Chapter 5.10
Categorizing Post–Deployment IT Changes:
An Empirical Investigation

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ABSTRACT

Although it has been widely recognized that post-deployment changes of information technology (IT) are unavoidable, little attention has been paid to the management of post-deployment IT changes. This study intends to advance our knowledge in this area. It first introduces a general framework for technology change in use, developed in an organizational study. Then, through tracking the post-deployment changes of a large workflow application, this study develops an enhanced and expanded categorization of post-deployment IT changes. The findings suggest that even custom-developed software can be plagued by misfit and that a learning-in-working perspective should be added to understand and resolve the misfit between IT and the organization. For future study, the findings of this study suggest that more efforts should be directed toward the issues of balancing system stability and volatility and continuous post-deployment communication between IT management and users.

INTRODUCTION

The deployment of IT is likely to be followed by mutual adaptation between IT and its user organization (e.g., Leonard-Barton, 1988; Majchrzak, Rice, Malhotra, King, & Ba, 2000; Orlikowski, 1996; Tyre & Orlikowski, 1994). But though the effects of IT on organizational changes have been investigated extensively, little work has been done to understand the post-deployment adaptations of IT itself. One exception has been a study of system maintenance. Swanson (1976) classified system maintenance types into adaptive, perfective, and corrective. This conceptual classification hinted at types and causes of system changes. However, it does provide details under each type. As noted by some commentators (e.g., Orlikowski & Iacono,

2001), the field of information systems (IS) research, which is premised on the centrality of IT, has not been deeply engaged in the study of IT itself. Research of IT in use seems to be dominated by the question of what can be done *by* IT, rather than what can be done *to* IT. Researchers tend to focus on other issues, such as the contexts in which some usually unspecified technologies operate, the discrete processing capabilities of artifacts separated from how they operate in contexts, or the dependent variables that the technologies presumably affect or change as it is developed, implemented, and used. This trend is puzzling, given that an emergent perspective in studying IT and organizational changes was called for more than a decade ago (Markus & Robey, 1988).

The need to study post-deployment IT changes has become urgent. As business processes and IT applications, such as workflow and enterprise resource planning (ERP), become ever more tightly coupled, they must evolve together for the sake of effective work transformation. Empirical evidence (Mitchell & Zmud, 1999) suggests that influence works both ways between IT and business process strategies during business process redesigns. When they are tightly coupled, project performance improves. However, current IS research still has not considered the two-way influence in this relationship beyond the project planning stage. Orlikowski and Iacono (2001) provided one explanation for the preoccupation with the one-way influence of IT on organization and business processes in current research. Researchers, armed with lenses provided by different reference disciplines, tend to search for dependent variables in the contexts of IT use. This current focus of IS research might have ignored the important needs of dealing with post-deployment IT changes in IT practice. With the growing complexity of today's IT projects, it is virtually impossible to get everything right before the time of deployment. No one can foresee all the necessary changes and the corresponding IT adjustments in real use because much learning

happens while working with it (Brown & Duguid, 1991). Post-deployment design changes to an IT may be necessary as results of, among others, social and organizational changes driven by conflicts between old and new business processes associated with old and new technologies (Robey, Ross, & Boudreau et al., 2002).

IT design change traditionally has been studied in the context of system development. Among others, the prototyping approach has been promoted as a primary solution to manage and even spur design changes during system development. In addition, IS research has pointed out the need for long-term, planned IT changes and incorporated this need into the notion of a system lifecycle. However, post-deployment, short-term emergent IT changes pose a different challenge for IT management. Compared with predeployment IT changes, post-deployment IT changes are far more consequential because they directly affect real work. Whereas long-term, planned system changes generally resemble the development of new systems, short-term, emergent IT changes must work within much shorter cycles of application development, testing, and installation. This difference can easily tip the balance between system stability and volatility during the crucial period of initial system use. Hardware and software changes often keep users away from their machines temporarily; system changes frequently disrupt established user expectations; and design changes sometimes can require changes in work practices. All these changes take place while the users are still learning the new systems and trying to incorporate them into their work. For these reasons, it is not sensible to manage post-deployment IT changes haphazardly.

The effective management of post-deployment IT changes requires a solid understanding of these changes. The objective of this study is to develop an initial categorization of such changes. Through investigation of what leads to such changes, we can also start to appreciate what organizational use of IT will do to IT management. Recognizing

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