropriately either in internal or in outsourced IT projects.

Previous research on IT project risk management exhibits three gaps. First, a plethora of studies focus on identifying, assessing, and mitigating risks (Aloini et al., 2012; Liu et al., 2010; Persson et al., 2009; Taylor et al., 2012), whereas the relationship between risks and performance still requires further examination. Various types of risks create different impact on performance (Wallace et al., 2004b). Moreover, the effects on the performance of IT projects even for the same risk are contradictory according to some studies. For example, while

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requirement and user risks have direct negative effects on performance (Huang and Han, 2008), other researchers argue and empirically find that their effects are indirect (Keil et al., 2013; Wallace et al., 2004b). Therefore, further empirical evidence is required for the relationship between risks and performance.

Second, when previous studies examine the effect of risks on performance, most of them fail to distinguish the sourcing characteristics of the investigated IT projects (Bakker et al., 2010; Wallace et al., 2004b), while a few merely focused on outsourced projects (Liu et al., 2011). Thus, how the relationship between risk and performance is influenced by project sourcing (i.e., whether the project is developed outsourced or in-house) is unknown. Moreover, a direct contrast of how risks influence the performance of internal projects relative to outsourced projects is lacking. The risk will likely have more influence on performance in outsourced projects than in internal projects because the former covers inter-organizational boundary and has limited control (Tiwana and Keil, 2010). However, empirical evidence and theoretical explanations for this finding are insufficient. Given that both internal and outsourced systems are widespread for IT project development, exploring their differences is necessary.

Third, project inherent uncertainty, such as strategic importance, can be an occasional factor on the effect of risks. Project strategic importance is defined as the degree to which the project is strategic and important to the organization (Boonstra, 2013; Jiang and Klein, 1999a; Wallace et al., 2004a). Researchers suggest that developing a strategic application is different from developing a system to automate transactions or aid in decision making (Kemerer and Sosa, 1991). Strategic projects embody high complexity risk, and hence, are less likely to be successful. However, key stakeholders (e.g., senior managers, project managers) may attach more importance to strategic projects and increase investment and resources on the project to ensure that expected outcomes are delivered (Jiang and Klein, 1999a). As a result, strategic importance of internal and outsourced IT projects can either strengthen or suppress the effect of risks on performance. Nevertheless, no prior research directly includes strategic importance in its theory development. Therefore, how strategic importance alters the relationship between various types of risk and performance in internal or outsourced projects remains unexplored.

These issues are related to significant practical problems because risks might negatively affect performance in a particular project context but might be ineffective in others. This disparity can prevent project managers and other stakeholders from investing unnecessary costs and resources. We attempt to bridge these gaps led by the following two research questions:

- *How do risks differentially influence performance in internal and outsourced IT projects?*
- *How does strategic importance change the risk–performance relationship in internal and outsourced IT projects?*

Our paper is organized as follows. First, relevant theory is introduced and a conceptual framework is established. Second, our research model and hypotheses are developed. Third, methodology

is presented, and each hypothesis is empirically tested with hierarchical analysis based on survey data collected from 128 projects. Finally, the results of hypotheses testing are provided, and implications of our findings are discussed.

2. Theoretical framework

2.1. IT project risk

Risk management is broadly recognized as an effective approach to improve the performance of IT projects (Bakker et al., 2010; Spears and Barki, 2010). Consistent with previous studies (Schmidt et al., 2001), risk refers to the condition that can exert serious threats on the successful delivery of an IT project. Prior studies have identified numerous risks that comprise diverse checklists on risks that threaten the success of IT projects (Barki et al., 1993; Moynihan, 1997). In addition, conceptual frameworks for classifying risk factors are proposed to explain different dimensions of risks (McFarlan, 1981; Keil et al., 1998). For example, Keil et al. (1998) developed a 2×2 grid framework to categorize four types of risk, namely, customer mandate, environment, scope and requirements, and execution. However, few of these efforts have explicitly distinguished the risks in internal projects from that in outsourced projects.

Measures of the risk factors in outsourced projects are also developed and validated. By adopting transaction cost theory, Bahli and Rivard (2005) categorized the risks based on the source of risk, such as transaction, supplier, and client. Ten risk factors were mapped into these three dimensions. Nakatsu and Iacovou (2009) classified the risks in outsourced project into 11 dimensions based on literature review and Delphi process. However, their categorization was not statistically validated.

Among these researchers, Wallace et al. (2004b) developed a long list of risk factors and mapped them into six dimensions. Their study validated the instrument through a rigid process using a sample of more than 500 respondents. In the current study, we further test and expand the model developed by Wallace et al. (2004b), because the previous model fails to distinguish the sourcing characteristics and strategic importance of IT projects. Six dimensions of IT project risks are identified, namely, team, organizational environment, requirements, planning and control, user, and complexity. Organizational environment and user risks are two dimensions of social subsystem risk, which refers to unstable and uncooperative social risk (e.g., unstable organizational environment and lack of user involvement). Requirement and complexity risks constitute technical subsystem risk, which refers to complex and volatile technical risk (e.g., the inherent complexity and requirement uncertainty). It is noteworthy that complexity risk is defined as the uncertainty inherent from system complexity from a traditional technical view, and thus, is conceptually different from complexity. Complexity is deemed as a source of risks (Vidal and Marle, 2008). However, risk can also influence project complexity because additional interactions and dynamics may be expected (Bosch-Rekveltda, 2011). Moreover, project complexity includes organizational complexity and IT complexity (Xia and Lee, 2005). Our definition of complexity risk is primarily related to IT complexity and thus

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