

IT Infrastructure for Collaborative Environments

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Abstract: *Collaborative communities representing different forms of expressing of the enterprises, which wish to remain competitive in the business environment. Being entirely or partly transposed in the virtual environment, they have to adopt a malleable business strategy, to make decisions based on knowledge, which regards the consumers, suppliers, shareholders, investors or even competitors. The collaborative systems, tools and technologies come to maintain the work teams, the collaborative communities and enterprises, the portal based IT platforms proving their efficiency as infrastructures of the considered environments.*

Keywords: *collaboration; collaborative environment; knowledge management; collaborative systems; portals; knowledge portals*

1. Introduction

In the present global economy, strongly influenced by information technology (IT) and information systems evolution, the modern organisations try to face the challenges by adjusting their strategies and restructuring their activities, for aligning them to the new economy requirements. Nowadays, people work in large virtual teams, spread around the world, including colleagues, clients and different partners. Different projects of common interest are started, projects of short or long term, which in time develop to common competitive businesses. Collaboration becomes a business strategy and involves activities/processes optimization within different workgroups, between these at organization level and between connected organizations with the purpose to assure a competitive advantage in the challenging environment.

The evolution of information systems in these collaborative environments led to the sudden necessity to adopt, for maintaining the mostly virtual activities/processes, the latest technologies/systems, that are capable to support integrated collaboration in business services. We mean collaborative systems of different type: conversational tools, multi-agent systems, and all these, among various enterprise applications, integrated in portal-based IT platforms.

It is obvious, that all collaborative environments (workgroups, practice communities, collaborative enterprises) are based on knowledge, and between collaboration and knowledge management (KM) there is a strong interdependence. Therefore, we made some remarks on how collaborative IT systems maintain knowledge management, interfering into all stages of the KM live cycle.

2. Collaborative Systems, Tools and Technologies

Collaborative technologies fundament a large range of tools, systems and IT platforms that sustain collaboration in the modern global economy, contributing decisively to the consolidation of different types of virtual collaborative communities, virtual world constituting a reality superstructure.

The orientation toward a collaborative business represents a necessity for developing a

competitive business in the actual global economy. At the end of 2008, Forrester Research Inc. surveyed business environment inquiring about companies' opening towards adopting new IT collaborative platforms; a trend was obvious, more than 50% heading to collaborative technologies. Based on our research, we propose the adoption of portal platforms at the level of collaborative communities/environments, and followed by integration of a series of systems, collaborative instruments, and enterprise applications which help to consolidate portal's SOA architecture (Service Oriented Architecture) meant to sustain collaboration as a business strategy.

Without iterating different consecrated approaches in the field of collaborative systems (Mooney, 1974; Giboin, 2000; Marakas, 2003; Crabtree, 2003; Pels, Wortmann, 2003; Kurdel, Sebestyenova, 2007; Nițchi, 2008) [8] [19] [20], we will develop our scientific approach around some consideration towards:

- Collaborative Systems Based on Software Agents

Multi-agent systems offer an innovative perspective on the capacity of configuration virtual communities. But some of their capabilities must be perfected, as follows [17]: incrementing the intelligence level of the agents through perfecting their capabilities, aiming autonomy, cooperation and learning; introducing new valences as for agents collaboration within MAS (Multi-Agent Systems) and, maybe even new approaches at protocol level and communication languages (KQML, KIF, COOL, etc.); upgrading the MAS's security level (processes, systems, respectively network security – securing communication between agents). It is obvious that developing MAS is a complex process which can raise real problems virtualizing some collaborative communities. In the last years it is ascertained the emergence of some specialized platforms for developing multi-agent systems, which contributes substantially to reducing the effort of developing those kinds of systems.

- Collaborative Tools (in fact, conversational tools)

Social or conversational technologies imposed themselves in the last years as tools that sustain knowledge management in collaborative environment [24] (Roll, 2004; Anghel, 2009). Bypassing the stage of simple conversational support, these instruments maintain tacit knowledge dissemination at the community level, consolidating collaboration through offering various facilities of collaboration based on the considered environments' demands/necessities, in literature contouring the concept of „on demand collaboration anytime/ anywhere” (Marcus, Coleman, 2006). Therefore, it is recommended the integration of this kind of tools in IT virtualizing collaborative environments platforms. We recommend the development of these tools with the help of various open-source solutions.

- Portal-Based IT Platforms

The IT infrastructure of collaborative communities presumes the existence of complex platforms, with various capabilities in order to virtualize a large part of the communities' reality. This can be achieved only with the help of portal technologies, at their level being integrated multi-agent systems with specific functions as well as a diverse range of conversational tools.

3. Portal Technology - Infrastructure for Knowledge Based Collaborative Communities

A successfully enterprise portal represents a single entry point for collaboration, information dissemination and communication, application functionality and interactive capabilities within and without the corporate entity – all provided in an efficient and centralized manner. The portal must enable the creation of knowledge through collaboration tools, such as chat, threaded discussions and workflow. The created knowledge needs to be

captured and stored for future use. In addition, outside knowledge needs to be brought into organization, and users need to be able to easily place their knowledge into the portal. All the knowledge, both structured data and unstructured content, must be easily retrievable. The portal must be configured to push relevant knowledge directly to the users. The level of support for each of these objectives defines the effectiveness of any enterprise portal solution. Considering the KM lifecycle based on phases such as: ❶ - knowledge generation, ❷ - knowledge storage/organizing, ❸ - knowledge dissemination and ❹ - knowledge auditing, we present a possible maintenance based on the knowledge portal technology .

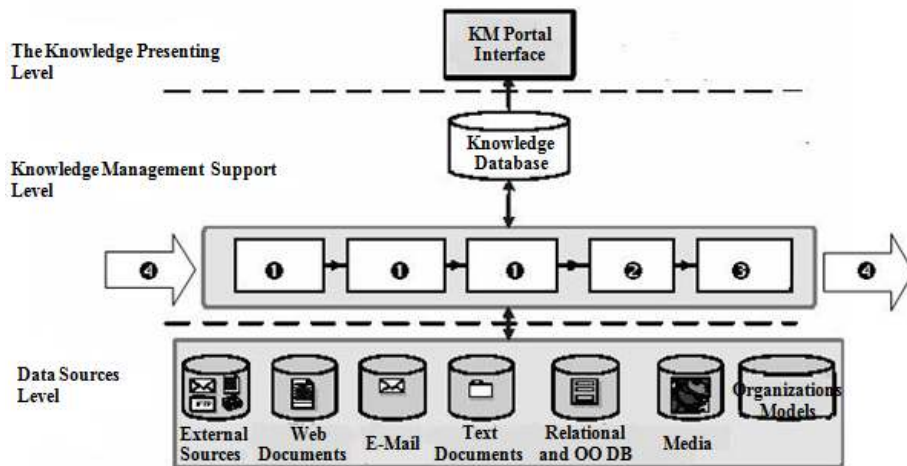


Fig. 1. MK life cycle phases implementation at the portal level [16]

❶ Knowledge Generation

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 is a following of some intelligent 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 document type, such as: text editors, multimedia, Web pages, images, sounds, video editing systems, spreadsheet editors, graphic programming's.

❷ 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 representative ness 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. One of the forms in which knowledge can be stored is knowledge repository, which stores knowledge that is often text based and has very different characteristics. It is also referred to as organizational knowledge base. A knowledge repository is not a knowledge base of an expert system, the repository containing all the organizational knowledge, not only the one needed in solving a specific problem.

Concordant with the different knowledge storing technologies, we will use specific methods/techniques to access/locate them.

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. Knowledge sharing goes beyond communication – it provides additional support by ensuring fast access to the latest information, being able to assist users in finding the most up to date knowledge needed for their task and the effective use of that knowledge.

④ Knowledge Auditing

Auditing 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. 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.

Knowledge management is not a goal by itself. Business don't exist with the purpose of spreading and advancing knowledge - it exists for selling competitive products and services of high quality. Because the competitive advantage is conditioned by an informed decision making within a business, knowledge management has a critical role in the knowledge based actual global economy. We are convinced that collaboration together with knowledge management maturity gives an intelligent behaviour to the community.

4. Final Remarks

Collaboration involves a different approach to business – focused on managing business relationships between people, within or without groups, and within and between organizations. Integrating collaborative services with business functions allows companies to gain significant competitive advantage.

At the core of true collaboration is the ability to share and catalog knowledge (ideas, standards, best practices and lessons learned) and to be able to retrieve that knowledge from anywhere at any time. The more collaborative the environment is, the more knowledge will be available to make right decisions.

Collaborative systems sustain work teams, communities and collaborative enterprises, portal type IT platforms proving their efficiency as infrastructures of those environments. Depending on particularities of each organization/community (organization dimension, working needs, etc) it can be chose from an unique portal solution or one based on a distributed model. The IT platform must sustain the KM strategy, which is consolidated by integrating the necessary collaborative tools, MASs and different enterprise applications.

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