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ScienceDirect
Decision Support Systems 42 (2006) 1321–1337
Decision Support Systems
www.elsevier.com/locate/dss

# Theoretical principles for knowledge management system design: Application to pediatric bipolar disorder

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Received 24 February 2004; received in revised form 27 October 2005; accepted 1 November 2005
Available online 19 December 2005

**Abstract**

Knowledge management systems (KMS) are systems designed to support organizational knowledge processes. Knowledge-oriented theories of the firm are emerging, as theories of KMS design continue to evolve. This paper adopts Habermas' theory of communicative action and discourse ethics [Drake, B, Yuthas, K, and Dillard, J F., "It's Only Words – Impacts on Information Technology on Moral Dialogue", Journal of Business Ethics 23: 41–59, 2000, Habermas, J., The Theory of Communicative Action: Reason and the Rationalization of Society," Beacon Press Books, Boston, MA., 1984, Habermas, J., "Reconciliation through the Public Use of Reason: Remarks on John Rawls's Political Liberalism," Journal of Philosophy, Vol. 92, No. 3, March, 1995, 1109–131.], and Churchman's [Churchman, C.W., The Design of Inquiring Systems: Basic Concepts of Systems and Organizations, Basic Books, New York, NY, 1971.] Singerian inquiring system as kernel theories [Van Gigch, J.P., "The Paradigm of the Science of Management: In Celebration of C.W. Churchman's 80th Birthday," Interfaces, 25 (2), March – April 1995, 81–88.] on which to base KMS design principles. Specifically, we build on Churchman's nine requirements for an object to constitute a system and his Singerian inquiring system, and Habermas' critical theory to develop the notion of Churchmanian–Habermasian knowledge management systems (CHKMS) and principles for their design. We define a CHKMS as a purposeful, ethical and adaptable system that creates exoteric knowledge (relevant for solving social and managerial problems) through communicative action, providing a link between knowledge and action in an organization or community of practice. The design principles involve a strong emphasis on ethical behavior, the development of success measures for CHKMS, the need to ensure that the CHKMS enhances the dignity of humankind, a highly participatory design process, the desire to unify the designers, the decision makers and clients, the need to shape CHKMS components in relation to the system as a whole, and the need for a "guarantor" to validate knowledge through discursive communication and the "cashing in" of validity claims. The principles are illustrated by applying them to management of knowledge concerning pediatric bipolar disorder. The implications of the design theory for KMS research are discussed.


*Keywords:* Knowledge management; Inquiring systems; Critical theory; Communicative action; Discourse ethics

## 1. Introduction

Today we live in what is clearly manifesting as an ever increasing "knowledge society" [6,27,77,78]. Correspondingly, organizations currently engage in knowledge management in order to create knowledge for

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doi:10.1016/j.dss.2005.11.001

strategic decisions [37,40,42,46,59,75,77,79]. Knowledge management (KM) involves the creation of value from an organization's intangible assets [37,74]. Many organizations are developing computer-based systems designed to facilitate the sharing and integration of knowledge. In doing so it is necessary to incorporate the notion that knowledge management involves more than just technology for facilitating knowledge sharing. Practitioners realize that people and the culture of the workplace are driving factors that ultimately determine the success or failure of knowledge management initiatives [73].

Despite the importance of KM to strategic decision processes, few design theories exist for how computer-based systems supporting KM should be developed. For example, Alavi and Leidner [2] reviewed the knowledge management literature and found that "... the preponderance of knowledge management theory stems from strategy and organizational theory re search," but that in practice KM tends to rely on information technology and the theories do not relate to design and use of information technology.

At least four attempts at developing KMS design theory have been undertaken. Boland et al. [10] developed design principles for distributed cognition systems by integrating hermeneutics, inquiring systems and cognitive mapping. Similarly, Markus et al. [53] proposed a design theory and design guidelines for systems supporting what they refer to as emergent knowledge processes (EKPs). Following Walls et al. [83] who suggest that design theories should be based on a "kernel theory," include design meta-requirements, a meta-design, and testable design hypotheses, Markus et al. [53] develop a set of design principles, use those principles in an action research project and generate a set of revised principles as a result. In discussing future research, they pose the question "Are there alternative sets of requirements that also fit the kernel theory of EKPs?" In a third approach to KMS development, Hall and colleagues [34–37] also follow Walls et al. [83] and rely on inquiring systems theory to develop an architecture for the major components of an integrated KMS that supports organizational learning. Lastly, Holsapple and Joshi [41] offer a KM ontology in order to provide a well-integrated framework that unifies the concepts of KM and lays a foundation for the future of KM research, practice and education. Their ontology is a first attempt to provide a common vocabulary in order to facilitate communication and sharing of ideas.

This paper takes an approach to design theory similar to that of Holsapple and Whinston [42], Boland et al. [10] and Hall and colleagues [34–37], building on Churchman's [16] inquiring systems theory, but adding elements of critical theory [26,50,51,65]. Specifically, our kernel theory is based upon Churchman's Singerian inquirer which is integrated with Habermas' theory of communicative action [32] and discourse ethics [27,33] to derive a set of design principles which emphasize ethical issues. Communication and ethical behavior are critical elements of Habermasian theories and we show that the works of Habermas and Churchman complement one another by deriving a broadly based set of design principles for knowledge management systems. Interestingly, even though we have in common the use of inquiring systems, our principles are much more general than those of Boland and Hall, and relate more to the climate and context of KMS rather than specific components of the KMS itself, more like the design ideals of Klein and Hirschheim [50].

Using communicative action, discourse ethics and inquiring systems as kernel theories has several advantages. First, inquiring systems are based on a long history of epistemology, the theory of knowledge, building upon some of the most well known philosophers of the ages. Second, our approach contributes to Keen's [48] goal of continuity in computer-based systems research, as inquiring systems theory has been part of this literature since early on [55]. Third, Churchman has done a large part of the work for us, as he has already viewed the epistemologies of five philosophers through the lens of systems theory. Fourth, communicative action can be used to generate what Churchman calls "exoteric" knowledge, or that which is suitable for solving social and managerial problems. And fifth, the theory of communicative action and discourse ethics can be used to create an environment for the open discourse required for Singerian inquiry, and as the basis of a "guarantor" for validating knowledge that is created by the system. In addition, we believe that our design principles are suitable for well defined organizations such as business firms, but also for more loosely coupled entities such as communities of practice [34].

This paper first describes Habermas' theory of communicative action and discourse ethics, then explores Churchman's nine requirements that define systems in general. The manner in which Churchman applies those nine requirements to Singerian inquirers is described next, and theoretical design guidelines for Churchmanian–Habermasian KMS are derived. As both Singerian systems and the theory of communicative action place great emphasis on ethical concerns, many of the design principles relate not simply to the system itself, but to the behavior of those involved in the design process. We illustrate these principles by showing how they