Information Technology & Organizational Knowledge Management

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Abstract: Information technologies contribute to knowledge management solutions, such as enterprise portals; they improve the enterprise’s business intelligence and its collaboration capabilities. Modern companies use knowledge-driven applications in order to respond rapidly to changing market conditions and customer needs. Acknowledging the need of using information technology in order to implement Knowledge Management Systems and to transform their organization into a modern one, many organizations developed knowledge-portals. The knowledge portal must be capable of maintaining the knowledge management life cycle and the knowledge contained by the portal must be collected from the collaborative environment, stored in a knowledge database and disseminated using collaborative tools. One of the parts that are usually left out of this process is the auditing process, verifying the knowledge database conformity degree with the standards in that domain, and its capacity to sustain the achievement of the strategic objectives of the organization. We propose a model of distributed knowledge management system based on principles of autonomy and coordination that permits the almost total virtualization of the collaborative environment, recommended for communities formed by organizations and their lawful clients.

Key-words: information technology, organizational knowledge management, collaborative systems, portals, virtualization.

1 Introduction

Being one the most important factors from the KM (Knowledge Management) triad, information technology, through portal type exponents, contributes essentially to maximize knowledge value [Bair, 1998; Cain, 1999; Firestone, 2000, 2001, 2002; White, 2000; Bock, 2001; Barette, 2003; Guruge, 2003; Sullivan, 2003; Torsten, 2004; Collins, 2004; Hoolahen, 2005; Herrmann, 2006].

Virtual organizations become more and more an economic reality, so the need for mutual knowledge transfer between their components increases. The real business advantage for virtualization has yet to be realized for most companies [Wittmann, 2008]. So far, from this study, the major advantages to its use have been for test and development, and for server consolidation. Companies reduced development times and lowered cost to testing infrastructure but they didn’t vastly reduce the number of servers, yet the rate of growth in server counts was substantially slowed.

2 Our proposal - a model of Knowledge Distributed Portal

A knowledge portal should be a gateway and a destination for employees and should provide transparent, tailored access to distributed digital resources. One of its main characteristic is the integration of as many applications possible and communications between them.

2.1 Sustaining KM business cycle

From a collaborative environment based on knowledge point of view, a successful portal means the ideal IT infrastructure, capable of maintaining the knowledge management life cycle (pieces of organizational knowledge coded and memorized in the so-called portal’s database of knowledge) [Muntean, 2005, 2007, 2008].
IT extends the reach and range of knowledge use and enhances the speed of knowledge transfer [Turban, 2007]. The knowledge portal, the most advanced exponent of portal technologies, sustains key processes that are important to the organization, maintaining its success in global economy. Starting from the life cycle of organizational knowledge management proposed in [Muntean, 2009] we will particularize phases 2.1.1 – 2.1.4 for the process of organizational knowledge management modeled by a portal. In this approach, phases 2.1.2 – 2.1.3 have an equivalent on the portal platform level, the last phase 2.1.4 being a characteristic of the organizational environment external of the informatics platform. Organizational knowledge is a result of phases of combining, internalizing, externalizing and socializing – fig. 1. This dynamic process is build using rules of communications between the groups of users within different organizations [Radu, 2005].

![Generating organizational knowledge](image)

**Fig. 1 – Generating organizational knowledge**

### 2.1.1 Knowledge generating/developing

At the portal level, creating new knowledge is possible through acquiring/attaining of some knowledge pieces from the collaborative organizational environment (or even external from the organization), or a following of some intelligent rationing (reasoning) made by modules of artificial intelligence incorporated in the portal’s architecture. The knowledge created that way are collected and refined to eliminate unjustified redundancies and filtering the ones most “valuable” for the organization. Creating documents represents a significant percentage of the current activities, so the less time is allocated to this activity, more time will remain for the members of the organization to achieve the other tasks. Therefore, at the portal level, we will have to integrate some instruments that facilitates creating knowledge of a document type, such as: text editors, multimedia, Web pages, images, sounds, video editing systems, spreadsheet editors, graphic programming’s.

### 2.1.2 Knowledge storing/organizing

At the portal level, in the central or distributed knowledge database (meta-base), different kinds of knowledge are coded efficiently, assuring quality, accessibility, and their representativeness with the help of some specific tools/technologies. Knowledge can be stored in data warehouses, knowledge databases specific to artificial intelligence, content specific structures or in a documents management system; all these will form the portal knowledge meta-base. Concordant with the different knowledge storing technologies, we will use specific methods/techniques to access/locate them.

### 2.1.3 Knowledge dissemination

The opening of the portal to its users, the members of the collaborative community, permits accessing the knowledge database and the use of different knowledge. The sharing of knowledge is a process distinct than managerial decision making which deserves consideration [Maracine, 2007]. Collaborative tools sustain and facilitate the transfer of knowledge. Some tools and technologies facilitates the use of knowledge: Business Intelligence tools, expert systems, simulations of dynamic complex processes, decision support systems, ERP applications (Enterprise Resource Planning), CRM (Customer Relation Management) and other enterprise applications, visualizing tools that permit understanding of some complex knowledge structures, etc. The latest technologies used are knowledge applications (Kapps) [Guran, 2008]. These applications can analyze large amounts of data from any business model and determine the personalized preferences of all potentially customers, than enrich them with relevant information. This new class of applications allows companies not only to collect but to analyze data and information, in order to develop better supplier and customer relationships.

### 2.1.4 Auditing

This represents a complex activity of verifying the conformity degree of the knowledge database with the standards in that domain, and its capacity to sustain the achievement of the strategic objectives.
of the organization. The main subjects tested are regarding the reliability and performance of the product, the efficiency of the operations and, not last, the security facilities [Lungu, 2003]. Auditing the organizational knowledge implies analyzing its impact on decisional processes, the contribution of each piece of knowledge in optimizing business processes, therefore in raising the quality of the products and services offered. At the end of this process, it is possible to have to regenerate some knowledge pieces.

A collaborative enterprise represents an adequate environment for developing a strategy for a better performance of the knowledge management, taking into consideration the social and cultural specific aspects and having an adequate IT infrastructure.

2.2 Distributed knowledge management
In the global economy, interconnected organizations that forms a collaborative network can be considered, based on their cumulative know-how, to be inter-connected knowledge nodes (KN) [Kirschenberg, 2003]. In this approach, collaborative community becomes an environment that must sustain two different kinds of processes: (1) knowledge management specific to each node (organization), and (2) coordination of different knowledge nodes.

Each organization is an absolute manager (from conceptual and technical point of view) of its organizational knowledge. Coordinating different KN arises some problems that can be overcome from the technological point of view by adopting at the level of the nodes of some knowledge-based portals with intelligent capabilities of communication. Starting from the technical architecture proposed by Firestone in 2001, 2002, 2003 for a knowledge-based portal, collaboration between KNs can be accomplished with some collaborative intelligent software agents that are integrated into the organizational portals [Muntean, 2005]. These agents assist the members of a KN to formulate queries (requests of knowledge) to other nodes and they respond to queries that came from the other KNs.

We support the strategy of a distributed KM approach based on two general principles: (1) Autonomy Principle – each node/organization manages her own knowledge; the enterprise portal will represent a unique access point to the knowledge meta-base, that stores a part of the organizational knowledge; (2) Coordination Principle – each node must permit exchange of knowledge with other nodes, without having to adopt a unique interpretative scheme at the level of collaborative network, but through a mapping mechanism of the context of the node queried to its own context, taking into consideration their own perspective on knowledge.

3 Conclusions
Modern organizations worldwide are slowly discovering that controlling knowledge is a major component for strategic growth and creating a competitive organization.

In order to reap the full potential benefits of acquiring, developing, managing, sharing and disseminating knowledge in this dynamic environment some changes must be done. We consider the approach presented above a recommendation for communities formed by organizations and their lawful clients, meanwhile the solution being viable for organizational networks also; and it represents an IT infrastructure

Fig. 2 Inter-connected knowledge nodes

Fig. 3 Infrastructure based on portals that sustain a distributed KM

This will be achieved with the help of some collaborative intelligent agents specially integrated, with this purpose, in the nodes portals. In these last years, software agents evolved spectacularly, gaining unexpected intelligent capabilities being able to sustain virtual collaborative environments. [Weiss, 2000; Kimatura, Yamada, Kokubu, 2001; AgentLink, 2004; Dang, 2004; Silaghi, 2005; Sycara, Sukthankar, 2006].

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that permits the almost total virtualization of the collaborative environment. The benefit that portals bring to the considered IT infrastructure is the fact that they sustain the whole life cycle specific to a KM approach.

The main desiderate of every intelligent organization represents the creation of a knowledge capital under the form of organizational knowledge (the expertise, the best practices, lessons learned, abilities) and the adoption of the best IT solution capable to incorporate as much as possible from the organization know-how, under the form of a knowledge meta-base.

It is certain that the IT element from the KM triad can be optimized by grounding it with the help of the portals technology. With these final considerations we recommend the distributed KM approach, sustained by a portal-based IT infrastructure typical for the different knowledge nodes.

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