Managing the Impact of Rapid IT Change

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ABSTRACT

Rapidly changing information technology is increasing the complexity of IT management. Research has suggested that such change causes nine different problem types for IT managers. It also suggested that these problems cause IT managers to use five categories of coping mechanisms to alleviate the problems. The current study used responses from 246 IT professionals to a survey about the problems and coping mechanisms related to rapid IT change. As examples, New integration refers to the incompatibility or need for interfaces between multiple ITs, and Education and training refers to staying informed of new IT as it becomes available and instructing or providing guidance for its use. The study developed and found support for an overarching hypothesis stating that the more extensively organizations experience the problems of rapid IT change, the more extensively they use coping mechanisms to address them. It also found support for ten specific sub-hypotheses about the effect of individual problems and on individual coping mechanisms. For example, organizations appear to address the problem of New integration needs with the increased use of the coping mechanism of Consultant support. They also cope with User resistance via Vendor support, and with Vendor oversell via Internal procedures. The findings provide IT managers, vendors, and consultants with alternative perspectives about the problems of rapid IT change and how others address them. Future research should focus on how specific coping mechanisms ameliorate specific problems.

Keywords: Change Management, IS Change, IS Management, IS Strategy, Issues in Organizing IS

INTRODUCTION

“One of the greatest difficulties confronting IT managers is adapting to rapid change” (Gallivan, 2004, p. 1). This challenge is not new. Information technology has been rapidly changing, and will continue to do so at an unprecedented and perhaps even accelerating rate (Kurzweil, 2004; Tsai et al., 2007).

Rapidly emerging IT has enabled the role of information systems to evolve from one of support to one of strategic business transformation, a role that has been increasing the expectations and responsibilities of the IT organization (Ceglieski et al., 2005; Smith & McKeen, 2006) to the point where “information technology is critically ubiquitous in every business process” (Lacity et al., 2004, p. 127). Combined with this new role, the unknown, unproven, and risky features of rapidly emerging IT make the

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management of IT more complex and difficult (Bhattacherjee, 1998).

Not surprisingly, industry observers have agreed for over a decade that rapid IT change is a major challenge for organizations (Diederich, 1998; Skok & Tan, 2007; Ware, 2003). Because new technologies perpetually change the nature of information systems work, one recent study maintained that IT professionals “live on the edge of change” (Kaplan & Lerouge, 2007, p. 325). Another asserted that, as a result, even IT “projects with ‘successful’ outcomes still suffer lengthy delays and cost overruns” (Brown et al., 2007, p. 96).

IT management must realize the potential of new IT while avoiding the risks. Mistakes can be costly, but it is virtually impossible to have experts on all emerging ITs because the profession “consists of a collection of ever-changing specialists and generalists…striving to keep pace with the evolution of technology…” (Kaplan & Lerouge, 2007, p. 335). Furthermore, while IT rapidly changes, lengthy acquisition and implementation processes can date many ITs before ever substantially contributing to their intended purpose. A new IT can, in fact, even become obsolete before it is ever implemented.

Understanding the factors influencing the use of emerging IT is thus a critical issue for researchers and practitioners (Ilie et al., 2005). The purpose of this research is to better understand how the IT organization responds to the various challenges of managing the selection and implementation of new IT in order to enable IT managers to better deal with rapid IT change. The study thus reviews the IT management problems resulting from rapid IT change, as well as the coping mechanisms used by IT managers to attempt to address such problems. It then proposes an overarching hypothesis that the more extensively organizations experience the problems of rapid change in IT, the more they use the coping mechanisms to address them. It then hypothesizes specific relationships between individual problems and coping mechanisms. Finally, it tests the overarching and sub-hypotheses.

THEORETICAL BASIS

A considerable amount of research has investigated the effects of IT on different aspects of organizations. Examples of areas of interest include business process reengineering (Attaran, 2004; Paper & Simon, 2005; Wastell et al., 2007), economic outcomes (Davamanirajan et al., 2006; Mahmood & Mann, 1993), resistance to change (Ferneley & Sobreperez, 2006; Wong & Tate, 1994), and virtual organizations (Larsen & McInerney, 2002; Warkentin et al., 1997). However little research has directly addressed the effects of changing IT on IT management, and how IT management copes with them.

This literature review first explains three foundational theories of organizational change used to motivate this research. It then elucidates the interaction of organizations with their changing environment to embellish the application of the theories in the IT change context. Finally, it recognizes IT as a changing dimension of the environment and discusses prior research on the impact of IT change on IT management.

Three Theories of Change

The effects of and reaction to change have been of interest for some time. Lewin (1947) suggested that systems exist at or settle to a state of equilibrium where active driving and resisting social forces are balanced. System change is the process of altering these forces to move the system to a new state of equilibrium. Lewin described three phases in the process of change. The first phase, unfreezing, involves increasing the receptiveness of the system to change the balance or status quo of social forces. The second, moving, is the altering of the social forces to shift the equilibrium to a new level. Finally, refreezing takes place to instill the new balance of forces and stabilize to the new state of equilibrium. Many factors can influence these phases (Schein, 1964).

Isabella (1990) added that the managerial interpretation of change unfolds in four stages: anticipation, confirmation, culmination, and aftermath. Anticipation refers to the manage-
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