THE TECHNICAL DIMENSION OF KNOWLEDGE MANAGEMENT IN THE CONTEXT OF LEARNING AND TRAINING

Luminița GIURGIU[1]
Ghiță BÂRSAN[2]
Dănuț MOȘTEANU[3]

ABSTRACT

The present paper focuses on aspects of placing knowledge management systems in the scene of learning for the purpose of showing how the complete cycle of the creation, dissemination, and utilization of knowledge by merging people, organizational structures, and technologies, is the key to achieve effective learning, problem solving, and finally decision making. The logical argumentation points out that there is a natural suitability between knowledge management and e-learning, together expressing the professional development way in the knowledge based society emphasized by dynamism and continuous renewal. In this perspective it is shown how military academies are facing the challenge of developing knowledge management best practices.

KEYWORDS: *knowledge management systems, e-learning, KM.*

JEL CLASSIFICATION: *D830.*

1. INTRODUCTION

The technical dimension of knowledge management, referred as knowledge management systems (KMS), addresses a class of information systems applied to manage organizational knowledge and make use of modern information technologies to support the organizational processes of knowledge creation, storage, retrieval, transfer, and application. Placing knowledge management systems in the context of learning, it is definitively characterized by a complete chain of the processes of knowledge creation and acquisition, knowledge capture, knowledge application, knowledge sharing and knowledge evaluation. Nowadays, learning and change are keys to cope with the world dynamism because they are absolutely essential for adaptation, experimentation and innovation. That's why application and sharing of knowledge is becoming one of the most important topics, discussed in a number of papers and case studies. In this light it is not surprising that most developed knowledge management tools and technologies focus mainly on knowledge sharing, knowledge transfer and e-learning solutions.

2. WHY AND HOW KNOWLEDGE MANAGEMENT GOT HERE

Nonaka and Takeuchi's "The Knowledge Creating Company" work (1995) had a great impact on the community of researchers in various fields, from economics to philosophy, creating an interdisciplinary concern and the most diverse attitudes toward the knowledge management theme. If some have found that knowledge management is the hottest topic of the day, others thought the knowledge management expression is meaningless. Thus it became necessary a founder demarche

---

[1] Land Forces Academy, Romania, lumigee35@gmail.com
[2] Land Forces Academy, Romania, ghbarsan@gmail.com
[3] Land Forces Academy, Romania, dmosteanu@gmail.com

starting from the question whether, indeed, knowledge can be approached in a managerial way. It was outlined an affirmative answer by the contribution of researchers coming from various disciplines of the economics, sociology, political science, information theory, philosophy. Is well known that we live today in a society in which knowledge is the best capital and it is crucial to know how to use it given that current trends are globalization, restructuring and generalization of good practices. Therefore, knowledge management provides a decisive competitive advantage.

Amid these discussions specific to the search stage of his own paradigmatic identity by the new discipline, in 1998 appears the work Working Knowledge: How organisations manage what they know - written by two Harvard economists, Tom Davenport and Larry Prusak. They refine the Nonaka and Takeuchi's theoretical proposals through an import from the meta-theoretical debates in the information and communication theory. It is formulated the distinction between knowledge and information, beginning to talk about corporate memory and holistic approach becomes dominant. It is investigated the relationship between cognition and organization, it is required and imposed the concept of the learning organization, stated the relationship between knowledge management and strategic management, signaled the need for formulation of criteria for recognition in a timely manner to those units of knowledge that contributes to improving the performances of the organization, first of all by increasing capacity not only of knowledge, but also of its competitive innovation aspect. Finally, a distinction is drawn between knowledge management aimed at creating new knowledge and knowledge management oriented towards existing knowledge transfer into the organization. After only a decade, knowledge management had all the characteristics of an institutionalized discipline. Specialized magazines appear, congresses are organized, research centers are established. Michael Stankosky publishes in 2004 the work Creating the Discipline of Knowledge Management - The Latest in Research University in which he is already talking about the new discipline history, and in 2005, Schwartz publishes an encyclopedia of discipline. As a mature discipline, knowledge management enters the debate stage on its theoretical foundations, including on epistemological theory and practice issues.

3. INFORMATION TECHNOLOGY TO SUPPORT KNOWLEDGE MANAGEMENT (KM)

3.1. Two ways KM

Knowledge management refers a large and complex collection of organizational practices and approaches. The domain professionals define it differently according to the organizational necessities and objectives. They come from two areas of concern:

(a) Information Technology (IT) area: promoters are researchers and professionals with training in computer science or information systems. They are involved in construction of management information systems, artificial intelligence systems, reengineering or groupware. Knowledge is viewed as objects that can be identified and handled in information systems. This area is rapidly advancing aided by new developments in IT.

(b) People Management area: promoters are researchers and professionals with training in philosophy, psychology, sociology or business management. They are primarily involved in the evaluation, skills improvements or individual behaviors change. Knowledge is seen as processes, as a dynamic set of skills, know-how, etc. that are in a permanent change. This area is old and not advancing so rapidly.

To conclude, knowledge management is about people, organizations, processes, content and technology, representing the synergy between social/structural mechanisms and latest technology. Although technology is not the main part of KM, it would be unthinkable to implement KM without considering any technological support. The main objective of this article is to assist in this particular task.

3.2. Knowledge management and e-learning

In the process of professional development, e-learning and KMS converge and affect each other and this depends on how they are designed and how they are used by learners:

- (a) if an e-learning module is designed to be completed by all learners, or if a manager requires that members on a team complete it to qualify for a particular position, that's training. The important thing in e-learning is to have the knowledge and skills necessary at the time it is required.
- (b) on the other hand, if an individual finds and accesses on his own an e-learning module in a knowledge repository just to learn about it, that's KM. The important thing in KM is to have the ability to apply the knowledge and skills necessary in a concrete work situation, when needed.

Integrated approach between KM and e-learning is needed and beneficial in improving organizational performance. The community web portals with dynamic delivery and presentation of the content, similar to Learning Content Management Systems (LCMS), contains a repository of content that is modularized and arranged to facilitate access, authorized users adding or modifying the content to keep it current. To target individual user needs and interests, customized information formalized in learning objects, can be aggregated and integrated within a particular working environment.

3.3. KM software solutions

The focus here should be determining the functionality of the IT systems that are required for the specific activities and initiatives within the learning organization, because, as said before, KMS refer to any kind of IT system that stores and retrieves knowledge, improves collaboration, locates knowledge sources, mines repositories for hidden knowledge, captures and uses knowledge, or enhances the KM process. As a result of the research, eleven categories of software solutions were founded, as following: Intranet-based systems; Electronic document management (EDM); Groupware; Workflow; LCMS, Artificial intelligence-based systems; Business intelligence (BI); Knowledge map systems; Innovation support tools; Competitive intelligence tools; Knowledge portals. Table 1 presents the categories according to the knowledge conversion spiral proposed by Nonaka and Takeuchi (1995):

Table 1. KM software categories and knowledge conversion processes

		To Tacit	To Explicit
		Socialization	Externalization
From Tacit		Knowledge Maps	Groupware
		Knowledge Portals	Workflow
			AI based Systems
			Knowledge Portals
		Internalization	Combination
From Explicit		Innovation Support Tools	Intranet
		LCMS	EDM
			BI
			Competitive Intelligence
			Knowledge Portals
			LCMS

It is of interest to notice how KM software solutions covers a large spectrum of information resources, features and users. For instance Groupware systems are appropriate to support communities of practice of a given domain of knowledge, where informal communication predominates and professionals can exchange opinions, feel free to collaborate across geographical dimensions in order to find solutions to specific problems, while EDM systems deal only with the

explicit dimension of knowledge, being made to retrieve documents. Like EDM systems, knowledge map systems retrieve people, but knowledge map systems deal only with the tacit dimension of knowledge. BI systems support the combination process like EDM and Intranet, but the BI structure is a database with a standardized format while the other two work with documents that appear in a variety of formats and are usually non-structured. Referring to the users, the typical users of the BI systems are managers, while the users of innovation support tools are scientists, engineers involved in creative activities. Finally, the LCMS and knowledge portals prove a synergy of features, being able to integrate features of not only groupware, but also of intranet-based systems, EDM systems, CI systems, and knowledge maps.

4. EFFECTIVE KNOWLEDGE MANAGEMENT IN MILITARY ACADEMIES

Military academies are well-defined educational and training centers, which build up officers for all army categories. As part of an organization focused on knowledge, the issue of KM gained a critical importance in terms of educational efficiency, institutional culture and development project. The future of an important society sphere – that is, security and defense – as well as of the military institution itself is dependent on the way knowledge and its specific processes are managed. Thus, knowledge management appears to be a complex reality, an essentially human process, a strategic-centered approach facilitating the formation, the setting up and the use of the organization intellectual capital. An efficient KM implies a combination of some clearly individualized organizational elements: culture and organizational structure, human resources, and technology.
Some KM aspects in the educational field, according to their diachronically approach are presented:
(a) Organizational measures to make knowledge centered academy;
(b) Needs for and availability of tools;
(c) Information gathering and maintenance;
(d) Implementing new communication process;
(e) Human resources development (faculties' development).

4.1. Organizational measures
The organizational measures which have a strong impact on military academies are part of the military institution restructuring process and consequently of the military learning system. In a knowledge-centered institution, the reform tried not only to encourage knowledge acquisition and systematization, but also to integrate and to transmit it throughout the entire organization, and to offer that explicit knowledge as a background for a viable learning system. Consequently, the measures taken in the knowledge management process concerned the development and the endorsement of techniques which can turn the individuals' "know-how" into explicit knowledge resources at the disposal of the institution. All the initiatives were based on an objective and impartial evaluation of the knowledge background in order to get a real view of the data, information and knowledge that exist within and outside the organization. The knowledge management evaluation facilitates the assessment of knowledge management capabilities in their various aspects: strategy, culture, technology, access, sources, knowledge processes and quality.
As a particular example, the Land Forces Academy undertook the following reform measures, taking into account the academy environment and its capabilities.
The design of the institution reform included:
(a) the change of the educational ideal concept (according to the social pattern expressed by means of the graduate model);
(b) a new building-up architecture based on higher quality standards, concerning the teaching staff, the cadets, the education and the training curricula;
(c) the achievement of a balance among the following aspects: the academic, military, character building and physical ones.

4.2. Needs for and availability of tools

Identifying the needs in the knowledge management field and the tools that contribute to the improvement of the educational process efficiency implies the setting up of the educational system functional requirements.

Generally, in an academy there are three main knowledge management activities: knowledge creation, knowledge dissemination and knowledge encoding.

The process begins with the development of individual tacit knowledge through study and experience as the basis of knowledge creation. It follows the socialization which implies the transfer and the dissemination of knowledge between individuals (teacher/student, trainer/ learner). The debates and dialogues make possible the conceptualization of the tacit/implicit knowledge and determine its externalization, which is the transformation of the tacit knowledge into explicit knowledge. Finally knowledge is combined with the existing and internalized knowledge.

Therefore, the processes providing the effective Knowledge Management are: socialization, externalization and combination, internalization and storing. The above mentioned processes imply the requested functions, which support the main activities of knowledge management. On their turn, these functions are supported by:

(a) the network which provides the dissemination;

(b) the ontological basis providing an unanimously accepted language;

(c) the meta-knowledge which supports the organizational memory.

4.3. Information gathering and maintenance

IT is considered sometimes as an intangible resource which is difficult to be managed. The greatest difficulty for any IT still lies in its ability to span the gap between cyber and cognitive space. Since knowledge is one of the most cognitive of human behaviors, the Information System, designed to manage an organization's knowledge, begins from an extraordinary disadvantage. The key to developing an effective Information System lies in choosing the appropriate technologies for and during specific phases of the knowledge processes: information validation, information dissemination, information storage. Finally, there is considered the critical importance of investments in knowledge enabling technologies, including data warehousing, messaging and Groupware, electronic document management, academic intelligence, work flow and Web-based technologies.

4.4. Implementing new communication processes

In knowledge –based organization, the communication quantity and quality are tightly connected to the learning level and quality which can be acquired in a communication sequence.

While trying an analysis regarding the communication process's developing manner, the following pattern resulted, see figure 1:
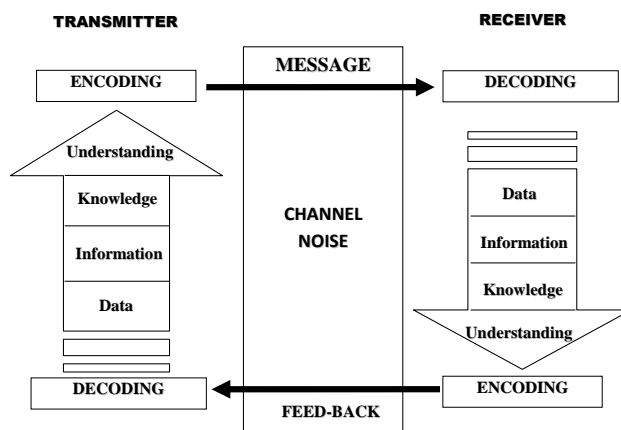
Figure 1. The communication model

It were introduced not only the basic elements of a communication model but also the message encoding and decoding and the message flow processing at the individual level. Emphasizing this aspect is because the entire communication process bears significance for the organization whose structure provides the communication particularity developed on three important levels:

(a) expert: the content of the message has a scientific nature, the information is selected so that only the relevant information should be acquired and here it takes place the validation of the selected information (according to the organizational nature);

(b) educational: focuses on drawing up the pedagogical objectives, disseminating information bearing contents, generating learning and development through the active involvement of those participating in the educational process and the message entails formative reactions at the educational level, it has a bilateral character with interchangeable roles (specific to inter-active methods), it has significance with the role of reproducing the social organizational structure in the subject's consciousness (student, learner) and of developing the organizational culture;

(c) other: accomplishes the information exchange with other organizations (there are subordination relations – reports, briefings and cooperation relations – similar organizations).

4.5. Human resources development

Effective knowledge management implies new roles for both managers and workers. Managing an academy's knowledge assets is a continuous social process of clarifying the goals in such a complex background, encouraging mutual learning and continuous skill development, maintaining trust among members of the academic community, within the institution and beyond it (including societal norms) and creating the rationale. Land Forces Academy is interested in knowing how teachers and others view and manage their knowledge. This is a shared business between the institution and the individuals. An educational program is going on, regarding the creation, sharing and use of knowledge. The main features of that program are: an increased attention to the accountability of teachers for their individual learning and consequently for the development of their tacit knowledge; training employees regarding the creation, sharing, and use of knowledge; developing abilities to use IT and new technique methods required in the activities of knowledge management; giving teachers a greater decision-making power in educational management; developing and adapting techniques for systematically turning the tacit "know-how" of individuals into explicit knowledge resources for the institution; creating and developing "communities of practice", as a new workplace culture, especially for research projects in interdisciplinary fields.

5. CONCLUSIONS

The development of information society as knowledge society is conditioned decisively by the presence of intelligent organizations with advanced capabilities for managing their collective skills as sources of performance. All organizations face the contemporary challenge of developing better knowledge management practices. Military academies are quite distinctive from at least two perspectives. First, it is more critical for academies to successfully address the challenges of KM; society and defense's future is at stake. Secondly the academies have fewer resources to address the challenges of KM. The educational system cannot afford expensive consultants or business systems, and this is unlikely to change dramatically in the near future. However, the complexity of the phenomena of modern society requires a knowledge base and skills increasingly richer: e-learning can be viewed as the core of the KM life cycle, and KM tools and technologies can be successfully applied to e-learning. The use of KM in e-learning definitely impacts the quality of the education on the one hand, and on the other hand a properly implemented e-learning platform provides knowledge management infrastructure to support the educational sector.

KM wise selection of software requires a prior knowledge of the needs of an organization. Among the considerations addressed in some organizations, for example, the critical point may be a low level of socialization; in others, it may be necessary to improve the externalization.

Many organizations that implement KM programs focus exclusively on the transformation of human capital in structural capital. They see KM as an opportunity to extract a portion of their employees' knowledge and store it in the knowledge data bases. This approach ignores dynamic and complex characteristics of the knowledge, his predominantly tacit nature and that, more than the existing knowledge, unceasing creation of knowledge is the distinguishing attribute. Even if it is aided and helped by good software, creative people will be the most useful resource for organization in the knowledge era. Another aspect comprises questions concerning "why" and not "how" to share knowledge, implying the role of personal motivation and organizational culture rather than technology issues.

Heavily relying on technology, knowledge management solution is not represented by its technical dimension. There are more subtle socio-cultural and organizational traits that need to be addressed in implementing a KMS to ensure the success and acceptance of knowledge management.

REFERENCES

Giurgiu, L. (2015). Vectors of Knowledge Society: Knowledge *Management and E-learning. Management Studies*, DOI:10.17265/2328-2185/2015.1112.004.

Jansen, C. *Knowledge Portals: Using the Internet to Enable Business Transformation.* Retrieved October 11, 2015 from: https://www.isoc.org/inet2000/cdproceedings/7d/7d_2.htm.

Lindvall, M., Rus, I., Jammalamadaka, R. &Thakker, R. (2001). *Software Tools for Knowledge Management, DACS State-of-the-Art-Report*.

Lindvall, M. & Rus, I. (2012). Technology Support for Knowledge Management. In Volume 2640 of the series Lecture Notes in Computer Science, *Advances in Learning Software Organizations* (pp 94-103), Springer Berlin Heidelberg.

Mansourvar, M. & Yasin, N. (2010). Web portal as Knowledge Management System in the universities. *World Academy and Science, Engineering and Tehnology*, *70*, 2010. Retrieved October 10, 2015 from: www.cedru.net/spiss/documente/v70-174.pdf.

Niculescu, C. (2008). *Sisteme de management de cunoştinţe*. Bucureşti: Editura Matrix Rom.

Nonaka, I. & Takeuchi, H. (1995). *The Knowledge Creating Company*, Oxford University Press.