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Organization Innovation and Its Implications for the Implementation of Information Systems

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INTRODUCTION

Many studies have indicated that organizations experience major difficulties in implementing information systems and in being able to utilize the full potential of these systems (Lyytinen & Robey, 1999; Wu, Shin, & Heng, 2007). These difficulties can be traced back to two gaps. On the one hand, between technical innovation and organizational innovation, which has been called the innovation design dilemma (Gjerding, 1992; Holbek, 1998). On the other hand, between planning activities and operating activities, which mean the social action perspective on the planning, implementation and use of information systems (Kuutti, 1994; Lyytinen, 1986).

The question is which research perspectives and development characteristics define the implementation process of information systems. For this reason, we would raise a central question that applies to the implementation process of information systems. The main argument is that this is a question of a profound change in research and development approaches, as many authors emphasize (Al-Mashari, 2003; Carlsson, 2010; Gregor, 2006). In this article, the main point of view is to look at the implementation process of information systems as an organizational innovation.

Here we will approach the implementation process of information systems by means of clarifying and defining the research and development approaches. The purpose is to form the concept models for implementation processes and to analyze their relationships (Meredith, 1993). With the help of these concept models, we will delineate the implementation process and its organizational dimensions. We will build a framework which serves to emphasize the factors by which one is able to define the implementation phenomenon as an organization innovation and to discern its essential characteristics and relationships, as well as its development mechanisms in practice (Eekels & Roozenburg, 1991).

In this article, we will discuss the constructive systems view of the planning, implementation and use of information systems. First, as a background, different research and development approaches to the implementation process of information systems are studied. Second, a systematic component model for the planning, implementation and use process of information systems is formed and analyzed. Third based on this systematic model a case detailing the planning, implementation and use process of an ERP system is described and analyzed. As a solution, the organizational construction model of the implementation process is concluded and evaluated. Finally, future research directions are proposed and conclusions are drawn.

BACKGROUND: RESEARCH AND DEVELOPMENT CHARACTERISTICS

Different research and development approaches can be discerned pertaining to the application of information systems (IS systems). Five research and development approaches are compared to each other in Table 1.

The technique-centered approach is often in the background in the building and application of IS systems (Checkland, 2000). This kind of research approach is mainly based on the premises that, the testing of different hypotheses is a way towards causal laws

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Table 1. Research and development approaches of systems and change models

	Technique-Centrered Approaches	Socio-Technical Approaches	Systems-Theoretical Approaches	Constructive Approaches	Design Science Approaches
Major Goals	Hard systems for the set goals and decision-making	Socio-technical design and change processes	Systemic activity systems	Action-oriented conceptual models of solutions	New constructions
Scientific Basis	Natural science research and positivistic concepts	Action research concepts	Soft systems concepts	Pragmatism concepts	Engineering and artificial concepts
Research Objectives	Hypothesis formation	Participation and case descriptions	Holistic systems	Social and organizational systems	Design of artifacts (constructs, models, methods)
Analysis Method	Testing hypotheses	Comparative case analysis	Analysis of meaningful activity systems	Modeling and experimenting organizational systems	Technology and management analysis
Study Results	Causal models, generalizations	Grounded theoretical bases	Systems theoretical models	Practical theory suppositions	Contextual theory-bases
Systems Designs	Design of technology systems	Design of user-centrered systems	Producing working and situated information systems	Producing use-oriented systems	Construction of innovative information systems
Change Method	Methods driven top-down change model	Collaborative change model	Iterative step-wise process model	Evolutionary organizational process model	Instantiation and evaluation
Author Examples	Morton, Ackermann, & Belton, 2003; Bento & Bento, 2004	Ehn, 1988; Lau, 1999; Mumford, 1999, 2001; Mathiasson, 2002; Kautz, 2011	Checkland & Scholes, 1990; Checkland & Hollwell, 1998; Checkland, 2000; Rose, 2002	Kasanen, Lukka, & Siitonen, 1993; Lukka, 2000; Van de Ven, 2007; Oyegoke, 2011	March & Smith, 1995; Hevner et al., 2004; Carlsson, 2010

(Bento & Bento, 2004). These approaches have also been criticized. Adams and Avison (2003) criticize the design and implementation of IS systems based solely on the use of techniques. In their view, applying different techniques will influence problem cognition and the problem-learning environment. This, in turn, will influence how any system is developed, and what the solution is like. They emphasize a more holistic view of defining and understanding a problem situation.

The second approach describes approaches based on the tradition of socio-technical design (Kautz, 2011; Mumford, 1999; Trist, 1981). These emphasize techno-organizational changes based on an action research tradition in which participation is an essential feature (Lau, 1999). Researchers are involved in the change processes in a practical context. User-centered systems are designed in the tradition of socio-technical design (Gulliksen et al., 2003). Action research, which is the base in the socio-technical approaches, has also been criticized. Baskerville and Wood-Harper (1996) describe some limits to action research as a method for information systems research.

The third approach describes a new focus in the design and application of information technology (IT), according to which the point of view has shifted towards soft systems (Checkland, 2000; Rose, 2002). IT is seen to be a potential technology. These approaches are based on an activity systems perspective, according to which the realization of IS systems is controlled by people and organizations that implement and use information systems. The goal is to create working and situational IS systems, based on the analysis and models of activity systems.

The fourth approach describes the constructive viewpoints which are based on action-oriented conceptual modeling (Åkerfalk & Eriksson, 2004) and the creation of social and organizational solutions (Oyegoke, 2011; Van de Wen, 2007). Constructive approaches