Chapter VII
Modeling and Analyzing Perspectives to Support Knowledge Management

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ABSTRACT

This chapter introduces a generic modeling approach that explicitly represents the perspectives of stakeholders and their evolution traversing a collaborative process. This approach provides a mechanism to analytically identify the interdependencies among stakeholders and to detect conflicts and reveal their intricate causes and effects. Collaboration is thus improved through efficient knowledge management. This chapter also describes a Web-based information system that uses the perspective model and the social network analysis methodology to support knowledge management within collaboration.

INTRODUCTION

The ability to effectively manage distributed knowledge and business processes is becoming an essential core competence of today's organizations. Various knowledge management theories and approaches have been proposed and adopted (Earl, 2001). These include ways to align knowledge processes with strategies (Spender, 1996), to leverage organizational learning abilities (Nonaka & Takeuchi, 1995), and to build IT infrastructures to support knowledge activities (Lu, 2000; Zack, 1999). Knowledge management systems (KMSs) can be viewed as the implementation of the KM strategy. KMS improves the knowledge processes through IT infrastructures and information-processing methodologies (Tanriverdi, 2005). Although the importance of knowledge management has been well recognized, organizations are still facing the problems of how to successfully implement knowledge management. In order to effectively utilize these theories and technologies to support teamwork, it is necessary to gain more fundamental understandings of the characteristics of knowledge management within collaboration processes.

BACKGROUND

Previous knowledge management approaches can be generally classified into two categories (Hanson, Nohira, & Tierney, 1999). The strategies supporting knowledge replication provide high-quality, fast, and reliable information systems implementation by reusing codified knowledge. The strategies supporting knowledge customization provide creative, analytically rigorous advice on high-level strategic problems by channeling individual expertise. The codification approaches view information technology as the central infrastructure of knowledge-based organizations. KMSs are thus treated as system-integration solutions or applications that retain employees' know-how. The major concern of these approaches is how to help organizations monitor the trends of rapidly changing technologies and inventions in order to recognize new applications that may provide competitive advantage (Kwan & Balasubramanian, 2003). However, IT is just one of the elements of KMS. As knowledge management involves various social and technical enablers, the scope, nature, and purpose of KMS vary during the collaboration processes. Researches from the knowledge-customization perspective focus on understanding knowledge and its relationships with organizations (Becerra-Fernanaez & Sabherwal, 2001; Nonaka & Takeuchi, 1995). A typology of knowledge creation and conversion of tacit and explicit knowledge was proposed (Nonaka, Reinmoeller, & Senoo, 1998). The conversion involves transcending the self of individuals, teams, or organizations and reveals the importance of organizational architecture and organizational dynamics to capitalize on knowledge. Recent research on knowledge management has been focusing on developing models that interconnect knowledge management factors, such as collaboration, learning, organizational structure, process, and IT support (Lee & Choi, 2003). These research works have been mainly addressing understanding the nature of knowledge

and knowledge management. Both approaches provide workable models and methods for implementing knowledge management.

In fact, knowledge replication is interlaced with knowledge customization within a collaborative process. In collaborative projects, it is important to systematically integrate these two groups of KM approaches to build methodologies and systems to facilitate the teamwork. First, KM methodologies should be coupled with process management in collaborative projects. An organization and its members can be involved in multiple knowledge management process chains. The tangible tasks are accompanied by the implicit knowledge-integration activities. As such, knowledge management is not a monolithic but a dynamic and continuous organizational phenomenon (Alavi & Leidner, 2001). Second, KM and KMS have to take account of various social factors within collaboration processes. Collaborative projects involve various stakeholders (i.e., all of the human participants and organizations who influence the collaboration process and the results) from different disciplines to work cooperatively over distance and time boundaries. When many heterogeneous groups work together on large projects over a long period of time, their knowledge of the system, the product, and other people will keep on evolving (Dym & Levitt, 1991; O'Leary, 1998). The professional expertise in particular is framed by a person's conceptualization of multiple, ongoing activities, which are essentially identities, comprising intentions, norms, and choreographies (Carley & Prietula, 1994; Erickson & Kellogg, 2000; Siau, 1999; Sowa & Zachman, 1992). Although the collaboration process might appear relatively technical, it is essentially a social construction process when different persons perform their tasks within various adaptive situations (Berger & Luckman, 1966; Clancey, 1993, 1997). The situations will eventually impact the evolution of participants' roles and form a shared understanding (Arias, Eden, Fischer, Gorman, & Scharff, 2000). Even within well-defined technical roles,

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