Chapter 9
A Complex Adaptive Systems–Based Enterprise Knowledge Sharing Model

Cynthia T. Small
The MITRE Corporation, USA

Andrew P. Sage
George Mason University, USA

ABSTRACT

This paper describes a complex adaptive systems (CAS)-based enterprise knowledge-sharing (KnS) model. The CAS-based enterprise KnS model consists of a CAS-based KnS framework and a multi-agent simulation model. Enterprise knowledge sharing is modeled as the emergent behavior of knowledge workers interacting with the KnS environment and other knowledge workers. The CAS-based enterprise KnS model is developed to aid knowledge management (KM) leadership and other KnS researchers in gaining an enhanced understanding of KnS behavior and its influences. A premise of this research is that a better understanding of KnS influences can result in enhanced decision-making of KnS interventions that can result in improvements in KnS behavior.

CAS-BASED MODELING OF ENTERPRISE KNOWLEDGE SHARING

The enterprise KnS model developed here models enterprise knowledge sharing from a complex adaptive systems perspective. Hypothetical concepts that are fundamental to the development of this CAS-based model and to this research include:

1. Knowledge sharing is a human behavior performed by knowledge workers;
2. Knowledge workers are diverse and heterogeneous;
3. Knowledge workers may choose to share knowledge; and
4. The KnS decision is influenced by other knowledge workers and the KnS environment.

Enterprise knowledge sharing is the result of the decisions made by knowledge workers, individually and as members of teams, regarding knowledge sharing. As depicted in *Figure 1*, there are two major decisions (rectangles) that a knowledge worker makes: "Share Knowledge?" and "Type of Knowledge to Share?" This research models the KnS decisions as being influenced by the attributes of the individual knowledge worker, the KnS behavior of other knowledge workers, and the state of the KnS environment. Previous KnS studies and research identify factors that influence KnS behavior. However, few address the heterogeneity of knowledge workers and how the attributes of the individual knowledge worker, and knowledge worker teams, impact KnS behavior. The emergent enterprise KnS behavior, noted by the diamond shape in *Figure 1*, is the result of the interactions of the knowledge worker with the KnS environment and other knowledge workers. Relevant aspects of enterprise KnS behavior and the associated KnS influences are discussed in the sections that follow.

Enterprise KnS behavior takes on many forms. It can be a conversation around a water fountain, e-mail sent to a co-worker or a group forum, a presentation to a small group, an enterprise "best-practice" forum, or documents published to a corporate repository. Murray (2003) categorizes KnS activities into technology-assisted communication (videoconferencing, databanks/intranet, e-mail, and teleconferencing), meetings (face-to-face interaction, seminars and conferences, social events, and retreats), and training and development (mentoring, instructional lectures, video tapes, and simulation games). This research combines the two types of knowledge (tacit and explicit) and the ontological dimension (individual, group, and organization) of knowledge creation presented by Nonaka and Takeuchi (1995) to derive the types of KnS behavior for the model. The KnS behaviors investigated and incorporated in the enterprise KnS model are as follows:

1. **Individual tacit:** This behavior includes sharing tacit knowledge with an individual

Figure 1. Enterprise KnS influence diagram
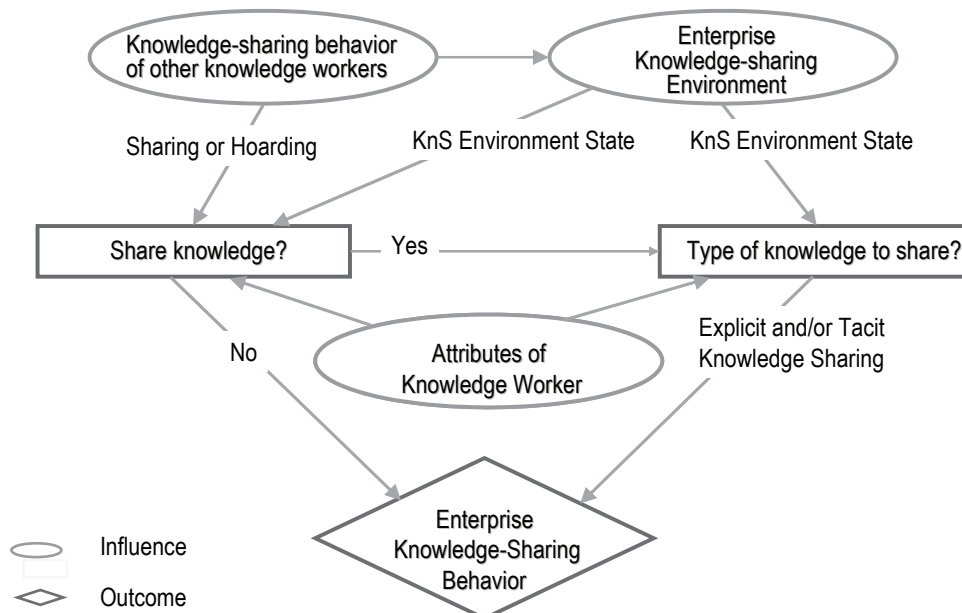
Related Content

High-Level Design and Implementation of a Home Autonomous System Based on CPS Modeling
Basman M. Alhafidhand William H. Allen (2018). *Cyber-Physical Systems for Next-Generation Networks (pp. 121-142).*
www.irma-international.org/chapter/high-level-design-and-implementation-of-a-home-autonomous-system-based-on-cps-modeling/204670

Activity Theory to Guide Online Collaborative Learning Instructional Design
Siti Rosni Mohamad Yusoffand Nor Azan Mat Zin (2012). *International Journal of Systems and Service-Oriented Engineering (pp. 15-29).*
www.irma-international.org/article/activity-theory-to-guide-online-collaborative-learning-instructional-design/78916

A Structured Method for Security Requirements Elicitation concerning the Cloud Computing Domain
Kristian Beckers, Isabelle Côté, Ludger Goeke, Selim Gülerand Maritta Heisel (2014). *International Journal of Secure Software Engineering (pp. 20-43).*
www.irma-international.org/article/a-structured-method-for-security-requirements-elicitation-concerning-the-cloud-computing-domain/113725

Improving the Detection of On-Line Vertical Port Scan in IP Traffic
Christine Fricker, Philippe Robertand Yousra Chabchoub (2014). *International Journal of Secure Software Engineering (pp. 61-74).*
www.irma-international.org/article/improving-the-detection-of-on-line-vertical-port-scan-in-ip-traffic/109581

Social Network Structures in Open Source Software Development Teams
Yuan Longand Keng Siau (2009). *Software Applications: Concepts, Methodologies, Tools, and Applications (pp. 1835-1848).*
www.irma-international.org/chapter/social-network-structures-open-source/29481