

Chapter 5.26

Lack of Skill Risks to Organizational Technology Learning and Software Project Performance

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ABSTRACT

To improve the performance of software projects, a number of practices are encouraged that serve to control certain risks in the development process, including a lack of essential skills and knowledge related to the application domain and system development process. A potential mediating variable between the lack of skill risk and project performance is the ability of an organization to acquire the essential domain knowledge and

technology skills through learning, specifically organizational technology learning. However, the same lack of knowledge that hinders good project performance may also inhibit learning. This study examines the relationship between information system personnel skills and domain knowledge, organizational technology learning, and software project performance with a sample of professional software developers. Indications are that the relationship between information systems (IS) personnel skills and project performance is

partially mediated by organizational technology learning.

INTRODUCTION

The importance of technical and business skills and knowledge for information systems personnel has been advocated in the IS literature for decades (Cheney & Lyons, 1980; Jiang, Klein, Van Slyke, & Cheney, 2003). In spite of the recognized importance, empirical investigations that examined the relationship between IS personnel skills and project performance, as measured comprehensively by attainment of goals and budgets, have been lacking in the IS research literature. To address this lack, Byrd and Turner (2001) conducted a study using the perceptions of chief information officers (CIOs) to evaluate IS personnel skills and the success of information systems in building competitive posture. To one's surprise, their study did not find a significant positive relationship between IS personnel skills and eventual success of the developed system. Why should an empirical study contradict experience? They suspect that the relationships in an organization where IS personnel skills are applied have too many complexities to be modeled accurately. Could there be a mediating variable between IS personnel skills and IS project performance that further explains how to overcome this essential lack?

Researchers have observed that activities during information system development and implementation offer an opportunity for organizational technology learning, or the ability and practice of bringing new skills and knowledge into the organization related to IS development and the application of IS tools to business domains (Ko, Kirsch, & King, 2005; Stein & Vandenbosch, 1996). For a successful IS implementation, skills must be brought to bear from the application domain and technical domains, which can best happen when the organization encourages the learning of newer skills and knowledge, and has

practices to incorporate these newly acquired assets into current and future projects. In short, organizational technology learning is a critical factor for predicting final IS project performance, and a base of knowledge and skills in the IS project team are a necessary condition for organizational technology learning to occur. This suggests that organizational technology learning is a mediator between IS skills and knowledge and the performance of the IS project. Unfortunately, no empirical study has attempted to validate this reasoning.

The focus of this study is, therefore, to examine the relationship from IS staff development skills and domain knowledge to project performance with organizational technology learning as a mediator. A positive result of this study will provide additional insights on IS skill research and provide an alternative explanation to the unsolved IS skills puzzle of Byrd and Turner (2001). From a survey sample of 212 Institute of Electrical and Electronics Engineers Computer Society members, the results indicate that the lack of system development skills and knowledge in the application domain have a direct negative impact on organizational technology learning and project performance. Furthermore, organizational technology learning has a significant positive impact on final project performance, showing that the impact of IS personnel skill levels on project performance is partially mediated by organizational technology learning.

BACKGROUND AND RESEARCH MODEL

Broad categories of critical IS personnel skills are identified, including (1) technical specialties/technology management skills and (2) business domain knowledge and skills (Jiang et al., 2003). Unfortunately, given decades of emphasis, these IS skills were still not linked to IS project performance (Byrd & Turner, 2001). This may be

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