



PERGAMON

Expert Systems with Applications 26 (2004) 203–215

Expert Systems
with Applications

www.elsevier.com/locate/eswa

An organizational memory for facilitating knowledge: an application to e-business architecture

Jaegyong Chang, Byounggu Choi, Heeseok Lee*

*Corporate Information System Laboratory, Graduate School of Management, Korea Advanced Institute of Science and Technology, 207-43,
Cheongryangri-dong, Dongdaemoon-gu, Seoul 130-012, South Korea*

Abstract

Our economy is increasingly dependent on knowledge. Organizational memory (OM) contains knowledge that companies need to manage. This paper proposes a knowledge facilitating organizational memory (KFOM) to decipher a harmony mechanism of OM from the Oriental Yin and Yang perspective. KFOM clarifies an architecture to catapult the OM to organizational effectiveness. This architecture is made up of two layers: storage layer and facilitation layer. Storage layer represents task and domain knowledge. Facilitation layer identifies the harmony mechanism for utilizing knowledge. This harmony mechanism leverages the knowledge chain with agent, collaborator, transactor, object and registry facilitators. In order to demonstrate its practical usefulness, we explore how KFOM can sharpen an international e-business technical standard. Furthermore, an extension to a real-life B2B collaboration project for Korean steel and automotive companies confirms that KFOM can lead to business practices which most knowledge-oriented companies can adopt.

© 2003 Elsevier Ltd. All rights reserved.

Keywords: Organizational memory; Knowledge management; Organizational effectiveness; e-Business; Electronic business eXtensible markup language; B2B collaboration; Yin and Yang; Harmony mechanism; Knowledge chain

1. Introduction

Increasingly, it seems successful companies run on knowledge. As knowledge's presence have expanded, companies have come to view it as a resource ever more critical to their success. Most organizations work assiduously to manage organizational knowledge for competing in an unpredictable environment (Davenport, Long, & Beers, 1998; Liebowitz, Beckman, & Beckman, 1998; Nonaka & Takeuchi, 1995). Organizational memory (OM) is critical for managing organizational knowledge. It contains actual knowledge that companies need to manage (Schwartz, Divitini, & Hersey, 2000). OM has been studied from a variety of fields such as digital library (Ackerman & Fielding, 1995), knowledge base and hyper documents (Euzenat, 1996), case-based decision support repository (Henninger, 1996), and knowledge base system (Liao, Hinkelmann, Abecker, & Sintek, 1999).

OM represents something more substantial than its contents. An effective OM should support tasks for

managing knowledge (Schwartz et al., 2000). Forward-thinking OM needs to facilitate the interaction of organizational knowledge, i.e. the way knowledge is actually organized and utilized. This knowledge utilization is a continuous process whereby individuals or groups within a company share knowledge (Lee & Choi, 2003). Yet, it is difficult to clarify how OM utilizes organizational knowledge—both explicit and tacit knowledge. Previous studies focus on the contents—explicit, domain-specific and codified knowledge in isolation. Currently, only explicit knowledge is the province of information technology (IT). To run on knowledge in organization, the importance of tacit, personal, and implicit knowledge is increasing (Nonaka & Takeuchi, 1995).

The primary objective of this study is to decipher the OM architecture which can enhance the organizational effectiveness. For this purpose, this paper proposes knowledge facilitating organizational memory (KFOM) which delineates its harmonious mechanism for facilitating knowledge in the view of information communication technologies. This mechanism is fundamentally inferred from the Oriental Yin and Yang perspective. The core of its mechanism includes two layers: storage and facilitation. The storage

* Corresponding author. Tel.: +82-2-958-3601; fax: +82-2-958-3604.

E-mail addresses: hsl@kgs.m.kaist.ac.kr (H. Lee); jasmine@kiec.or.kr (J. Chang); bchoi1@csom.umn.edu (B. Choi).

layer stores the harmonious knowledge contents. The facilitation layer explores the mechanism for utilizing this knowledge in more competitive fashion. This facilitation layer includes five knowledge facilitators such as agent, collaborator, transactor, object and registry. Each knowledge facilitator brings forth its own knowledge and transfers its deliverables to others, which finally makes knowledge harmonious.

In order to demonstrate its usefulness, this paper applies KFOM architecture to a technical framework for e-business, electronic business eXtensible Markup Language (eXML). This usefulness will be further illustrated by a real-life e-business collaboration project for Korean steel and automotive industries. This observation is important because the velocity of the new economy has created a competitive incentive among many companies to leverage their knowledge as a means of creating sustainable business value.

2. Literature review: organizational memory

Many researchers have defined OM from various perspectives. For example, Stein and Zwass (1995) defined OM as “means by which knowledge from the past is brought to bear on present activities, thus resulting in higher or lower levels of organizational competitiveness.” However, most previous perspectives fail to consider interactions between information systems and people for enhancing the effectiveness of organizations. For emphasizing these interactions, this paper defines OM as “a computer supported human interactive mechanism to store and facilitate knowledge for enhancing organizational effectiveness” on the basis of Kuhn and Abecker’s work (1998).

After nearly 20 years of its initial investigation, OM has been explored in a variety of fashions. Although recognition of OM has increased, so has the need to treat it systematically.

These explorations can be categorized into four evolutionary groups on the basis of their focuses (Table 1). Each group presents a particular orientation. Yet, no claims are made that any group outperforms others.

The first group is labeled ‘technology’ because its emphasis is on information technologies. This group points out that IT helps make the knowledge management (KM) tasks less daunting. It believes robust OM is the result of conscious IT initiatives. A fundamental component is to capture knowledge via the common system storage area in which qualified people share the same meaning (Chen, Lynch, Himler, & Goodman, 1994). Various subsets of IT-driven OM include meeting memory (Sandoe, Olfmann, & Mandviwalla, 1991), team memory (Morrison, 1993), and project memory (Favela & Connor, 1994). However, this group fails to provide any concrete OM architecture.

The ‘system’ group addresses an OM architecture called organizational memory information system (OMIS). It focuses on organizational effectiveness and memorial

functionality. For example, Burstein, Smith, and Fung (1998) augmented OMIS with three layers: pragmatic, conceptual and process. However, this group also assumes that IT itself can facilitate knowledge. It fails to nurture OM by facilitating interactive knowledge processes. For example, Stein and Zwass (1995) originally proposed OMIS of the two layers: organizational effectiveness and mnemonic. However, it is still unclear how the organizational effectiveness layer can drive the strategic action toward the goals of organizations (Heijst, Spek, & Kruizinga, 1996).

The ‘human’ group highlights the human aspects in OM as a vehicle for managing knowledge; this group attempts to understand OM within the framework of KM. For example, Heijst et al. (1996) investigated OM as a tool to support KM within the context of organizational learning. Nonaka and Konno (1998) attempted to adapt the concept of ‘ba’ for the purpose of elaborating knowledge creation process. Schwartz et al. (2000) proposed an AOD (Acquire, Organize, Distribute) model for Internet-based KM. However, this group fails to sharpen any OM architecture. Its OM architectures tend to be too complex to manage (Tschaitshian, Abecker, Hackstein, & Zakraoui, 2000).

The essence of the ‘harmony’ group is that knowledge workers can capture individual or group-held knowledge and make it the augmented property of the organization. For example, Kuhn and Abecker (1998) proposed a well-defined OM architecture of information depository and its processing services. This OM describes how to store and manage information for KM. Yet, they do not clarify knowledge facilitating processes and elements.

As shown in Table 1, previous studies do not consider how OM enhances the organizational effectiveness. Some of them identify storage and facilitating layers. Others focus on either storage or facilitating layer in isolation. The harmonious interaction among the layers is yet to be clarified. For this clarification, this paper proposes an OM architecture, KFOM, as follows.

3. KFOM (Knowledge facilitating organizational memory)

3.1. Overview

The importance of harmony for organizational knowledge can be found in a number of resources. For better understanding of KM, many studies emphasize the harmony between explicit and tacit knowledge (Baumard, 1999; Nonaka & Takeuchi, 1995; Polanyi, 1966). From the psychological perspective, adaptive control of thought (ACT) model asserts that declarative knowledge like domain knowledge has to be transformed into procedural knowledge like task knowledge (Anderson, 1983, 1986). Several studies hint the needs of harmony mechanism for OM (Choi & Lee, 2003a; Heijst et al., 1996; Karsten, 1996;

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات