Chapter 63
A Multi-Agent Knowledge Management System for Reactive and Proactive Knowledge Supply

Carlos M. Toledo
Institute of Development and Design, Argentina & National Council of Scientific and Technological Research, Argentina

Omar Chiotti
Institute of Development and Design, Argentina & National Council of Scientific and Technological Research, Argentina

María R. Galli
Institute of Development and Design, Argentina & National Council of Scientific and Technological Research, Argentina

ABSTRACT

This chapter presents an agent-based architecture for integrating organizational knowledge repositories and business processes orchestrated by a workflow management system. This architecture proactively provides relevant knowledge to workflow tasks considering their context, and stores the information generated by its execution for future requirements. It describes components of the architecture, models a multi-agent system that enables the integration, presents a strategy to annotate and retrieval knowledge of non-structured information sources, and defines a new workflow pattern to be used in knowledge intensive tasks in order to make possible the knowledge provision. This architecture allows workers to count, in a proactive way, with all necessary information for the task executions without suspending their activities to retrieve information scattered in the organization. It reduces the wasted time in manual knowledge searches included in mostly knowledge management approaches.

INTRODUCTION

Knowledge is currently recognized as a valuable asset for organizations. It is considered a capital that has an economic value for an organization; a strategic resource used to increase productivity and offer stability in dynamic competitive environments (Ermine, 2000). In this new paradigm, in which physical capital and work are no longer the only fundamental basis for successful management, Knowledge Management (KM) has captured the attention of organizations as one of the most promising ways to reach success in this information era (Malone, 2003). Companies are beginning to understand the importance of knowledge in the organization as a resource which enables them to gain a sustainable competitive advantage (Bolloju et al.,2002).

In the pursuit of strategic competitiveness, great KM effort has dealt with capturing, codifying, storing, and disseminating knowledge in the organization (Lai, 2007). However, most of these efforts have been carried out in an isolated manner, without linking the organizational knowledge with organizational business processes. Nowadays, organizations coordinate their activities through business processes. To accomplish the tasks involved in a business process, workers can need information that is scattered along the organization.

This need for information should be considered in a contextualized way and be suitably delivered by the organizational KM infrastructure. Business Process Management (BPM) and KM are closely interrelated and are both essential elements of an organization. Therefore, this interrelation must be addressed in the development of a system architecture for KM.

Traditionally, KM approaches focused on providing information in a reactive way (Ale, 2009). When a worker needs information while executing a task, the worker must do an explicit search in an organizational knowledge repository with the aim of finding relevant information to continue the task execution. Once a task has been executed, the information generated as a result of its execution should be stored in a suitable way for future requirements. This paradigm is adequate in organizational areas in which the executed processes are unstructured, dynamic, unpredictable, and constantly changing without a fixed model that guides the control flow among their activities and workers. However, in areas where workers execute tasks belonging to a structured business process, information needs should be satisfied in a proactive way, allowing workers continue task execution while collecting all the necessary information from the organizational knowledge repository.

Workers will not do extra work to support a KM system unless it contributes to improve their jobs. In this case, organizational activities structured through a business process and automated by a Workflow Management System (WfMS) (Hollingsworth, 2005) should be considered as an opportunity to provide a KM infrastructure in order to bring the right knowledge to the right people in the right form and at the right time. WfMS should be considered a trigger of KM-support activities and a distributor of organizational knowledge that provides workers with necessary information to make better judgments and decisions.

In this new vision, process-based KM emerges as a potential challenge to support business processes with manual or semi-automatic tasks that need knowledge for their execution and, as a result, can produce new knowledge. Tasks with these needs are called Knowledge Intensive Tasks (KIT) and workflows composed of KITs are called knowledge intensive workflows (Sarnikar & Deokar, 2010). Process-based KM takes advantage of the task context provided by the workflow to deliver task-relevant knowledge. Organizations often execute activities with both types of information needs (reactive and proactive); thus, the KM architecture should support both needs (Jung et al., 2007).

Related Content

Enterprise Resource Planning Under Open Source Software

Ashley Davis (2008). *Enterprise Resource Planning for Global Economies: Managerial Issues and Challenges (pp. 56-76).*

www.irma-international.org/chapter/enterprise-resource-planning-under-open/18429

Re-Examining the ERP Concept: Toward an Agenda for Reducing the Unbalance Between the Push and Pull Sides on the ERP Market

David Sammonand Frédéric Adam (2004). *The Enterprise Resource Planning Decade: Lessons Learned and Issues for the Future (pp. 248-262).*

www.irma-international.org/chapter/examining-erp-concept/30336

Enterprise Resource Planning and Knowledge Management Systems: An Empirical Account of Organizational Efficiency and Flexibility

Jimmy C. Huang, Sue Newell, Robert D. Galliersand Shan-Ling Pan (2002). *Enterprise Resource Planning: Solutions and Management (pp. 153-171).*

www.irma-international.org/chapter/enterprise-resource-planning-knowledge-management/18453

The Future of ERP and Enterprise Resource Management Systems

Carlos Ferranand Ricardo Salim (2008). *Enterprise Resource Planning for Global Economies: Managerial Issues and Challenges (pp. 328-348).*

www.irma-international.org/chapter/future-erp-enterprise-resource-management/18442

Do ERP Implementations Have to be Lengthy? Lessons from Irish SMEs

Frédéric Adamand Peter O'Doherty (2004). *The Enterprise Resource Planning Decade: Lessons Learned and Issues for the Future (pp. 114-137).*

www.irma-international.org/chapter/erp-implementations-have-lengthy-lessons/30331