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
- 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 "bestpractice" 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-toface 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

17 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

www.igi-global.com/chapter/complex-adaptive-systems-based-

enterprise/38178

Related Content

Development Framework Pattern for Pervasive Information Systems

José Eduardo Fernandesand Ricardo J. Machado (2014). *Systems and Software Development, Modeling, and Analysis: New Perspectives and Methodologies (pp. 161-185).* www.irma-international.org/chapter/development-framework-pattern-for-pervasive-information-systems/108815

Evaluation and Ranking of E-Government Websites Using Weighted-Combinative Distance-Based Assessment Approach

Aakash Guptaand Mohit Bansal (2022). *International Journal of Software Innovation (pp. 1-15).* www.irma-international.org/article/evaluation-and-ranking-of-e-government-websites-using-weighted-combinativedistance-based-assessment-approach/309729

Using ECG Authentication for Biometrics in Smart Cities

Rohit Rastogi, Aditi Mittal, Ishanki Vermaand Pallavit Saxena (2023). *International Journal of Systems and Software Security and Protection (pp. 1-26).* www.irma-international.org/article/using-ecg-authentication-for-biometrics-in-smart-cities/324078

CPU Architecture

(2017). *Microcontroller System Design Using PIC18F Processors (pp. 7-24).* www.irma-international.org/chapter/cpu-architecture/190442

Understanding the Role of Knowledge Management in Software Development: A Case Study in Very Small Companies

Rory V. O'Connorand Shuib Basri (2014). International Journal of Systems and Service-Oriented Engineering (pp. 39-52).

www.irma-international.org/article/understanding-the-role-of-knowledge-management-in-software-development/104653