

Chapter 7.3

Factors Influencing Information System Flexibility: An Interpretive Flexibility Perspective

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ABSTRACT

Information System (IS) flexibility has been regarded as an important indicator of information technology success. This article provides a model of IS flexibility encompassing all stages of IS implementation and usage. The model considers the cognitive factors from IS staff and users as important leveraging IS flexibility with adaptation activities. A review of constructs extending from the interpretive flexibility perspective in the literature is used to identify these cognitive factors. By hypothesizing the relationships among these cognitive factors, IS flexibility, and adaptation activities several propositions are identified. Empirical testing is then warranted to refute or validate the propositions.

INTRODUCTION

Enhancing information system flexibility with flexible information technology infrastructure and adaptable application systems has been a critical issue for IS managers (Duncan, 1995; Prahalad & Krishnan, 2002; Sambamurthy *et al.*, 2003). Information systems must be flexible to satisfy user requirements, particularly in changing environments. Sufficient IS flexibility could extend the life cycle of information systems and expand the effectiveness of IT investment (Cha-Jan Chang & King, 2005; Chang & King, 2005; Gebauer & Schober, 2006; Moitra & Ganesh, 2005).

Truex et al. (1999) found users can never be satisfied in emergent organizations, because their

needs are always changing. The user-to-systems relationship, which often experiences continuing conflict, requires application systems flexibility. This viewpoint holds that IS projects should not only focus on design and development activities, but also value the adaptation activities in both implementation and post-implementation stages (Markus *et al.*, 2003; Ross *et al.*, 2003; Truex *et al.*, 1999). As emphasized in prior studies, this calls for considering IS flexibility through the overall life cycle in addition to planning and crafting an infrastructure of IT (Byrd & Turner, 2000; Lewis & Byrd, 2003). Despite a wealth of research on IS flexibility and its impacts on organizations and business processes (Gebauer & Schober, 2006; Moitra & Ganesh, 2005; Sambamurthy *et al.*, 2003), decisions regarding IS flexibility, especially considering the entire IS life cycles, have rarely been included into the analysis. As a result, flexibility guidelines for managing IS have not been developed.

In addition, the benefits of IS flexibility are difficult to measure physically or objectively; particularly as they are perceived by both IS staff and system users. IS flexibility to accommodate changes in the supported business processes depends on the various ways staff members combine application functions with business activities (Askenas & Westelius, 2003; Moitra & Ganesh, 2005). Thus, this study uses an interpretive flexibility perspective that differs with most prior studies which consider IS flexibility as being built into IT artifacts through IS design and development activities (Byrd *et al.*, 2004; Byrd & Turner, 2000; Lewis & Byrd, 2003). In addition, this study asserts that the cognitive factors of staff members would influence the decisions and adaptation activities associated with IS flexibility.

Flexibility comes at the price of complexity and the additional investment required (Gebauer & Schober, 2006; Stigler, 1939). The decisions regarding IS flexibility are filled with the tradeoffs that need to find a balance between *IS rigidity* and *IS complexity* (Gebauer & Schober, 2006; Silver,

1991). IS implementation always involves the risk of failure from rigidity, changing requirements, or too much complexity to maintain. Therefore, we apply the concept of *perceived risk* from the consumer behavior literature to analyze the perceived requirement for IS flexibility. This perception is related to decisions for lowering or limiting the risk of failures on future IS usage. The perceived risk approach, based on the interpretive flexibility perspective, could be an original and important direction for analyzing IS flexibility. This leads to the following research questions:

1. What kinds of factors interact to change IS flexibility in each stage of IS adoption, implementation, and post-implementation?
2. How do these factors for IS flexibility differ between IS staff and users in each stage of IS adoption, implementation, and post-implementation?

THEORETICAL BACKGROUND

First, it is necessary to clarify the content of IS flexibility (for use and for change) and IS adaptation activities (including technology systems and task adaptation) since these are the primary means to alter IS flexibility in actual usage. Subsequently, the related concepts that form the foundation for the theoretical model: perceived risk and interpretive flexibility are reviewed.

Information System Flexibility

There are two types of IS flexibility: (1) *IS flexibility for use* is the range of possibilities provided by an information system until a major change is required, and (2) *Flexibility to change* or the potential adaptability for further changes of a given information systems (Gebauer & Schober, 2006; Knoll & Jarvenpaa, 1994). Mostly, scholars focus the issue of *flexibility to use* on the functions of the information system that can be determined by

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