Chapter 2.23
Designing Information Systems Capabilities to Create Business Value:
A Theoretical Conceptualization of the Role of Flexibility and Integration

Christoph Schlueter Langdon
University of Southern California, USA

ABSTRACT

Despite Internet success and the fact that software has become the factory in many businesses, questions remain concerning information technology (IT) business value, the IT payoff paradox, and why IT even matters. While numerous econometric studies have established that there is significant business value from IT investments at an aggregate level, it is often unclear how this value accrues specifically and how a particular IS design and specific IS capabilities contribute. Therefore, this article focuses on IT business value (ITBV) antecedents. It analyzes the role of two distinct key IS capabilities: integration and flexibility, which are widely considered central to IS analysis and design. This article is a necessary first step toward decomposing and measuring ITBV antecedents. Subsequent efforts can build on it by developing scales and survey instruments for quantitative-empirical evaluation. This article follows a tradition of theory development adapted and condensed into a four-step approach for IS literature by Zmud (1998), defines and clearly delineates the constructs, and evolves a model that links them with IT business value.

INTRODUCTION

With a more uncertain and disruptive business environment today on the one hand and, as a result, sharply increased information systems (IS) requirements and more distributed information

technology (IT) choices such as Web services on the other hand, companies are struggling to design and build appropriate IS capabilities.

In the past, many companies have invested in information systems and software with the particular goal of facilitating business process reengineering (Davenport, 1990; Hammer, 1990; Hammer & Champy, 1993). The adoption of this strategy has been so widespread that it has created entirely new IT markets and businesses, such as systems integration consulting, enterprise resource planning (ERP), and customer relationship management (CRM) software markets. Akin to Henry Ford's introduction of the moving assembly line using the conveyor belt (Womack, Jones, & Roos, 1990), tight integration of business operations using software applications has resulted in efficiency gains (Turban, McLean, & Wetherbe, 2001). However, anecdotal evidence suggests that tight integration also has reduced companies' flexibilities (e.g., the ability to respond quickly to new sales opportunities, to add new product features, or to link quickly with new business partners) (*The Economist*, 2002). Early research has pointed to the importance of flexibility as a key characteristic of information systems architectures. Allen and Boynton (1991) stated, "Traditional [information] systems don't bend; they won't change, and they can't adapt. … The change must come through a revamped IS architecture" (p. 435). In order to address this issue, the IT industry has responded with innovation in distributed systems architectures. Examples include the common object request broker architecture (CORBA) (www.omg. org) and J2EE (http://java.sun.com/j2ee/). The latest IT innovation is Web services technology, the use of which is expected to facilitate loosely coupled intersystem interaction, or machine-to-machine communications (Hagel & Brown, 2001; Hars & Schlueter Langdon, 2002; Patil & Saigal, 2001; Schlueter Langdon, 2003a). While Internet technology has made interconnectivity easier, Web services technology could improve greatly the interoperability of distributed systems.

Despite the importance of various IS capabilities, there is little scientific guidance on the subject. Early attempts at conceptualizing and measuring IS capabilities have been promising (Byrd & Turner, 2000; Nelson & Ghods, 1998). However, inconsistencies in construct definitions remain. For example, the meaning and subject of the capability of flexibility often remain unclear. There is infrastructure flexibility, IT flexibility, system flexibility, and even adaptability and dynamic capabilities, all of which sound very similar. Furthermore, antecedents, dimensions, and consequences of flexibility are not delineated clearly. Such weak theoretical support hinders empirical confirmatory analysis. To the author's best knowledge, there is no empirical analysis of IS architecture capabilities and their business values. Weak theory and empirical confirmation, in turn, contribute to uncertainty about IT investments and to misunderstandings and faulty expectations of IS design. Therefore, it appears to be appropriate to propose to develop a theoretic paper "to develop and present a rich conceptual understanding of this issue to serve as a basis for future empirical as well as theoretical work" (Zmud, 1998). This exploratory, theoretic stage is crucial "since validation of causal assumptions which go undetected at this stage are unlikely to be detected at the confirmatory phase either" (Lee, Barua, & Whinston, 1997, pp. 117, 121). This article is a first step only but a necessary one toward decomposing and measuring IT business value (ITBV) antecedents. Subsequent efforts can build on it by developing scales and survey instruments for quantitative-empirical evaluation.

RESEARCH OBJECTIVES AND METHOD

Deeper research into IS capabilities is crucial in order to design systems that help to create business value. Lee et al. (1997) have pointed to the "reengineering paradox" in the IS literature in

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